

ATTACHMENT 3
Eberline Correspondence

ZSRP is in receipt of communications from Eberline Labs which include the analysis explications for the term “false positive” as used in discussions relevant to the ZSRP release records, final reports, and other correspondences during reconciliation of the *Request for Additional Information Related to Final Status Survey Reports Phase 2A, 2B, and 3*.

These communications consists of e-mails from the Eberline Analytical Laboratory Manager in Oak Ridge, Tennessee to both the Lead Radiological Engineer and the Coordinating Point of Contact at ZSRP. The substance of the attached communications is synopsized below.

- Sr-90 false positives:
 - Sr-90 false positives are typically encountered during expedited sample requests when NORM in the laboratory environment is entrained into the sample, and the sample is then counted before the NORM has been allowed to decay off. This then interferes in the sample count acquisition; these are construed as “Noise Level Equivalents” at the counting facility.
- Tc-99 false positives:
 - Tc-99 false positives are “noise equivalent” for the analytical technique. Technetium-99 is counted by beta liquid scintillation and is prone to background noise variations directly related to the counting method. Using an absolute value that is > than the MDA is not appropriate for a beta liquid scintillation method when the value at these levels is truly $\pm 200\%$ of the value.

From: Mike McDougall <mike.mcdougall@eberlineanalytical.com>
Sent: Thursday, January 9, 2020 2:51 PM
To: Gerald Wood-ext
Subject: FW: Zion- Expedite Sample
Importance: High
From: Mike McDougall
Sent: Tuesday, March 5, 2019 12:15 PM
To: Patricia A. Giza <pagiza@energysolutions.com>
Cc: David L. Wojtkowiak-ext <DLWOJTKOWIAK-EXT@energysolutions.com>; Cheryl Conner <cheryl.conner@eberlineanalytical.com>; Elizabeth Towery <elizabeth.towery@eberlineanalytical.com>; Kathy Shaulis <kathy.shaulis@eberlineanalytical.com>
Subject: RE: Zion- Expedite Sample
Importance: High

Dear Patsy:

I will take care of it. I agree, it is most likely a counting artifact in that these results are "Noise Level Equivalent" for the analytical technique. In order to assure that we don't have contributions from NORMs we will need to allow the sample to sit a day before counting. I know you need this quickly; however, **A 3 day TAT for Strontium is about all we can do with all of the chemistry involved.** I will personally do the chemistry to expedite the process.

Best Regards,

Michael R. McDougall

Eberline Analytical | Oak Ridge, TN | Laboratory Manager | 865-481-0683 x128 | 865-776-0874 (cell)

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From: Mike McDougall <mike.mcdougall@eberlineanalytical.com>
Sent: Thursday, January 9, 2020 2:48 PM
To: Gerald Wood-ext
Cc: Cheryl Conner; Elizabeth Towery
Subject: Strontium False Positives.
Attachments: **1808010.CN.doc**

Gerry:

I found a narrative that referenced possible causes for pseudo positive Strontium results. I did not find an email that relates to this issue other than the one that led me to this narrative which I will send you. I'll keep looking, I do seem to recall something but my recollection is not real clear.

Best Regards,

Michael R. McDougall

Eberline Analytical | Oak Ridge, TN | Laboratory Manager | 865-481-0683 x128 | 865-776-0874 (cell)

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(NARRATIVE INCLUDED AT THE END OF THESE EMAILS)

From: Mike McDougall <mike.mcdougall@eberlineanalytical.com>
Sent: Tuesday, May 5, 2020 11:17 AM
To: Gerald Wood-ext
Cc: Sarah Roberts; David Wojtkowiak; Robert F. Yetter
Subject: RE: Complete/partial results - ESLLC-IL ZION FULL SUITE samples - Eberline 20-04071 & 20-04072

Gerry:

These are not positive results. They are “noise equivalent” for the analytical technique. Technetium-99 is counted by beta liquid scintillation and is prone to background noise variations directly related to the counting method. Using an absolute value that is > than the MDA is not appropriate for a beta liquid scintillation method when the value at these levels is truly $\pm 200\%$ of the value. These are typical for all of the Technetium-99 data that we reported. You do not have positive Technetium-99 activity. If results exceed 3 time the MDA they we can safely say that there is Technetium-99 activity present.

Best Regards,

Michael R. McDougall

Eberline Analytical | Oak Ridge, TN | Laboratory Manager | 865-481-0683 x128 | 865-776-0874 (cell)

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(END OF EMAILS)

EBS-OR-44221
May 15, 2020
Patricia Giza
Zion Solutions, LLC
101 Shiloh Blvd
Zion, IL 60099

CASE NARRATIVE

Work Order # 18-08010-OR

SAMPLE RECEIPT

This work order contains eleven soil samples received 08/02/2018. Samples were analyzed for Total Strontium, Tritium, Nickel-63 and by Gamma Spectroscopy.

<u>CLIENT ID</u>	<u>LAB ID</u>	<u>CLIENT ID</u>	<u>LAB ID</u>
L1-12106K-FSGS-019-SB-B	18-08010-04	L1-12106K-FSGS-029-SB-B	18-08010-10
L1-12106K-FSGS-020-SB-B	18-08010-05	L1-12106K-FSGS-031-SB-B	18-08010-11
L1-12106K-FSGS-021-SB-B	18-08010-06	L1-12106K-FSGS-032-SB-B	18-08010-12
L1-12106K-FSGS-022-SB-B	18-08010-07	L1-12106K-FSGS-037-SB-B	18-08010-13
L1-12106K-FSGS-023-SB-B	18-08010-08	L1-12106K-FSGS-038-SB-B	18-08010-14
L1-12106K-FSGS-024-SB-B	18-08010-09		

ANALYTICAL METHODS

Total Strontium was analyzed using EIChroM Method SRW01 Modified. Tritium was performed using Method LANL ER-210 Modified. Nickel-63 was performed using Method ASTM 3500-Ni Modified. Gamma Spectroscopy was performed using EPA Method 901.1 Modified.

Laboratory qualifiers are as follows:

U - Result is less than the MDA.

ANALYTICAL RESULTS

Combined Standard Uncertainty is reported at 1-sigma value.

Minimum Detectable Activity (MDA) values for data represented in this report are sample-specific. MDA measurements are determined based on factors and conditions including instrument settings, aliquot size and matrix type.

ANALYTICAL RESULTS CONTINUED

TOTAL STRONTIUM

Samples were prepared by digesting with acids as appropriate. Strontium recovery carriers were added to the samples. Chemical separations were conducted using selective extractions. Strontium precipitate was mounted on tared filter media. Chemical recovery was determined by Strontium carrier mass determinations. Samples were counted by gas flow proportional counting and corrected for Yttrium-90 ingrowth.

Samples demonstrated acceptable results for all Total Strontium analyses. Strontium-90 results are reported from Total Strontium. Due to slightly positive count rates, some samples were recounted. This was caused by conducting the first count too soon after filtration causing minor Radon-222 progeny to be present. Chemical recovery was acceptable for all samples. The Total Strontium method blank demonstrated an acceptable result. Results for the Total Strontium duplicate demonstrated a high relative percent difference; however, normalized difference is within acceptable limits for the analytical technique. Results for the Total Strontium laboratory control sample demonstrated an acceptable percent recovery.

TRITIUM

Tritium, Nickel-63 and Gamma Spectroscopy Results Edited from Narrative as they are not the subject matter of this Attachment

CERTIFICATION OF ACCURACY

I certify that this data report is in compliance with the terms and conditions of the Purchase Order, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the cognizant project manager or his/her designee to be accurate as verified by the following signature.

M.R. McDougall

Laboratory Manager

Date: 5/15/2020

Eberline Analytical wants and encourages your feedback regarding our performance providing radioanalytical services. Please visit <http://eberlineanalytical.com/> to provide us with feedback on our services.