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

FILE
SEP 28 2011
SR

September 28, 2011

CERTIFIED MAIL
RETURN RECEIPT REQUIRED

Dan Shrum, Senior Vice President of Regulatory Affairs
EnergySolutions, LLC.
423 West 300 South, Suite 200
Salt Lake City, Utah 84101

RE: Radioactive Material License (RML) Number UT 2300249: Notice of Violation Dated August 11, 2011

Dear Mr. Shrum:

On August 11, 2011 the Utah Division of Radiation Control (DRC) issued EnergySolutions a Notice of Violation (NOV) for not making the proper notification for Waste Shipment 9069-17-0001, as per RML UT 2300249 License Condition 13H. On September 8, 2011 EnergySolutions responded to the August 11, 2011 NOV. In the EnergySolutions response it states: *"Although the 9069-17-0001 shipment contained U-235 concentrations in excess of the Table-13A values, the U-235 was not enriched, therefore did not meet the definition of special nuclear material. Therefore, the concentration limits in Table-13A do not apply."* EnergySolutions clarifies this by explaining *"This analytical* (analytical results from samples collected from Waste Shipment 9069-17-0001) *data shows that shipment 9069-17-0001 contained less uranium-235 (0.266% U-235 Mass Spec) than the naturally occurring distribution of isotopes (0.711% U-235) therefore met the NRC's definition in title 10CFR 71.4 for Depleted Uranium."* The DRC has reviewed EnergySolutions response and agrees that the distribution of U-235 is part of determining if SNM license conditions apply. However, the definitions for SNM material and Source material have additional regulatory clarification to why the distribution of the U-235 is important, but also the origin of the U-235.

In Utah Administrative Code (UAC) R313-12-3 has the following definitions (also referenced by EnergySolutions in their September 8, 2011 letter):

"Depleted uranium" means the source material uranium in which the isotope uranium-235 is less than 0.711 weight percent of the total uranium present. **Depleted uranium**

does not include special nuclear material.

"Special nuclear material" means:
(a) plutonium, uranium-233, uranium enriched in the isotope 233 or in the isotope 235, and other material that the U.S. Nuclear Regulatory Commission, pursuant to the provisions of section 51 of the Atomic Energy Act of 1954, as amended, determines to be special nuclear material, but does not include source material; or
(b) **any material artificially enriched by any of the foregoing but does not include source material**.

In addition *10 CFR 40.4 Definitions* and UAC 313-12-3 have the following definitions: *Source Material* means: (1) Uranium or thorium, or any combination thereof, in any physical or chemical form or (2) ores which contain by weight one-twentieth of one percent (0.05%) or more of: (i) Uranium, (ii) thorium or (iii) any combination thereof. **Source material does not include special nuclear material.**

Special nuclear material means: (1) Plutonium, uranium 233, uranium enriched in the isotope 233 or in the isotope 235, and any other material which the Commission, pursuant to the provisions of section 51 of the Act, determines to be special nuclear material; or **(2) any material artificially enriched by any of the foregoing.**

The definition section of NUREG/BR-0096 Instructions and Guidance for Completing Physical Inventory Summary Reports states:

SOURCE MATERIAL (SM) --- Natural uranium, depleted uranium, natural thorium, or any combination thereof, provided the combined thorium plus uranium content is at least 0.05 percent by weight.

SPECIAL NUCLEAR MATERIAL (SNM) --- (1) Plutonium, uranium-233, uranium enriched in the isotope U-233 and/or U-235, and any other material that NRC, pursuant to the provisions of Section 51 of the Atomic Energy Act of 1954 (as amended), determines to be SNM; and (2) any uranium material artificially enriched in U-233 and/or U-235 **(e.g., by blending normal or depleted uranium with enriched uranium to form a homogeneous mixture).**

By these definitions U-238 (Depleted Uranium) is a source material. Enriched U-235 is a special nuclear material (SNM). If the two forms of Uranium (SNM and Depleted) are blended, the enriched U-235 does not become source material again. The U-235 will remain SNM, because it has been enriched. The Waste Profile Record for Waste Shipment 9069-17-0001 in Attachment B.5 states in the first paragraph, last sentence: *"This waste originally contained enriched uranium but has been downblended to natural uranium isotopic percentages."* When the enriched uranium was blended, the concentrations changed but its classification of being SNM did not because it was previously enriched.

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Another issue that the DRC had to consider in determining if EnergySolutions failed to comply with License Condition 13A was: Did EnergySolutions have previous knowledge that the drums in question contained enriched U-235? The answer appears to be yes. First, the profile for Waste Stream 9069-17 in Attachment B.5 showed there was enriched uranium in the waste stream. Second, EnergySolutions was an active participant in re-profiling three drums that were previously rejected (Waste Shipment 9069-01-0006) for exceeding SNM limits for U-235 and working with LATA/Parallax Portsmouth, LLC. to send the drums in questions back to EnergySolutions in Waste Shipment 9069-17-0001, as natural Uranium (U-nat). Attachment 1 includes four examples from a series of emails between EnergySolutions and the shippers of the two shipments involved (9069-01-0006 and 9069-17-0001), that demonstrate EnergySolutions had prior knowledge that the drums in Waste Shipment 9069-17-0001 contained enriched U-235.

In summary, the U-235 in the drums from Waste Shipment 9069-17-0001 is SNM material, because the origin of the U-235 is from enriched uranium. EnergySolutions was aware that the U-235 in Waste Shipment 9069-17-0001 was SNM material because the profile documented that the material was enriched uranium that was downblended. In addition, EnergySolutions was aware that the drums in Waste Shipment 9069-17-0001 were the same drums from Waste Shipment 9069-01-0006, which had been previously rejected for exceeding SNM limits for U-235. Therefore, EnergySolutions request for the Executive Secretary to rescind the NOV dated August 11, 2011 is hereby denied.

The Executive Secretary maintains that a violation that a violation did occur; therefore, EnergySolutions is required to provide a written response within 30 calendar days after receipt of this letter. The following information is required: 1) The corrective steps which have been taken and the results achieved, 2) The corrective steps which have been taken to prevent recurrence, and 3) The date full compliance will be achieved.

If you have any additional question please contact Phil Goble at (801) 536-4250.

Dated at Salt Lake City, Utah
This 28th day of September, 2011

UTAH RADIATION CONTROL BOARD

Rusty Lundberg

Rusty Lundberg, Executive Secretary

RL/RJ:rj

Enclosure
cc: Sean McCandless, Director of Permitting & Compliance

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ATTACHMENT 1

From: Michelle Hallmark [mahallmark@energysolutions.com]
Sent: Monday, January 03, 2011 3:23 PM
To: Hawk, Mike
Cc: Newman, Mitch
Subject: RE: New Profile 9069-17

Thanks Michael. I will let you know if there are any questions on this one.

Michelle

From: Hawk, Mike [mailto:MHawk@lpports.com]
Sent: Monday, January 03, 2011 1:11 PM
To: Michelle Hallmark
Cc: Newman, Mitch
Subject: New Profile 9069-17

Michelle, LPP profile 9069-01 covered drums belonging to us that were recently shipped to y M&EC but were rejected and returned. Rather that revise that profile to incorporate the reque changes we are submitting this new profile for your approval. Thanks,

J. Michael Hawk

J. Michael Hawk
Waste Engineer
LATA/Parallax
740-897-2782

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From: Michelle Hallmark [mahallmark@energysolutions.com]
Sent: Monday, December 06, 2010 1:17 PM
To: Newman, Mitch
Cc: Fontaine, James
Subject: RE: PORTS Profiles 9069-02 and 07

Mitch,

I checked to see if I have a Word file for these but could not find one.

The 9069-01-0006 shipment is the most important of the 4 as it puts us into realm for SNM depleted uranium issues. Please let me know if this manifest is accurate by noon (mountain t today so that we may make the appropriate notifications if necessary.

Thanks,
Michelle

From: Hawk, Mike
Sent: Thursday, January 27, 2011 3:12 PM
To: Michelle Hallmark
Cc: Newman, Mitch; Bartling, Marilew; Turner, Laura
Subject: M&EC Drums

Michelle, attached is the radionuclide breakdown for our 3 drums of waste which have been pro and are in their final form. They are scheduled for shipment to Clive from M&EC next week. As notice 2 of the 3 calculate as being DU. We need your help in determining if these drums fall wit limits of our profile 9069-17 and then would they be compliant with the presently in place moretorium limits for DU. Your help with this is greatly appreciated.

J. Michael Hawk

J. Michael Hawk
Waste Engineer
LATA/Parallax
740-897-2782

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From: Jeff Ginsburg [jginsburg@energysolutions.com]

Sent: Thursday, December 09, 2010 5:29 PM

To: Newman, Mitch; bchambers@perma-fix.com; cjones@perma-fix.com

Cc: Michelle Hallmark; Johnny Bowne; Veronica Pitts; rsheffield@perma-fix.com; Brittany J.

Subject: RE: ES shipments

Please be aware that these shipments will not be scheduled until manifests are received, reviewed written approval is provided by EnergySolutions to PermaFix. Also, when preparing the manifest, because the shipments were rejected, new shipment numbers will be required.

Jeffrey Ginsburg
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