

GROUND WATER QUALITY DISCHARGE PERMIT UGW450005

**STATEMENT OF BASIS**

Low-Level and 11e.(2) Radioactive Waste Disposal Facility

EnergySolutions, LLC  
423 West 300 South, Suite 200  
Salt Lake City, Utah 84101

February 4, 2014

Purpose

This Statement of Basis describes proposed changes to Ground Water Quality Discharge Permit No. UGW 450005 (hereafter Permit) for the EnergySolutions (hereafter Permittee) Low-Level, 11e.(2), and mixed radioactive waste disposal facility at Clive, Tooele County, Utah; located in Section 32, Township 1 South, Range 11 West, Salt Lake Baseline and Meridian. The Utah Division of Radiation Control (hereafter DRC) oversees the Permittee's Ground Water Quality Discharge Permit to ensure compliance with all applicable regulatory requirements. The operation of a waste disposal facility involves a process of continual on-going observation, surveillance, inspections, and evaluations to assure the satisfactory and safe performance of the facility, and to protect the environment. Proposed changes are related to Permittee requests to the Director of the DRC (hereafter Director), dated November 20, 2013, January 14, 2014, September 7, 2013, and December 20, 2013. To maintain facility performance, and respond to Permittee requests, changes to the Permit are proposed, as outlined below. The acceptance and implementation of these proposed changes will replace the previous Permit modification, dated October 10, 2013.

The changes described below are considered minor in nature by the Director and as a result are not subject to a public comment period. Minor changes to the Permit are those that are considered to have no impact on the protection of the environment, a change of requirements to be more stringent than those already existing, or administration in nature to clarify Permit conditions. Proposed modifications pertain to Table 5 of the Permit, *Approved Engineering Design Drawing for Waste/Wastewater Related Facilities*, and Appendix B of the Permit, *Water Monitoring Quality Assurance Plan (WMQAP)*.

Permittee November 20, 2013 Approved Engineering Design Drawing for Waste/Wastewater Related Facilities, Table 5 Modification Request

In a letter dated November 20, 2013, the Permittee requested a minor modification, updating some East Side Drainage and Gray Water System engineering drawings in Table 5 of the Permit (see Attachment A). This request was related to an August 9, 2012 request by the Permittee for a change

in the design of the stormwater drainage system between tracks 2 and 3, specifically the repair of a damaged asphalt surface, and catch basins between tracks 2 and 3; and the addition of three new catch basins. The stormwater collection system collects stormwater through catch basins located south of the intermodal container wash building, north and south of the intermodal unloading facilities, and in the rail car unloading area between tracks 2 and 3. Stormwater in the system is routed to the stormwater lift sump, and collected water is pumped from the sump to the 1997 pond. The asphalt surface and catch basins located between tracks 2 and 3 had been damaged by intermodal unloading cranes and other heavy equipment. The Permittee had started the process of repairing the asphalt surface, and catch basins between track 2 and 3, when they decided to request a change for more robust/durable catch basins, and three additional catch basins. The DRC reviewed this request and other unresolved issues with the Permittee that are summarized in a September 24, 2012 memorandum (see Attachment B). The design of the stormwater drainage system between tracks 2 and 3 was approved in a September 27, 2012 letter (see Attachment C). Approved Engineering Design Drawings for Waste/Wastewater Related Facilities need to be revised to reflect three revised engineering drawings.

The Permittee proposed changes to improve drainage control in this area, by adding the three new stormwater catch basins and improving the surface with new asphalt, improving the durability of the catch basin that add to the stability of the stormwater drainage system. The Permittee has submitted the revised drawings to update Table 5 of the Permit. These changes were approved in a DRC letter dated September 27, 2012 as they provided improved protection of ground water.

#### Permittee January 10, 2014 Approved Engineering Design Drawing for Waste/Wastewater Related Facilities, Table 5 Modification Request

In a letter dated January 10, 2014, the Permittee requested an update of a containerized waste facility engineering drawing (CWF) in Table 5 of the Permit. This drawing shows the active CWF area, specifically the minor change in the stormwater evaporation basin (see Attachment D). The CWF is a distinct area within the footprint of the Class A West embankment that is used for the disposal of certain waste packages and the evaporation basin is used to contain stormwater that contacts the CWF. The Permittee requested a revised CWF footprint in the Class A West embankment that was discussed in an earlier Statement of Basis, dated August 2013. The DRC reviewed the Permittee submittals and found the engineering designs proposed consistent with the previously approved design basis for CWF disposal and conforms with stormwater management requirements. The expanded CWF is constructed in accordance with the current approved CQA/QC Manual and submitted engineering drawings.

The Permittee's proposed change is for the removal of a small area of the evaporation basin in order to enable access to the CWF border areas. The basin remains adequate to accommodate design storm events.

#### Permittee September 7, 2013 WMQAP Modification Request

In a letter dated September 17, 2013, the Permittee requested two minor modifications to the

WMQAP. The two requested modifications were to; (1) Remove the temperature preservation requirement for carbon-I4, iodine-129, technetium -99, and tritium; and (2) Change language in the WMQAP for flow rates associated with collection of Volatile Organic Compound (VOC) samples. The WMQAP outlines and enforces the objectives of groundwater compliance sampling at the Clive facility, with regard to data quality, including protocols used for groundwater sampling, storage, and shipping; required criteria for analytical laboratories, and; required analytical methods and Quality Assurance (QA). Selecting the appropriate groundwater monitoring parameters and methods for analyzing groundwater samples are critical to properly assessing groundwater quality, and just as critical is the care taken during sample collection, shipping, and analysis.

Regarding the temperature preservation requirement modification request, the Permittee was informed by their contract laboratory, Test America in Richland, Washington, that the data quality for these parameters (carbon-I4, iodine-129, technetium -99, and tritium) is not affected by sample temperature, and that they have sometimes received shipping containers containing melted ice, which lead to concerns regarding radiological contamination and sample cross-contamination. The DRC reviewed this request and documented their findings in a memorandum dated January 30, 2014 (Attachment D).

It was determined appropriate to remove the temperature requirement since the removal will not affect ground water data quality. The DRC based its findings on a review of analytical methods, Environmental Protection Agency (EPA) recommendations, and also noted that the same parameters collected for DRC regulatory oversight do not have temperature restrictions placed on them by the DRC contract laboratory (Eberline Services).

Regarding the flow rate for VOC sampling request, the Permittee requested to change language in the WMQAP regarding groundwater sampling for VOCs, although VOCs are fairly soluble in water, the primary fate of VOCs in water is their loss to the atmosphere which is accelerated if the groundwater sample is aerated during collection. The Permittee proposed to change the current language requiring sampling flow rate less than 100 milliliters per minute to minimize the loss of volatile organics due to agitation and aeration of the sample at the low flow rate.

The Permittee proposed to change the requirement, which was originally based on 1986 EPA guidance to a less prescriptive requirement in order to eliminate agitation or oxygenation of the sample to the extent possible. The request is based on more recent EPA guidance regarding VOC sampling as well as observations made by ground water sampling personnel who noted that the ground water samples were being aerated at the low flow rates due to sputtering flows.

The DRC reviewed this request and documented their findings in the memorandum dated January 30, 2014 (Attachment D). It was determined that for VOC sampling, the discharge rate of the bladder pump will be reduced to the extent possible to allow gentle filling of the sample bottles without aeration. The flow rate will be measured and documented in the field prior to the start of groundwater sampling events each day. Immediately after VOC sample collection, sample containers will be placed in a cooler containing ice in order to meet the VOC preservation requirements.

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**Permittee December 20, 2013 WMQAP Modification Request**

In a letter dated December 20, 2013, the Permittee requested a minor modification to the WMQAP to remove matrix spike and matrix spike duplicate sample requirements for dioxin and furan analysis.

The Permittee was notified by its contract laboratory, Test America Sacramento CA that it is not necessary to perform analysis of matrix spike and matrix spike duplicate QA samples for dioxin and furan analysis. Matrix spike and matrix spike duplicates are used to determine laboratory accuracy and precision. The methods used for dioxin and furan analysis (isotopic dilution methods) use an analogous target analyte that is spiked into the sample at the time of extraction, and matrix effects for dioxin and furan can be judged by the recovery of this target analyte. Since matrix effects on method performance can be judged by the recovery of these analogues, there is little added benefit of performing matrix spike and matrix spike duplicate samples for these methods.

In the case of dioxin and furan analysis, it is recognized that QA sample modifications are associated with the RCRA Part B permit (Clive Mixed Waste Facility) and as such the changes were reviewed and approved by the Utah Division of Solid and Hazardous Waste (DSHW). DRC staff contacted DSHW staff to confirm that the changes are appropriate.

Since the WMQAP is associated with the Permit, changes must be approved by the Director. A footnote will be added to the WMQAP stating that dioxin and furan analyses are exempt from matrix spike and matrix spike duplicate requirements.

**List of Proposed Changes:**

The Director is proposing a modification of the permit at this time to accommodate the proposed minor Table 5, and WMQAP changes. The changes are:

Modification of Table 5, Related facility East Side Drainage and Gray Water System drawing versions and dates are changed to:

06007-C1 Rev 6 dated 7/23/12  
06007-C2 Rev 6 dated 7/23/12  
06007-V1 Rev 4 dated 7/23/12

Modification of Table 5, Related Facility Class A West Containerized Waste Facility and Large Component Area Evaporation Basin drawing version and date is changed to:

10014-C07 Rev 4 dated 1/10/14

Modification of Table B.4-2, removal of "chill to 4°C" preservative requirement for C-14, I-129, Tc-99, and Tritium.

Language has been changed in the paragraph on page 8.4-12 to read "*For groundwater samples collected for VOCs, the discharge rate of the bladder pump will be reduced to the extent possible to allow gentle filling of the sample bottles without aeration. The VOC sampling flow rate will be measured and documented on the sampling field sheet immediately prior to sample collection for VOC's, at least once daily on all days when VOC samples are collected. Immediately after VOC sample collection, sample containers will be placed in a cooler containing ice in order to meet the VOC preservation requirements.*"

Part B, Page 8.4-8 will be modified to include a footnote under the table associated with collection of matrix spike and matrix spike duplicate samples which will exempt dioxin and furan from matrix spike and matrix spike duplicate requirements and reads "*except for dioxin/furan analysis by method 8290 or equivalent, where isotopic dilution is used to assess the effects of matrix on method performances.*"

These changes are appropriate and consistent with Approved Engineering Design Drawing for Waste/Wastewater Related Facilities, and laboratory and guidance documents and the current protocols required by the DRC contract laboratory. The proposed changes are presented in underline/strikeout format (underline is added to the text, and strikeout is removed from the text) for the Table 5 and WMQAP pages affected, in Appendix E of this statement of Basis.

References:

EnergySolutions, November 20-, 2013, Groundwater Quality Discharge Permit No. UGW450005: As-Built Report and Request for Minor Modification - East Side Drainage and Gray Water System: letter from Sean McCandless, Manager, Compliance and Permitting for EnergySolutions to Rusty Lundberg, Director of Utah Division of Radiation Control.

EnergySolutions, August 9, 2012, Groundwater Quality Discharge Permit No.UGW450005 – Request for minor modification, and approval of revised Appendix J and K: letter from Sean McCandless, Manager, Compliance and Permitting for EnergySolutions to Rusty Lundberg, Director of Utah Division of Radiation Control.

DRC, September 24, 2012, EnergySolutions minor Permit modification request dated May 1, 2012, and September 10, 2012: Memorandum from Charles Bishop of the DRC to File, East Side Drainage Piping Project.

DRC, September 27, 2012, EnergySolutions Request for Minor Permit Modification, Clarifying requirements associated with the Managements of PCB waste at the Shredder Facility, and changes in the design of the stormwater drainage system between tracks 2 and 3: Approval: letter from Rusty Lundberg, Director of Utah Division of Radiation Control to Sean McCandless, Manager, Compliance and Permitting for EnergySolutions.

EnergySolutions, January 10, 2014, Groundwater Quality Discharge Permit No. UGW450005: Request for Minor Modification – Containerized Waste Facility Evaporation Basin: letter from Sean McCandless, Manager, Compliance and Permitting for EnergySolutions to Rusty Lundberg, Director of Utah Division of Radiation Control.

DRC, August 2013, Statement of Basis for Permit modification dated October 10, 2013.

EnergySolutions, September 17, 2013, Groundwater Quality Discharge Permit No. UGW450005: Request for Modification of Appendix B - Water Monitoring Quality Assurance Plan (WMQAP): letter from Sean McCandless, Manager, Compliance and Permitting for EnergySolutions to Rusty Lundberg, Director of Utah Division of Radiation Control.

EnergySolutions, January 30, 2014, EnergySolutions September 17, 2013 and December 20, 2013 Request for Modification of Appendix B -Water Monitoring Quality Assurance Plan: Memorandum from Tom Rushing of the DRC to File.

EnergySolutions, December 20, 2013, Groundwater Quality Discharge Permit No. UGW450005: Request for Modification of Appendix B - Water Monitoring Quality Assurance Plan (WMQAP): letter from Sean McCandless, Manager, Compliance and Permitting for EnergySolutions to Rusty Lundberg, Director of Utah Division of Radiation Control.

Attachment A

November 20, 2013 letter

Subject: Groundwater Quality Discharge Permit No. UGW450005: As-Built  
Report and Request for Minor Modification – East Side Drainage and Gray Water  
System

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**ENERGYSOLUTIONS**

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November 20, 2013

Mr. Rusty Lundberg  
Director  
Utah Division of Radiation Control  
Salt Lake City, UT 84114-4850

CD13-0322

**RECEIVED**  
**NOV 20 2013**  
DEPARTMENT OF  
ENVIRONMENTAL QUALITY

Re: Groundwater Quality Discharge Permit No. UGW450005: As-Built Report and Request for Minor Modification – East Side Drainage and Gray Water System

Dear Mr. Lundberg:

In letters dated August 2, 2012 and September 10, 2012, EnergySolutions requested minor modification to the East Side Drainage and Gray Water System. In a letter dated September 27, 2012, DRC approved construction of these changes. That construction has now been completed. Attached please find as-built drawings.

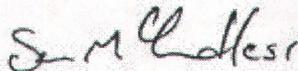
As noted in our request letters, this construction project triggers revision to Table 5 of the Permit. Specifically, the following drawing versions and dates now apply:

1. 06007-C1, Rev. 6, 7/23/12
2. 06007-C2, Rev. 6, 7/23/12
3. 06007-V1, Rev. 4, 7/23/12

No changes to these drawings are needed as a result of the construction project. Please update Table 5 with the next Permit modification.

Please contact me at 801-649-2151 with any questions regarding this issue.

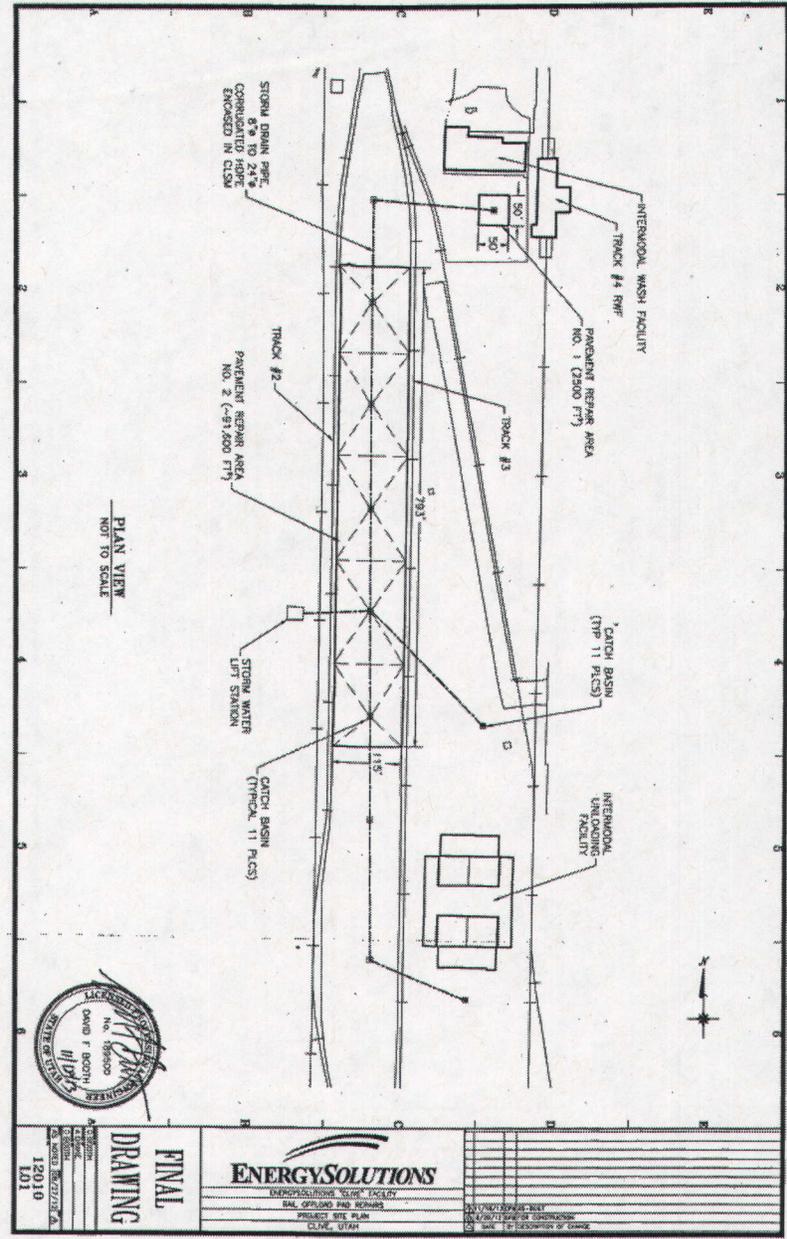
Sincerely,



Sean McCandless  
Manager, Compliance and Permitting

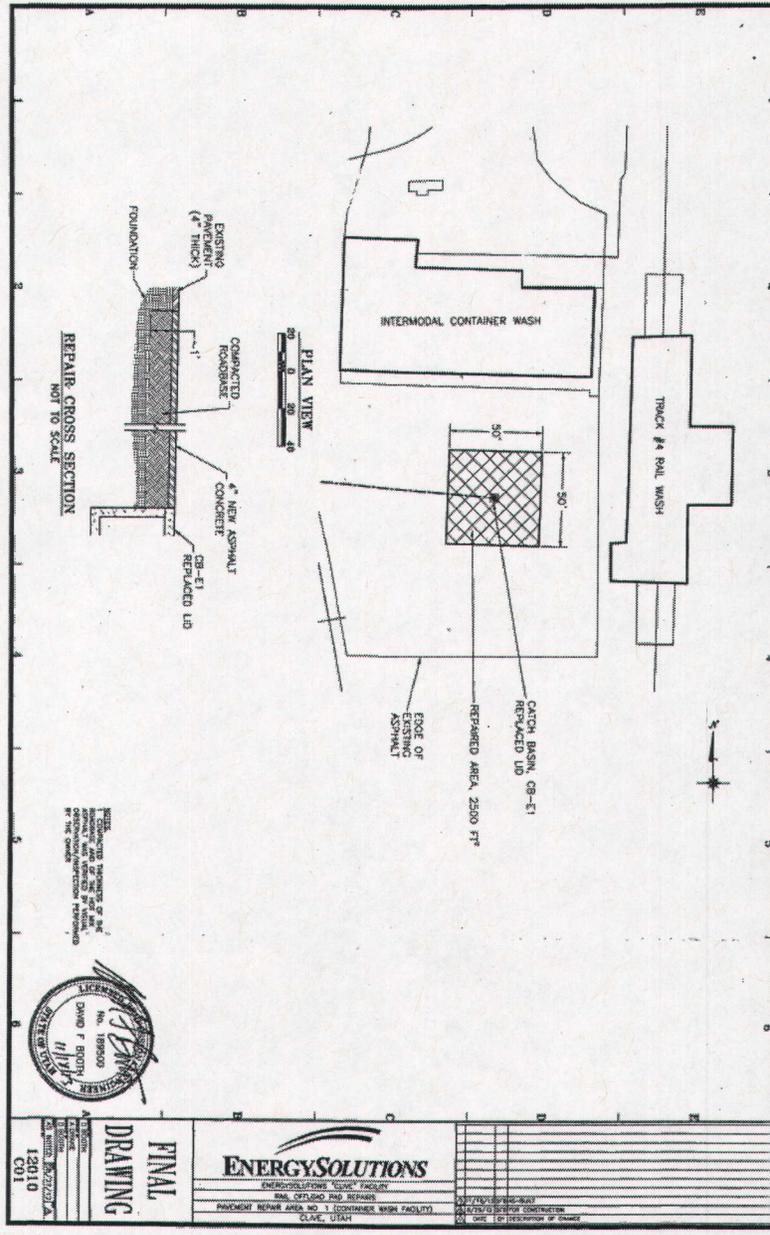
cc: John Hultquist, DRC

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.



<b>FINAL DRAWING</b> No. 58900 CHAD F. SCOTT M/D/C STATE OF UTAH 12018 101	 ENERGY SOLUTIONS ENERGOLOGIC'S "SLIM" FACILITY BNL OFFSHORE PAD REMEDIATION PROJECT SITE PLAN CLARK, UTAH	DATE: 12/11/18 DRAWN BY: J. B. [unclear] CHECKED BY: J. B. [unclear] APPROVED BY: J. B. [unclear]
		SCALE: AS SHOWN SHEET NO.: 101 OF 101







Attachment B

September 24, 2012 memorandum

Subject: EnergySolutions minor permit modification requests dated May 1, 2012,  
and September 10, 2012



State of Utah

GARY R. HERBERT  
Governor

GREG BELL  
Lieutenant Governor

Department of  
Environmental Quality

Amanda Smith  
Executive Director

DIVISION OF RADIATION CONTROL  
Rusty Lundberg  
Director

DRC - 2012 - 002055

MEMORANDUM

TO: File, East Side Drainage Piping Project

THROUGH: John Hultquist, Licensing Manager *JH 9/26/2012*

FROM: Charles Bishop, P G, Hydrogeologist *CEB 9-26-2012*

DATE: September 24, 2012

SUBJECT: EnergySolutions minor permit modification requests dated May 1, 2012, and September 10, 2012

EnergySolutions submitted requests for minor modifications to the Ground Water Quality Discharge Permit No. UGW 450005, and its Appendixes J and K on May 1, 2012 and September 10, 2012

The May 1, 2012 request is for a proposed revision to Appendix J, Best Available Technology (BAT) Performance Monitoring Plan. The modification proposed is to clarify requirements associated with the management of PCB waste at the Shredder Facility in accordance with a U.S. Environmental Protection Agency, Toxic Substances Control Act approval letter, dated February 8, 2012. Shredder pad inspection requirements have been revised in accordance with this approval, which requires a just as rigors inspection of the shredder pad. Additionally, a minor editorial correction was made to the DU Building weekly inspection form. These changes are evaluated and considered as a minor modification in the current SOB for the proposed Permit modification for the CAW. The request requires only the approval of the BAT Performance Monitoring Plan.

The September 10, 2012 request is for a proposed minor Permit modification and revision of Appendix J, BAT Performance Monitoring Plan, and Appendix K, BAT Contingency Plan. This modification provides a change in the design of the stormwater drainage system between tracks 2 and 3, specifically the repair of damaged catch basins and the asphalt surface between tracks 2 and 3, and the addition of three new catch basins. The approximate location of this project area for the stormwater catch basins is shown in Figure 1. This is a resubmittal of a request dated August 9, 2012 (EnergySolutions, August 9, 2012). In the August 9, 2012 request, EnergySolutions requested that Table 5 of the Permit, Approved Engineering Design Drawings for Waste/Wastewater Related Facilities, be revised to reflect three engineering drawing revisions, and that Condition I.E. 24 c of the Permit be revised to

Review of minor Permit mod requests dated May 1 and Sept 10, 2012  
Page 2

To ensure the fluid level in the stormwater catch basin is always maintained below the level of their respective grates.

Currently condition I.E 24 c states

To ensure the fluid level in the 11 stormwater catch basin is always maintained below the level of their respective outlet pipes

The request included revision of Appendix J, which included revision of the LLRW/11e (2) facility daily inspection form, updates of figure 1 and Table 1 (revision for consistency) The inspection criteria in the inspection forms for free drainage of water to the catch basins would change from water above the outlet pipe to water above the grate

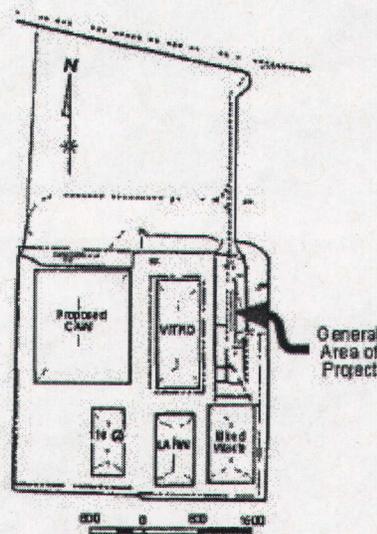


Figure 1 Plan view outline map of the Clive facility showing the general area affected by the September 10, 2012 request

The DRCs, Charles Bishop and David Rupp, made a site visit to the EnergySolutions' Clive facility, to better understand the August 9, 2012 request and to look at the stormwater drainage system on August 23, 2012, meeting with EnergySolutions' operational and engineering staff. The stormwater collection system is part of the East Side Drainage Piping System, where stormwater is collected by catch basins located south of the intermodal container wash building, north and south of the intermodal unloading facilities, and the rail car unloading area between tracks 2 and 3. Stormwater in the system is routed to the stormwater lift sump, and collected water is pumped from the sump to the 1997 pond. The DRC staff observed that some of the catch basins located between tracks 2 and 3 have been damaged by intermodal unloading cranes and other heavy equipment driving over the catch basins. Figure 2 shows one of the damaged catch basins. EnergySolutions plans on replacing these damaged catch basins with more indestructible catch basins. The asphalt surface between tracks 2 and 3 had also been pretty much destroyed by the intermodal unloading cranes and other heavy equipment driving over it. As part of the repair of the stormwater drainage system, EnergySolutions has excavated and removed the

Review of minor Permit mod requests dated May 1 and Sept 10, 2012  
Page 3

asphalt surface between track 2 and 3 and will replace it with a more durable asphalt surface. Figure 3 shows the excavated surface with a geomembrane placed down, before asphalt is replaced.

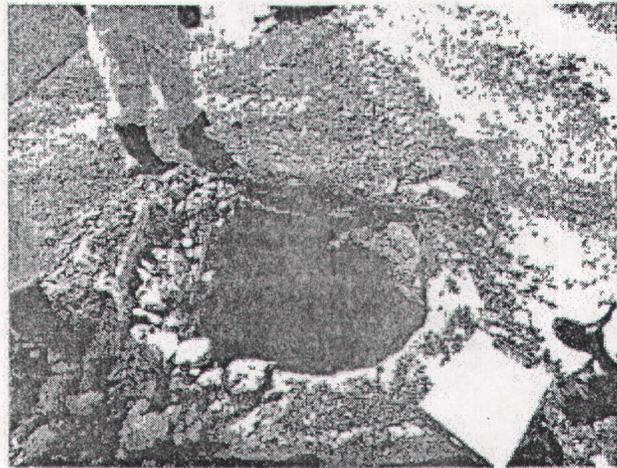


Figure 2 Damaged stormwater collection system catch basin between tracks 2 and 3

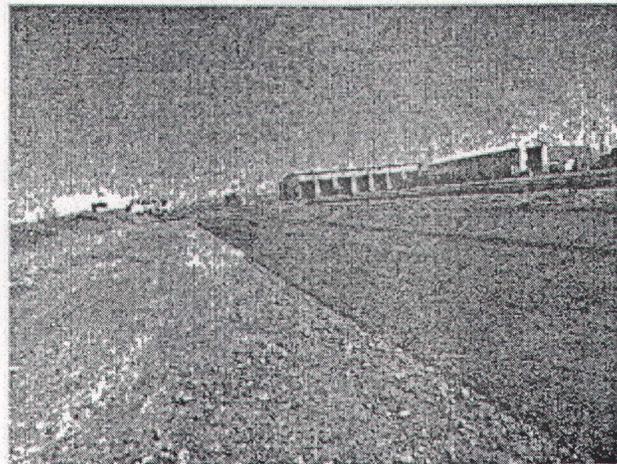


Figure 3 Area of excavated surface with a geomembrane laid down between tracks 2 and 3. The picture is looking north towards the intermodal wash building.

After the site visit, the DRC evaluated the August 9, 2012 request and submitted a Request for Information (RFI) letter to EnergySolutions (DRC, August 30, 2012). In the RFI letter the DRC informed EnergySolutions that if all the East Side Drainage Project stormwater catch basins are allowed to store water to the tops of the grates, the catch basins will need to be permanently sealed.

Review of minor Permit mod requests dated May 1 and Sept 10, 2012  
Page 4

to prevent exfiltration, and they should provide detailed typical drawing(s) of the new East Side upgraded stormwater catch basin design(s). These drawings were to show the sealed stormwater catch basins, how the affected stormwater catch basins will be modified to increase bearing strength and prevent failure from heavy loadings, and if the catch basin changes affect other existing drawings, they must also be revised to be current with the modification proposal, and submitted for approval

On September 4, 2012 a conference call between the DRC staff of John Hulquist, David Rupp, and Charles Bishop, and EnergySolutions staff of Sean McCandless, David Booth, and Tressa Parker discussed the August 30, 2012 RFI letter (DRC, September 4, 2012). EnergySolutions was troubled that sealing the catch basins was being required. They argued that no bulk waste handling occurred in this area, and thus only non-contact storm water was collected in this system. The DRC was concerned that the system was in the restricted area, and thus had a potential to contact waste; the catch basins could act as a storm water storage systems, and as such, if they leaked they would be contributing to ground water under the facility, and how did this change meet BAT and Best Management Practices requirements. EnergySolutions' reason for wanting the change the compliance point listed in Part I E 24c of the Permit was so its inspectors could more easily confirm compliance at the catch basins. Again, the DRC was concerned that this did not meet BAT and Best Management Practices requirements. It was decided during the conference call that EnergySolutions would resubmit the request, without the proposed wording change to Part I E.24c and continue on with the repairs to the storm water drainage system. They would look at making the grates more amenable to observing the compliance point in the catch basins.

On September 10, 2012 EnergySolutions resubmitted the request for a minor modification of the stormwater drainage system between tracks 2 and 3. EnergySolutions requested that the three drawing affected by the redesign of the system be added to Table 5 of the Permit, these are,

- 06007-C1, Rev 6 East Side Drainage, General Site Plan
- 06007-C2, Rev 6, East Side Drainage, Storm Water Drainage Plan
- 06007-V1, Rev 4, East Side Drainage, Storm Water and Waste Flow Diagram

These revised drawings were submitted with the transmittal letter dated August 9, 2012. The location of the new catch basins and the area to be resurfaced are shown in Figure 4. EnergySolutions modified the previous request of August 9, 2012 for Condition I E 24 c to

To ensure the fluid level in the stormwater catch basins is always maintained below the level of the respective outlet pipes

The only change was the deletion of the specific number of stormwater catch basins, which is acceptable to the DRC

EnergySolutions is requesting approval of the proposed revision of the Permit, Appendix J, BAT Performance Monitoring Plan, and Appendix K, BAT Contingency Plan. The appendices upon approval will be dated September 7, 2012 and includes the change of the May 1, 2012 request.

Review of minor Permit mod requests dated May 1 and Sept 10, 2012  
Page 5

The removal of the specific number of catch basins eliminates potential changes to the Permit if catch basins are added or removed in the future, but does not reduce the protection provided by the Permit. The update of Appendix J include revisions to the LLRW/11e (2) facility daily inspection form, minor editorial change to the DU building weekly inspection form, and updates to Figure 1 and Table 1 for consistency. The appendix K revisions are only minor spelling corrections

EnergySolutions is improving drainage in this area by adding the three new stormwater catch basins and improving the surface with new asphalt. EnergySolutions is improving the durability of the catch basin which will add to the stability of the stormwater drainage system. EnergySolutions has submitted the revised drawings to update Table 5 of the Permit. These proposed changes should be approved as they provide better protection of ground water. The inspection criteria for free drainage of water to and through the catch basins will remain as it is now, thus there is no concern with the storage of water in the catch basins

### Attachment C

September 27, 2012 letter

Subject: EnergySolutions Request for Minor Permit Modification, Clarifying requirements associated with the management of PCB waste at the Shredder Facility, and changes in the design of the stormwater drainage system between tracks 2 and 3: Approval



State of Utah

GARY R. HERBERT  
Governor

GREG BELL  
Lieutenant Governor

Department of  
Environmental Quality

Amanda Smith  
Executive Director

DIVISION OF RADIATION CONTROL  
Rusty Lundberg  
Director

SEP 28 2012

September 27, 2012

CERTIFIED MAIL  
(Return receipt Requested)

Sean McCandless, Director of Compliance and Permitting  
EnergySolutions, LLC  
423 West 300 South, Suite 200  
Salt Lake City, Utah 84101

**SUBJECT:** EnergySolutions Requests for Minor Permit Modifications, Clarifying requirements associated with the management of PCB waste at the Shredder Facility, and changes in the design of the stormwater drainage system between tracks 2 and 3: Approval.

Dear Mr. McCandless:

The Utah Division of Radiation Control (DRC) has reviewed the EnergySolutions proposed changes to the Ground Water Quality Discharge Permit (hereafter Permit), and its Appendices J and K. This letter serves as the Director of the Division of Radiation Controls' approval of those proposed changes to the Permit and its Appendices J and K, found in transmittal letters dated May 1, 2012, and September 10, 2012.

The May 1, 2012 request clarifies requirements associated with the management of PCB waste at the Shredder Facility in accordance with a TSCA Shredder Approval letter dated February 8, 2012. The September 10, 2012 request deals with a modification affecting the East Side Drainage Project, specifically the stormwater drainage system between tracks two and three. With the approval of Appendices J and K, dated September 7, 2012, this version becomes the effective BAT Performance Monitoring Plan (Appendix J), and BAT Contingency Plan (Appendix K) for the EnergySolutions' Clive facility. The Permit and Appendices changes will be included in the next Permit modification. Thank you for your cooperation in this matter.

Utah Division of Radiation Control

*Rusty Lundberg*  
Rusty Lundberg, Director

RL/CB:cb  
F:\wp\ES\East Side Drainage Project\ September 26, 2012 approval letter

**Attachment D**

**January 30, 2014 memorandum**

**Subject: EnergySolutions September 17, 2013 and December 20, 2013 Request for  
Modification of Appendix B – Water Monitoring Quality Assurance Plan**



State of Utah  
GARY R. HERBERT  
Governor

SPENCER J. COX  
Lieutenant Governor

Department of  
Environmental Quality

Amanda Smith  
Executive Director

DIVISION OF RADIATION CONTROL  
Rusty Lundberg  
Director

MEMORANDUM

TO: File

THROUGH: Phil Goble, Compliance Section Manager *PR 6 1/30/2014*

FROM: Tom Rushing, P.G. *JR 1-30-2014*

DATE: January 30, 2014

SUBJECT: EnergySolutions September 17, 2013 and December 20, 2013 Request for Modification of Appendix B – Water Monitoring Quality Assurance Plan

September 17, 2013 ES Request

*Summary:*

The September 17, 2013 EnergySolutions ("ES") Request for Modification of Ground Water Discharge Permit No. UGW450005, Appendix B Water Monitoring Quality Assurance Plan ("WMQAP") includes two requested changes as follows:

1. A request to delete the temperature preservation requirement (chill to 4° C) for carbon-14, iodine-129, technetium-99, and tritium analysis.
2. A request to change language in the WMQAP for flow rates associated with collection of Volatile Organic Compound ("VOC") samples from a prescribed flow rate of ≤100 milliliters per minute to less prescriptive requirements to prevent aeration of the sample when filling sample containers "to the extent possible."

Specific discussion regarding these WMQAP modification requests is below.

*Temperature Preservation Requirement for Specific Radiological Parameters:*

Per the request ES notes that it's contract laboratory for radiological samples, Test America in Richland, Washington ("TAR"), "informed EnergySolutions that the data quality for these parameters was not affected by sample temperature" and that "shipping containers received by TAR have sometimes contained melted ice, leading to radiological contamination concerns and sample cross-contamination concerns."

EnergySolutions WMQAP Modification Request  
Page 2

Per DRC review of analytical methods used for these parameters (non-metallic radionuclides) the following was found:

Parameter	WMQAP Listed Analytical Method	Method Used by TAR, Per Laboratory Reports
Carbon-14	EPA C-01/EPA 520	EPA 520C-01
Iodine-129	EPA R4-73-0141	EPA R4-73-0141(d)
Technetium-99	HASL 300	Mod RP550/DOE0089T
Tritium	EPA 906.0	EPA 906.0

Per DRC review of the above methods and parameters no specific requirements for sample temperature were noted. DRC did note that the Environmental Protection Agency recommends that tritium samples be kept cool if the sample will be stored for an extended period of time. DRC additionally notes that samples collected for regulatory oversight (DRC split sample protocols) do not require that the sample for the above parameters be kept cool as per the DRC contract laboratory (Eberline Services).

Based on DRC review of the temperature requirements for the listed parameters, DRC concurs that it is appropriate to remove the temperature requirement, and that the data quality will not be affected by the removal.

The change will result in modification of the WMQAP TableB.4-2, removal of "chill to 4°C" preservative requirement for Radiologics - C-14, I-129, Tc-99, and Tritium. Per discussion above this change seem appropriate and consistent with laboratory guidance documents and with the current protocols required by the DRC contract laboratory.

**Ground Water Flow Rate for VOC Sampling:**

ES additionally requests to change language in the WMQAP regarding groundwater sampling for VOC's. Specifically, ES proposes to change the current language which requires sampling flow rate  $\leq 100$  milliliters per minute to minimize the loss of volatile organics due to agitation and aeration of the sample. ES proposes to change the quantitative requirement, which was originally based on recommendations in EPA guidance (EPA, 1986 TEGD) to a less prescriptive requirement to eliminate agitation or oxygenation of the sample to the extent possible.

Specifically, The EPA 1986 TEGD states that "when collecting samples where volatile constituents or gases are of interest using a positive gas displacement bladder pump, pumping rates should not exceed 100 milliliters/minute. Higher rates can increase the loss of volatile constituents and can cause fluctuation in pH and pH-sensitive analytes."

ES states in the request that the proposed language change is based on more recent guidance (EPA 2002 and EPA 2013) which "recommend sampling be conducted in a manner that minimizes disturbance and aeration of the sample without placing quantitative limits on the flow rate." However, based on DRC review of the EPA 2002 reference, it appears that this guidance does recommend a specific flow rate when collecting groundwater samples to minimize agitation and aeration as follows: EPA 2002 p. 47 "If the water-quality-indicator parameters have stabilized,

EnergySolutions WMQAP Modification Request  
Page 3

*sample the well. Samples will be collected by lowering the flow rate to a rate that minimizes aeration of the sample while filling the bottles (approximately 300 ml/min)."* Therefore, the EPA 2002 guidance recommends a flow rate greater than the EPA 1986 TEGD maximum flow rate although it is noted that the EPA 2002 reference was not specific to sampling with a bladder pump.

Per DRC review, the EPA 2013 reference does not appear to recommend specific flow rates when collecting volatile organic samples but does state that, "The samples should be collected with as little agitation or disturbance as possible."

Per the September 17, 2013 ES proposal, "the VOC sampling flow rate will be measured and documented at the start of groundwater sampling events. This will take place on the first day of the annual event or first day of accelerated monitoring (monthly and quarterly) when monitoring wells are sampled for VOC's." DRC has concerns regarding the stated frequency of flow monitoring when collecting VOC samples. DRC representatives (Phil Goble and Tom Rushing) met with EnergySolutions representatives (Sean McCandless and Bob Sobocinski) in the DRC offices on January 30, 2014 to discuss the flow measurement frequency. Based on agreements during the meeting, the flow rate will be measured at least once daily when VOC samples are collected at the Clive Facility monitoring wells.

The WMQAP language has been changed in the paragraph on page B.4-12 as follows:

*"For groundwater samples collected for VOCs, the discharge rate of the bladder pump will be reduced to the extent possible to allow gentle filling of the sample bottles without aeration. The VOC sampling flow rate will be measured and documented on the sampling field sheet immediately prior to sample collection for VOC's, at least once daily on all days when VOC samples are collected. Immediately after VOC sample collection, sample containers will be placed in a cooler containing ice in order to meet the VOC preservation requirements"*

The revised language in redline strike-out form is attached to this memo (attachment 3).

December 20, 2013 ES Request

*Summary:*

The December 20, 2013 ES Request for Modification of the WMQAP, request the addition of a footnote on page B.4-8 regarding requirements for Matrix Spike and Matrix Spike Duplicate Samples. Specifically, EnergySolutions request that the collection of these samples for dioxin/furan analysis be given an exception.

EnergySolutions includes a copy of a June 19, 2013 e-mail from their contract laboratory, TestAmerica Sacramento CA, which states "For future work, it may not be necessary to request an MS/MSD unless it is a requirement for your client. Please note the following explanation for the isotope dilution methods. - Isotope Dilution: For isotope dilution methods, isotopically

EnergySolutions WMQAP Modification Request  
Page 4

*labeled analogs (internal standards) of the native target analytes are spiked into the sample at time of extraction. These internal standards are used for quantitation, and monitor and correct for matrix effects. Since matrix effects on method performance can be judged by the recovery of these analogs, there is little added benefit of performing MS/MSD for these methods. MS/MSD is only performed for client or QAPP requirements'."*

The EnergySolutions June 19, 2013 request further clarifies that *"The correspondence indicates that for isotopic dilution methods, including SW-846 Method 8290 for dioxins and furans, matrix effects on method performance can be judged by the recovery of carbon-13 labeled analog compounds, and therefore, there is little added benefit of performing MS/MSD analyses."*

*"9.5 Matrix spike and laboratory control samples*

*The laboratory must also have procedures for documenting the effect of the matrix on method performance (precision, accuracy, and detection limit). At a minimum, this will include the analysis of at least one matrix spike and one duplicate unspiked sample or one matrix spike/matrix spike duplicate (MS/MSD) pair with each preparation batch of up to 20 samples of the same matrix processed together (see Chapter One). If samples are expected to contain the target analytes of concern, then laboratories may use one matrix spike and a duplicate analysis of an unspiked field sample as an alternative to the MS/MSD pair (see Sec. 9.5.3).*

*In the case of purge-and-trap methods, the MS/MSD, or MS and duplicate samples, should be prepared and analyzed concurrently with the samples. In the case of samples that involve an extraction procedure, the MS/MSD, or MS and duplicate samples, should be extracted with the batch of samples but may be analyzed at any time.*

*In addition, a Laboratory Control Sample (LCS) should be included with each preparation batch. The LCS consists of an aliquot of a clean (control) matrix similar to the sample matrix and of the same weight or volume. The LCS is spiked with the same analytes at the same concentrations as the matrix spike and is processed in the same manner as the samples. When the results of the matrix spike analysis indicates a potential problem due to the sample matrix itself, the LCS results are used to verify that the laboratory can perform the analysis in a clean matrix.*

*The concentration of the matrix spike sample and/or the LCS should be determined as described in Secs. 9.5.1 and 9.5.2, and the spiking solutions should contain all of the target analytes of concern."*

**Current WMQAP Format and Applicability to RCRA Part B Permit**

Although the EnergySolutions Clive WMQAP is written to address ground water quality assurance associated with the DRC/DWQ Groundwater Quality Discharge Permit, it is noted that the RCRA Part B Permit requirements are also explicitly mentioned in several parts:

EnergySolutions WMQAP Modification Request  
Page 5

1. Part B of the WMQAP includes QA samples to be collected during RCRA sampling events (e.g. field blanks for volatile organics sampling and spike and spike duplicate samples),
2. Table B.3-1 lists RCRA monitoring wells for evaluation of ground water,
3. Table B.4-1a lists wells and associated RCRA analytes,
4. Table B.4-1b of the WMQAP lists the RCRA analytes.

Since the WMQAP is associated with the DRC/DWQ Groundwater Permit it is specified that any changes must be approved by the DRC Director. In the case of sampling for dioxins and furans it is recognized that quality assurance sample changes are associated with the RCRA Part B permit and as such the changes need to be reviewed and approved by the Utah Division of Solid and Hazardous Waste ("DSHW"). DRC staff contacted DSHW staff to confirm that the changes were appropriate as discussed below.

*DRC Confirmation with Utah Division of Solid and Hazardous Waste:*

DRC staff contacted the Utah Division of Solid and Hazardous Waste (DSHW) to confirm that the removal of MS/MSD requirements for dioxins and furans was acceptable. Specifically, DRC contacted Otis Willoughby by telephone on Thursday, January 9, 2014 (4:08 P.M.) to discuss the issue. He reported that he had received a copy of the WMQAP request and that Deborah Ng (DSHW Chemist) had reviewed the request and was o.k. with the change. DRC reported that based on the DSHW confirmation and review of literature sources the change to the WMQAP would be included in a Permit Modification process.

*Summary of WMQAP Changes Associated with Dioxin and Furan Ground Water Sampling:*

The WMQAP Part B (Page B.4-8) will be modified to include a footnote under the table associated with collection of matrix spike and matrix spike duplicate samples which will exempt dioxin/furan from MS/MSD requirements and states "*except for dioxin/furan analysis by method 8290 or equivalent, where isotopic dilution is used to assess the effects of matrix on method performances.*"

*References:*

U.S. Environmental Protection Agency, September 1986, *RCRA Ground Water Monitoring Technical Enforcement Guidance Document (TEGD)* OSWER-9950.1.

U.S. Environmental Protection Agency, May 2002, *Ground Water Sampling Guidelines for Superfund and RCRA Project Managers, Ground Water Forum Issue Paper*, U.S. EPA Office of Solid Waste and Emergency Response, EPA-542-S-02-001.

U.S. Environmental Protection Agency, March 2003, *Method 8000 C, Determinative Chromatographic Separations.*

EnergySolutions WMQAP Modification Request  
Page 6

U.S. Environmental Protection Agency, February 2007, *Method 8290A. Polychlorinated Dibenzo-  
p-Dioxins (PCDD's) and Polychlorinated Dibenzofurans (PCDF's) by High Resolution Gas  
Chromatography/High Resolution Mass Spectrometry (HRGC/HRMS).*

U.S. Environmental Protection Agency, March 2013, *Groundwater Sampling, Operating  
Procedure SESPROC-301-R3. U.S. EPA Region 4 Science and Ecosystem Support Division.*

Attachment 1 – EnergySolutions September 17, 2013 WMQAP Modification Request



**ENERGYSOLUTIONS**

**"DRC-2013-003166"**

September 17, 2013

CD13-0261

Rusty Lundberg, Co-Director  
Utah Division of Water Quality  
195 North 1950 West  
P.O. Box 144850  
Salt Lake City, UT 84114-4850

**RECEIVED**  
SEP 17 2013  
DEPARTMENT OF  
ENVIRONMENTAL QUALITY

**Re: Groundwater Quality Discharge Permit (GWQDP) Number UGW450005:  
Request for Modification of Appendix B - Water Monitoring Quality Assurance  
Plan (WMQAP)**

Dear Mr. Lundberg:

EnergySolutions requests two modifications of the Appendix B (WMQAP) to the GWQDP. The first is a change in the preservation of water samples for radiological analysis, and the second is a modification of the flow rate for the collection of groundwater samples for volatile organic compound (VOC) analysis. Each is discussed below.

**Preservation of Water Samples for Radiological Analysis** - The modification is a change of preservation requirements listed in Table B.4-2 for water samples collected for carbon-14, iodine-129, technetium-99, and tritium analysis. EnergySolutions requests changing "Chill to 4°C" to "None." EnergySolutions' radioanalytical laboratory, TestAmerica in Richland, Washington (TAR), informed EnergySolutions that the data quality for these parameters was not affected by sample temperature. Therefore, including ice in shipping containers to chill samples sent from the Clive, Utah facility to TAR was not necessary. Shipping containers received by TAR have sometimes contained melted ice, leading to radiological contamination concerns and sample cross-contamination concerns. This modification will reduce these concerns. A redline-strikeout version of the requested modification of Table B.4-2 is attached.

**Groundwater Flow Rate for VOC Sampling** - U.S. Environmental Protection Agency (EPA) guidance (EPA, 1986) and other guidance (e.g., Barcelona et al., 1985) recommend a sampling rate of  $\leq 100$  milliliters per minute (mL/min) during VOC sampling to minimize the loss of volatile constituents. However, other guidance (e.g., EPA, 2002 and EPA, 2013) recommend sampling be conducted in a manner that minimizes disturbance and aeration of the sample without placing quantitative limits on the flow rate.



Mr. Rusty Lundberg  
September 17, 2013  
CD13-0261  
Page 2 of 3

The EnergySolutions groundwater sampling team has determined during past sampling events that the optimum flow rate is greater than 100 mL/min for collecting VOC samples with minimal aeration from the dedicated bladder pumps at the Clive facility. When the flow rate is decreased to approximately 100 mL/min, the groundwater sputters out of the pump tubing and splashes into the VOC sample vial, potentially aerating the sample.

In a letter dated August 31, 2012, the Division of Solid and Hazardous Waste (DSHW) provided EnergySolutions with findings from its 2012 Comprehensive Groundwater Monitoring Evaluation Report (CME) for the Mixed Waste embankment. One of the findings was that the observed groundwater flow rate during VOC sampling was greater than 100 mL/min. EnergySolutions met with DSHW on January 16, 2013 to discuss the 2012 CME findings, and the flow-rate finding was resolved for Mixed Waste compliance wells by agreement to modify Condition 1.f.iii, Attachment VI-1 of the State-issued Part B permit. The modification was submitted to DSHW as part of permit renewal, with approval anticipated prior to the end of 2013. EnergySolutions requests that the applicable text in Part B.4 of the WMQAP is modified similarly to make GWQDP requirements for sampling VOCs in groundwater consistent with State-issued Part B permit requirements. A redline-strikeout version of the requested modification of Part B.4 (Page B.4-12) is attached.

Please contact me at 801-649-2000 with any questions regarding this submittal.

Sincerely,

A handwritten signature in cursive script that reads "Vera C. Rogers".

for Sean McCandless  
Manager, Compliance and Permitting

cc: Phil Goble, DRC  
John Hultquist, DRC  
Otis Willoughby, DSHW

Enclosures

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.



Mr. Rusty Lundberg  
September 17, 2013  
CD13-0261  
Page 3 of 3

**References -**

- Barcelona, M.J., J.P. Gibb, J.A. Helfrich, and E.E. Garske, 1985. *Practical Guide for Ground-Water Sampling*. Illinois State Water Survey, ISWS Contract Report 374.
- U.S. Environmental Protection Agency (EPA), 2013. *Groundwater Sampling, Operating Procedure SESDPROC-301-R3*. U.S. EPA Region 4 Science and Ecosystem Support Division. March 6, 2013.
- U.S. Environmental Protection Agency (EPA), 2002. *Ground-Water Sampling Guidelines for Superfund and RCRA Project Managers*, Ground Water Forum Issue Paper. U.S. EPA Office of Solid Waste and Emergency Response. EPA 542-S-02-001. May 2002.
- U.S. Environmental Protection Agency (EPA), 1986. *RCRA Ground-Water Monitoring Technical Enforcement Guidance Document (TEGD) OSWER-9950.1*. September 1986.

EnergySolutions  
Water Monitoring QAP, Rev 6  
Aug 30, 2011

TABLE B.4-2  
Standard Units of Measurement, Sample Containers, and Holding Times  
EnergySolutions  
(Page 1 of 2)

Analysis (Method)	Sample Container	Preservative	Filtered	Unit of Measure	Holding Time
Volatile Organic Compounds (VOCs) EPA Method 8260	3 40-ml glass bottles with a Teflon septum cap, No head space	Chill to 4°C Hydrochloric Acid	No	µg/L	14 days from sample collection to analysis
Semi-Volatile Organic Compounds (SVOCs) EPA Method 8270 Organochlorine Pesticides EPA Method 8081 Polychlorinated Biphenyls (PCBs) EPA Method 8382	2 1-l amber glass bottles with a Teflon lined cap	Chill to 4°C	No	µg/L	7 days from sample collection to extraction 40 days from extraction to analysis
Metals - Various methods (see Attachment A)	1 1-l plastic bottle with a Teflon lined cap	Chill to 4°C Nitric Acid pH < 2	Yes (No for RCRA)	µg/L	28 days for Hg 6 months for all other metals
Anions - Various Methods (see Attachment A)	1 250-ml plastic bottle with a Teflon lined cap	Chill to 4°C	No	mg/L	28 days from sample collection to analysis
Nitrate/Nitrite (EPA 353.2)	1 250-ml plastic bottle with a Teflon lined cap	Chill to 4°C Sulfuric Acid to pH < 2	No	mg/L	28 days from sample collection to analysis
Total Dissolved Solids (SM 2540 C)	1 250-ml plastic bottle with a Teflon lined cap	Chill to 4°C	Yes	mg/L	7 days for sample collection to analysis
Total Suspended Solids (SM 2540 D)	1 liter plastic bottle with a Teflon lined cap	Chill to 4°C	No	mg/L	7 days for sample collection to analysis
Alkalinity (SM 2320 B)	1 250-ml plastic bottle with a Teflon lined cap	Chill to 4°C	No	mg/L	7 days for sample collection to analysis

EnergySolutions  
Water Monitoring QAP, Revision 6  
August 30, 2011/September XX, 2013

## ENVIRONMENTAL AND QA/QC SAMPLE COLLECTION

**Environmental Samples.** Groundwater samples will be collected directly into the appropriate sample container from the discharge line of the dedicated bladder pump. For all samples, the sample bottles will be filled in the order of compound volatility or stability as follows:

1. Volatile Organic Compounds (VOC)
2. Semi-Volatile Organic Compounds (SVOCs)
3. Inorganics/Anions
4. Total Dissolved Solids (TDS), Total Suspended Solids (TSS)
5. Sulfides/Cyanide
6. Metals/Cations
7. Radiological Parameters

The analytical methods for this program, and the associated sample containers and preservatives are listed on Table B.4-2.

For groundwater samples collected for VOCs from the bladder pumps, the discharge rate of the pump will be reduced to the extent possible to allow gentle filling of the sample bottles without aeration. The VOC sampling flow rate will be measured and documented at the start of groundwater sampling events. This will take place on the first day of the annual event or first day of accelerated monitoring (monthly and quarterly) when monitoring wells are sampled for VOCs. EPA recommended rate of less than 100 milliliters per minute during sample collection. Immediately after sample collection, sample containers will be placed in a cooler containing ice and chilled to 4°C.

Quality assurance/quality control samples for these sampling programs include trip blank, field blank (for RCRA sampling), blind duplicate, matrix spike, and matrix spike duplicate samples. These samples will be collected as described below.

Attachment 2 – EnergySolutions December 20, 2013 WMQAP Modification Request



December 20, 2013

DRC-2013-003915 CD13-0351

Rusty Lundberg, Co-Director  
Utah Division of Water Quality  
195 North 1950 West  
P.O. Box 144850  
Salt Lake City, UT 84114-4850

RECEIVED  
DEC 27 2013  
DEPARTMENT OF  
ENVIRONMENTAL QUALITY

Re: Groundwater Quality Discharge Permit (GWQDP) Number UGW450005:  
Request for Modification of Appendix B - Water Monitoring Quality Assurance Plan  
(WMQAP)

Dear Mr. Lundberg:

Module VI of the State-Issued Part B Permit for EnergySolutions' Mixed Waste Treatment, Storage, and Disposal Facility requires EnergySolutions to analyze groundwater samples from compliance monitoring wells GW-131 and GW-132 for dioxins and furans. These analytes are not GWQDP compliance parameters; however, requirements for quality control (QC) samples, applicable to Mixed Waste embankment monitoring wells, are listed in Appendix B (WMQAP). Attached is a redline/strikeout version of proposed modification of the WMQAP to include an exception for dioxin/furan analyses from the matrix spike/matrix spike duplicate (MS/MSD) sample requirement. Also attached is correspondence from TestAmerica to EnergySolutions. The correspondence indicates that for isotopic dilution methods, including SW-846 Method 8290 for dioxins and furans, matrix effects on method performance can be judged by the recovery of carbon-13 labeled analog compounds, and therefore, there is little added benefit of performing MS/MSD analyses.

Please contact me at 801-649-2000 with any questions regarding this submittal.

Sincerely,

  
Sean McCandless  
Manager, Compliance and Permitting

cc: Phil Goble, DRC  
John Hultquist, DRC  
Otis Willoughby, DSHW

Enclosures

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

EnergySolutions  
Water Monitoring QAP, Revision 6  
August 30, 2011- December XX, 2013

Blind Duplicate	One blind duplicate will be collected for each scheduled analysis for each round of sampling (5 percent)
Matrix Spike	One sample for matrix spike analysis will be collected for each scheduled analysis for each round of sampling (5 percent) <sup>a</sup>
Matrix Spike Duplicate	One sample for matrix spike duplicate analysis will be collected for each scheduled analysis for each round of sampling (5 percent) <sup>a</sup>

<sup>a</sup> Except for dioxin/furan analysis by Method 8290 or equivalent, where isotopic dilution is used to assess the effects of matrix on method performance.

**Sample Designation.** All environmental groundwater samples will be designated using their current EnergySolutions location identification. The QA/QC samples will be designated based on type. Trip blanks will be designated by "TB", which indicates the sample is a trip blank, and the date it was submitted for analysis (e.g., TB-7/24/97). Field blank samples will be designated with "FB", which indicates the sample is a field blank, and the date the sample was collected (e.g., FB-7/24/97). Blind duplicates will be designated with a fictitious sample identification (e.g., the blind duplicate for GW-29 may be labeled GW-301). Samples collected for matrix spike (MS) and matrix spike duplicate (MSD) analyses will have the same designation as their associated environmental sample,

**From:** Kellmann, Jill  
**To:** Robert W. Sobocinski  
**Subject:** RE: Files from 320-2679-1 Dioxins  
**Date:** Wednesday, June 19, 2013 11:18:33 AM

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Certainly. For future work, it may not be necessary to request a MS/MSD unless it is a requirement for you client. Please note the following explanation for the isotope dilution methods. Let me know if you have any questions.

**Isotope Dilution:** For isotope dilution methods, isotopically labeled analogs (internal standards) of the native target analytes are spiked into the sample at time of extraction. These internal standards are used for quantitation, and monitor and correct for matrix effects. Since matrix effects on method performance can be judged by the recovery of these analogs, there is little added benefit of performing MS/MSD for these methods. MS/MSD are only performed for client or QAPP requirements.

Thank you,

Jill

**JILL KELLMANN**  
Project Manager

**TestAmerica**  
THE LEADER IN ENVIRONMENTAL TESTING

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[www.testamericainc.com](http://www.testamericainc.com)

**HOLIDAY REMINDER - TestAmerica Sacramento will be closed on Thursday, July 4th for the Independence Day Holiday. Please contact your Project Manager in advance if you will need sampling supplies or to make alternative arrangements for submitting samples.**

of the addressee, and may be confidential and/or privileged. If the reader of this message is not the intended recipient, or the employee or agent responsible to deliver it to the intended recipient, you are hereby notified that any dissemination, distribution or copying of this communication is strictly prohibited. If you have received this communication in error, please notify the sender immediately by telephone at (916) 374-4367.

---

**From:** Robert W. Sobocinski [mailto:[rwsobocinski@energysolutions.com](mailto:rwsobocinski@energysolutions.com)]  
**Sent:** Wednesday, June 19, 2013 10:15 AM  
**To:** Kellmann, Jill  
**Subject:** RE: Files from 320-2679-1 Dioxins

Jill,

Thanks for the clarification. I signed the invoice. We'll get payment out promptly.

Thanks Again,

Bob

---

**Attachment 3 – Revised WMQAP Language on Page B.4-12 regarding VOC sample collection flow rate measurements, based on a January 30, 2014 meeting between EnergySolutions and DRC**

EnergySolutions  
Water Monitoring QAP, Revision 6  
August 30, 2011

## ENVIRONMENTAL AND QA/QC SAMPLE COLLECTION

**Environmental Samples.** Groundwater samples will be collected directly into the appropriate sample container from the discharge line of the dedicated bladder pump. For all samples, the sample bottles will be filled in the order of compound volatility or stability as follows:

1. Volatile Organic Compounds (VOC)
2. Semi-Volatile Organic Compounds (SVOCs)
3. Inorganics/Anions
4. Total Dissolved Solids (TDS), Total Suspended Solids (TSS)
5. Sulfides/Cyanide
6. Metals/Cations
7. Radiological Parameters

The analytical methods for this program, and the associated sample containers and preservatives are listed on Table B.4-2.

For groundwater samples collected for VOCs from the bladder pumps, the discharge rate of the bladder pump will be reduced to the extent possible to allow gentle filling of the sample bottles without aeration. The VOC sampling flow rate will be measured and documented on the sampling field sheet immediately prior to sample collection for VOCs, at least once daily on all days when VOC samples are collected. EPA recommended rate of less than 100 milliliters per minute during sample collection. Immediately after VOC sample collection, sample containers will be placed in a cooler containing ice in order to meet the VOC preservation requirements and chilled to 4°C.

Quality assurance/quality control samples for these sampling programs include trip blank, field blank (for RCRA sampling), blind duplicate, matrix spike, and matrix spike duplicate samples. These samples will be collected as described below.



### Attachment E

Underlines/Strikeout text of selected Pages of the EnergySolutions'  
Permit, Table 5, and Water Monitoring Quality Assurance Plan,  
Appendix B of the Permit

Table 5: Approved Engineering Design Drawings for Waste/Wastewater Related Facilities

Related Facility	Drawing No.	Last Revision	Subject / Title
Decontamination Access Control Building	05015-G001, Rev. 1	February 23, 2006	Access Control Building; Map Layout and Index
	05015-C100, Rev. 1	February 23, 2006	Access Control Building; Facilities Location Map
	05015-C101, Rev. 2	February 23, 2006	Access Control Building; Floor Plan
	05015-C102, Rev. 2	February 23, 2006	Access Control Building; Elevations
	05015-C103, Rev. 3	February 23, 2006	Access Control Building, Typical Sections
	05015-C104, Rev. 0	February 23, 2006	Access Control Building, Site Layout and Gray Water Tank and Pipe
	05015-S100, Rev. 2	June 30, 2006	Access Control Building, 1000 Gallon Gray Water Tank
	05015-P100, Rev. 1	February 23, 2006	Access Control Building, Plumbing Plan
	05015-P101, Rev. 1	February 23, 2006	Access Control Building, Plumbing Details
East Side Drainage and Gray Water System Modifications	06007-G1, Rev. 5	2/26/07	East Side Drainage, Map Layout and Index
	06007-G2, Rev. 4	2/26/07	East Side Drainage, Notes and Specifications
	06007-C1, Rev. <del>56</del>	<del>2/26/07</del> /23/12	East Side Drainage, General Site Plan
	06007-C2, Rev. <del>56</del>	<del>2/26/07</del> /23/12	East Side Drainage, Storm Water Drainage Plan
	06007-C3, Rev. 7	2/1/2010	East Side Drainage, Intermodal Container Wash Facility Gray Water System Plan
	06007-C4, Rev. 6	3/12/08	East Side Drainage, Decon Access Control Gray Water System
	06007-D1, Rev. 7	6/10/09	East Side Drainage, Section and Details
	06007-P1, Rev. 4	2/26/07	East Side Drainage, Pipelines #4 and #5 Alignments and Profiles
	06007-SL1, Rev. 3	3/14/07	East Side Drainage, Storm Water Lift Sump Plan
	06007-SL2, Rev. 3	3/14/07	East Side Drainage, Storm Water Lift Sump Section
	06007-SL3, Rev. 3	3/14/07	East Side Drainage, Storm Water Lift Sump Section
	06007-V1, Rev. <del>34</del>	<del>2/26/07</del> /23/12	East Side Drainage, Storm Water and Waste Flow Diagram

Table 5: Approved Engineering Design Drawings for Waste/Wastewater Related Facilities

Related Facility	Drawing No.	Last Revision	Subject / Title
Track 4 Railcar Decontamination Pad	T-100, Rev. 3	Aug. 14, 1999	Foundation
	T-101, Rev. 3	Aug. 16, 1999	Foundation Details
	9906-02, Rev. H	Feb 26, 2007	Wash Water System As-Built
	9906-02A, Rev. H	Feb. 26, 2007	Wash Water System As-Built
Class A West Containerized Waste Facility and Large Component Area Evaporation Basin	10014-C05, Rev. 6	May 10, 2013	Class A West Embankment – Active CWF & LC Areas: Area and Haul Road Layout
	10014-C06, Rev. 4	May 2, 2012	Class A West Embankment Large Component Area Plan & Details
	10014-C07, Rev. <del>3</del> <sup>4</sup>	<del>June 3, 2013</del> January 10, 2014	Class A West Embankment CWF Area Plan & Details
	10014-C07A, Rev. 1	May 10, 2013	Class A West Embankment Active CWF Area CWF Area Plan & Details
1995 Evaporation Pond	9718-1, Rev. C	March 13, 2007	Facility Layout
	9504-3, Rev. E	Oct. 28, 1999	Storage Pond
	9504-3A, Rev. A	Oct. 28, 1999	Leak Detection System Details, As-Built
	9504-4, Rev. E	Oct. 28, 1999	Facility Details
	9718-4, Rev. A	Aug. 17, 1998	Piping Diagrams and Pump Station
	08007-C01, Rev. 1	June 26, 2008	1995 Evaporation Pond HDPE Repairs, New 60 mil HDPE Liner
1997 Evaporation Pond	9718-1, Rev. C	March 13, 2007	Facility Layout
	9718-2, Rev. D	Feb. 25, 1999	Evaporation and Storage Pond
	9718-2a, Rev. B	Feb. 25, 1999	Leak Detection System Details, As-Built
	9718-3, Rev. -	Sept. 17, 1997	Details
	9718-4, Rev. A	Aug. 17, 1998	Piping Diagrams and Pump Station
2000 Evaporation Pond	0009-00, Rev. A	July 10, 2000	Site Plan and Facility Layout
	0009-01, Rev. E	Feb. 22, 2008	Plan View
	0009-02, Rev. A	Jan. 29, 2001	Cross Sections
	0009-03, Rev. B	Jan. 29, 2001	Details
	0009-04, Rev. A	Jan. 29, 2001	Sump/Side Slope Cross-Section
	0009-05, Rev. A	Jan. 29, 2001	Leak Detection Details
	0009-06, Rev. A	Feb. 22, 2008	Water Transfer Piping Details
Mixed Waste Evaporation Pond	9802-1, Rev. D	Dec. 22, 1999	Facility Layout

## ENVIRONMENTAL AND QA/QC SAMPLE COLLECTION

**Environmental Samples.** Groundwater samples will be collected directly into the appropriate sample container from the discharge line of the dedicated bladder pump. For all samples, the sample bottles will be filled in the order of compound volatility or stability as follows:

1. Volatile Organic Compounds (VOC)
2. Semi-Volatile Organic Compounds (SVOCs)
3. Inorganics/Anions
4. Total Dissolved Solids (TDS), Total Suspended Solids (TSS)
5. Sulfides/Cyanide
6. Metals/Cations
7. Radiological Parameters

The analytical methods for this program, and the associated sample containers and preservatives are listed on Table B.4-2.

For groundwater samples collected for VOCs from the bladder pumps, the discharge rate of the bladder pump will be reduced to the extent possible to allow gentle filling of the sample bottles without aeration. The VOC sampling flow rate will be measured and documented on the sampling field sheet immediately prior to sample collection for VOC's, at least once daily on all days when VOC samples are collected. EPA recommended rate of less than 100 milliliters per minute during sample collection. Immediately after VOC sample collection, sample containers will be placed in a cooler containing ice in order to meet the VOC preservation requirements and chilled to 4°C.

Quality assurance/quality control samples for these sampling programs include trip blank, field blank (for RCRA sampling), blind duplicate, matrix spike, and matrix spike duplicate samples. These samples will be collected as described below.

Table B.4-2

Analysis (Method)	Sample Container	Preservative	Filtered	Unit of Measure	Holding Time
Cyanide (EPA 335.4) and sulfide (EPA 376.1 and 376.2)	1 500-ml plastic bottle with a Teflon lined cap	Chill to 4°C NaOH to pH > 12 add Zinc Acetate for sulfide	No	mg/L	14 days from sample collection to analysis
B.4-24 Radiologics - Gross β, Ra-226 and 228, Iso-Th, K-40, Sr-90, Np-237, Iso-U, Tot-U, and Tc-99 (see Attachment A for methods)	1 4-l plastic bottle	Nitric acid pH < 2	Yes	pCi/L (Tot-U mg/L)	6 months from sample collection to analysis
Radiologics - C-14, I-129, Tc-99, Tritium (see Attachment A for methods)	1 1- plastic bottle	Chill to 4°C None	Yes	pCi/L	6 months from sample collection to analysis

Blind Duplicate	One blind duplicate will be collected for each scheduled analysis for each round of sampling (5 percent)
Matrix Spike	One sample for matrix spike analysis will be collected for each scheduled analysis for each round of sampling (5 percent)
Matrix Spike Duplicate	One sample for matrix spike duplicate analysis will be collected for each scheduled analysis for each round of sampling (5 percent) <sup>a</sup>

**<sup>a</sup> Except for dioxin/furan analysis by Method 8290 or equivalent where isotopic dilution is used to assess the effects of matrix on method performance**

**Sample Designation.** All environmental groundwater samples will be designated using their current EnergySolutions location identification. The QA/QC samples will be designated based on type. Trip blanks will be designated by “TB”, which indicates the sample is a trip blank, and the date it was submitted for analysis (e.g., TB-7/24/97). Field blank samples will be designated with “FB”, which indicates the sample is a field blank, and the date the sample was collected (e.g., FB-7/24/97). Blind duplicates will be designated with a fictitious sample identification (e.g., the blind duplicate for GW-29 may be labeled GW-301). Samples collected for matrix spike (MS) and matrix spike duplicate (MSD) analyses will have the same designation as their associated environmental sample, except that an MS or MSD will follow the sample designation, e.g., GW-29 MS or GW-29 MSD.