

# TEXAS COMMISSION ON ENVIRONMENTAL QUALITY RADIOACTIVE MATERIALS DIVISION

## DRAFT COMPLETION REVIEW REPORT

**Date:** July 24, 2012

**Licensee:** Uranium One USA, Inc.

**License Number:** R03024

**Facility Name:** Holiday/El Mesquite Project

**Location:** 2.8 Miles Southeast of Bruni, Texas

**Licensed Area Being Terminated:** Approximately 3500 acres

**Manager:** Gary L. Smith, Ph.D., Manager, Uranium and Technical Assessments Section

**Technical Reviewer:** Tony J. Gonzalez, Health Physicist, UTAS

### I. SUMMARY

Uranium One USA's Holiday/El Mesquite Project (HEM) is an *in situ* leach uranium mining and processing site which has been decommissioned and reclaimed under Texas' Agreement State authority, derived from Title II of the Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA). The Texas Commission on Environmental Quality (TCEQ) is the agency of the State of Texas currently granted jurisdictional authority for regulation of source material recovery licensees, under the provisions of Chapter 401 of the Texas Health and Safety Code. UMTRCA requires that prior to termination of the license, the U.S. Nuclear Regulatory Commission (NRC) shall make a determination that the licensee has complied with the applicable standards and requirements. Further, the NRC has reserved the right to provide concurrence on release to unrestricted use of licensed sites prior to license termination, under the provisions of Title 10 of the Code of Federal Regulations, Section 150.15a. Under the Agreement State program, the State of Texas via its agency, the TCEQ, is responsible for approval of the remediation plans for HEM and for site inspections to ensure that the actual remedial actions have been completed pursuant to the approved plans and complies with the applicable criteria.

This report documents the TCEQ's basis for its conclusion that decommissioning and reclamation has been acceptably completed at the HEM site. The NRC STP Procedure SA-900 entitled, "Termination of Uranium Milling Licenses in Agreement States," was used to prepare this report. The primary applicable standards for uranium mill reclamation in Texas is Title 30 of the Texas Administrative Code (30 TAC), Section (§) 336.1115, entitled "Expiration and Termination of Licenses; Decommissioning of Sites Separate Building or Outdoor Areas." This state rule is consistent with and compatible with NRC regulations, as required by the state's Agreement State status with the NRC.

The applicable standards and requirements, with appropriate references to related sections of this completion review report (CRR), are identified in Table 1 of this CRR. In response to the licensee's request for release to unrestricted use of the HEM site on Radioactive Material License No. R03024, the TCEQ has performed a review of the HEM site for compliance with all applicable standards and requirements for release to unrestricted use. As part of that review, the TCEQ has prepared a Review Sheet (Log No. CN601313802) to document the TCEQ's review of the licensee's request to release the HEM site to unrestricted use and so amend the license to reflect that status. This CRR is a part of the License Amendment Review Sheet; however, additional information recorded on the Review Sheet

may provide reference to more detailed evaluations made by the TCEQ and to Uranium One's documents submitted for TCEQ review during the site's reclamation period. The TCEQ's reviews of licensee submittals were conducted using guidance from NRC's NUREG-1569.

**Table 1 Applicable Standards and Requirements Related to Topics Discussed in the CRR**

Applicable Standards/Requirements			CRR Sections
State Rule: Title 30 TAC § 331.107 Aquifer Restoration.			Sections II.2 and II.3
State Rule: Title 30 TAC § 331.46 Plugging and abandonment of wells.			Section 2 and 3
State Rule: Title 30 TAC §336.364 and §336.1115 Release of equipment and materials. Criteria for release of equipment, facilities and materials (i.e., discrete solid objects) for unrestricted use.			Section 4
Nuclide	Average	Maximum	Removable
U-nat	5,000 dpm alpha/100 cm <sup>2</sup>	15,000 dpm alpha/cm <sup>2</sup>	1,000 dpm alpha/cm <sup>2</sup>
Ra-226, Ra-228, Th-nat,	1,000 dpm/100 cm <sup>2</sup>	3,000 dpm/100 cm <sup>2</sup>	200 dpm/100 cm <sup>2</sup>
Beta-gamma emitters	5,000 dpm beta, gamma/100 cm <sup>2</sup>	15,000 dpm beta, gamma/100 cm <sup>2</sup>	1,000 dpm beta, gamma/100 cm <sup>2</sup>

<p>State Rule: 30 TAC § 336.1115(e)</p> <p>Outdoor areas are considered suitable for release for unrestricted use if the following limits are not exceeded.</p> <p>Criteria for release to unrestricted use of soils (i.e., land) are the following limits averaged over 100 square meters:</p> <p>Radium-226 or –228 - (A) 5 pCi/g averaged over the first 15 cm of soil below the surface; and (B) 15 pCi/g, averaged over 15 cm thick layers of soil more than 15 cm below the surface.</p> <p>Natural uranium – (A) 30 pCi/g, averaged over the top 15 cm of soil below the surface; and (B) 150 pCi/g, average concentration at depths greater than 15 centimeters below the surface so that no individual member of the public will receive an effective dose equivalent in excess of 100 mrem per year.</p>	Section 4
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In conclusion, the TCEQ considers Uranium One’s HEM site to have met the applicable standards and requirements for release to unrestricted use. Upon receipt of a determination by the NRC, as required by Section 274c.(4) of the Atomic Energy Act, that the applicable standards and requirements have been met, the licensee will be notified and Radioactive Material License No. R03024 will be amended to signify that Site No. 002 (Holiday/El Mesquite) may be released to unrestricted use.

## II. DOCUMENTATION OF BASES FOR CONCLUSION

The following are the TCEQ’s review results for items specified in STP Procedure SA-900 “Termination of Uranium Milling Licenses in Agreement States.”

### 1. Description of licensee’s activities associated with decommissioning and license termination

The HEM is an *in situ* leach uranium mine located near 2.8 miles southeast of Bruni, Texas. The HEM’S uranium leases cover approximately 3,500 contiguous acres of land. Of that acreage, 1,400 acres comprise the production area divided among seven well fields. Originally, HEM had eleven well fields, four well fields were released for unrestricted use in 2001 following confirmatory surveys and sampling events at that time by the Texas Department of Health (TDH), precursor to the Texas Department of State Health Services (DSHS) (TDH 2001). In addition to the well fields, the site also had a concrete pad with sumps, four sets of cascading ion exchange columns, a reverse osmosis unit, a precipitation tank, several 17x16 reinforced fiberglass tanks, hydrogen peroxide storage tank, two sand filters, two byproduct waste storage ponds, a backwash pit, a small warehouse, a shop, a lab/small office, a main office building, a restroom/change room, a septic tank system, a diesel fuel storage tank, and three pipelines connecting the O’Hern site to the Holiday/El Mesquite Plant site.

Surface activities at the site were licensed by the TDH/DSHS, and recently transferred to the Texas Commission on Environmental Quality (TCEQ) an agency of the State of Texas, under Radioactive Material License No. L03024. Subsurface activities were permitted by the Texas Water Commission (TWC), subsequently renamed the Texas Natural Resource Conservation Commission (TNRCC), and now currently named the TCEQ under TWC Permit No. UR02155 and UR02156, for injection wells, and Underground Injection Control Permit WDW-197, for a waste disposal well.

The HEM Site was operated from 1978 to 1998 when production operations were ceased, and groundwater restoration began. Figure 1 below depicts the change in ownership of the site over time (A) as well as regulatory authorities during the same time period for both groundwater (B) and source material recovery and by-product disposal activities (C). Active groundwater restoration was begun in 1998 under the jurisdiction of the TNRCC. The TNRCC authorized cessation of groundwater restoration and plugging and abandonment of all uranium recovery related wells in 2009 (TCEQ 2009). Following the plugging and abandonment of the wells, full-scale surface reclamation and decommissioning could proceed.

Figure 1 Timeline of Events

Production Period				1998	Reclamation and Restoration Period			
A	Mobil Oil	1987	Malapai Resources	1990	COGEMA Mining	2009	Uranium One	
B	Texas Water Commission			1993	TNRCC	2001	TCEQ	
C	TDH: Bureau of Radiation Control			1993	TNRCC	1997	TDH/DSHS 2007 TCEQ	

The licensee initiated decommissioning of the well fields by removal of wellheads and related piping. These items were transferred to Pathfinder Mines (a sister company of the licensee) at Shirley Basin, Wyoming for disposal in the tailings impoundment at that site.

The licensee decommissioned the plant site by either decontamination of structures (e.g., office building) and transferring them to other persons for unrestricted use, or by transferring contaminated structures and equipment to licensed disposal sites. Items no longer of value or use were dismantled and transferred to the Pathfinder Mines facility for disposal. The two byproduct material waste ponds were decommissioned and the liners removed. The liners and the rubble from the concrete pads were transferred to the Pathfinder Mines facility for disposal.

Following the removal of structures, equipment and features from the site, the licensee initiated a survey program to identify areas where the soil was contaminated.

**2. Information which demonstrates that the groundwater has been restored to meet applicable standards and requirements.**

Injection authorization associated with the mining of uranium and restoration of the groundwater in the mining zones was the jurisdiction of, initially the TWC and subsequently, the TNRCC during mining activities at the HEM. Thus, all data pertaining to the restoration of the groundwater was sent to the TNRCC and reviewed by that agency. During the initial decommissioning and restoration, the radioactive materials regulatory authority over HEM at the time was the DSHS, and thus the DSHS relied on the TNRCC to determine that the data pertaining to groundwater restoration was acceptable and that the groundwater had been restored to meet applicable standards and requirements.

The TNRCC, now the TCEQ, has jurisdiction over the underground injection control program and has reviewed letters dated December 15, 1998, September 16, 1999, October 4, 1999, November 13, 2000, June 21, 2001, September 10, 2002, and December 10, 2007 from the TNRCC/TCEQ to COGEMA Mining, Inc. and obtained the following information: The TNRCC has reviewed the restoration data for Production Areas 1, 3, 5, 6 and 7 and determined that the production area (groundwater) has been restored to the specifications in permit UR02155/2156 and as required by rule in Title 30 of the Texas Administrative Code, Section 331.107. COGEMA Mining, Inc. has been authorized to cease any restoration activities, including monitoring, in the production areas (TNRCC 1998A, TNRCC 1999A, TNRCC 1999B, TNRCC 2000, TNRCC 2001, TNRCC 2002, TCEQ 2007). Furthermore, Permits UR02155 and UR02156, for HEM were revoked, per the letter dated April 13, 2009 from TCEQ to COGEMA Mining, Inc. and the certification of revocation dated October 20, 2009 (TCEQ 2009A/B). Thus, the referenced correspondence from TNRCC to COGEMA demonstrates that the groundwater at the HEM has been restored to meet applicable standards and requirements.

**3. Documentation that the production, injection and monitoring wells have been closed and plugged in accordance with applicable standards and requirements**

The TCEQ Radioactive Materials Division has reviewed letters dated April 13, 2009 and May 17, 2000 from the then TNRCC and now TCEQ Underground Injection Control Team to COGEMA Mining, Inc. and obtained the following information:

The TCEQ has reviewed the Closure Reports for a total of 765 wells in El Mesquite Production Area 7, Holiday Production Area H-1 Extension, and Holiday Production Area 7 submitted December 4, 2008, February 12, 2009, and March 4, 2009. Based on information provided in the Closure Reports, the Executive Director acknowledges that plugging and abandonment of wells in UR02155-071, UR02156-011, and UR2156-071 have been completed in substantial compliance with the approved closure plans and in accordance with the closure requirements of 30 TAC §331.46 (TCEQ 2009 A). Consequently COGEMA filed for a voluntary permit revocation and was granted October 20, 2009 (TCEQ 2009A/B).

In addition to the wells associated with the mining of uranium, COGEMA was also permitted by the TNRCC for a waste disposal well at the HEM. TDH reviewed a letter dated November 20, 2000 from the TNRCC to COGEMA Mining, Inc. and obtained the following information: COGEMA has met all applicable closure requirements for the well, and UIC Permit WDW-197 was voluntarily revoked (TNRCC 2000). Thus, the referenced correspondence from TNRCC to COGEMA demonstrates that

the waste disposal well at the West Cole site has been closed to meet applicable standards and requirements.

**4. Decommissioning information which documents that all radiologically contaminated materials have been properly disposed of, transferred to licensees authorized to possess such materials, or meet applicable standards and requirements for release.**

Agency inspectors periodically (at least once every 12 months) observed aspects and effects of licensee decommissioning efforts and reviewed licensee's records to ascertain disposition of contaminated materials. As documented in agency inspection reports, under the section of the report titled "Scope of Operations", the licensee was noted to ship contaminated materials to COGEMA's Pathfinder operation at Shirley Basin, Wyoming for disposal (TDH 2004). The authorization for Pathfinder to receive this material was verified by a review of the Pathfinder license (Amendment 34 dated 3/19/93). This was documented under the section of the inspection report titled "License Conditions", specifically Condition 24.A (TDH 2004).

Agency inspectors verified the removal of the plant pad and the decommissioning and reclamation of waste water ponds, and documented such in an inspection report (TCEQ 2012B). Agency inspectors also verified that equipment and materials released from the site for unrestricted use met the surface contamination levels specified at 25 TAC §336.364 and documented as such in inspection reports (TDH 1999, TDH 2000, TDH 2003).

Uranium One also submitted documentation of decommissioning and disposition of waste in a report entitled "Holiday/El Mesquite and O'Hern: Final Disposition of Byproduct Material, Non-Byproduct Material, Equipment Transfers, and TCEQ Acknowledgements on Groundwater Restoration, Well Plugging and Abandonment and UIC Permit Revocations" (Uranium One 2011B). This report contains copies of the records related to the disposition of waste. The report was reviewed to ensure compliance with all regulations when transferring or disposing of materials from HEM. In accordance with 30 TAC § 336.1123(b)(4) and the acceptable method of verification provided in 30 TAC § 336.1123(c)(d)(1) for parties interested in obtaining certain equipment or materials, they were reviewed to provide Uranium One with a copy of their current Radioactive Materials License to demonstrate that the party was authorized to receive the certain type, form and quantity of radioactive material. Such material was transferred to either of two licensees: Uranium Resources, Inc. or Mesteña Uranium LLC, both Texas agreement state licensees.

The agency's inspections reports and the documentation provided by the licensee confirm the use of the surface contamination limits referenced at 25 TAC § §336.364 and §336.1115 and appropriate survey and radiation detection instrumentation for determining the release of material from the HEM site to unrestricted use; and confirms the licensee's proper transfer of contaminated material to an appropriate facility for disposal or to other appropriately licensed persons or facilities.

## **5. Discussion of the results of radiation surveys and soil sample analyses which confirm that the licensed site meets applicable standards and requirements for release.**

The licensee submitted a document titled "Closure Report for the Holiday/El Mesquite Project" dated May 10, 2011 (Uranium One 2011A). This report described the licensee's efforts to demonstrate that the site meets the criteria for release to unrestricted use. Those efforts included the following:

### General Survey Information

The licensee engaged Health Physics Consultants (HPC) of Austin, Texas to conduct surveys of the site after Uranium One had performed the removal of soils exhibiting levels of radioactivity above clean-up standards from its HEM and O'Hern operations. HPC used a GPS-based automated survey system (GASS) to conduct gamma surveys. The system consisted of Ludlum Model 2221 digital ratemeter/scalers with 2-inch by 2-inch sodium iodide Ludlum Model 44-10 detectors paired with a Trimble ProXRS global positioning system. Two of the detectors were mounted on a vehicle with the detectors separated by approximately 3 meters and positioned at approximately 45 centimeters above the ground surface. The detectors were operated in ratemeter mode and counts were automatically recorded in one-second intervals. The vehicle was operated at a speed to produce data at approximately 1 to 3 meter intervals. Instrumentation calibration and function check data are also presented.

#### **A. Description of method for and establishment of background gamma levels.**

A background study generated by SENES Consultants Limited was incorporated by HPC to establish background levels (SENES 1999). In the report, background gamma levels and soil concentrations were determined by surveying and sampling areas outside the license boundaries. Based on this report, an initial background gamma count rate of 4,500 counts per minute (cpm) was indicated. Surveys to determine background were made using a survey system similar to the one previously described.

In addition to having a previous background study, HPC conducted one as well. Using the setup described in the previous section, measurements were made in each of the 7 areas with counts ranging from 3,033 to 7,483 cpm. Statistical background levels for each well field varied by as much as a factor of 2. An average of 4,547 cpm was derived by averaging the counts from all 7 areas. The standard deviation for the data set was determined to be 375 cpm.

#### **B. Description of method for development of a correlation between radium-226 concentrations in soil and the gross gamma rate obtained in the surveys.**

Another background study of the area was previously done by Environmental Restoration Group (ERG) and incorporated by HPC to establish a correlation between Ra-226 concentrations and gamma count rate (COGEMA 2003). In the ERG report, correlation between gamma counts and soil concentration of radium-226 was made using data collected at 74 locations using a 5-spot composite sampling procedure. Prior to sampling, static gamma counts were made at each of the 5 sub-sampling locations ( $74 \times 5 = 370$  static gamma measurements). ERG used an unshielded Ludlum 2" x 2" NaI probe coupled to a 2221 ratemeter at 45 cm above grade for a one minute scalar counts. The soil samples were analyzed on site using a laboratory gamma spectrometry system. Split samples

were also analyzed by Energy Labs in Casper, Wyoming. There were 19 sample points with Ra-226 above 2 pCi/g, two outliers were removed from the data set, leaving only 17 data points. The data was plotted with a least-squares-fit line and bounding 95-percent confidence lines. Using a radium-226 concentration of 5.5 picocuries per gram (pCi/g), derived from a correlation equation and an assumed Ra-226 background of 0.5 pCi/g, a gamma count rate of 7,500 cpm was obtained as a guide during real time excavations.

**C. Description of the survey methodology employed for the initial survey and the data obtained from the survey.**

Surveys were made of the entire site using the methodology described in section 5 above. Statistical background levels for each well field varied by as much as a factor of 2. An appropriate background was designated for each well field which would correlate to the statistical mean of each area. Gamma readings were grouped into ranges of less than mean background (less than 4,500 cpm), mean background to 1.25 times background (4,500 to 6,750 cpm), 1.25 times mean background to twice mean background (6,750 to 9,000 cpm) and greater than twice mean background (greater than 9,000 cpm).

**D. Description of the clean-up criteria used.**

Soil clean-up criteria is cited in TCEQ Rules at 30 TAC §336.1115(e). Soil clean-up criteria uses the limits of 5 pCi/g for Ra-226 in the first 15 centimeter horizon of soil, and 15 pCi/g for soil more than 15 centimeters below the surface. The uranium clean-up standard is 30 pCi/g of uranium in the first 15 centimeter horizon of soil, and 150 pCi/g for soil more than 15 centimeters below the surface.

Additionally, a dose limit is also specified at 30 TAC § 336.1115(e)(4). The dose limit is as follows: no individual member of the public will receive an effective dose equivalent in excess of 100 mrem (1 mSv) per year as calculated by the methodology provided in NUREG-1620, Appendix H- "Guidance to the U.S. Nuclear Regulatory Commission Staff on the Radium Dose Approach."

**E. Description of the methodology used for identifying and delineating the areas for soil removal, the method for removing the soil, and the disposition of the removed soil.**

The action limit of 7,500 cpm was used by HPC to designate areas as exceeding the regulatory limits for Ra-226 concentration. These areas were staked for a second phase manual survey. Surface soils were delineated at that time to count rates greater than 7,500 cpm for removal in 3 to 6 inch lifts. Subsurface surveys were then done on these to investigate possible exceedance of the 15 pCi/g subsurface concentration limit for Ra-226. Any artifacts encountered on these surveys were removed during the excavation phase using a front-end loader and/or backhoe. Removed soil was stockpiled and shipped to Pathfinder Mines (Uranium One 2011B).

**F. Description of the final verification survey methodology and the data obtained from the survey.**

Final surveys were conducted in reclaimed areas in the manner previously described in "General Survey Information" in section 5 above, with the exception that the spacing between the detectors was decreased to approximately 1.8m which limited the field of view to 4.8m and vehicle speed was reduced (approximately 1 m/s). The reduction in spacing and speed allowed for a denser survey



protocol. In the case where vehicle access was limited (e.g., deep excavations, trenches, etc.), the surveys were conducted on foot. Surveys of trenches were conducted with the detector held within 18 inches of the bottom of the trench and with the detector held at mid depth of the trench. The results of the final gamma surveys for all the areas at HEM indicate no expectation for incidence of areas in excess of release criteria.

**G. Description of the methodology used to select areas for collection of soil samples, the criteria for collection of soil samples, the methodology used to collect the soil samples, the analytical service provider used to analyze the soil samples, and the analytical service provider's methodology for analyzing the soils, and the results of the soil sample analysis.**

The survey and sampling was conducted in an initial and final phase. The initial phase was conducted to provide comprehensive survey coverage in all accessible areas at each site. This survey used the GASS and generated maps showing color tracks and indicating areas above twice background and/or above the action level for additional remediation. Areas above the action level would be staked for remediation. A handheld survey would then be employed to demarcate the extent of any areas having elevated readings. Following remediation the areas would be re-surveyed with the automated system to ensure satisfactory reclamation. The final survey was done in the same manner but using a denser scanning technique and with focus paid to areas which had previously been identified for further remediation.

After the final survey was done and areas shown to be satisfactorily remediated, ninety-two random soil samples were collected among the seven well fields and plant area in both 0-6" and 6-12" soil horizons for a total of 184 discrete soil samples. Randomized locations for sampling were generated using Spatial Analysis and Detection Assistance (SADA) software generated by the University of Tennessee. The SADA software includes a MARSSIM module and a simple random option for determining sample locations.

For each area designated for sampling, a five spot composite sample was collected. All samples were analyzed for natural uranium and Ra-226. The laboratory dried, pulverized, homogenized and digested the samples in acid prior to analysis. Radium concentration was determined using U.S. EPA Method 903.0. Uranium analysis was performed using U.S. EPA Method 6020. All of the discrete sample laboratory results were reviewed by the TCEQ and found to be below release limits for uranium and Ra-226.

**6. Discussion of results of the state's site closure inspection.**

On May 31, 2011 and April 18, 2011, TCEQ staff performed surveys of Uranium One's HEM site (TCEQ 2012A, TCEQ 2012B). The surveys were performed on foot using Ludlum 1" x 1" NaI probes coupled to Model 2241-3I ratemeters. The purpose of the survey was to confirm the results of the survey data submitted by Uranium One (Uranium One 2011) to the TCEQ and to determine if the site met the criteria for release to unrestricted use. Background readings were around 1,300 cpm for the one-by-one NaI probe instruments.

Surveys were conducted according to a draft internal procedure for conducting confirmatory close-out surveys of in-situ leach uranium recovery facilities (TCEQ DIP). Using two times background as an

allowable limit, the confirmatory surveys were performed in a two-fold manner: selected area survey and random survey.

For the selected area survey, data submitted by HPC showing gamma rates and their respective coordinates were analyzed for areas of interest. The data was mapped using ArcGIS and manipulated to focus on areas with elevated readings. Clusters of high readings, as well as anomalously high readings were considered areas of interest and their coordinates entered into a database. The database was then imported a Trimble Juno GPS unit as waypoints which were then found on site and surveyed. Total areas of interest on the selected area surveys per well field and plant site varied relative to the amount of elevated readings for each data set.

A secondary random survey was also done of the areas. The random survey focused on areas that might be neglected during remediation. Areas adjacent to the fence line, beneath trees or surrounded by denser brush were some of the areas of focus during the random survey.

A few areas were noted to have exceeded twice background. Soil samples were collected at the areas that exceeded two times background. Samples were also collected at areas that did not exceed twice background. For each area designated for sampling, a center point was made of the high spot, around which a 100 m<sup>2</sup> sampling area was set with flags. Five spots were then sampled in this area and composited. Sample collection was made in each at surface (0-6") and subsurface (6-12").

The DSHS Lab was used for analysis of the samples and each sample was analyzed for Ra-226 and natural uranium by standard actinide separation procedures in DOE Method A-20. Lab analysis of these samples confirmed that the areas do not exceed the criteria for release to unrestricted use (TCEQ 2011A, TCEQ 2011B).

On-site disposal of radioactive material, including byproduct material, was not authorized at the Holiday/El Mesquite project site, thus, there is no land to be transferred to the state or the Federal Government. As a result of these findings, the TCEQ is proposing to authorize Uranium One to release the Holiday/El Mesquite Project site to unrestricted use and remove the site from the license.

**7. Documentation that release of a portion of the site will not negatively impact the remainder of the site to be closed at a later date.**

The O'Hern site was the final site Uranium One decommissioned. The West Cole Plant, which was under the same license, was released for unrestricted use through NRC concurrence March 21, 2006 (NRC 2006). The Holiday/El Mesquite site is not contiguous with the O'Hern site or the West Cole Plant and was decommissioned prior to the O'Hern site. Recontamination of the Holiday/El Mesquite did not occur. Byproduct material and waste from the site was disposed of at authorized waste disposal facilities.

### **III. REFERENCES**

Uranium One 2011A	Closure Report for the Holiday/ El Mesquite Site dated May 09, 2011 Subject: Provides description of Uranium One’s survey methods and data to support request for release to unrestricted use of the HEM site.
Uranium One 2011B	“Holiday/El Mesquite and O’Hern: Final Disposition of Byproduct Material, Non-Byproduct Material, Equipment Transfers, and TCEQ Acknowledgements on Groundwater Restoration, Well Plugging and Abandonment and UIC Permit Revocations”
TNRCC 1998	TNRCC letter dated December 15, 1998 from Ben Knape to Donna L. Wichers of COGEMA Mining, Inc. Subject: Authorization to cease restoration activities at Production Area 6
TNRCC 1999A	TNRCC letter dated September 16, 1999 from Ben Knape to David G. Benavides of COGEMA Mining, Inc. Subject: Authorization to cease restoration activities at Production Area 7 (El Mesquite)
TNRCC 1999B	TNRCC letter dated October 4, 1999 from Ben Knape to David G. Benavides of COGEMA Mining, Inc. Subject: Authorization to cease restoration activities at Production Area 7 (Holiday)
TNRCC 2000	TNRCC letter dated November 13, 2000 from Ben Knape to David G. Benavides of COGEMA Mining, Inc. Subject: Authorization to cease restoration activities at Production Area 3
TNRCC 2001	TNRCC letter dated June 21, 2001 from Ben Knape to David G. Benavides of COGEMA Mining, Inc. Subject: Authorization to cease restoration activities at Production Area 5
TNRCC 2002	TNRCC letter dated September 10, 2002 from Ben Knape to David G. Benavides of COGEMA Mining, Inc. Subject: Authorization to cease restoration activities at Production Area 1
SENES 1999	SENES Background Radiological Survey of Well Fields E-1, H-2/E-2, and H-3, COMIN Holiday/El Mesquite Project prepared by Everest Environmental Services Corporation in with SENES Consultants Limited, September 1999.
COGEMA 2003	Background study conducted by ERG dated October 20, 2003 of the Holiday/El Mesquite and O’Hern area.

TCEQ 2007	TCEQ letter dated December 10, 2007 from Ben Knape to David G. Benavides of COGEMA Mining, Inc. Subject: Authorization to cease restoration activities at Production Areas 1 and 7 of the Holiday Mine and Productions Area 7 of the El Mesquite Mine.
TCEQ 2009A	TCEQ Certificate of Revocation of Class III Underground Injection Control Area Permit No. UR02155 issued October 20, 2009.
TCEQ 2009B	TCEQ Certificate of Revocation of Class III Underground Injection Control Area Permit No. UR02156 issued October 20, 2009.
TCEQ 2011A	TCEQ Radionuclide Analysis Report dated July 14, 2011. Subject: Soil Sample Analysis for samples collected April 18-19, 2011 at Holiday/El Mesquite during a confirmatory survey.
TCEQ 2011B	TCEQ Radionuclide Analysis Report dated September 8, 2011. Subject: Soil Sample Analysis for samples collected June 1-2, 2011 at Holiday/El Mesquite during a confirmatory survey.
TCEQ 2012A	TCEQ Interoffice Memorandum by Tony Gonzalez dated June 14, 2012 on a confirmatory survey performed May 31-June 01, 2011 by Bob Beleckis and Tony Gonzalez. The memo discusses gamma survey and soil sampling analyses detailed in TCEQ 2011B which indicate the well fields 3, 5, 6 and 1-Extension, along with the plant site meet release criteria.
TCEQ 2012B	TCEQ Interoffice Memorandum by Tony Gonzalez dated June 14, 2012 on a confirmatory survey performed April 18-19, 2011 by Lee Line, Bob Beleckis and Tony Gonzalez. The memo discusses gamma survey and soil sampling analyses detailed in TCEQ 2011A which indicate the well fields 1, 4 and 7 meet release criteria.
TCEQ DIP	TCEQ Draft Internal Procedure: "Procedure for Conducting Confirmatory Close-Out Surveys of Open Lands at In-Situ Leach Uranium Recovery Facilities".
TDH 1999	TDH Facility Inspection (Report) dated May 4-5, 1999 by Martin Utley Subject: In addition to the inspection of the facility, also describes the disposition of items and material transferred from the site, and verifies that equipment and materials released for unrestricted use meet the surface contamination limits or soil concentration limits.

TDH 2000	TDH Facility Inspection (Report) dated October 25, 2000 by Martin Utley <b>Subject:</b> In addition to the inspection of the facility, also describes the disposition of items and material transferred from the site, and verifies that equipment and materials released for unrestricted use meet the surface contamination limits or soil concentration limits.
TDH 2001	TDH Memo dated January 29, 2001 by Brad Caskey to Robert Free, Arthur Tate, and Ruth McBurney confirming the release for unrestricted use of the Holiday/El Mesquite well fields: E-1, E-2, H-2 and H-3.
TDH 2003	Texas Department of Health report of inspection conducted on January 22-23, 2003 of the COGEMA Mining, Inc. West Cole, O'Hern, and Holiday/El Mesquite Projects performed by Martin Utley. <b>Subject:</b> In addition to the inspection of the facility, also verifies that equipment and materials released for unrestricted use meet the surface contamination limits or soil concentration limits.
TDH 2004	Texas Department of Health Inspection Report dated 2004-04-08 of the COGEMA Mining, Inc. West Cole, O'Hern, and Holiday/El Mesquite Projects performed by Bob Burkhart <b>Subject:</b> In addition to the inspection of the facility, also describes the disposition of items and material transferred from the site.
NRC 2006	Letter of Nuclear Regulatory Commission concurrence of West Cole Project's release for unrestricted use, dated March 21, 2006 and signed by Janet R. Schlueter, Director of Office of State and Tribal Programs.