Designated Original

Department of Energy
Office of Legacy Management

WM-41

FEB 23 2006

Mr. Gary Janosko, Chief
U.S. Nuclear Regulatory Commission
Fuels Cycle Facilities Branch, NMSS
Mail Stop T-8F42
Washington, DC 20555-0001

Subject: Transmittal of 2005 Annual Status Report for the Salt Lake City, Utah, UMTRCA Title I Processing Site

Dear Mr. Janosko:

The enclosed report presents the results of the annual monitoring and the status of institutional controls conducted at the subject site on December 20, 2005.

The monitoring performed at the site was the first of two additional years of reduced monitoring requested by the State of Utah Department of Environmental Quality, Division of Radiation Control (DEQ/DRC), and approved by your office (December 15, 2005, letter with enclosed Technical Evaluation Report: *Termination of Monitoring at the Salt Lake City UMTRCA Title I Processing Site*). Reduced monitoring resulted following the U.S. Department of Energy submittal of a 5-year monitoring evaluation in March 2005, which recommended discontinuing all monitoring at the site. Due to concerns over the concentration of molybdenum in on-site well MW–0144 completed in the shallow aquifer, primarily in 2003 when a concentration of 0.215 mg/L was reported, the Utah DEQ/DRC requested an additional 2 years of reduced monitoring.

According to the 2005 monitoring results, the concentration of molybdenum in well MW–0144 was 0.085 mg/L, which is below the maximum concentration limit (MCL) of 0.1 mg/L. In addition, a continued upward hydraulic gradient was reported in the deeper uncontaminated aquifer, which prevents the contamination present in the shallow unconfined aquifer beneath the site from downward migration.

The Central Valley Water Reclamation Facility, Assistant Manager, Mr. Thomas Holstrom, verified that no unauthorized construction within the supplemental standards residual soil contamination areas or on-site use of ground water occurred during the past year.

Please review and provide any comments or contact me at 970-248-6048 if you want to discuss the report.

Sincerely,

Thomas C. Pauling

Thomas C. Pauling
Site Manager

Enclosure

cc w/enclosure:
R. Fisher, Central Valley Water Reclamation Facility
D. Henderson, Utah Department of Environmental Quality
S. Hall, Stoller
File: SLP 535.10 (D. Roberts)

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2005 Annual Status Report for the Salt Lake City, Utah, UMTRCA Title I Processing Site

Summary

The annual site visit to perform monitoring and assess the status of the institutional controls at the Salt Lake City Processing Site was conducted on December 20, 2005.

Reduced ground water monitoring was performed as called for by the State of Utah Department of Environmental Quality, Division of Radiation Control (Utah DEQ/DRC) and approved by the U.S. Nuclear Regulatory Commission (NRC). Monitor wells were in excellent condition. Water quality results indicate that molybdenum concentrations in ground water are below the maximum concentration limit (MCL) in well MW–0144. Ground water level data were collected in conjunction with the ground water quality monitoring. Ground water level measurements indicate an upward hydraulic gradient continues to exist, which prevents contaminants in the shallow unconfined aquifer from migrating downward into the deeper uncontaminated confined aquifer.

The Central Valley Water Reclamation Facility (CVWRF) assistant manager verified that no unauthorized construction within the supplemental standards residual soil contamination areas or onsite use of ground water occurred during the past year. Shallow aquifer ground water was being removed under a permit with the Utah DEQ in order to dewater the construction site of two new wastewater treatment clarifiers being built in the northwest corner of the site. The water removed was run through a lined settling pond to remove excess sedimentation prior to being discharged to Mill Creek. No cause for maintenance or a follow-up visit was identified.

1.0 Introduction

This report presents the results of the annual U.S. Department of Energy (DOE) monitoring and the status of the institutional controls at the Uranium Mill Tailings Radiation Control Act (UMTRCA) Title I Processing Site at Salt Lake City, Utah. The CVWRF owns all of the former processing site and controls access to the land and to ground water beneath the site. S.M. Stoller Corporation, the DOE Legacy Management Contractor, conducted the monitoring on December 20, 2005. The monitoring was conducted in accordance with the *Long-Term Management Plan* [LTMP] *for the Salt Lake City, Utah, UMTRA Project Processing Site* (GJO-2002-307-TAR, January 2002). However, reduced monitoring was performed as called for by the Utah DEQ/DRC (November 9, 2005 letter) and approved by the NRC (December 15, 2005 letter with enclosed Technical Evaluation Report; *Termination of Monitoring at the Salt Lake City UMTRCA Title I Processing Site*).

2.0 Final Site Conditions

A shallow unconfined aquifer contains two constituents of potential concern (COPCs)—uranium and molybdenum—as a result of historic uranium processing operations. Throughout the region this aquifer also has widespread arsenic contamination resulting primarily from former lead, copper, silver, and gold processing activities (molybdenum also was a byproduct of these processing activities), which were independent of uranium processing. Useable ground water

exists in a deeper confined aquifer. An upward hydraulic gradient within the deeper aquifer prevents degradation by the overlying contaminated shallow unconfined aquifer.

The shallow aquifer is not a current or potential source of drinking water due to widespread ambient arsenic contamination, unrelated to the site, which cannot be cleaned up using treatment methods reasonably employed in public water supply systems. Sources of potable water are readily available from municipal water supply systems in the vicinity of the site. Future use of ground water from the shallow aquifer is unlikely based on historical trends and the rapid expansion of commercial and industrial facilities in the area. Therefore, with NRC approval and Utah DEQ/DRC concurrence, supplemental standards were applied to the contaminated ground water in the shallow aquifer. Application of supplemental standards was based on the limited use ground water designation resulting from the widespread ambient contamination.

Soils contaminated with residual radioactive material were left in place at several locations on the original property, as shown on Figure 1. NRC and the Utah DEQ/DRC concurred that these contaminated soils pose no unacceptable risk to human health or the environment. DOE, Utah DEQ/DRC, and the CVWRF jointly established institutional controls governing soil excavation and the construction of structures in areas where contaminated soils remain. These institutional controls are presented in the *Notice of Residual Radioactive Contamination* (Attachment 1) to which DOE, Utah DEQ/DRC, and the CVWRF are all signatories. Annotation of the notice was made to the property deed to serve as a future control for this residual radioactive soil contamination.

3.0 Site Access and Features

3.1 Facility Access

The former processing site, currently owned by the CVWRF, has been redeveloped as a regional wastewater treatment facility, a solid waste transfer facility, and a golf course. Visitors must check in at the Administration Building of the CVWRF before accessing the site.

Access to portions of the wastewater treatment facility is restricted by security fences and locked gates. After-hours access to the golf course also is restricted. Access to the solid waste transfer station is unrestricted, but personnel are asked to check in with facility staff before entering the facility.

3.2 Monitor Wells

DOE owns and maintains four ground water monitor wells remaining at the Salt Lake City Processing Site. The wells are located in pairs. In each pair, one well is completed in the shallow unconfined aquifer and the other is completed in the deeper confined aquifer. One pair of wells are flush-mounted (MW–0144 and MW–0145) and centrally located on the site in a grass-covered area south of the Administration Building (Figure 1). The second pair of wells (MW–0134 and MW–0143), downgradient of the first pair, is located in the northwest corner of the site; construction of two new clarifiers by CVWRF was being performed in this area. Both pairs of wells are downgradient of locations where soils contaminated with residual radioactive material remain (Figure 1). All wells were secure and in excellent condition.

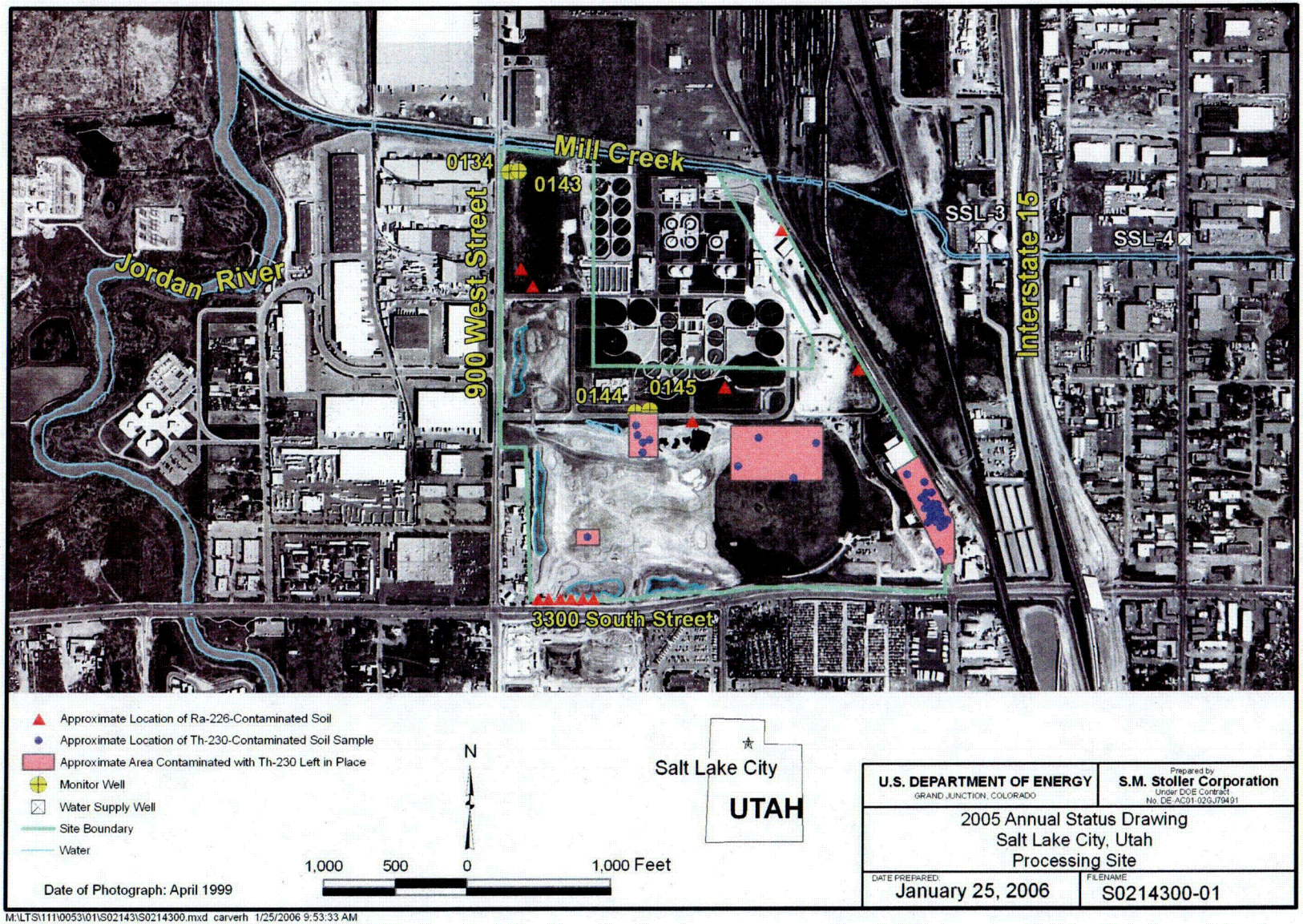

Figure 1. Salt Lake City, Utah, Processing Site

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4.0 Ground Water Monitoring

The purpose of the annual ground water monitoring is to confirm compliance with the *Ground Water Compliance Action Plan* [GCAP] *for the Salt Lake City, Utah, UMTRA Project Site* (Document Number U0039502, May, 2000).

Long-term monitoring of ground water is not normally required under a supplemental standards compliance strategy; however, NRC and the Utah DEQ/DRC stipulated limited monitoring as a best management practice in the GCAP. The water-monitoring program at this site started in early 2000. It included both ground water and surface water monitoring. Ground water monitoring consisted of water quality sampling from two onsite wells completed in the shallow aquifer and water level measurements from four onsite wells; two completed in the shallow aquifer and two completed in the deeper aquifer to confirm that an upward hydraulic gradient continued preventing contaminated ground water in the shallow aquifer from migrating to the lower uncontaminated aquifer. If the upward hydraulic gradient was found to have reversed, ground water quality monitoring would also be conducted in the two deeper aquifer wells. Uranium and molybdenum were selected as the COPCs because they are two of the most mobile constituents in mill tailings.

Ground water monitoring was performed at the site from 2000 to 2004 which was the minimum period specified in the GCAP and LTMP. In 2005, following the minimum 5-year monitoring period and in accordance with the GCAP and LTMP the monitoring results were evaluated, and based on established criteria, a recommendation to discontinue all ground water monitoring was made and submitted to the NRC for approval and to the Utah DEQ/DRC for concurrence. The monitoring evaluation was presented in the *2004 Annual Status Report for the Salt Lake City, Utah, UMTRCA Title I Processing Site* (February 2005). The criteria for discontinuing monitoring at the site, as directed in the GCAP, are: (1) No reversal of the ground water hydraulic gradient; (2) A decrease in uranium and molybdenum concentrations in the ground water; and (3) No unacceptable risks related to pumping of ground water by CVWRF or the storm drain sump.

Due to concerns over the concentration of molybdenum in onsite well MW–0144 completed in the shallow aquifer, primarily in 2003 when a concentration of 0.215 mg/L was reported, the Utah DEQ/DRC called for an additional two years of reduced monitoring. This reduced monitoring includes sampling for molybdenum in well MW–0144 and continuing the collection of water level measurements from both the shallow aquifer wells (MW–0144 and MW–0134) and the deeper aquifer wells (MW–0143 and MW–0145) to confirm that the upward hydraulic gradient between the aquifers continues onsite.

Ground Water Quality Results

In 2005, the first of the two additional years of reduced ground water monitoring, a molybdenum concentration of 0.0850 mg/L was reported in well MW–0144. A blind duplicate sample collected from the same location for quality assurance compared very well; it was reported at essentially the same concentration (0.0852 mg/L). The results are below the MCL of 0.1 mg/L established for molybdenum in Table 1 of 40 CFR 192. With the exception of the initial result reported in 1999 (0.137 mg/L), and what appears to be an anomalous result reported in 2003

(0.215 mg/L), all five other molybdenum results reported in ground water from this location have been below the MCL. A concentration of 0.075 mg/L was reported in 2004. Figure 2 provides a concentration versus time plot of the molybdenum results reported in well MW–0144 from 1999 through 2005.

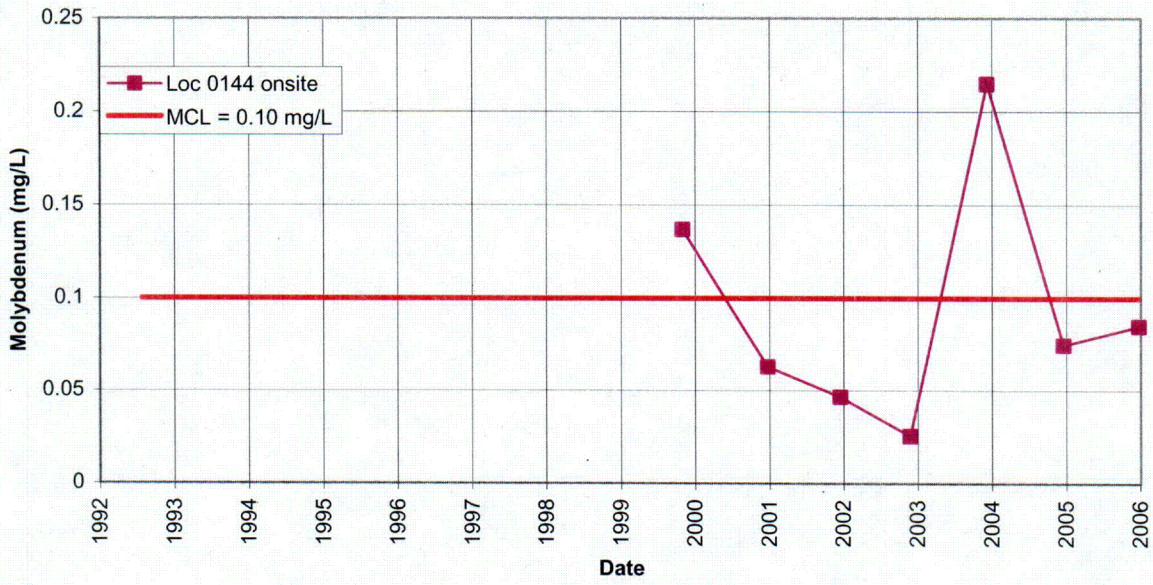

Figure 2. Shallow Aquifer Molybdenum Concentrations at the Salt Lake City Processing Site

Ground Water Level Measurements

Water level data loggers in the shallow wells were downloaded (continual measurements) and static water levels were obtained (single point measurements) in the deep wells. In each well pair, the water level was higher in the deep wells than in the shallow wells (Figure 3). Indeed, artesian conditions were found to be occurring in the two deeper aquifer wells as indicated by the slow overtopping flow of ground water from the well casing. This condition demonstrates the continued upward hydraulic gradient, monitored and recorded over the past 6 years, that prevents contaminated ground water from flowing from the shallow aquifer into the deeper uncontaminated aquifer. Therefore, no ground water quality monitoring was performed in the deeper aquifer.

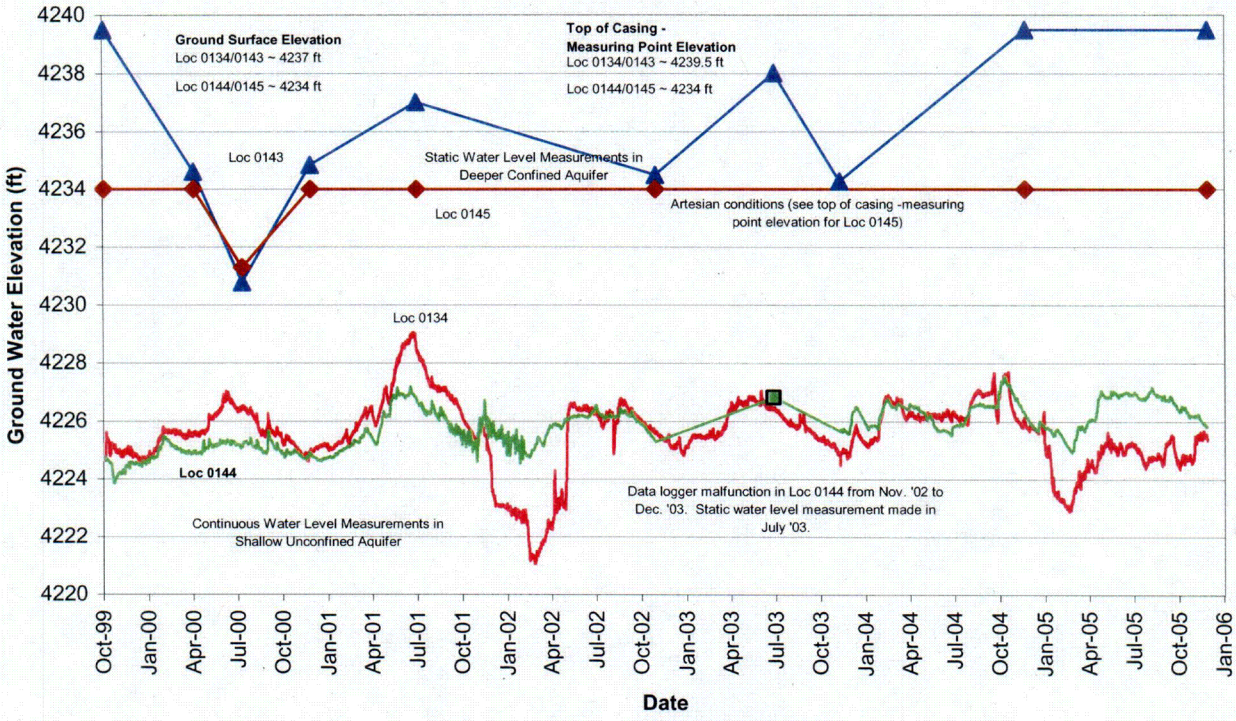

Figure3. Ground Water Level Measurements at the Salt Lake City Processing Site

5.0 Surface Water Monitoring

Samples were collected from seven surface water locations at the site from 2000 through 2004; the four golf course ponds, a golf course drainage ditch, and upstream and downstream on Mill Creek. Samples were analyzed for molybdenum and uranium.

In 2005 following the minimum 5-year monitoring period, and in accordance with the GCAP and LTMP, the monitoring results were evaluated and based on established criteria a recommendation to discontinue all surface water monitoring was made and submitted to the NRC for approval, and to the Utah DEQ/DRC for concurrence. The monitoring evaluation was presented in the *2004 Annual Status Report for the Salt Lake City, Utah, UMTRCA Title I Processing Site* (February 2005).

NRC approval and Utah DEQ/DRC concurrence was received in December 2005 to discontinue all surface water monitoring at the site. As a result, surface water monitoring was not performed in 2005 and is not planned for the future.

6.0 Effectiveness of the Ground Water Compliance Strategy

The ground water compliance strategy for the site is no remediation and application of supplemental standards based on limited use ground water resulting from ambient arsenic contamination unrelated to the site. Ground water from the shallow aquifer is not a current or potential source of drinking water, and there was no evidence of unauthorized ground water use

in 2005. Ground water quality monitoring results were reported below MCL for the COPC (molybdenum) at location MW–0144 in 2005. Ground water level measurements confirm that an upward hydraulic gradient continues to exist, which prevents COPCs in the shallow unconfined aquifer from migrating downward into the deeper uncontaminated confined aquifer that contains potable water. Therefore, the application of supplemental standards as a compliance strategy remains effective by ensuring that the shallow aquifer is not used for drinking water and that the deeper aquifer continues to be unaffected by the shallow aquifer.

7.0 Institutional Controls

On December 20, 2005, during site monitoring, DOE representatives met with Mr. Holstrom, assistant manager of the CVWRF, to verify the continued awareness of the land and ground water use restrictions at the former DOE processing site property that result from the residual radiactive soil and ground water contamination remaining at the site under supplemental standards. Mr. Holstrom was representing Mr. Reed Fisher, the CVWRF manager, who was not in the office and had been the contact for notification in prior years.

Due to Mr. Holstrom's recent employment in April 2005, he was not aware of the restrictions regarding (1) soil excavations in the areas where residual radioactive soil contamination remains, or (2) the onsite use of ground water from the shallow aquifer for consumption. Mr. Holstrom was informed of the restrictions and provided a brief history of the DOE uranium processing activities that took place onsite. In addition, Mr. Holstrom was informed of the areas where residual soil contamination occurred, primarily on the southern half of the property where the golf course is located (Figure 1), and of the ground water contamination present in the upper aquifer resulting from both the former DOE processing site activities and historical non-processing site activities (primarily historical smelting performed in the Salt Lake City valley).

Mr. Holstrum confirmed that no excavations had occurred in the areas with residual radioactive soil contamination. Mr. Holstrum also indicated that there is no ground water being withdrawn and used onsite. Mr. Holstrom also was not aware of any onsite wells being pumped by the CVWRF as stated in the LTMP and GCAP. Specifically, these documents state there are two onsite wells; one pumps continuously at 150 gpm for construction purposes with extracted water being run through the treatment plant and the other well is pumped only as needed. Mr. Holstrom did mention that the CVWRF is currently constructing two new clarifiers in the northwest corner of the site, and that shallow ground water is being withdrawn to dewater the construction site under a permit with the Utah DEQ. The dewatering is run through a lined sediment pond before being discharged into Mill Creek (estimated at 60 gpm). These construction activities are not located in an area of known remaining soil contamination.

8.0 Recommendations

1. **Issue**: In accordance with the GCAP and LTMP, constituents of potential concern (uranium and molybdenum) in the shallow aquifer are not to migrate to the deeper aquifer that contains potable water. The compliance strategy presented in the GCAP is to (1) monitor ground water quality in the shallow aquifer, (2) monitor water levels to verify that an upward hydraulic gradient continues preventing contamination in the overlying contaminated shallow unconfined aquifer from degrading the deeper uncontaminated

aquifer, and (3) ensure, through annual notification and inquiry, that no unacceptable risks related to any onsite pumping of shallow aquifer ground water by the CVWRF is occurring.

Following 5 years of monitoring, the GCAP called for an evaluation of the monitoring program. This evaluation was completed and submitted to the NRC and Utah DEQ/DRC in March 2005 with a recommendation to discontinue all surface and ground water monitoring at the site. Due to concerns over the concentration of molybdenum in onsite well MW–0144 (completed in the shallow aquifer), the Utah DEQ/DRC called for an additional two years of reduced monitoring. The NRC approved the additional two years of reduced monitoring (through 2006) with the understanding that monitoring would be discontinued at the end of this period if molybdenum concentrations in well MW–0144 remain below the MCL and the upward hydraulic gradient in the lower aquifer continues.

Recommendation: Perform reduced monitoring for the additional two-year period (through 2006). At the end of this period, with the NRC's approval and the Utah DEQ/DRC concurrence, DOE will discontinue all monitoring provided molybdenum concentrations in well MW–0144 remain below the MCL and the upward hydraulic gradient in the lower aquifer continues. Because CVWRF states that no onsite pumping of shallow aquifer ground water for human use or consumption occurs or is planned in the future, there is no current or future risk.

2. **Issue**: Effective institutional controls associated with the locations of remaining contaminated soil must be maintained.

Recommendation: Annually verify the effectiveness of institutional controls by interviewing the manager of CVWRF. In addition, periodically check that the *Notice of Residual Radioactive Contamination* (Attachment 1), to which DOE, Utah DEQ/DRC, and the CVWRF are all signatories, continues to be annotated to the property deed. Annotation of the notice to the property deed serves as a future control for this residual radioactive soil contamination. Requesting a copy of the property deed every five years is recommended (a copy was last requested in January 2006).

ATTACHMENT 1

Notice of Residual Radioactive Contamination

AMENDED

NOTICE OF RESIDUAL RADIOACTIVE CONTAMINATION

THIS NOTICE IS TO ALERT BUYERS OR DEVELOPERS THAT RESIDUAL RADIOACTIVE CONTAMINATION ~~EXITS~~ /EXISTS ON THE PROPERTY HEREIN DESCRIBED.

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6753637

RECITALS

A. WHEREAS, the current owner of the property known as the Salt Lake Vitro Site situated in the county of Salt Lake, Salt Lake City, Utah, and more particularly described on Exhibit 1 attached hereto is Central Valley Water Reclamation Facility Board located at 800 West Central Valley Road, Salt Lake City, Utah, 84119

Received
Division Of
Radiation
Control

B. WHEREAS, the Salt Lake Vitro Site was used by the Vitro Chemical Company to process uranium ore from 1951 to 1964 and to process vanadium ore from 1964 to 1968;

C. WHEREAS, when milling operations were discontinued in 1968, more than four million tons of uranium mill tailing waste remained on the Salt Lake Vitro Site;

D. WHEREAS, under the Uranium Mill Tailings Radiation Control Act of 1978 (Public Law 95-604), which requires the remediation of the identified uranium mill tailing sites, the United States Department of Energy and the state of Utah entered into Cooperative Agreement Number DE-FC04-81AL616309, dated March 30, 1983, for the remediation of the Salt Lake Vitro Site; between 1985 and 1987 excavation and disposal of the uranium mill tailings and site restoration were performed.

E. WHEREAS, not all residual radioactive materials were removed during remedial action, isolated areas of the radioactive contamination remain, examples of which are shown on the map attached hereto as Exhibit 2.

F. WHEREAS, the cleanup of the Salt Lake Vitro Site is documented in the *Completion Report for the UMTRA Project Vitro Processing Site Salt Lake City, Utah*, ("Completion Report") dated June 1997 which provides a discussion of the known contaminated areas, including an estimate of the amount of contamination present, the approximate location of the radioactive contamination, and a health assessment resulting from exposure to the contaminants; and

G. WHEREAS, the Completion Report may be examined at and copies obtained from the following:

State of Utah
Department of Environmental Quality
Division of Radiation Control
168 North 1950 West, Building #2
Salt Lake City, UT 84114-4850
(801) 536-4250

Department Of Energy
Grand Junction Office
2597 B $^{3}/_{4}$ Road
Grand Junction, CO 81503
(970) 248-6000

Department of Commerce
National Technical Information Services
5282 Port Royal Road
Springfield, VA 22161
(703) 487-4650

H. NOW THEREFORE the United States Department of Energy, the state of Utah, and the Central Valley Water Reclamation Facility Board hereby recommend to prospective purchasers or developers of part or all of the Salt Lake Vitro Site that the following actions be taken:

1. Verify that future construction plans do not occur in contaminated areas. If there is a possibility of encountering contaminated material, contact the Utah Department of Environmental Quality, Division of Radiation Control.

2. Prior to construction, conduct appropriate radiological surveys to determine whether radioactive elements are present, and their identity, concentration, and distribution.

#7600796

3. If radioactive materials are encountered during construction, the materials may be: (a) dispensed of as radioactive waste in an appropriate waste facility; or (b) buried into the deepest part of the excavation during back filling.

4. Regardless of the results of the radiological surveys, if there are construction plans for habitable structures (e.g., residential, institutional, commercial or industrial buildings and the like), consider installing a passive sub-slab radon ventilation system that will vent radon soil gas to the atmosphere.

Dated this 26th day of August, 1997

UNITED STATES DEPARTMENT OF ENERGY

By: George J. Rael
George Rael
Director
Environmental Restoration Division

STATE OF NEW MEXICO)
) ss.
COUNTY OF BERNALILLO)

Before me, a Notary Public qualified for Bernalillo County, personally appeared George Rael, who by me duly swore did say that he is the Director of the Environmental Restoration Division and he further acknowledged to me that the above NOTICE OF RESIDUAL RADIOACTIVE CONTAMINATION document was duly executed by him on behalf of the United States Department of Energy.

WITNESS my hand and Notarial Seal on this 26th day of August, 1997

Notary Public

Residing at: Albuquerque NM

My Commission Expires: 5/25/2001

Dated this 3rd day of September, 1997

STATE OF UTAH
DEPARTMENT OF ENVIRONMENTAL QUALITY

By: William J. Sinclair
William Sinclair
Director
Division of Radiation Control

STATE OF UTAH)
) ss.
COUNTY OF SALT LAKE)

Before me, a Notary Public qualified for Salt Lake County, personally appeared William Sinclair, who by me duly swore did say that he is the Director of the Division of Radiation Control and he further acknowledged to me that the above NOTICE OF RESIDUAL RADIOACTIVE CONTAMINATION document was duly executed by him on behalf of the state of Utah.

WITNESS my hand and Notarial Seal on this 3rd day of Sept., 1997.

Mary Charlene Lamph
Notary Public

NOTARY PUBLIC
Mary Charlene Lamph
168 North 1950 West
Salt Lake City, Utah 84116
My Commission Expires
September 9, 1999
STATE OF UTAH

Residing at: Salt Lake City

My Commission Expires: Sept. 9, 1999

#760094

Dated this 11 day of Sept., 1997

CENTRAL VALLEY WATER RECLAMATION FACILITY BOARD

By: _____
Reed Fisher
General Manager

STATE OF UTAH)
) ss.
COUNTY OF SALT LAKE)

Before me, a Notary Public qualified for Salt Lake County, personally appeared Reed Fisher, who by me duly swore did say that he is the General Manager of the Central Valley Reclamation Facility and he further acknowledged to me that the above NOTICE OF RESIDUAL RADIOACTIVE CONTAMINATION document was duly executed by him on behalf of the Central Valley Water Reclamation Facility Board.

WITNESS my hand and Notarial Seal on this 11th day of September 1997.

Beverly N. Bell
Notary Public

NOTARY PUBLIC
BEVERLY N. BELL
800 W. Central Valley Rd.
So. Salt Lake, Utah 84119
My Commission Expires
September 30, 1997
STATE OF UTAH

Residing at: Salt Lake City, UT

My Commission Expires: 09/30/97

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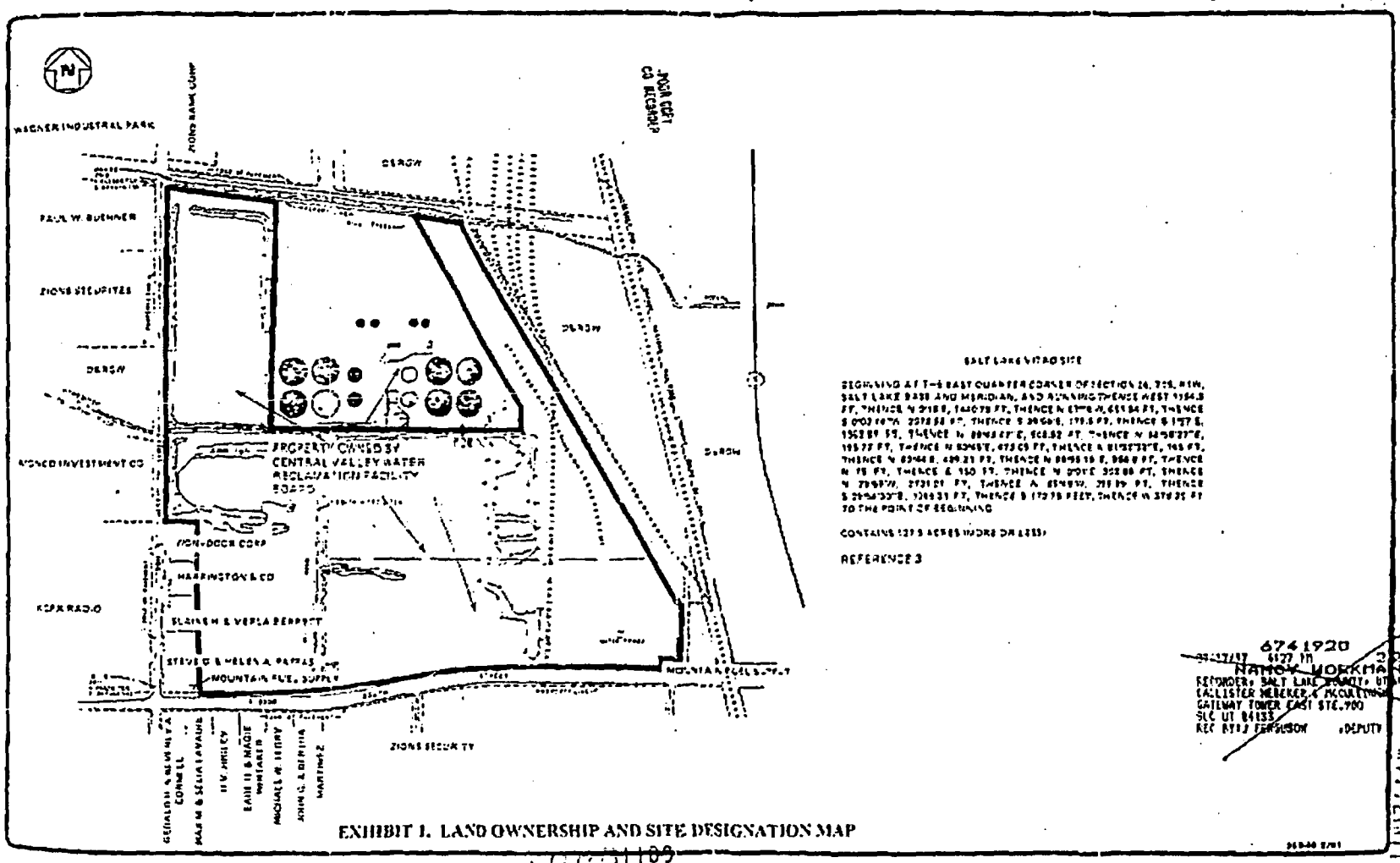

EXHIBIT 1. LAND OWNERSHIP AND SITE DESIGNATION MAP

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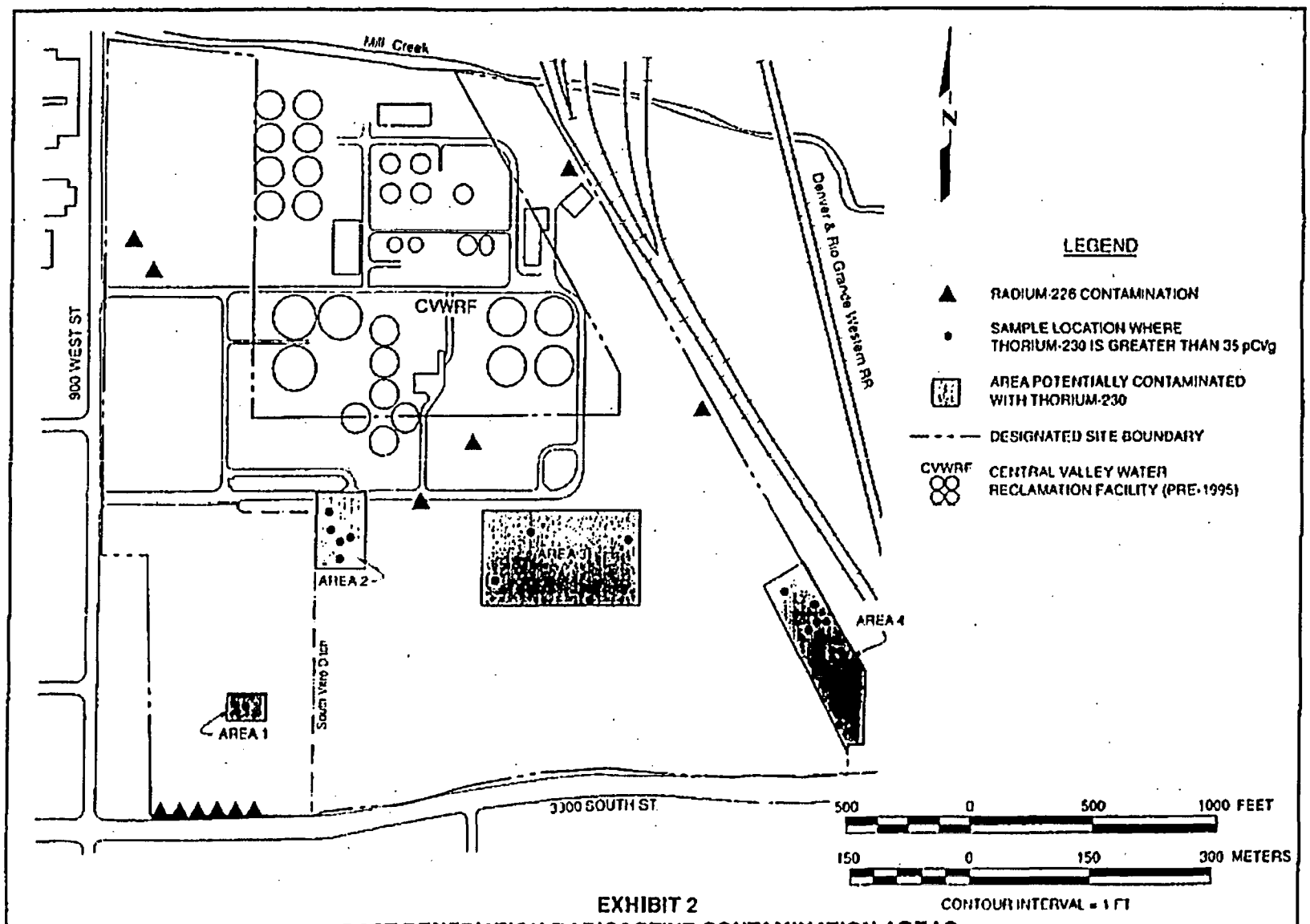

EXHIBIT 2
POST-REMEDIATION RADIOACTIVE CONTAMINATION AREAS
SALT LAKE CITY, UTAH, VITRO PROCESSING SITE

MAC SITES\SLCATTCH\TOCH\CRATTACH