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**ENVIROCARE** OF UTAH, INC.  
THE SAFE ALTERNATIVE

March 13, 1998

Mr. Joseph J. Holonich, Chief  
Uranium Recovery Branch  
Division of Waste Management  
Office of Nuclear Materials Safety  
and Safeguards  
U.S. Nuclear Regulatory Commission  
MST-739  
11545 Rockville Pike  
Washington, DC 20555-0001

Re: 11e(2) Groundwater Monitoring System Performance  
Response to NRC letter dated January 28, 1998  
License Number SMC1559, Amendment No. 10,  
Docket No. 40-8989

Dear Mr. Holonich:

**Introduction**

Envirocare of Utah, Inc. (Envirocare) has prepared this letter in response to the letter dated January 28, 1998, from the Nuclear Regulatory Commission (NRC) and to inspection report 40-8989/97-01 (inspection conducted October 27-30, 1997). The letter of January 28, 1998, requested that Envirocare provide the NRC either 1) an evaluation of the past and current conditions in the groundwater system, modifications to current practices, and alternative measures that will allow early detection of any licensed constituent of concern that may potentially be released from the 11e.(2) disposal cell; or 2) data and analysis that refute the observations and conclusions of the inspection report and support the effectiveness of the current Point of Compliance (POC) groundwater monitoring program. Envirocare believes that the current POC groundwater-monitoring program is effective in early detection of any licensed constituents. Envirocare, also, makes several recommendations that can improve the overall effectiveness of the groundwater-monitoring program.

1/0  
N/40

**Overview of NRC's findings**

The NRC made several observations and conclusions in Section 5.3.c., "Groundwater Monitoring Program Effectiveness" of the inspection report. Envirocare agrees with the NRC conclusion that the increase in arsenic concentrations at the POC monitoring well

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GW-27 does not suggest that the 11e.(2) cell is leaking. Envirocare is confident that the increase in arsenic is a direct result of the increase in groundwater elevations.

As discussed in the NRC report, the increase in groundwater elevations was due to enhanced recharge from storm water drainage from the Department of Energy (DOE) Vitro embankment. This storm water drainage has since been diverted to a lined collection pond. As the groundwater elevations increased, residual arsenic, left in the soil as a precipitate, was re-mobilized.

Envirocare does not fully agree with the conclusion made by the NRC that this increase in arsenic (currently only one monitoring well, GW-27, actually exceeds the background concentrations identified in Tables S-1 or STD-1 of the 11e.(2) license for arsenic) potentially render the current groundwater monitoring program ineffective for detecting potential releases from the constructed portions of the 11e.(2) disposal cell. Envirocare is confident that the current groundwater-monitoring program is effective at detecting releases, but Envirocare is willing to consider modifications that will improve the overall program.

The location of Envirocare's South Clive Facility is ideal for the disposal of 11e.(2) waste material. One of the favorable attributes of the location is that the groundwater is of extremely poor quality (greater than 50,000 mg/L Total Dissolved Solids (TDS)) and is found in a low-yielding aquifer. High TDS waters are found in this area due to the large quantity of evaporite deposits left from the Great Salt Lake and its predecessors. These evaporites are repositories for metals (such as arsenic) and are easily re-mobilized when re-wetted. In addition, waters with high TDS have a much higher ionic strength, which further increases the water's potential for re-mobilizing evaporites.

The low quality and quantity of groundwater found beneath the Envirocare facility make the site well suited for a disposal facility. However, the high TDS of the groundwater and the naturally occurring "source" of arsenic and other natural "constituents" make monitoring the groundwater challenging. It is therefore critical that the groundwater monitoring network "focus" on monitoring for those constituents which would best indicate a release from a disposal cell.

Envirocare's 11e.(2) disposal cell accepts uranium and thorium byproducts generated from uranium mills, and processing facilities. Envirocare's position is that if the groundwater-monitoring program relied on the diagnostic properties of the licensed constituents of the waste (the radioactive isotopes of uranium and thorium), then the monitoring program would be very effective at indicating a release from the cell. For example in 1997, Envirocare received approximately 171,617 kilograms of uranium and thorium (as calculated from 151,577,575 kilograms of received waste) compared to approximately 1,818 kilograms of arsenic (as calculated from 151,577,575 kilograms of received waste).

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Therefore, if the 11e (2) disposal cell were leaking, elevated concentrations of uranium and thorium would more likely to be observed than elevated concentrations of arsenic. In addition to being a diagnostic parameter, the radioactive isotopes of uranium and thorium are more mobile, and would be detected before the appearance of arsenic (Adrian Brown Consultants, 1998, LARW Groundwater Fate and Transport Modeling Input and Results, prepared for Envirocare of Utah, Inc., February 12, 1998).

**Recommendations**

Based on the following observations and conclusions, Envirocare proposes the following recommendations for the NRC's consideration.

- 1) Arsenic meets the three criteria for identifying a constituent as a hazardous constituent as stated in 10 CFR Part 40, Appendix A, Criterion 5B(2). However, Criterion 5B(3) states:

*Even when constituents meet all three tests in paragraph 5B(2) of this criterion, the Commission may exclude a detected constituent from the set of hazardous constituents on a site specific basis if it finds that the constituent is not capable of posing a substantial present or potential hazard to human health or the environment.*

The section continues with a list of criteria that the Commission would consider should a request be made to exclude a detected constituent. Envirocare is confident that the removal of arsenic and selenium from the list of detected constituents would not pose a hazard to human health or the environment. Envirocare proposes that the NRC evaluate the feasibility of excluding arsenic as a detected constituent and from the current compliance reporting requirements. Pending the results of the feasibility evaluation, Envirocare will prepare a request (including a risk-based analysis) for the exclusion.

- 2) Because the current arsenic exceedances are due to elevated groundwater elevations, Envirocare proposes to evaluate whether lowering the groundwater levels would affect the arsenic concentrations. Envirocare proposes to install two extraction wells and lower the groundwater elevation near GW-27. After the groundwater elevation has been lowered, a time series of groundwater samples will be collected from GW-27 and analyzed for arsenic. Based on the results of this study, a full-scale system may be installed to lower the groundwater elevation near the 11e.(2) mound.
- 3) In a conference call held with NRC and Envirocare personnel, we agreed that the cell was not leaking; however, we also agreed that additional monitoring

March 13, 1998  
NRC-GW Monitoring System Performance

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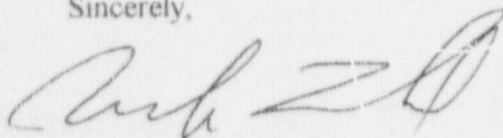
wells could be used to further demonstrate that fact. Currently, monitoring wells are required to be installed downgradient of the disposal area. Because of the groundwater mounding in the 11e.(2) disposal area, Envirocare is required to surround the disposal area with monitoring wells. Envirocare proposes to install additional temporary monitoring wells near the west side of the active disposal area. These monitoring wells will not be considered POC monitoring wells, but will be used to monitor in the immediate vicinity of the active disposal area. Envirocare proposes that these temporary monitoring wells be sampled on a quarterly basis, and would be used as an early warning system to check for parameters that would be indicative of a leaking cell. Envirocare also proposes that the use of temporary monitoring wells be abandoned once all POC monitoring wells return to below background concentrations listed in Tables S-1 and STD-1 of the 11e.(2) license.

**Conclusions**

Envirocare is committed to protecting human health and the environment. Currently, there are no known receptors for the groundwater beneath the Envirocare facility, and future use is doubtful, due to poor water quality and aquifer yield. Envirocare is confident that the above mentioned studies/corrective actions will help alleviate the NRC's concerns and demonstrate that the 11e.(2) disposal cell continues to meet all performance standards.

Should you have any questions regarding this report or need any additional details, please feel free to contact me at (801) 532-1330.

Sincerely,



Mark Ledoux, CHP  
Corporate Radiation Safety Officer

cc: Bill Sinclair, State of Utah, DRC  
Linda Howell, Region IV NRC  
Loren Morton, State of Utah, DRC