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June 26, 2001
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Mr. Steve Shaffer
U.S. Nuclear Regulatory Commission
Region I
475 Allendale Road
King of Prussia, PA 19406

Subject: Transmittal of SCIENTECH, Inc. Document

Dear Mr. Shaffer:

Please find enclosed one (1) uncontrolled copy of Addendum 3, *Whittaker Site Groundwater Monitoring Well Sampling*, to SCIENTECH Document No. 82A9103, Rev. 2, *Groundwater Monitoring Plan, Whittaker Corporation, Greenville, PA*, for your records.

Should you have any questions or comments, please call me at (203) 796-5340.

Sincerely,

Roy Racino

Roy Racino
Project Manager

RR:lp
Enclosure

NMSS/RGN MATERIALS-002

44 Shelter Rock Road • Danbury, CT 06810 • Tele: (203) 796-5000 • Fax: (203) 792-3168

nes
A SCIENTECH, INC., Company

Effective Date

## ADDENDUM AUTHORIZATION

Document Title: GROUNDWATER MONITORING PLAN
Document No. 82A9103, Rev 2
Addendum No.: 3
Originator Roy Racine
For Site/Utility: Whittaker Site, Greenville, PA.

Description of Addendum:

Report on site Groundwater Monitoring activities for the 1st Quarter of 2001.

UNCONTROLLED COPY

Reason for Change:

Per the GROUNDWATER MONITORING PLAN, Section 3, results of annual groundwater monitoring are to be submitted by the end of the second calendar quarter.

APPROVALS:

| Title | Signature | Date |
|---|---|---|
| Tech Review | Stewart R Smith | 6/26/01 |
| Dept Mgr | Edwec Donlan | 6/26/01 |
| | | |
| | | |
| | | |

Approvals for the Addendum shall at least be equal to the approvals of the base document and may include customer sign off.

Distribute to all Controlled Copy holders of affected document and _____.

A copy of this authorization shall be attached to the affected document.

**FIGURE 4.7**
**ADDENDUM AUTHORIZATION FORM**

June 25, 2001

Subject: Whittaker Site Groundwater Monitoring Well Sampling

## INTRODUCTION

In accordance with Whittaker Corporation's US Nuclear Regulatory Commission (NRC) License No. SMA-1018, Amendment No. 8, Condition No. 14, and SCIENTECH, Inc. (SCIENTECH) Document 82A9103, Rev. 2, "Groundwater Monitoring Plan, Whittaker Corporation, Greenville, PA" (the Plan), well sampling activities were conducted during April 3 – 5, 2001. SCIENTECH personnel on-site to perform this work were Roy Racino (Project Manager and Site RSO), Pat Horkman (Site Supervisor), and Mark Burno (Senior Environmental Scientist). Well sampling procedures and analytical protocol are discussed and specified in the Plan.

New site groundwater monitoring wells were installed and sampled in April and May of 2000. These activities were reported in Addendas 1 and 2 to the Plan. Although the Plan requires annual sampling and radiological analysis of groundwater, it was decided to implement more frequent monitoring of these new wells to confirm or supplement data that has been utilized as inputs for site dose modeling parameters. Inputting site-specific data that is generated from these wells for parameters such as contaminant solubility, leaching, and depths to groundwater may assist in producing a more accurate dose model. Initiation of a quarterly sampling frequency was discussed and agreed upon at the site risk analysis meeting at NRC Headquarters on February 15, 2000. This additional sampling will be incorporated into the site quarterly surveillance inspection visits that are required by License SMA-1018.

Another factor influencing the decision to perform radiological monitoring on a quarterly basis was the necessity of initiating quarterly sampling of site groundwater to investigate site compliance with Pennsylvania's Environmental Cleanup Program. As part of a site remediation, any materials that meet the radiological criteria for unrestricted release and are to remain on-site must conform to the criteria in PA Code, Title 25, Chapter 250 for Organic and Inorganic Regulated Substances in Soil, Surface Water, and Groundwater (Act 2 Land Recycling Regulations). A quarterly well and surface water sampling

protocol has been implemented to analyze for regulated substances to determine the status of the site in regards to compliance with Chapter 250 criteria.

## ACTIVITIES

Groundwater samples were analyzed for the presence of gross beta and gross alpha emitters by Teledyne Brown Engineering of Oak Ridge, TN. Unfiltered samples and samples that were field filtered to 0.45 microns were analyzed from each monitoring well. The order in which the wells were sampled was determined by access and weather conditions during a particular day.

Table 1 provides a summary of well analytical results for gross alpha and beta. Wells #4, #6 and #10 produced gross alpha and/or gross beta results greater than 15 pCi/L or 50 pCi/L, respectively, and were analyzed isotopically for Thorium and Uranium. The results of the isotopic analyses are summarized in Table 2.

**Table 1: Groundwater Monitoring Well (MW) Data**

| MW# | Date Sampled | Results – pCi/L | | Results, Filtered *– pCi/L | |
|---|---|---|---|---|---|
| | | Gross Alpha | Gross Beta | Gross Alpha | Gross Beta |
| 1 | 4/3/01 | < 4 | < 3 | < 4 | 6.0 |
| 2 | 4/3/01 | < 5 | 13 | < 4 | 3.6 |
| 3 | 4/4/01 | < 3 | 3.9 | < 3 | 5.5 |
| **4** | 4/4/01 | **26** | **140** | < 4 | 7.6 |
| 5 | 4/4/01 | < 3 | 13 | < 3 | 12 |
| **6** | 4/4/01 | 15 | **61** | < 4 | 12 |
| 7 | 4/4/01 | < 3 | 6.7 | < 3 | 3.6 |
| 8 | 4/3/01 | < 7 | 39 | < 6 | 30 |
| 9 | 4/3/01 | < 6 | 4.5 | < 5 | 4.0 |
| **10** | 4/3/01 | < 1 | **77** | < 5 | 12 |

* = field filtered sample, 0.45 micron

**Table 2: Isotopic Analysis of Elevated Groundwater Samples**

| MW# (Unfiltered) | Isotopic Results – pCi/L | | | | | |
|---|---|---|---|---|---|---|
| | Th-232 | Th-230 | Th-228 | U-233/234 | U-235 | U-238 |
| 4 | 3.3 | 1.7 | 3.9 | 2.8 | <0.1 | 1.9 |
| 6 | <0.09 | 1.0 | 1.6 | 2.4 | 0.52 | 1.3 |
| 10 | <0.2 | 0.71 | <0.5 | 0.26 | <0.1 | 0.29 |

The results in Table 2 indicate that the thorium and uranium concentrations in the elevated well water samples are below the 10 CFR 20, Appendix B criteria for water effluent concentrations.

Table 3 compares the results of monitoring well water analysis for gross alpha and gross beta for unfiltered samples for the May 2000 and April 2001 samplings.

**Table 3: 2000 to 2001 Well Data Comparison**

| MW # (Unfiltered) | pCi/L – 5/00 sampling | | pCi/L – 4/01 sampling | |
|---|---|---|---|---|
| | Gross Alpha | Gross Beta | Gross Alpha | Gross Beta |
| 1 | <5 | 29 | <4 | <3 |
| 2 | 15 | 28 | <5 | 13 |
| 3 | <3 | 8.6 | <3 | 3.9 |
| 4 | 9.9 | 48 | **26** | **140** |
| 5 | <3 | 18 | <3 | 13 |
| 6 | **25** | **85** | 15 | **61** |
| 7 | 6.2 | 19 | <3 | 6.7 |
| 8 | 8.6 | **73** | <7 | 39 |
| 9 | <5 | 13 | <6 | 4.5 |
| 10 | **23** | **95** | <1 | **77** |

Table 4 compares the groundwater depths in the monitoring wells for the initial well installations and the two subsequent sampling dates.

**Table 4: Monitoring Wells - Depth to Water**

| MW# | Depth to Water – Ft * | | |
|---|---|---|---|
| | 4/14/00 | 5/16 – 5/18/00 | 4/3 – 4/4/01 |
| 1 | 4.27 | 5.62 | 4.87 |
| 2 | 8.55 | 10.79 | 11.12 |
| 3 | 0.74 | 1.44 | 1.72 |
| 4 | 15.17 | 16.07 | 16.33 |
| 5 | 4.72 | 7.30 | 6.91 |
| 6 | 19.98 | 19.48 | 20.42 |
| 7 | 3.98 | 4.35 | 4.33 |
| 8 | 19.25 | 19.13 | 18.74 |
| 9 | 2.65 | >0 ** | 0.0 |
| 10 | 20.04 | 21.51 | 21.13 |

* – measured from top of PVC pipe

** groundwater was pushing up and out of the top of the PVC pipe

With the exception of MWs #8 and #9, the depths to water in April of 2001 were greater than in May of 2000. This drop in water column ranged from 4.2 (Mw #7) to 30.8 (MW #2) inches.

Well samples were also taken and shipped to Virginia LeGore of Pacific Northwest National Labs (PNNL) in Richland, WA to assist in NRC sponsored research on slags that contain thorium and uranium. These consisted of two (2) each 500ml unfiltered samples from wells #1, #5, #6, #8, and #10 to encompass up and down gradient groundwater conditions. In addition, water from the Shenango River at a point downriver from the site was sampled.

PA Act 2 sampling was performed for ground and surface water contaminant analysis. Groundwater analysis was performed on samples from monitoring wells #1 - #10. Surface water analysis was performed on samples from the two small culvert discharge ponds in the ravine area (North and South Ponds), a small surface drainage point from the base of the Section 3 slope to the Shenango River (Section 3 Discharge), and a sample from the Shenango River upriver from the site. A detailed discussion of the scope and results of the Act 2 sampling program will be provided as a separate report.

## SUMMARY

Unfiltered sample results for gross alpha and beta emitters for the April 2001 sampling were all less than the results for the May 2000 sampling with the exception of MW #4. The MW #4 results for this year were approximately three times greater than last year for both gross alpha and gross beta. The gross beta result for MW #8, which was greater than 50 pCi/L last year, decreased to 39 pCi/L. MWs #6 and #10 remained greater than 50 pCi/L for gross beta, although substantially decreased, while gross alpha levels decreased to less than or equal to 15 pCi/L.

Isotopic Thorium and Uranium results for MWs #6 and #10 were generally less than the isotopic results from the May 2000 sampling. Isotopic results for MW #4, although well below the 10 CFR 20, Appendix B criteria for water effluent concentrations, were generally greater than any of the isotopic results from the May 2000 sampling. It is not clear at this time why the radionuclide concentrations in the upgradient MW #4 would have increased.

Field filtering with a 0.45 micron filter reduced all elevated gross alpha and beta concentrations significantly, which would suggest that the contaminants are not soluble and are in a particulate form.

Information on radionuclide concentrations and water levels will continue to be collected and monitored to evaluate site conditions and to identify possible trends regarding groundwater conditions.

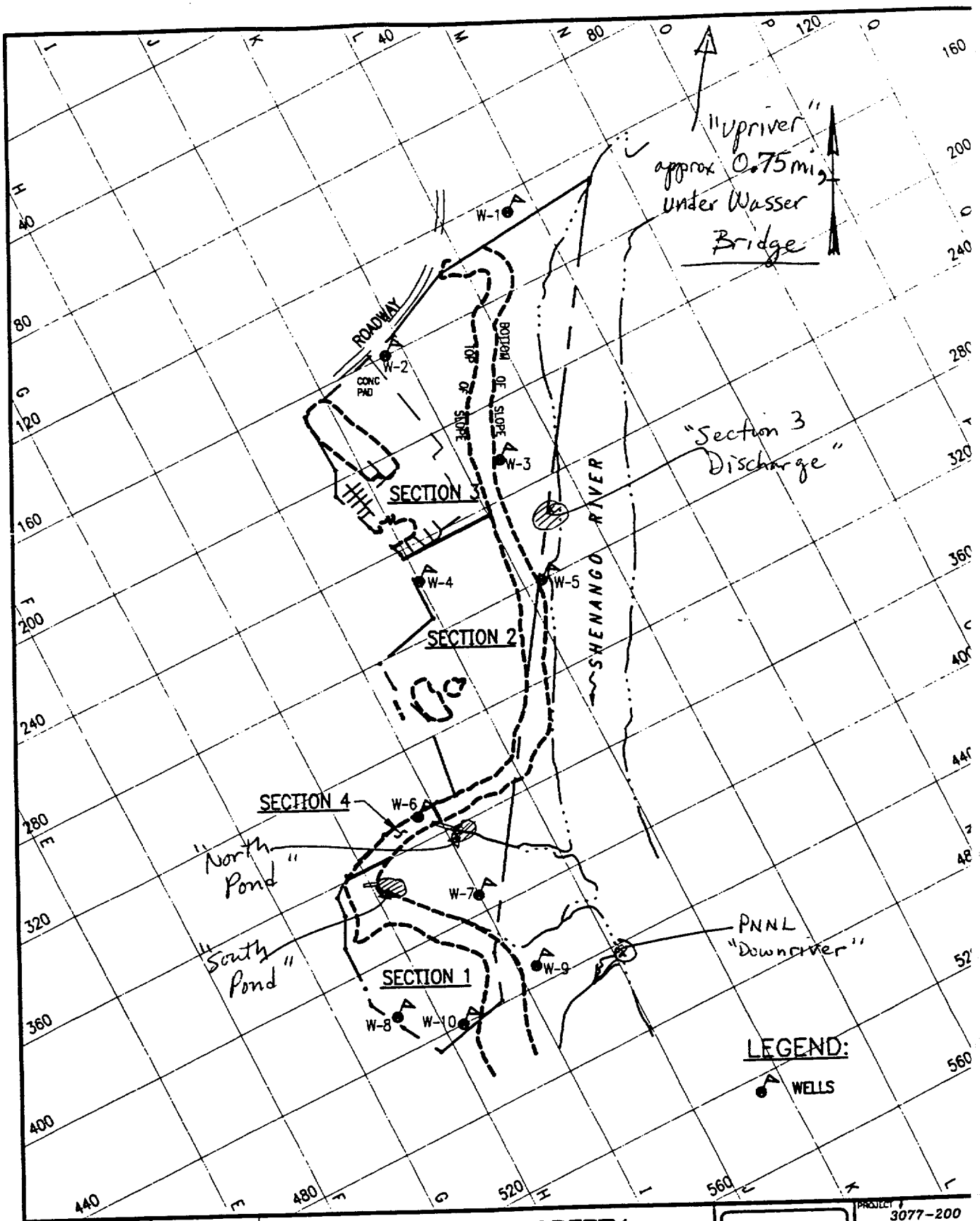
## ATTACHMENTS

The following supporting documentation is provided as attachments to this report.

| | # of Pages |
|---|---|
| • Site Well and Sample Location Map | 1 |
| • Teledyne Water Analysis Reports | 25 |
| • Groundwater Sampling Logs and Field Notes | 11 |
| • Instrument Calibration & Operational Checks, RWP and Dosimetry Data (See SCIENTECH Doc. 82A9103, Addendum 8) | |

**Site Well and Sample Location Map**

**(1 page)**




| DOCUMENT CONTROL NO. | PROJECT | WHITTAKER PROPERTY<br>PYMATUNING TWP., MERCER CO., PA | SCIENTECH NES, Inc.<br>44 Shelter Rock Road<br>Danbury, CT 06810<br>(203) 796-5000 | PROJECT # 3077-200 |
|---|---|---|---|---|
| 829103-ADDM. 1 | | | | FILENAME: 3077200A |
| REVISION NO. | DRAWING | GROUNDWATER MONITORING WELL LOCATIONS | | SCALE: 1" =200' DATE: 8/4/ |
| | | | | BY: AD CK: |
| | | | | FIGURE # 1 |

**Teledyne Water Analysis Reports**
**(25 pages)**

ALATHAM

TELEDYNE BROWN ENGINEERING Environmental Services

REPORT OF ANALYSIS

May 07 2001, 04:20 pm

LOGIN # L15160

PROJECT # NE506-3EREGLS

| Address: | Work Order #: | Cust. P.O. #: | Date Received | Delivery Date | PAGE: 1 |
|---|---|---|---|---|---|
| ROY RACINO<br>SCIENTECH NES INC<br>44 SHELTER ROCK ROAD<br>DANBURY CT 06810-7095 | L15160 | Release #: | 04/13/01 | 05/11/01 | Project Manager: A.LATHAM |

| Teledyne Sample # | Customer's Identification | Sta. # | Collection-Dates Start Date/Time | Stop Date/Time | Matrix/ Nuclide | Activity | Units | Count Date | Volume Procedure # | Units | Lab Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Matrix - W-Other | | | | | | | | | | | |
| L15160-1 | MW#1 | | 04/03/01 10:35 | | Water | | | | | | |
| TI#-56311 | | | | | GR-A | L.T. 4. E 00 | pCi/l | 04/18/01 | | | 32 |
| | | | | | GR-B | L.T. 3. E 00 | | 04/18/01 | | | 32 |
| L15160-2 | MW#2 | | 04/03/01 11:47 | | Water | | | | | | |
| TI#-56312 | | | | | GR-A | L.T. 5. E 00 | | 04/18/01 | | | 32 |
| | | | | | GR-B | 1.3 +-0.3 E 01 | | 04/18/01 | | | 32 |
| L15160-3 | MW#3 | | 04/04/01 12:15 | | Water | | | | | | |
| TI#-56313 | | | | | GR-A | L.T. 3. E 00 | | 04/18/01 | | | 32 |
| | | | | | GR-B | 3.9 +-2.2 E 00 | | 04/18/01 | | | 32 |
| L15160-4 | MW#4 | | 04/04/01 09:30 | | Water | | | | | | |
| TI#-56314 | | | | | GR-A | 2.6 +-1.4 E 01 | | 04/18/01 | | | 32 |
| | | | | | GR-B | 1.4 +-0.1 E 02 | | 04/18/01 | | | 32 |
| L15160-5 | MW#5 | | 04/04/01 11:00 | | Water | | | | | | |
| TI#-56315 | | | | | GR-A | L.T. 3. E 00 | | 04/18/01 | | | 32 |
| | | | | | GR-B | 1.3 +-0.3 E 01 | | 04/18/01 | | | 32 |
| L15160-6 | MW#6 | | 04/04/01 14:47 | | Water | | | | | | |
| TI#-56316 | | | | | GR-A | 1.5 +-0.9 E 01 | | 04/18/01 | | | 32 |
| | | | | | GR-B | 6.1 +-0.7 E 01 | | 04/18/01 | | | 32 |
| L15160-7 | MW#7 | | 04/04/01 16:15 | | Water | | | | | | |
| TI#-56317 | | | | | GR-A | L.T. 3. E 00 | | 04/18/01 | | | 32 |
| | | | | | GR-B | 6.7 +-2.5 E 00 | | 04/18/01 | | | 32 |

Lab Key: 22 - Gas Lab; 32 - Radiochemistry Lab; 42 - GE(Li) Gamma Spec Lab; 52 - Tritium Lab; 62 - Alpha Spec Lab; 12 - Environmental TLD; 72 - Consulting;

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TELEDYNE BROWN ENGINEERING Environmental Services

REPORT OF ANALYSIS

May 07 2001, 04:20 pm

LOGIN # L15160

PROJECT # NE506-3EREGLS

| Address: | Work Order #: | Cust. P.O. #: | Date Received | Delivery Date | PAGE: 2 |
|---|---|---|---|---|---|
| ROY RACINO<br>SCIENTECH NES INC<br>44 SHELTER ROCK ROAD<br>DANBURY CT 06810-7095 | L15160 | Release #: | 04/13/01 | 05/11/01 | Project Manager: A.LATHAM |

| Teledyne Sample # | Customer's Identification | Sta. # | Collection-Dates Start Date/Time | Stop Date/Time | Matrix/ Nuclide | Activity | Units | Count Date | Volume Procedure # | Units | Lab Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Continued | | | | | | | | | | | |
| L15160-8 | MW#8 | | 04/03/01 14:25 | | Water | | | | | | |
| TI#-56318 | | | | | GR-A | L.T. 7. E 00 | pCi/l | 04/18/01 | | | 32 |
| | | | | | GR-B | 3.9 +-0.5 E 01 | | 04/18/01 | | | 32 |
| L15160-9 | MW#9 | | 04/03/01 15:45 | | Water | | | | | | |
| TI#-56319 | | | | | GR-A | L.T. 6. E 00 | | 04/18/01 | | | 32 |
| | | | | | GR-B | 4.5 +-2.8 E 00 | | 04/18/01 | | | 32 |
| L15160-10 | MW#10 | | 04/03/01 17:00 | | Water | | | | | | |
| TI#-56320 | | | | | GR-A | L.T. 1. E 01 | | 04/18/01 | | | 32 |
| | | | | | GR-B | 7.7 +-0.8 E 01 | | 04/18/01 | | | 32 |
| L15160-11 | MW#1(F) | | 04/03/01 10:35 | | Water | | | | | | |
| TI#-56321 | | | | | GR-A | L.T. 4. E 00 | | 04/18/01 | | | 32 |
| | | | | | GR-B | 6.0 +-2.6 E 00 | | 04/18/01 | | | 32 |
| L15160-12 | MW#2(F) | | 04/03/01 11:47 | | Water | | | | | | |
| TI#-56322 | | | | | GR-A | L.T. 4. E 00 | | 04/18/01 | | | 32 |
| | | | | | GR-B | 3.6 +-2.5 E 00 | | 04/18/01 | | | 32 |
| L15160-13 | MW#3(F) | | 04/04/01 12:15 | | Water | | | | | | |
| TI#-56323 | | | | | GR-A | L.T. 3. E 00 | | 04/18/01 | | | 32 |
| | | | | | GR-B | 5.5 +-2.4 E 00 | | 04/18/01 | | | 32 |
| L15160-14 | MW#4(F) | | 04/04/01 09:30 | | Water | | | | | | |
| TI#-56324 | | | | | GR-A | L.T. 4. E 00 | | 04/18/01 | | | 32 |
| | | | | | GR-B | 7.6 +-2.6 E 00 | | 04/18/01 | | | 32 |
| L15160-15 | MW#5(F) | | 04/04/01 11:00 | | Water | | | | | | |

Lab Key: 22 - Gas Lab; 32 - Radiochemistry Lab; 42 - GE(Li) Gamma Spec Lab; 52 - Tritium Lab; 62 - Alpha Spec Lab; 12 - Environmental TLD; 72 - Consulting;

ALATHAM

TELEDYNE BROWN ENGINEERING Environmental Services

REPORT OF ANALYSIS

May 07 2001, 04:20 pm

LOGIN # L15160

PROJECT # NE506-3EREGLS

| Address: | Work Order #: | Cust. P.O. #: | Date Received | Delivery Date | PAGE: 3 |
|---|---|---|---|---|---|
| ROY RACINO<br>SCIENTECH NES INC<br>44 SHELTER ROCK ROAD<br>DANBURY CT 06810-7095 | L15160 | Release #: | 04/13/01 | 05/11/01 | Project Manager: A.LATHAM |

| Teledyne Sample # | Customer's Identification | Sta. # | Collection-Dates Start Date/Time | Stop Date/Time | Matrix/ Nuclide | Activity | Units | Count Date | Volume Procedure # | Units | Lab Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Continued | | | | | | | | | | | |
| TI#-56325 | | | | | GR-A | L.T. 3. E 00 | pCi/l | 04/18/01 | | | 32 |
| | | | | | GR-B | 1.2 +-0.3 E 01 | | 04/18/01 | | | 32 |
| L15160-16 | MW#6(F) | | 04/04/01 14:47 | | Water | | | | | | |
| TI#-56326 | | | | | GR-A | L.T. 4. E 00 | | 04/18/01 | | | 32 |
| | | | | | GR-B | 1.2 +-0.3 E 01 | | 04/18/01 | | | 32 |
| L15160-17 | MW#7(F) | | 04/04/01 16:15 | | Water | | | | | | |
| TI#-56327 | | | | | GR-A | L.T. 3. E 00 | | 04/18/01 | | | 32 |
| | | | | | GR-B | 3.6 +-2.2 E 00 | | 04/18/01 | | | 32 |
| L15160-18 | MW#8(F) | | 04/03/01 14:25 | | Water | | | | | | |
| TI#-56328 | | | | | GR-A | L.T. 6. E 00 | | 04/18/01 | | | 32 |
| | | | | | GR-B | 3.0 +-0.5 E 01 | | 04/18/01 | | | 32 |
| L15160-19 | MW#9(F) | | 04/03/01 15:45 | | Water | | | | | | |
| TI#-56329 | | | | | GR-A | L.T. 5. E 00 | | 04/18/01 | | | 32 |
| | | | | | GR-B | 4.0 +-2.7 E 00 | | 04/18/01 | | | 32 |
| L15160-20 | MW#10(F) | | 04/03/01 17:00 | | Water | | | | | | |
| TI#-56330 | | | | | GR-A | L.T. 5. E 00 | | 04/18/01 | | | 32 |
| | | | | | GR-B | 1.2 +-0.3 E 01 | | 04/18/01 | | | 32 |

Lab Key: 22 - Gas Lab; 32 - Radiochemistry Lab; 42 - GE(Li) Gamma Spec Lab; 52 - Tritium Lab; 62 - Alpha Spec Lab; 12 - Environmental TLD; 72 - Consulting;

ALATHAM

TELEDYNE BROWN ENGINEERING Environmental Services

REPORT OF ANALYSIS

May 07 2001, 04:20 pm

LOGIN # L15160

PROJECT # NE506-3EREGLS

| Address: | Work Order #: | Cust. P.O. #: | Date Received | Delivery Date | PAGE: 4 |
|---|---|---|---|---|---|
| ROY RACINO<br>SCIENTECH NES INC<br>44 SHELTER ROCK ROAD<br>DANBURY CT 06810-7095 | L15160 | Release #: | 04/13/01 | 05/11/01 | Project Manager: A.LATHAM |

| Teledyne Sample # | Customer's Identification | Sta. # | Collection-Dates Start Date/Time | Stop Date/Time | Matrix/ Nuclide | Activity | Units | Count Date | Volume Procedure # | Units | Lab Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|

Cathey B. Sharp
Operation Manager

Last Page of Report

Lab Key: 22 - Gas Lab; 32 - Radiochemistry Lab; 42 - GE(Li) Gamma Spec Lab; 52 - Tritium Lab; 62 - Alpha Spec Lab; 12 - Environmental TLD; 72 - Consulting;

**RADIOCHEMICAL WORK SHEET - GROSS BETA/GROSS ALPHA (gr-abws)**

Customer: NES INC  Project #: NE506-3EREGLS

Analyst: Susan Frank  Preparation Date: 4/17/01  Aliquot: 300  Units: mls  Sample Type: WO

Counter: 74  Count Date Start: 4/18  Stop:  Client Rep.: A.LATHAM  Origin: E

| T.I. # | LIMS Sample # | Client I.D. | QC | Analysis | Weight of Mount (grams) | Seq. # | N (counts | dT (min) | Bkg. (cpm) | Eff. | Volume or Weight (gms) WET DRY | ASH | % | Activity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 56311 | L15160-1 | MW#1 - | | GR-B | 0.2497 | 3 | 74 | 50 | .94 | | | | | L.T 3. E+00 |
| 56311 | L15160-1 | MW#1 - | | GR-A | ↓ | | 3 | ↓ | .08 | | | | | L.T 4. E+00 |
| 56312 | L15160-2 | MW#2 - | | GR-B | 0.3439 | 4 | 160 | ↓ | ↓ | | | | | 1.3 ± 0.3 E+01 |
| 56312 | L15160-2 | MW#2 - | | GR-A | ↓ | | 9 | ↓ | ↓ | | | | | L.T 5. ~~6~~ 04/30/01 E+00 |
| 56313 | L15160-3 | MW#3 - | | GR-B | 0.1808 | 5 | 88 | ↓ | ↓ | | | | | 3.9 ± 2.2 E+00 |
| 56313 | L15160-3 | MW#3 - | | GR-A | ↓ | | 4 | ↓ | ↓ | | | | | L.T 3. E+00 |
| 56314 | L15160-4 | MW#4 - | | GR-B | 1.1206 | 6 | 812 | ↓ | ↓ | | | | | 1.4 ± 0.1 E+02 |
| 56314 | L15160-4 | MW#4 - | | GR-A | ↓ | | 23 | ↓ | ↓ | | | | | 2.6 ± 1.4 E+01 |
| 56315 | L15160-5 | MW#5 - | | GR-B | 0.1611 | 7 | 191 | ↓ | ↓ | | | | | 1.3 ± 0.3 E+01 |
| 56315 | L15160-5 | MW#5 - | | GR-A | ↓ | | 7 | ↓ | ↓ | | | | | L.T ~~3~~ 04/30/01 3. E+00 |

Units: pCi/L  Code: A

Calc. By: JW  Date: 04/30/01

Checked By: [illegible]  Date: 5/3/01

Date Entered: MAY - 4 2001

Note: If GR-A is > 15 pCi/l or GR-B is > 50 pCi/l, perform Isotopic Th and U on that sample

**RADIOCHEMICAL WORK SHEET - GROSS BETA/GROSS ALPHA (gr-abws)**

Customer: NES INC  Project #: NE506-3EREGLS

Analyst: SUSAN FRANK  Preparation Date: 04/17/01  Aliquot: 300  Units: MLS  Sample Type: WO

Counter: T-4  Count Date Start: 04/18  Stop:  Client Rep.: A.LATHAM  Origin: E

| T.I. # | LIMS Sample # | Client I.D. | QC | Analysis | Weight of Mount (grams) | Seq. # | N (counts | dT (min) | Bkg. (cpm) | Eff. | Volume or Weight (gms) WET DRY | ASH | % | Activity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 56316 | L15160-6 | MW#6 - | | GR-B | 0.6709 | 8 | 461 | 50 | 0.94 | 0.2040 | | | | 6.1 ± 0.7 E+01 |
| 56316 | L15160-6 | MW#6 - | | GR-A | ↓ | | 21 | ↓ | 0.08 | 0.0338 | | | | 1.5 ± 0.9 E+01 |
| 56317 | L15160-7 | MW#7 - | | GR-B | 0.1905 | 9 | 116 | ↓ | ↓ | 0.0378 ~~0.0862~~ | | | | 6.7 ± 2.5 E+00 |
| 56317 | L15160-7 | MW#7 - | | GR-A | ↓ | | 7 | ↓ | ↓ | 0.0862 | | | | L.T 3. E+00 |
| 56318 | L15160-8 | MW#8 - | | GR-B | 0.5768 | 10 | 331 | ↓ | ↓ | 0.2163 | | | | 3.9 ± 0.5 E+01 |
| 56318 | L15160-8 | MW#8 - | | GR-A | ↓ | | 4 | ↓ | ↓ | 0.0382 | | | | L.T 7.0 E+00 |
| 56319 | L15160-9 | MW#9 - | | GR-B | 0.4074 | 11 | 84 | ↓ | ↓ | 0.2454 | | | | 4.5 ± 2.8 E+00 |
| 56319 | L15160-9 | MW#9 - | | GR-A | ↓ | | 1 | ↓ | ↓ | 0.0503 | | | | L.T 6. E+00 |
| 56320 | L15160-10 | MW#10 - | | GR-B | 0.8458 | 12 | 522 | ↓ | ↓ | 0.1857 | | | | 7.7 ± 0.8 E+01 |
| 56320 | L15160-10 | MW#10 - | | GR-A | ↓ | | 11 | ↓ | ↓ | 0.0279 | | | | L.T 1. E+01 |

Units: pCi/L  Code: A

Calc. By: MW  Date: 05/02/01

Checked By: [illegible]  Date: 5/3/01

Date Entered: MAY - 1 2001

**RADIOCHEMICAL WORK SHEET - GROSS BETA/GROSS ALPHA (gr-abws)**

Customer: NES INC  Project #: NE506-3EREGLS

Analyst: Susan Frank  Preparation Date: 4/17/01  Aliquot: 300  Units: ml  Sample Type: WO

Counter: 74  Count Date Start: 4/18  Stop:  Client Rep.: A.LATHAM  Origin: E

| T.I. # | LIMS Sample # | Client I.D. | QC | Analysis | Weight of Mount (grams) | Seq. # | N (counts | dT (min) | Bkg. (cpm) | Eff. | Volume or Weight (gms) WET DRY | ASH | % | Activity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 56321 | L15160-11 | MW#1(F) - | | GR-B | 0.2476 | 13 | 104 | 50 | .94 | | | | | 6.0 ± 2.6 E+00 |
| 56321 | L15160-11 | MW#1(F) - | | GR-A | ↓ | | 4 | ↓ | .08 | | | | | L.T 4. E+00 |
| 56322 | L15160-12 | MW#2(F) - | | GR-B | 0.2912 | 14 | 80 | ↓ | ↓ | | | | | 3.6 ± 2.5 E+00 |
| 56322 | L15160-12 | MW#2(F) - | | GR-A | ↓ | | 8 | ↓ | ↓ | | | | | L.T 4. E+00 |
| 56323 | L15160-13 | MW#3(F) - | | GR-B | 0.2050 | 15 | 102 | ↓ | ↓ | | | | | 5.5 ± 2.4 E+00 |
| 56323 | L15160-13 | MW#3(F) - | | GR-A | ↓ | | 7 | ↓ | ↓ | | | | | L.T 3. E+00 |
| 56324 | L15160-14 | MW#4(F) - | | GR-B | 0.2221 | 16 | 122 | ↓ | ↓ | | | | | 7.6 ± 2.6 E+00 |
| 56324 | L15160-14 | MW#4(F) - | | GR-A | ↓ | | 6 | ↓ | ↓ | | | | | L.T 4. E+00 |
| 56325 | L15160-15 | MW#5(F) - | | GR-B | 0.1539 | 17 | 175 | ↓ | ↓ | | | | | 1.2 ± .3 E+01 |
| 56325 | L15160-15 | MW#5(F) - | | GR-A | ↓ | | 4 | ↓ | ↓ | | | | | L.T 3. E+00 |

Units: pCi/L  Code: A

Note: If GR-α is >15pci/l or GR-B is > 50pci/l, perform Isotopic Th and U on that sample.

Calc. By: [illegible]  Date: 04/30/01

Checked By: [illegible]  Date: 5/3/4

Date Entered:

MAY - 4 2001

**RADIOCHEMICAL WORK SHEET - GROSS BETA/GROSS ALPHA (gr-abw#)**

Customer: NES INC  Project #: NE506-3EREGLS

Analyst: SUSAN FRANK  Preparation Date: 04/17/01  Aliquot: 300  Units: mLS  Sample Type: WO

Counter: T-4  Count Date Start: 04/18  Stop:  Client Rep.: A.LATHAM  Origin: E

| T.I. # | LIMS Sample # | Client I.D. | QC | Analysis | Weight of Mount (grams) | Seq. # | N (counts | dT (min) | Bkg. (cpm) | Eff. | Volume or Weight (gms) WET DRY | ASH | % | Activity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 56326 | L15160-16 | MW#6(F) - | | GR-B | 0.2434 | 18 | 165 | 50 | 0.94 | 0.2884 | | | | 1.2 ± 0.3 E+01 |
| 56326 | L15160-16 | MW#6(F) - | | GR-A | ↓ | | 3 | | 0.08 | 0.0732 | | | | L.T 4. E+00 |
| 56327 | L15160-17 | MW#7(F) - | | GR-B | 0.1724 | 19 | 85 | | | 0.3154 | | | | 3.6 ± 2.2 E+00 |
| 56327 | L15160-17 | MW#7(F) - | | GR-A | ↓ | | 3 | | | 0.0918 | | | | L.T 3. E+00 |
| 56328 | L15160-18 | MW#8(F) - | | GR-B | 0.4735 | 20 | 282 | | | 0.2327 | | | | 3.0 ± 0.5 E+01 |
| 56328 | L15160-18 | MW#8(F) - | | GR-A | ↓ | | 2 | | | 0.0447 | | | | L.T 6. E+00 |
| 56329 | L15160-19 | MW#9(F) - | | GR-B | 0.3754 | 21 | 81 | | | 0.2523 | | | | 4.0 ± 2.7 E+00 |
| 56329 | L15160-19 | MW#9(F) - | | GR-A | ↓ | | 5 | | | 0.0535 | | | | L.T 5. E+00 |
| 56330 | L15160-20 | MW#10(F) - | | GR-B | 0.3572 | 22 | 146 | | | 0.2565 | | | | 1.2 ± 0.3 E+01 |
| 56330 | L15160-20 | MW#10(F) - | | GR-A | ↓ | | 4 | | | 0.0555 | | | | L.T 4. E+00 |

Units: pCi/L  Code: A

Calc. By: MW  Date: 05/02/01

Checked By: [illegible]  Date: 5/3/01

Date Entered: MAY - 1 2001

RCHARLES

TELEDYNE BROWN ENGINEERING Environmental Services

REPORT OF ANALYSIS

Jun 07 2001, 10:48 am

LOGIN # L15358

PROJECT # NE506-3EREGLS

| Address: | Work Order #: | Cust. P.O. #: | Date Received | Delivery Date | PAGE: 1 |
|---|---|---|---|---|---|
| ROY RACINO<br>SCIENTECH NES INC<br>44 SHELTER ROCK ROAD<br>DANBURY CT 06810-7095 | L15358 | Release #: | 05/03/01 | 06/02/01 | Project Manager: A.LATHAM |

| Teledyne Sample # | Customer's Identification | Sta. # | Collection-Dates Start Date/Time | Stop Date/Time | Matrix/ Nuclide | Activity | Units | Count Date | Volume Procedure # | Units | Lab Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Matrix - W-Other | | | | | | | | | | | |
| L15358-1 | MW#4 | | 04/04/01 09:30 | | Water | | | | | | |
| TI#-58298 | | | | | TH-228 | 3.9 +-0.7 E 00 | pCi/l | 05/16/01 | | | 62 |
| | | | | | TH-230 | 1.7 +-0.5 E 00 | | 05/16/01 | | | 62 |
| | | | | | TH-232 | 3.3 +-0.7 E 00 | | 05/16/01 | | | 62 |
| | | | | | U-233/234 | 2.8 +-0.5 E 00 | | 05/17/01 | | | 62 |
| | | | | | U-235 | L.T. 1. E-01 | | 05/17/01 | | | 62 |
| | | | | | U-238 | 1.9 +-0.4 E 00 | | 05/17/01 | | | 62 |
| L15358-2 | MW#6 | | 04/04/01 14:47 | | Water | | | | | | |
| TI#-58299 | | | | | TH-228 | 1.6 +-0.4 E 00 | | 05/16/01 | | | 62 |
| | | | | | TH-230 | 1.0 +-0.3 E 00 | | 05/16/01 | | | 62 |
| | | | | | TH-232 | L.T. 9. E-02 | | 05/16/01 | | | 62 |
| | | | | | U-233/234 | 2.4 +-0.8 E 00 | | 05/17/01 | | | 62 |
| | | | | | U-235 | 5.2 +-4.2 E-01 | | 05/17/01 | | | 62 |
| | | | | | U-238 | 1.3 +-0.6 E 00 | | 05/17/01 | | | 62 |
| L15358-3 | MW#10 | | 04/04/01 17:00 | | Water | | | | | | |
| TI#-58300 | | | | | TH-228 | L.T. 5. E-01 | | 06/01/01 | | | 62 |
| | | | | | TH-230 | 7.1 +-3.8 E-01 | | 06/01/01 | | | 62 |
| | | | | | TH-232 | L.T. 2. E-01 | | 06/01/01 | | | 62 |
| | | | | | U-233/234 | 2.6 +-1.8 E-01 | | 05/17/01 | | | 62 |
| | | | | | U-235 | L.T. 1. E-01 | | 05/17/01 | | | 62 |
| | | | | | U-238 | 2.9 +-1.9 E-01 | | 05/17/01 | | | 62 |

Lab Key: 22 - Gas Lab; 32 - Radiochemistry Lab; 42 - GE(Li) Gamma Spec Lab; 52 - Tritium Lab; 62 - Alpha Spec Lab; 12 - Environmental TLD; 72 - Consulting;

TELEDYNE BROWN ENGINEERING Environmental Services

REPORT OF ANALYSIS

Jun 07 2001, 10:48 am

LOGIN # L15358

PROJECT # NE506-3EREGLS

| Address: | Work Order #: | Cust. P.O. #: | Date Received | Delivery Date | PAGE: 2 |
|---|---|---|---|---|---|
| ROY RACINO<br>SCIENTECH NES INC<br>14 SHELTER ROCK ROAD<br>DANBURY CT 06810-7095 | L15358 | Release #: | 05/03/01 | 06/02/01 | Project Manager: A.LATHAM |

| Teledyne Sample # | Customer's Identification | Sta. # | Collection-Dates Start Date/Time | Stop Date/Time | Matrix/ Nuclide | Activity | Units | Count Date | Volume Procedure # | Units | Lab Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|

Cathey E. Sharp
Cathey E. Sharp
Operation Manager

Last Page of Report

TELEDYNE ISOTOPES

## ALPHA SPECTROSCOPY DATA

Th-229 1ml (3.75) ml
Am-243 ml
Pu-236 ml

U-232 1ml (1.96) ml
Cm-243 ml
Pu-242 ml

CUSTOMER Nesco Nes Inc
ANALYST LCB
PREP DATE 5-10-01

TI NO. 58298
SAMPLE TYPE WO
ALIQUOT 100 ml/s

| Det. | Bkg Nuclide | Mid Count MM/DD/HHMM | Counts | #t, sec | Tracer Counts | Tracer Bkg | Tracer Activity pCi | Counts | Bkg #t, sec | Results |
|---|---|---|---|---|---|---|---|---|---|---|
| | Np-237 | | | | | | | | | |
| | Pu-239 | | | | | | | | | |
| | Pu-238 | | | | | | | | | |
| 01 | U-238 | 05/17 02:21 | 84 | 60000 | 892 | 18 | 1.96 | 1 | | 1.9 ± .4 E00 (108.5) |
| | U-235 | | 4 | | | | | 1 | | L.T. 1.0E-01 |
| | U-234 | | 128 | | | | | 1 | | 2.8 ± .5 E00 |
| | U-236 | | | | | | | | | |
| | Am-243 | | | | | | | | | |
| | Cm-246 | | | | | | | | | |
| | Am-241 | | | | | | | | | |
| | Cm-244 | | | | | | | | | |
| | Cm-242 | | | | | | | | | |
| 30 | Th-232 | 05/16 24:10 | 111 | 60000 | 1254 | 1 | 3.75 | 1 | 80000 | 3.3 ± .7 E00 (76.8) |
| | Th-230 | | 57 | | | | | 1 | | 1.7 ± .5 E00 |
| | Th-228 | | 134 | | | | | 3 | | 3.9 ± .7 E00 |
| | Po-210 | | | | | | | | | |

Result Units pCi/L
Ash Fraction
Calc. by KPW
Date 05/17/01
Checked by
Date

TELEDYNE ISOTOPES

## ALPHA SPECTROSCOPY DATA

Th-229 1ml (3.75) ml
Am-243 ml
Pu-236 ml
TI NO. 58299

U-232 1ml (1.96) ml
Cm-243 ml
Pu-242 ml
SAMPLE TYPE WO

CUSTOMER NESOLO NES INC
ANALYST LCB
PREP DATE 5-10-01
ALIQUOT 100mls

| Det. | Bkg Nuclide | Mid Count MM/DD/HHMM | Counts | #t, sec | Tracer Counts | Tracer Bkg | Tracer Activity pCi | Counts | Bkg #t, sec | Results |
|---|---|---|---|---|---|---|---|---|---|---|
| | Np-237 | | | | | | | | | |
| | Pu-239 | | | | | | | | | |
| | Pu-238 | | | | | | | | | |
| 02 | U-238 | 05/17 02:21 | 23 | 60000 | 346 | 8 | 1.96 | 1 | 80000 | 1.3±.6 E00 |
| | U-235 | | 8 | | | | | 1 | | 5.2±4.2 E-01 |
| | U-234 | | 42 | | | | | 1 | | 2.4±.8 E00 |
| | U-236 | | | | | | | | | |
| | Am-243 | | | | | | | | | |
| | Cm-246 | | | | | | | | | |
| | Am-241 | | | | | | | | | |
| | Cm-244 | | | | | | | | | |
| | Cm-242 | | | | | | | | | |
| 31 | Th-232 | 05/16 24:10 | 1 | 60000 | 1762 | 2 | 3.75 | 1 | 80000 | L.T. 9.0E-02 |
| | Th-230 | | 49 | | | | | 1 | | 1.0±.3 E00 |
| | Th-228 | | 76 | | | | | 1 | | 1.6±.4 E00 |
| | Po-210 | | | | | | | | | |

56.9%

85.8%

Result Units pCi/L
Ash Fraction
Calc. by KPW
Date 05/17/01
Checked by [illegible]
Date 5/18/01

TELEDYNE ISOTOPES

## ALPHA SPECTROSCOPY DATA

Th-229 1ml (3.75) ml
Am-243 ml
Pu-236 ml

U-232 1ml (1.96) ml
Cm-243 ml
Pu-242 ml

CUSTOMER NESOG NESINC
ANALYST KCB
PREP DATE 5-10-01

TI NO. 58300
SAMPLE TYPE WO
ALIQUOT 100mls

| Det. | Bkg Nuclide | Mid Count MM/DD/HHMM | Counts | #t, sec | Tracer Counts | Tracer Bkg | Tracer Activity pCi | Counts | Bkg #t, sec | Results |
|---|---|---|---|---|---|---|---|---|---|---|
| | Np-237 | | | | | | | | | |
| | Pu-239 | | | | | | | | | |
| | Pu-238 | | | | | | | | | |
| | | | | | | | | | | 80.2 J. |
| 03 | U-238 | 05/17 02:21 | 11 | 60000 | 708 | 5 | 1.96 | 1 | 80000 | 2.9 ± 1.9E-01 |
| | U-235 | | 1 | | | | | 1 | | L.T. 1E-01 |
| | U-234 | | 10 | | | | | 1 | | 2.6 ± 1.8E-01 |
| | U-236 | | | | | | | | | |
| | Am-243 | | | | | | | | | |
| | Cm-246 | | | | | | | | | |
| | Am-241 | | | | | | | | | |
| | Cm-244 | | | | | | | | | |
| | Cm-242 | | | | | | | | | |
| | | | | | | | | | | 05/17/01 KPW |
| 32 | Th-232 | | | | | | | | | |
| | Th-230 | | | | | | | | | |
| | Th-228 | | | | | | | | | |
| | Po-210 | | | | | | | | | |

Result Units pCi/L
Ash
Calc. by KPW
Date 05/17/01
Checked by [illegible]
Date 5/19/01

MCA #1 - Canberra S100 - U58298.MCA - D01 NES U58298 100ML

Tag Number: 62
Report Group: 1/16
Input: 1 Group: A
Group Size: 512

Readout: Thu 17 May 2001 @ 10:48:39
Acquire Started: Wed 16 May 2001 @ 17:01:31

Elapsed Live Time: 60000.00 sec.
Elapsed True Time: 60001.62 sec.
Dead Time: 0.00 %

MCA Mode: PHA+ M/R, Inputs: 16, Type: 1520, Mode: Route
Preset Conditions: Live Time = 60000 sec.

Calibration: 0.0000*Ch^2 + 0.007819*Ch + 2.961 MeV

Area Statistics: Background Channels = 4
% Error Sigma = 1.65

REGION OF INTEREST REPORT

| ROI # | From(MeV) To (MeV) | Integral CPS | Area %Error | Peak(MeV) FWHM(MeV) |
|---|---|---|---|---|
| 1 | 4.103 | 84 | 10 | 4.203 |
| | 4.220 | 0.00 | 151.22 | 0.0101 |
| 2 | 4.338 | 4 | 3 | 4.416 |
| | 4.424 | 0.00 | 118.98 | 0.0432 |
| 3 | 4.439 | 1 | 0 | 4.478 |
| | 4.494 | 0.00 | 0.00 | 0.0432 |
| 4 | 4.689 | 128 | 72 | 4.764 |
| | 4.807 | 0.00 | 25.93 | 0.0207 |
| 5 | 5.174 | 892 | 265 | 5.305 |
| | 5.338 | 0.01 | 22.98 | 0.0280 |

MCA #2 - Canberra S100 - TH58298.MCA - D30 NES TH58298 100ML

Tag Number: 73
Report Group: 14/16
Input: 14 Group: D
Group Size: 512

Readout: Wed 16 May 2001 @ 10:30:21
Acquire Started: Tue 15 May 2001 @ 15:50:14

Elapsed Live Time: 60000.00 sec.
Elapsed True Time: 60000.26 sec.
Dead Time: 0.00 %

MCA Mode: PHA+ M/R, Inputs: 16, Type: 1520, Mode: Route
Preset Conditions: Live Time = 60000 sec.

Calibration: 0.0000*Ch^2 + 0.007941*Ch + 3.011 MeV

Area Statistics: Background Channels = 4
% Error Sigma = 1.65

REGION OF INTEREST REPORT

| ROI # | From(MeV) To (MeV) | Integral CPS | Area %Error | Peak(MeV) FWHM(MeV) |
|---|---|---|---|---|
| 1 | 3.964 | 111 | -27 | 4.046 |
| | 4.068 | 0.00 | 52.94 | 0.0102 |
| 2 | 4.576 | 57 | 24 | 4.719 |
| | 4.759 | 0.00 | 65.22 | 0.0199 |
| 3 | 4.782 | 1254 | 1051 | 4.879 |
| | 5.124 | 0.02 | 6.96 | 0.0405 |
| 4 | 5.314 | 134 | -37 | 5.451 |
| | 5.473 | 0.00 | 69.89 | 0.0112 |
| 5 | 5.894 | 8 | -11 | 6.071 |
| | 6.085 | 0.00 | 82.79 | 0.0067 |

MCA #1 - Canberra S100 - U58299.MCA - D02 NES U58299 100ML

Tag Number: 62
Report Group: 2/16
Input: 2 Group: A
Group Size: 512

Readout: Thu 17 May 2001 @ 10:48:44
Acquire Started: Wed 16 May 2001 @ 17:01:31

Elapsed Live Time: 60000.00 sec.
Elapsed True Time: 60001.62 sec.
Dead Time: 0.00 %

MCA Mode: PHA+ M/R, Inputs: 16, Type: 1520, Mode: Route
Preset Conditions: Live Time = 60000 sec.

Calibration: 0.0000*Ch^2 + 0.007819*Ch + 2.961 MeV

Area Statistics: Background Channels = 4
% Error Sigma = 1.65

REGION OF INTEREST REPORT

| ROI # | From(MeV) To (MeV) | Integral CPS | Area %Error | Peak(MeV) FWHM(MeV) |
|---|---|---|---|---|
| 1 | 4.126 | 23 | 3 | 4.186 |
| | 4.244 | 0.00 | 263.77 | 0.0144 |
| 2 | 4.345 | 8 | -3 | 4.407 |
| | 4.424 | 0.00 | 58.34 | 0.0469 |
| 3 | 4.439 | 12 | 0 | 4.466 |
| | 4.494 | 0.00 | 0.00 | 0.0059 |
| 4 | 4.697 | 42 | 10 | 4.745 |
| | 4.791 | 0.00 | 94.83 | 0.0378 |
| 5 | 5.206 | 346 | 142 | 5.295 |
| | 5.378 | 0.01 | 26.64 | 0.0489 |

MCA #2 - Canberra S100 - TH58299.MCA - D31 NES TH58299 100ML

Tag Number: 73
Report Group: 15/16
Input: 15 Group: D
Group Size: 512

Readout: Wed 16 May 2001 @ 10:30:26
Acquire Started: Tue 15 May 2001 @ 15:50:14

Elapsed Live Time: 60000.00 sec.
Elapsed True Time: 60000.26 sec.
Dead Time: 0.00 %

MCA Mode: PHA+ M/R, Inputs: 16, Type: 1520, Mode: Route
Preset Conditions: Live Time = 60000 sec.

Calibration: 0.0000*Ch^2 + 0.007831*Ch + 3.008 MeV

Area Statistics: Background Channels = 4
% Error Sigma = 1.65

REGION OF INTEREST REPORT

| ROI # | From(MeV) To (MeV) | Integral CPS | Area %Error | Peak(MeV) FWHM(MeV) |
|---|---|---|---|---|
| 1 | 3.705 | 1 | -3 | 3.917 |
| | 3.917 | 0.00 | 165.00 | 0.0066 |
| 2 | 4.512 | 49 | 23 | 4.696 |
| | 4.739 | 0.00 | 70.67 | 0.0291 |
| 3 | 4.762 | 1762 | 1421 | 4.868 |
| | 5.099 | 0.03 | 6.31 | 0.0428 |
| 4 | 5.373 | 76 | 37 | 5.426 |
| | 5.459 | 0.00 | 33.52 | 0.0154 |
| 5 | 6.148 | 48 | 48 | 6.309 |
| | 6.375 | 0.00 | 23.82 | 0.0705 |

MCA #1 - Canberra S100 - U58300.MCA - D03 NES U58300 100ML

Tag Number: 62
Report Group: 3/16
Input: 3 Group: A
Group Size: 512

Readout: Thu 17 May 2001 @ 10:48:50
Acquire Started: Wed 16 May 2001 @ 17:01:31

Elapsed Live Time: 60000.00 sec.
Elapsed True Time: 60001.62 sec.
Dead Time: 0.00 %

MCA Mode: PHA+ M/R, Inputs: 16, Type: 1520, Mode: Route
Preset Conditions: Live Time = 60000 sec.

Calibration: 0.0000*Ch^2 + 0.007891*Ch + 2.995 MeV

Area Statistics: Background Channels = 4
% Error Sigma = 1.65

REGION OF INTEREST REPORT

| ROI # | From(MeV) To (MeV) | Integral CPS | Area %Error | Peak(MeV) FWHM(MeV) |
|---|---|---|---|---|
| 1 | 4.132 | 11 | 2 | 4.201 |
| | 4.234 | 0.00 | 217.70 | 0.0092 |
| 2 | 4.321 | 0 | 0 | 2.995 |
| | 4.424 | 0.00 | 0.00 | 0.0112 |
| 3 | 4.440 | 0 | 0 | 2.995 |
| | 4.503 | 0.00 | 0.00 | 0.0112 |
| 4 | 4.700 | 10 | -5 | 4.807 |
| | 4.810 | 0.00 | 94.06 | 0.0112 |
| 5 | 5.260 | 708 | 547 | 5.357 |
| | 5.402 | 0.01 | 8.37 | 0.0248 |

TELEDYNE ISOTOPES

## ALPHA SPECTROSCOPY DATA

Th-229 _____ ml
Am-243 _____ ml
Pu-236 _____ ml

U-232 _____ ml
Cm-243 _____ ml
Pu-242 _____ ml

CUSTOMER NES
ANALYST _____
PREP DATE _____

TI NO. 58300C
SAMPLE TYPE WO
ALIQUOT 100 mls

| Det. | Bkg Nuclide | Mid Count MM/DD/HHMM | Counts | #t, sec | Tracer Counts | Tracer Bkg | Tracer Activity pCi | Counts | Bkg #t, sec | Results |
|---|---|---|---|---|---|---|---|---|---|---|
| | Np-237 | | | | | | | | | |
| | Pu-239 | | | | | | | | | |
| | Pu-238 | | | | | | | | | |
| | U-238 | | | | | | | | | |
| | U-235 | | | | | | | | | |
| | U-234 | | | | | | | | | |
| | U-236 | | | | | | | | | |
| | Am-243 | | | | | | | | | |
| | Cm-246 | | | | | | | | | |
| | Am-241 | | | | | | | | | |
| | Cm-244 | | | | | | | | | |
| | Cm-242 | | | | | | | | | |
| 25 | Th-232 | 06/01 24:27 | 3 | 60000 | 806 | 3 | 3.75 | 1 | 80000 | L.T. 2.0E-01 |
| | Th-230 | | 16 | | | | | 1 | | 7.1 ± 3.8 E-01 |
| | Th-228 | | 6 | | | | | 6 | | L.T. 5.0 E-01 |
| | Po-210 | | | | | | | | | |

46

Result Units pci/L
Ash _____
Calc. by KAW
Checked by [illegible]
Date 06/01/01
[illegible]

MCA #2 - Canberra S100 - TH58300C.MCA - D25 NES TH58300C 100ML

Tag Number: 39
Report Group: 9/16
Input: 9 Group: C
Group Size: 512

Readout: Fri 01 Jun 2001 @ 10:07:52
Acquire Started: Thu 31 May 2001 @ 16:07:10

Elapsed Live Time: 60000.00 sec.
Elapsed True Time: 60000.20 sec.
Dead Time: 0.00 %

MCA Mode: PHA+ M/R, Inputs: 16, Type: 1520, Mode: Route
Preset Conditions: Live Time = 60000 sec.

Calibration: 0.0000*Ch^2 + 0.008083*Ch + 3.076 MeV

Area Statistics: Background Channels = 4
% Error Sigma = 1.65

REGION OF INTEREST REPORT

| ROI # | From(MeV) To (MeV) | Integral CPS | Area %Error | Peak(MeV) FWHM(MeV) |
|---|---|---|---|---|
| 1 | 3.908 | 3 | -3 | 4.070 |
| | 4.078 | 0.00 | 176.17 | 0.0266 |
| 2 | 4.563 | 16 | -16 | 4.728 |
| | 4.741 | 0.00 | 69.79 | 0.0266 |
| 3 | 4.773 | 806 | 623 | 4.882 |
| | 5.113 | 0.01 | 9.99 | 0.0395 |
| 4 | 5.282 | 6 | -1 | 5.347 |
| | 5.485 | 0.00 | 1240.25 | 0.0162 |
| 5 | 5.881 | 10 | -17 | 6.063 |
| | 6.067 | 0.00 | 59.04 | 0.0162 |

MCA #2 - Canberra S100 - TH53800B.MCA - D25 NES TH5800B 100ML

Tag Number: 39
Report Group: 9/16
Input: 9 Group: C
Group Size: 512

Readout: Wed 23 May 2001 @ 10:14:22
Acquire Started: Tue 22 May 2001 @ 17:14:02

Elapsed Live Time: 60000.00 sec.
Elapsed True Time: 60003.86 sec.
Dead Time: 0.01 %

MCA Mode: PHA+ M/R, Inputs: 16, Type: 1520, Mode: Route
Preset Conditions: Live Time = 60000 sec.

Calibration: 0.0000*Ch^2 + 0.008083*Ch + 3.076 MeV

Area Statistics: Background Channels = 4
% Error Sigma = 1.65

REGION OF INTEREST REPORT

| ROI # | From(MeV) To (MeV) | Integral CPS | Area %Error | Peak(MeV) FWHM(MeV) |
|---|---|---|---|---|
| 1 | 3.908 | 1 | -2 | 4.078 |
| | 4.078 | 0.00 | 165.00 | 0.0902 |
| 2 | 4.563 | 5 | 2 | 4.717 |
| | 4.741 | 0.00 | 212.87 | 0.0902 |
| 3 | 4.765 | 152 | 114 | 4.879 |
| | 5.113 | 0.00 | 24.62 | 0.0384 |
| 4 | 5.282 | 1 | -2 | 5.460 |
| | 5.485 | 0.00 | 165.00 | 0.1980 |
| 5 | 5.881 | 2 | -1 | 5.921 |
| | 6.067 | 0.00 | 368.95 | 0.1980 |

MCA #2 - Canberra S100 - TH58300.MCA - D32 NES TH58300 100ML

Tag Number: 73
Report Group: 16/16
Input: 16 Group: D
Group Size: 512

Readout: Wed 16 May 2001 @ 10:30:30
Acquire Started: Tue 15 May 2001 @ 15:50:14

Elapsed Live Time: 60000.00 sec.
Elapsed True Time: 60000.26 sec.
Dead Time: 0.00 %

MCA Mode: PHA+ M/R, Inputs: 16, Type: 1520, Mode: Route
Preset Conditions: Live Time = 60000 sec.

Calibration: 0.0000*Ch^2 + 0.007979*Ch + 3.010 MeV

Area Statistics: Background Channels = 4
% Error Sigma = 1.65

REGION OF INTEREST REPORT

| ROI # | From(MeV) To (MeV) | Integral CPS | Area %Error | Peak(MeV) FWHM(MeV) |
|---|---|---|---|---|
| 1 | 3.912 | 0 | 0 | 3.010 |
| | 4.079 | 0.00 | 0.00 | 0.0718 |
| 2 | 4.566 | 3 | 3 | 4.718 |
| | 4.750 | 0.00 | 95.26 | 0.0718 |
| 3 | 4.774 | 220 | 182 | 4.870 |
| | 5.117 | 0.00 | 17.12 | 0.0251 |
| 4 | 5.292 | 3 | -3 | 5.472 |
| | 5.484 | 0.00 | 160.80 | 0.2793 |
| 5 | 5.891 | 5 | -4 | 6.003 |
| | 6.074 | 0.00 | 154.34 | 0.0080 |

L15358 ~~L15160~~ MD 5/8/01

SCIENTECH [redacted] Inc. 82A8016 ATTACHMENT B
CHAIN OF CUSTODY RECORD

page 1 of 3

SCIENTECH, Inc.

[redacted]

44 SHELTER ROCK RD
DANBURY, CT 06810
(203) 796-5000

Parameters for Analysis

Sampler's Name: Roy Racino

Project No: 2289

Project Name: Whittaker Site

Shelf D-38D

TO: Teledyne Brown Engineering
2508 Quality Lane
Knoxville, TN 37931-3133
ATTN: Sample Receiving

| | Sample ID No. | Date Collected | Time Collected | Gross Alpha - water | Gross Beta - water | | | | | | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MW #1 | 4/3/01 | 1035 | X | X | | I | 5 | 6 | 3 | 1 | 1 | If a gross Alpha result is >15 pCi/L (or) |
| | MW #2 | 4/3/01 | 1147 | X | X | | | 5 | 6 | 3 | 1 | 2 | a gross Beta result is >50 pCi/L, perform |
| | MW #3 | 4/4/01 | 1215 | X | X | | | 5 | 6 | 3 | 1 | 3 | Isotopic Th and U on that sample. |
| 58298 | MW #4 | 4/4/01 | 0930 | X | X | | | 5 | 6 | 3 | 1 | 4 | |
| | MW #5 | 4/4/01 | 1100 | X | X | | | 5 | 6 | 3 | 1 | 5 | |
| 58299 | MW #6 | 4/4/01 | 1447 | X | X | | | 5 | 6 | 3 | 1 | 6 | |
| | MW #7 | 4/4/01 | 1615 | X | X | | | 5 | 6 | 3 | 1 | 7 | |

R. Racino 4/3-4/4/01
Collected By (Signature) Date/Time

R. Racino
Relinquished By (Signature) Date/Time

Received By (Signature) Date/time

GAR 4/13/01
Received By (Signature) Date/time

SHIPPING INFORMATION _____
Carrier Date Shipped

SCIENTECH [redacted] CONTACT Roy Racino (203) 796-5340

L15358 ~~L15160~~ MD 5/8/01

SCIENTECH [redacted] Inc. 82A8016 ATTACHMENT B

# CHAIN OF CUSTODY RECORD

SCIENTECH

[redacted]

44 SHELTER ROCK RD
DANBURY, CT 06810
(203) 796-5000

Page 2 of 3

Shelf D-38D

Sampler's Name: Roy Racino

Project No: 2289

Project Name: Whittaker Site

TO: Teledyne Brown Engineering
2508 Quality Lane
Knoxville, TN 37931-3133
ATTN: Sample Receiving

Parameters for Analysis

58300

| Sample ID No. | Date Collected | Time Collected | Gross Alpha - water | Gross Beta - water | | | | | | T | I | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MW #8 | 4/3/01 | 1425 | X | X | | | 5 | 6 | 3 | 1 | 8 | | If a gross Alpha result is > 15 pCi/L (or) |
| MW #9 | 4/3/01 | 1545 | X | X | | | 5 | 6 | 3 | 1 | 9 | | a gross Beta result is > 50 pCi/L, perform |
| MW #10 | 4/3/01 | 1700 | X | X | | | 5 | 6 | 3 | 2 | 0 | | Isotopic Th and U on that sample. |
| MW #1 (F) | 4/3/01 | 1035 | X | X | | | 5 | 6 | 3 | 2 | 1 | | |
| MW #2 (F) | 4/3/01 | 1147 | X | X | | | 5 | 6 | 3 | 2 | 2 | | |
| MW #3 (F) | 4/4/01 | 1215 | X | X | | | 5 | 6 | 3 | 2 | 3 | | |
| MW #4 (F) | 4/4/01 | 0930 | X | X | | | 5 | 6 | 3 | 2 | 4 | | (F) = Filtered Sample |

R. Racino 4/3-4/4/01
Collected By (Signature) Date/Time

R. Racino
Relinquished By (Signature) Date/Time

Received By (Signature) Date/time

JAR 4/13/01
Received By (Signature) Date/time

SHIPPING INFORMATION

SCIENTECH [redacted] CONTACT Roy Racino (203) 791-5311
Name Phone No

L15358 ~~L15160~~ 5/8/01

SCIENTECH
[redacted], Inc. 82A8016 ATTACHMENT B
CHAIN OF CUSTODY RECORD

page 3 of 3

SCIENTECH

[redacted]

44 SHELTER ROCK RD
DANBURY, CT 06810
(203) 796-5000

Parameters for Analysis

Sampler's Name: Roy Racino

Project No: 2289

Project Name: Whittaker Site

TO: Teledyne Brown Engineering
2508 Quality Lane
Knoxville, TN 37931-3133
ATTN: Sample Receiving

Shelf D-38D

| Sample ID No. | Date Collected | Time Collected | Gross Alpha - water | Gross Beta - water | | | | | TI | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MW #5 (F) | 4/4/01 | 1100 | X | X | | | 5 | 6 | 3 | 2 | 5 | If a gross Alpha result is >15 pCi/L (or) |
| MW #6 (F) | 4/4/01 | 1447 | X | X | | | 5 | 6 | 3 | 2 | 6 | a gross Beta result is >50 pCi/L, perform |
| MW #7 (F) | 4/4/01 | 1615 | X | X | | | 5 | 6 | 3 | 2 | 7 | Isotopic Th and U on that sample |
| MW #8 (F) | 4/3/01 | 1425 | X | X | | | 5 | 6 | 3 | 2 | 8 | |
| MW #9 (F) | 4/3/01 | 1545 | X | X | | | 5 | 6 | 3 | 2 | 9 | |
| 58300 MW #10 (F) | 4/3/01 | 1700 | X | X | | | 5 | 6 | 3 | 3 | 0 | |
| | | | | | | | | | | | | (F) = Filtered Sample |

R. Racino 4/3-4/4/01
Collected By (Signature) Date/Time

Received By (Signature) Date/time

R. Racino
Relinquished By (Signature) Date/Time

[signature] 4/13/01
Received By (Signature) Date/time

SHIPPING INFORMATION _____ SCIENTECH [redacted] CONTACT Roy Racino (203) 796-5340

Carrier Phone No.

**Groundwater Sampling Logs**
**And Field Notes**
**(11 pages)**

Field Staff: M. Burner
P. Horkman

Date: 4/3/01

Whittaker Corporation
Greenville, PA

SCIENTECH, Inc.

## Groundwater Sampling Log

Project: Whittaker Corporation | Well No. 1 | Sampling Date 4/3/01 | Static $H_2O$ Elev. 4.87

PID reading ____ | Screen Length 10 | Well Diameter 2" | Casing Type steel

Screen Elev. ____ | Pump Set @* 14' | Date Pump Set 4/3/01 | Time Pump Set 10:15

Sampling Device In-well Pump | Tubing type Polyethylene | $H_2O$ Elev. Before Pumping 4.87

Pump Start Time 10:20 | Pump Stop Time 11:01 | $H_2O$ Level After Pumping 5.41 | Pumping Rate (avg) 0.5

Well Bottom Elev.** 17.36 | $H_2O$ Vol. In Equip. ____

Measuring Point Elevation PVC

* Elevation relative to surveyed point on the well.
** Depth to bottom taken from boring logs.
Screen Elevation (top of Screen)

| Time | DTW (ft) | pH | Temp. (°C) | Cond. (umhos) | DO (mg/kg) | Approx. Vol. Removed (L) | Pumping Rate (L/min) |
|---|---|---|---|---|---|---|---|
| 10:22 | 5.35 | 6.75 | 15.8 | 889 | 3.9 | 1 | 0.5 |
| 10:25 | 5.59 | 6.74 | 16.4 | 898 | 4.0 | 2.5 | 0.5 |
| 10:28 | 5.61 | 6.75 | 16.4 | 894 | 3.8 | 4 | 0.5 |
| 10:31 | 5.36 | 6.67 | 16.6 | 897 | 3.8 | 5.5 | 0.5 |
| | 5.41 | | | | | | |
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Notes:

$H_2O$ cloudy

Field Staff: M. Burno
P. Harkman

Date: 4/3/01

Whittaker Corporation
Greenville, PA

SCIENTECH, Inc.

## Groundwater Sampling Log

Project: Whittaker Corporation | Well No. 2 | Sampling Date 4/3/01 | Static $H_2O$ Elev. 10.99'

PID reading — | Screen Length 15' | Well Diameter 2" | Casing Type steel

Screen Elev. — | Pump Set @* 20' | Date Pump Set 4/3/01 | Time Pump Set 11:26

Sampling Device In-well Pump | Tubing type Polyethylene | $H_2O$ Elev. Before Pumping 11.12

Pump Start Time 11:36 | Pump Stop Time 12:02 | $H_2O$ Level After Pumping 14.33 | Pumping Rate (avg) 0.4

Well Bottom Elev.** 26.84 | $H_2O$ Vol. In Equip. ____

Measuring Point Elevation TOC

* Elevation relative to surveyed point on the well.
** Depth to bottom taken from boring logs.
Screen Elevation (top of Screen)

| Time | DTW (ft) | pH | Temp. (°C) | Cond. (umhos) | DO (mg/kg) | Approx. Vol. Removed (L) | Pumping Rate (L/min) |
|---|---|---|---|---|---|---|---|
| 11:38 | 12.33 | 7.18 | 18.3 | 1000 | 3.7 | 0.5 | 0.4 |
| 11:41 | 12.18 | 7.15 | 18.7 | 1017 | 3.5 | 1.5 | 0.4 |
| 11:44 | 12.13 | 7.14 | 18.5 | 1017 | 3.4 | 3.5 | 0.4 |
| 11:47 | sampled | | | | | | |
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Notes:

14.28 to GW after pump removed

H2O slightly turbid to clear

File: \\NES-NT\DEPT\DEPT020\3077 - Whittaker\WellData.xls
Sheet: LowFlowWorkSheet


Printed: 3/28/01, 11:05 AM

Field Staff: M. Burno
P. Horkman

Date: 4/4/01

Whittaker Corporation
Greenville, PA

SCIENTECH, Inc.

## Groundwater Sampling Log

Project: Whittaker Corporation | Well No. 3 | Sampling Date 4/4/01 | Static $H_2O$ Elev. 1.58

PID reading — | Screen Length 10' | Well Diameter 2" | Casing Type Steel

Screen Elev. — | Pump Set @* 10' | Date Pump Set 4/4/01 | Time Pump Set 11:53

Sampling Device In-well Pump | Tubing type Polyethylene | $H_2O$ Elev. Before Pumping 1.7

Pump Start Time 11:58 | Pump Stop Time 12:31 | $H_2O$ Level After Pumping 1.61 | Pumping Rate (avg) 0.4

Well Bottom Elev.** 16.53 | $H_2O$ Vol. In Equip. ____

Measuring Point Elevation ____

* Elevation relative to surveyed point on the well.
** Depth to bottom taken from boring logs.
Screen Elevation (top of Screen)

| Time | DTW (ft) | pH | Temp. (°C) | Cond. (umhos) | DO (mg/kg) | Approx. Vol. Removed (L) | Pumping Rate (L/min) |
|---|---|---|---|---|---|---|---|
| 12:00 | 1.65 | 6.64 | 18.9 | 707 | 0.9 | 0.9 | 0.45 |
| 12:03 | 1.64 | 6.63 | 19.3 | 721 | 0.9 | 2.3 | 0.46 |
| 12:06 | 1.64 | 6.62 | 19.4 | 722 | 0.9 | 3.7 | 0.46 |
| 12:09 | 1.64 | 6.61 | 19.5 | 723 | 1.4 | 5.1 | 0.46 |
| 12:12 | 1.64 | 6.61 | 19.4 | 723 | 2.0 | 6.5 | 0.46 |
| 12:15 | 1.64 | 6.61 | 19.5 | 723 | 1.9 | 7.9 | 0.46 |
| 12:18 | 1.64 | 6.60 | 19.5 | 723 | 1.9 | 9.3 | 0.46 |
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Notes:

$H_2O$ clear

Field Staff: M. Burno
P. Horkman

Date: 4/4/01

Whittaker Corporation
Greenville, PA

SCIENTECH, Inc.

## Groundwater Sampling Log

Project: Whittaker Corporation
Well No. 4
Sampling Date 4/4/01
Static $H_2O$ Elev. 1619
PID reading —
Screen Length 15'
Well Diameter 2"
Casing Type Steel
Screen Elev.
Pump Set @* 24'
Date Pump Set 4/4/01
Time Pump Set 9:09
Sampling Device In-well Pump
Tubing type Polyethylene
$H_2O$ Elev. Before Pumping 16.3
Pump Start Time 09:20
Pump Stop Time
$H_2O$ Level After Pumping
Pumping Rate (avg) 0.5
Well Bottom Elev.** 31.66
$H_2O$ Vol. In Equip.
Measuring Point Elevation PVC

* Elevation relative to surveyed point on the well.
** Depth to bottom taken from boring logs.
Screen Elevation (top of Screen)

| Time | DTW (ft) | pH | Temp. (°C) | Cond. (umhos) | DO (mg/kg) | Approx. Vol. Removed (L) | Pumping Rate (L/min) |
|---|---|---|---|---|---|---|---|
| 9:24 | 16.81 | 7.21 | 21.0 | 812 | 3.6 | 2 | 0.5 |
| 9:27 | 16.81 | 7.21 | 21.3 | 823 | 3.4 | 3.5 | 0.5 |
| 9:30 | 16.81 | 7.18 | 21.7 | 821 | 3.5 | 5 | 0.5 and le |
| 9:33 | 16.81 | 7.19 | 21.7 | 812 | 3.4 | 6.4 | |
| 9:30 | Sample | | | | | | |
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Notes:
1st 4 min. flow needed constant adj to keep at 0.5L/min or less
Flow adjusted; keeps reducing

$H_2O$ light brown and turbid
2 filters used due to silt.

Field Staff: M. Burro
P. Horkman

Date: 4/4/01

Whittaker Corporation
Greenville, PA

SCIENTECH, Inc.

## Groundwater Sampling Log

Project: Whittaker Corporation | Well No. 5 | Sampling Date 4/4/01 | Static $H_2O$ Elev. 6.9

PID reading — | Screen Length 15' | Well Diameter 2" | Casing Type Steel

Screen Elev. — | Pump Set @* 15' | Date Pump Set 4/4/01 | Time Pump Set 10:30

Sampling Device In-Well Pump | Tubing type Polyethylene | $H_2O$ Elev. Before Pumping 6.91

Pump Start Time 10:38 | Pump Stop Time 11:21 | $H_2O$ Level After Pumping 7.48 | Pumping Rate (avg) ~~0.5~~

Well Bottom Elev.** 22.28 | $H_2O$ Vol. In Equip. ____ | * Elevation relative to surveyed point on the well. 0.41

Measuring Point Elevation PVC | ** Depth to bottom taken from boring logs.

Screen Elevation (top of Screen)

| Time | DTW (ft) | pH | Temp. (°C) | Cond. (umhos) | DO (mg/kg) | Approx. Vol. Removed (L) | Pumping Rate (L/min) |
|---|---|---|---|---|---|---|---|
| 10:40 | 7.26 | 7.41 | 18.5 | 781 | 3.1 | 1 | 0.5 |
| 10:43 | 7.36 | 7.34 | 18.5 | 781 | 3.0 | 2.5 | 0.5 |
| * 10:46 | 7.47 | 7.21 | 18.7 | 745 | 2.5 | 4 | 0.5 |
| 10:49 | 7.45 | 7.15 | 18.8 | 721 | 2.5 | 5.3 | ~~0.38~~ 0.43 |
| 10:52 | 7.44 | 7.11 | 19.0 | 714 | 2.8 | 6.6 | 0.43 |
| 10:55 | 7.43 | 7.06 | 19.2 | 699 | 2.8 | 7.9 | 0.43 |
| 10:58 | 7.44 | 7.01 | 19.3 | 693 | 2.8 | 8.2 ~~0.41~~ | 0.43 |
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Notes:

* reduced flow to less than 0.5 L/min to stop drawdown

Field Staff: M. Burno
P. Hirkman

Date: 4/4/01

Whittaker Corporation
Greenville, PA

SCIENTECH, Inc.

## Groundwater Sampling Log

Project: Whittaker Corporation | Well No. 6 | Sampling Date 4/4/01 | Static $H_2O$ Elev. 20.4

PID reading — | Screen Length 15' | Well Diameter 2" | Casing Type Steel

Screen Elev. — | Pump Set @* 25' | Date Pump Set 4/4/01 | Time Pump Set 14:25

Sampling Device In-well Pump | Tubing type Polyethylene | $H_2O$ Elev. Before Pumping 20.4

Pump Start Time 14:28 | Pump Stop Time ____ | $H_2O$ Level After Pumping ____ | Pumping Rate (avg) 0.4

Well Bottom Elev.** 31.61 | $H_2O$ Vol. In Equip. — | * Elevation relative to surveyed point on the well.

Measuring Point Elevation N/A | ** Depth to bottom taken from boring logs.

Screen Elevation (top of Screen)

| Time | DTW (ft) | pH | Temp. (°C) | Cond. (umhos) | DO (mg/kg) | Approx. Vol. Removed (L) | Pumping Rate (L/min) |
|---|---|---|---|---|---|---|---|
| 14:30 | 20.58 | 7.16 | 22.6 | 769 | 2.8 | 0.8 | 0.40 |
| 14:33 | 20.68 | 7.12 | 22.2 | 777 | 2.6 | 2 | 0.40 |
| 14:36 | 20.76 | 6.95 | 22.6 | 785 | 0.5 | 3.2 | 0.40 |
| * 14:39 | 20.86 | 6.82 | 22.7 | 787 | 0.4 | 4.5 | 0.43 |
| 14:42 | 20.99 | 6.78 | 22.8 | 775 | 0.4 | 5.8 | 0.43 |
| 14:45 | 21.08 | 6.75 | 22.7 | 791 | 0.4 | 7.1 | 0.43 |
| 14:47 | sampled | | | | | | |
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Notes:

* reduced flow to stop draw down
Pump silted up during sampling
During sampling well went dry — sampled well #7 and returned to
GW level dropped to 24.5' bgs
$H_2O$ turbid.

Field Staff: M. Burns
P. Horkman

Date: 4/4/01

# Whittaker Corporation
## Greenville, PA

SCIENTECH, Inc.

## Groundwater Sampling Log

Project: Whittaker Corporation  Well No. 7  Sampling Date 4/4/01  Static $H_2O$ Elev. 4.21

PID reading ____  Screen Length 10'  Well Diameter 2"  Casing Type Steel

Screen Elev. ____  Pump Set @* 10'  Date Pump Set 4/4/01  Time Pump Set 14:50

Sampling Device In-well Pump  Tubing type Polyethylene  $H_2O$ Elev. Before Pumping 4.33

Pump Start Time 16:05  Pump Stop Time ____  $H_2O$ Level After Pumping ~~2.40~~ 4.24  Pumping Rate (avg) 0.4

Well Bottom ~~Elev.~~** 14.20  $H_2O$ Vol. In Equip. ____  * Elevation relative to surveyed point on the well.

Measuring Point Elevation PVC  ** Depth to bottom taken from boring logs.

Screen Elevation (top of Screen)

| Time | DTW (ft) | pH | Temp. (°C) | Cond. (umhos) | DO (mg/kg) | Approx. Vol. Removed (L) | Pumping Rate (L/min) |
|---|---|---|---|---|---|---|---|
| 16:06 | 4.32 | 7.07 | 18.7 | 800 | 0.4 | 0.4 | 0.4 |
| 16:09 | 4.32 | 7.09 | 17.9 | 795 | 0.4 | 1.7 | 0.43 |
| 16:12 | 4.34 | 7.08 | 18.0 | 795 | 0.3 | 3.1 | 0.47 |
| 16:15 | Sampled | | | | | | |
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Notes:

$H_2O$ Clear

Field Staff: M. Burns
P. Horkman

Date: 4/3/01

Whittaker Corporation
Greenville, PA

SCIENTECH, Inc.

## Groundwater Sampling Log

Project: Whittaker Corporation | Well No. 8 | Sampling Date 4/3/01 | Static $H_2O$ Elev. 19.7

PID reading — | Screen Length 15' | Well Diameter 2" | Casing Type Steel

Screen Elev. — | Pump Set @* 25' | Date Pump Set 4/3/01 | Time Pump Set 14:00

Sampling Device In-well Pump | Tubing type Polyethylene | $H_2O$ Elev. Before Pumping 18.7

Pump Start Time 14:07 | Pump Stop Time 14:41 | $H_2O$ Level After Pumping 19.74 | Pumping Rate (avg) 0.5

Well Bottom Elev.** | $H_2O$ Vol. In Equip. | * Elevation relative to surveyed point on the well.

Measuring Point Elevation | ** Depth to bottom taken from boring logs.

Screen Elevation (top of Screen)

| Time | DTW (ft) | pH | Temp. (°C) | Cond. (umhos) | DO (mg/kg) | Approx. Vol. Removed (L) | Pumping Rate (L/min) |
|---|---|---|---|---|---|---|---|
| 14:08 | 19.78 | 6.41 | 18.9 | 1774 | 1.8 | 1 | 0.5 |
| 14:11 | 19.81 | 6.41 | 19.5 | 1.90 | 4.3 | 2.0 | 0.5 |
| 14:14 | 19.84 | 6.40 | 19.9 | 1.90 | 4.2 | 3.5 | 0.5 |
| 14:17 | 19.81 | 6.38 | 20.6 | 1.94 | 4.2 | 5.0 | 0.5 |
| 14:21 | | | | | | | |
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Notes: Penn DEP Watching us sample

$H_2O$ slightly turbid

Field Staff: M. Burno
P. Horkman
Date: 4/3/01

Whittaker Corporation
Greenville, PA

SCIENTECH, Inc.

## Groundwater Sampling Log

Project: Whittaker Corporation | Well No. 9 | Sampling Date 4/3/01 | Static $H_2O$ Elev. 0
PID reading — | Screen Length 10' | Well Diameter 2" | Casing Type steel
Screen Elev. — | Pump Set @* 14' | Date Pump Set 4/3/01 | Time Pump Set 15:30
Sampling Device In-well Pump | Tubing type Polyethylene | $H_2O$ Elev. Before Pumping 0.0
Pump Start Time 15:35 | Pump Stop Time 16:05 | $H_2O$ Level After Pumping 0.0 | Pumping Rate (avg) 0.5
Well Bottom Elev.** 15.68 | $H_2O$ Vol. In Equip. ____
Measuring Point Elevation PVC

* Elevation relative to surveyed point on the well.
** Depth to bottom taken from boring logs.
Screen Elevation (top of Screen)

| Time | DTW (ft) | pH | Temp. (°C) | Cond. (umhos) | DO (mg/kg) | Approx. Vol. Removed (L) | Pumping Rate (L/min) |
|---|---|---|---|---|---|---|---|
| 15:36 | 0.16 | 7.20 | 18.6 | 1387 | 0.7 | 0.5 | 0.5 |
| 15:39 | 0.19 | 6.97 | 18.8 | 1371 | 0.6 | 2 | 0.5 |
| 15:42 | 0.10 | 6.97 | 18.9 | 1335 | 0.6 | 3.5 | 0.5 |
| 15:45 | 0.0 | 6.97 | 19.1 | 1335 | 0.7 | 5 | 0.5 |
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Notes: Penn DEP observing sample process

$H_2O$ clear

Field Staff: M. Burno
P. Harkman

Date: 4/3/01

Whittaker Corporation
Greenville, PA

SCIENTECH, Inc.

## Groundwater Sampling Log

Project: Whittaker Corporation | Well No. 10 | Sampling Date 4/3/01 | Static $H_2O$ Elev. 21.3

PID reading — | Screen Length 15' | Well Diameter 2" | Casing Type steel

Screen Elev. ____ | Pump Set @* 29' | Date Pump Set 4/3/01 | Time Pump Set 16:35

Sampling Device In-well Pump | Tubing type Polyethylene | $H_2O$ Elev. Before Pumping 21.13

Pump Start Time 16:45 | Pump Stop Time 17:28 | $H_2O$ Level After Pumping 22.76 | Pumping Rate (avg) 0.3

Well Bottom Elev.** 31.32 | $H_2O$ Vol. In Equip. ____

Measuring Point Elevation PVC

* Elevation relative to surveyed point on the well.
** Depth to bottom taken from boring logs.
Screen Elevation (top of Screen)

| Time | DTW (ft) | pH | Temp. (°C) | Cond. (umhos) | DO (mg/kg) | Approx. Vol. Removed (L) | Pumping Rate (L/min) |
|---|---|---|---|---|---|---|---|
| 16:47 | 22.30 | 6.82 | 18.5 | 1104 | 0.6 | 1 | 0.5 |
| 16:50 | 22.85 | 6.80 | 19.9 | 1098 | 0.6 | 2.2 | 0.4 |
| 16:53 | 22.77 | 6.80 | 19.9 | 1098 | 0.7 | 3 | 0.3 |
| 16:56 | 22.82 | 6.79 | 20.4 | 1103 | 0.7 | 3.4 | 0.3 0.2 |
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Notes:

2min for 500 ml

$H_2O$ turbid

File: \\NES-NT\DEPT\DEPT020\3077 - Whittaker\WellData.xls
Sheet: LowFlowWorkSheet


Printed: 3/28/01, 11:05 AM

4/3-4/01 4/3/01 Rain 40° 4/4/01 Sunny 50°

| | DTW | DTB | SW | Top of Screen | Mid Screen | Pump Place | DTB After | Sampled | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 4.87' | 18.46 | 13.59 | 8.46 | 13.46 | 14.480 | 17.36' | 10:35 | 4/3/01 |
| 2 | 10.99' | 26.82 | 15.83 | 11.82 | 19.32 | 20.30 | 26.84 | 11:47 | 4/3/01 |
| 3 | 1.58' | 15.0 | 13.42 | 5.0 | 10.0 | 10 | 16.33 | 12:15 | 4/4/01 |
| 4 | 16.19 | 31.73 | 15.54 | 16.73 | 24.23 | 24 | 31.66 | 9:30 | 4/4/01 |
| 5 | 6.93 | 22.29 | 15.36 | 7.23 | 14.79 | 15 | 22.27 | 11:00 | 4/4/01 |
| 6 | 20.45 | 31.67 | 11.22 | 16.67 | 24.17 | 25 | 31.61 | 14:47 | 4/4/01 |
| 7 | 4.21 | 14.38 | 10.17 | 4.38 | 9.38 | 10 | 14.20 | 16:15 | 4/4/01 |
| 8 | 19.74 | 28.22 | 8.48 | 13.22 | 20.72 | 25 | 28.27 | 14:21 | 4/3/01 |
| 9 | *4.89 | 18.4 | 18.4 | 8.4 | 13.4 | 14 | 15.68 | 1545 | 4/3/01 |
| 10 | 21.30 | 32.29 | 10.99 | 17.29 | 24.79 | 29 | 31.32 | 1700 | 4/3/01 |

* from top of PVC extension
$H_2O$ leaking from weep hole in PVC
4.89 = ~~2.9~~ 0.29' above PVC

M. Burns & P Harkman Sampling

Well 6 goes dry
Well 4 silty