

APPENDIX B

ALARA Audit

August 2017

2017 Semi-Annual Effluent
And Monitoring Report
Willow Creek Project
SUA-1341



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**2016 ANNUAL ALARA AUDIT REPORT
AS LOW AS IS REASONABLY ACHIEVABLE**

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**USNRC LICENSE NUMBER: SUA-1341
WILLOW CREEK PROJECT**

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1.0 EXECUTIVE SUMMARY

The annual 2016 ALARA audit was performed on March 29, 2017 for Uranium One USA, Inc. (U1) Willow Creek ISR Project (WC), located in Johnson and Campbell counties, Wyoming. Per Regulatory Guide (RG) 8.31, Section 2.3.3 Radiation Protection and ALARA Program Audit the review should address *trends in personnel exposures for identifiable categories of workers and types of operational activities, whether equipment for exposure control is being properly used, maintained, and inspected, and provide recommendations on ways to further reduce personnel exposures from uranium and its daughters.*

The start up of the current WC ISR Project was on December 22, 2010 followed by dryer operations beginning September 30, 2011. Christensen Ranch (CR) satellite recovery and Irigaray (IR) Central Processing Plant (CPP) have been in continuous operation since. Currently, the Willow Creek Project operation has eliminated lixiviant chemical fortification and is maintaining the required recovery bleed.

The radiation safety staff continued to assess the operations and make recommendations for improvement using engineering techniques (process isolation, ventilation, controls, etc.) to reduce occupational exposures. Corporate and Site managers are committed to maintaining the ALARA principle and the radiation safety staff has the full cooperation of management regarding the protection of their employees to limit occupational exposure. Specific findings and recommendations are identified within the ALARA report.

The audit results indicate that U1 is operating in a manner consistent with the ALARA principle, represented by the overall operation's 2016 average TEDE of 0.139 rem compared to 2015 average TEDE of 0.143 rem.

2.0 2016 ALARA SUMMARY

The audit team was comprised of Sheryl Garling and Roger A. Garling of R and D Enterprises, Inc. (RDE). U1 WC Project's Senior Radiation Safety Technician (RST) Larry Arbogast and Scott Schierman, Radiation Safety Officer, accompanied the audit team. This audit serves as the annual review of the content and implementation of the radiation protection program for 2016 as required by 10 CFR Part 20.1101(c) and License Condition (LC) 12.3.

Prior to, during and post audit visit, the following documents were reviewed:

- ✓ ALARA audit reports from 2015,
- ✓ USNRC License SUA-1341, Amendment No.4, Dated August 20, 2015
- ✓ USNRC Regulatory Guides and other relevant documents including, but not limited to, 1.86, 8.10, 8.22, 8.30, 8.31, 10 CFR Part 20, NUREG -1400, etc.,
- ✓ USNRC Inspection Reports 040-08502/16-001
- ✓ 2016 Monthly Radiation Safety Summary Reports, and



- ✓ Licensee documentation, site records and reports generated by the Radiation Safety Officer and Health Physics staff.

Regulatory Guide 8.31, Revision 1, May 2002: *Information Relevant To Ensuring That Occupational Radiation Exposure At Uranium Facilities Will Be As Low As Is Reasonably Achievable (ALARA)*, Section 2.3.3, *Radiation Protection and ALARA Program Audit*, audit guidelines were followed.

2.1 ALARA PHILOSOPHY – REGULATORY GUIDE 8.31, SECTION 1

A major purpose of the occupational radiation protection program at a uranium recovery facility is to maintain radiation [occupational] exposure ALARA for all employees, contractors and visitors. The implementation and effectiveness of a successful ALARA program is the responsibility of everyone involved in the processing of uranium ores. Responsibilities for conducting a radiation protection and ALARA program are shared by licensee management, the radiation safety officer and all workers in the uranium recovery facility.

The ALARA program is predicated on timeliness of sampling, measurement and documentation of occupational exposure and effluent monitoring. RG 8.30 recommends...*Sample analysis should usually be completed within two working days after sample collection...to determine employee occupational exposures.*

In 2016, U1 sampling, the site radiation safety staff perform measurements and analyses within time constraints in accordance with the sampling procedures and analytical methods required for the analytical and monitoring programs.

2.2 SAFETY AND ENVIRONMENTAL REVIEW PANEL (SERP)

The following table represents the Safety and Environmental Review Panel (SERP) proposed changes evaluated during 2016. LC 9.4(b) allows U1 to make changes in the facility, procedures and conduct tests or experiments that are not presented in the approved application as long as such changes follow the specified criteria identified in the LC.

SERP ID	Proposed Changes
Evaluation Report – SERP 16-001	Annual Review of the License Renewal Section 7.5, Effects of Accidents: the licensee conducted annual review in accordance with LC 9.18, Performance Base Licensing- NRC Licensee SOP PBL-1 R4, Dated 11/3/2010
Evaluation Report – SERP 16-002	Scrubber Solids Processing Test



2.3 NRC LICENSING ACTIVITIES

- 2.3.1 July 26-28, 2016 - The USNRC performed an onsite, announced annual inspection. U1 received one Notice of Violation (NOV), failure to maintain wellfield bleed, and corrected the NOV prior to the NRC departing the site. U1 followed up by transmitting a formal letter of completion dated September 13, 2016.
- 2.3.2 July 27, 2016 – Continuing correspondence between U1 and NRC regarding LC 11.3 pertaining to effluent air particulate and radon gas progeny sampling, monitoring and occupational dose contributions.
- 2.3.3 July 25, 2016 – Continuing correspondence between U1 and NRC regarding LC 11.9, minimum detectable concentration (MDC) for radiation survey instruments.
- 2.3.4 July 5, 2016 – Continuing correspondence between U1 and NRC regarding Irigaray Mine Units 1-9 Final Status of Decommissioning activities and third party (ORAU) report.
- 2.3.5 March 7, 2013 – SUA-1341 license renewal was issued. Continuing correspondence between U1 and NRC regarding License Condition 9.8 and 9.12. Correspondence pertains to obligations for submittal of information within 90 days of license renewal regarding Standard Operating Procedures (SOPs) for training of personnel other than HPT's. Multiple documents have been submitted (June 5, 2013, August 8, 2014 and November 2104).

2.4 FACILITY AND 2016 PROGRAM IMPROVEMENTS

Improvements during 2016 include:

- Noticeable progress was made in migrating occupational exposure calculations to electronic format; staff is continuing to migrate records into electronic format, revising forms to be consistent between programs;
- Noticeable progress was made in charting of uranium particulate and radon progeny, which are incorporated into the RSO monthly reports;
- The operations, occupational and radiation safety staff initiated weekly meetings to increase awareness regarding lines of communications;
- The RSO continues the practice of conducting investigation/evaluation of monitoring data anomalies or detection that could identify a compromise in an operational or personnel procedure resulting in a potential occupational exposure;
The radiation safety staff initiated the task to revise, update and improve SOPs with the inclusion of detailed descriptions and photographs. This is a dynamic process and staff continued to migrate SOPs, forms and calculations to electronic/digital format.



3.0 2016 ASSESSMENTS AND AUDITS

3.1 NRC INSPECTIONS AND RELATED ACTIONS DURING 2016

The following summarizes NRC inspections and related actions at Willow Creek during 2016:

3.1.1 July 26-28, 2016 - The USNRC performed an onsite, announced annual inspection, which included confirmatory survey activities for Mine Units 1-9 and two associated buildings at the Irigaray site, provided by Oak Ridge Institute for Science and Education (ORISE).

3.1.1.1 One NOV was identified, failure to maintain wellfield bleed, which was prior to the NRC departing the site. U1 followed up by transmitting a formal letter of completion dated September 13, 2016.

3.1.1.2 One Unresolved Item was identified, SERP approval of monitoring wells located outside of permit boundary.

3.1.2 May 18-19, 2016 – An onsite ALARA audit was performed by a third party contractor.

3.2 2015 ANNUAL ALARA AUDIT

Recommendations from the 2015 ALARA audit were implemented and incorporated into U1's Willow Creek Project Radiation Safety and Health Physics program and operating procedures.

U1 has been in correspondence with the NRC regarding license condition 11.9, minimum detectable concentrations (MDC) and personnel contamination surveys and will incorporate procedures into their operations when approval is received.

3.3 SELF-IDENTIFIED VIOLATIONS (SIV)

There were no SIVs reported in 2016.

4.0 RADIATION PROTECTION AND ALARA PROGRAM

Radiation detection equipment used for monitoring occupational exposure is appropriate for the operation and application of use, is properly maintained and calibrated, and the radiation safety staff demonstrated accurate and correct information on the use and operation of instrumentation. Refer to item 3.2, above regarding LLD documentation.

4.1 EMPLOYEE EXPOSURE RECORDS AND TRENDS IN PERSONNEL EXPOSURES

The Total Effective Dose Equivalent (TEDE) is defined as the sum of the Deep Dose Equivalent (DDE, for external exposures) and the Committed Dose Equivalent (CDE, for internal exposures). The dose limit for TEDE (TEDE = DDE + CDE (CEDE)) is 5 rem/year. [RG 8.30]

Historically, employee exposures have been very low due to stand-by operations, non-operational



or renovation mode. The following table summarizes the 2016 employee occupational exposures with 2014 data in parenthesis for comparison.

2016 Employee Occupational Exposure Summaries –Willow Creek Site (2015 Data Provided in Parentheses)				
Exposure Category	rem		2016 % of Regulatory Limit Limit = 5 rem/year	
	Average	Maximum	Average %	Maximum %
External (DDE)	0.020 (0.020-2015)	0.088 (0.087-2015)	0.40	1.8
Radon Progeny (CEDE)	0.095 (0.101-2015)	0.141 (0.113-2015)	1.9	2.8
Airborne Uranium (CEDE)	0.007 (0.013-2015)	0.013 (0.014-2015)	0.14	0.26
Dry Pack Airborne Uranium (CEDE)	0.017 (0.009-2015)	0.040 (0.074-2015)	0.34	0.80
CEDE combined	0.119 (0.124-2015)	0.194 (0.201-2015)	2.4	3.9
Total Equivalent Dose Equivalent (DDE+CEDE = TEDE)	0.139 (0.143-2015)	0.266 (0.288-2015)	2.78	5.32

Dose assessments from routine and non-routine operations are included in the table summaries. Routine operations generally include those covered by an SOP. Non-routine operations are those covered by a Radiation Work Permit (RWP).

The RSO is timely in assessing employee occupational exposures, which complies with the ALARA principle.

In 2016 (2015 data in parentheses) average TEDE for all employee categories was 0.139 (0.143) mrem, with a maximum of 0.266 (0.29) mrem. The 2016 average TEDE represents a 2.8% reduction from 2015.

The above data demonstrates U1's commitment to operating in a manner consistent with the ALARA principle.



4.1.1 EXTERNAL RADIATION AND DEEP DOSE EQUIVALENT (DDE)

Monitoring is provided for employees that may exceed 10% of the allowable limit as required in 10 CFR Part 20.1502, Conditions requiring individual monitoring of external and internal occupational dose.

The RSO continues to evaluate gamma occupational exposure levels for wellfield personnel to determine if there are any engineering controls or SOPs that can be incorporated to further reduced gamma exposure. Gamma occupational exposure levels continue to be below 10% of the allowable limits.

Gamma surveys are conducted quarterly to verify operating conditions do not develop which could cause elevated external occupational exposures.

The addition of operational notes on gamma survey reports provides useful information to assess short-term trends (e.g., IX column status, operating status of modules, etc.). Throughout the year, the radiation safety staff refers to this information when making assessments to determine if trends are developing. This activity supports the ALARA principle.

All postings were current.

4.1.2 EXTERNAL RADIATION

4.1.2.1 BETA

Beta dose measurements were conducted semiannually in 2016. Seventeen (17) locations were measured at the IR CPP, thirty (30) locations were measured at the CR Satellite and twenty-one (21) measurements were taken in the wellfield MOD buildings. In 2016, the maximum reading of 2.58 mrem/hr was observed in the drum storage area.

4.1.2.2 GAMMA

In 2016, gamma readings were measured on a quarterly frequency. Gamma measurement fluctuation is attributed to process flow, radon daughters, and precipitate in filter media. The maximum gamma measurement observed in 2016 was 4.8 mrem/hour in MOD building 8-4/5.

U1 complies with Subpart J-Precautionary Postings, 10 CFR Part 20.1902. Due to the fluctuation of gamma measurements and the site action level of 2 mrem/hour, U1 continually maintains postings in areas where gamma measurements have been observed greater than site action levels.



4.1.3 AIRBORNE RADIATION

4.1.3.1 URANIUM PARTICULATES

Air sampling for airborne particulate uranium is performed on a continuous basis at eleven standard locations with filter changes performed on Monday, Wednesday, and Friday when the dryer is in operation. Breathing zone air sampling is also performed for non-routine operations such as tank entries that are not represented by the standard locations. After the drying campaign of the Honeymoon product, U1 instituted the use of the Y-class Unat DAC to assess occupational exposure. The Y-Class value, 2E-11 uCi/ml, is more conservative than the lung solubility value, 4.7E-10 mCi/ml, which was derived by the original owner and operator of the facility, Wyoming Minerals, and has been historically used for occupational exposure assessment.

During drying and packaging operations, the dryer enclosure is posted as an Airborne Radioactivity Area and access is prohibited unless respiratory protection is worn.

Operational and data analysis, specific to the dryer room, identify that dryer atmosphere engineering controls are effective in maintaining uranium air particulate concentration ALARA. Data collected in the Control Area for 2016 indicates an average of 8.5% and a maximum of 27.3% of the Y-Class DAC, 2E-11 uCi/ml, which confirms that the dryer is operated to comply with the ALARA requirements.

Routine air particulate sampling results for 2016 from the dryer and packaging enclosure and areas outside the YC circuit are summarized in the following table. Sample locations identified as locker room, control area, drum loading room furnace room and drum storage area are equipped with continuous air sampling pumps and data collected is used to assess the employee occupational exposure.

Dryer and Packaging Enclosures and Areas Outside the YC Circuit used to assess Employee Occupation Exposures – 2016 (2015)		
Sampler Location	Average Result % DAC (uCi/ml)	Maximum Result % DAC (uCi/ml)
Locker Room	3.45697E-12 17.3% (2.59E-12 - 2015)	1.26264E-11 63% (1.87E-11 - 2015)



Dryer and Packaging Enclosures and Areas Outside the YC Circuit used to assess Employee Occupation Exposures – 2016 (2015)		
Sampler Location	Average Result % DAC (uCi/ml)	Maximum Result % DAC (uCi/ml)
Control Area	1.70403E-12 8.5% (4.81E-12 – 2015)	5.45001E-12 27.3% (5.29E-11 - 2015)
Drum Loading Room	2.95736E-11 148% (8.2E-11 – 2015)	1.37712E-10 689% (6.45E-10 – 2015)
Furnace Room	2.18704E-11 109% (7.26E-11 – 2015)	9.98451E-11 499% (2.73E-10 - 2015)
Drum Storage	2.28842E-12 11.4% (6.36E-12 - 2015)	6.06522E-12 30.3% (4.11E-11 - 2015)

Review of the continuous air sampling data indicates that airborne radioactivity levels demonstrates that the furnace and drum loading rooms are at negative pressure to the other areas of the facility, which confirms that the engineering controls maintain doses ALARA. The air particulate concentrations outside of the drying facility are at a small fraction of the DACs.

Airborne uranium sampling from the Christensen Satellite facility is collected on a monthly basis at three sampling locations. The DAC at the Christensen Satellite is based on a solubility classification of 100% Class D or a DAC of 5 E-10 $\mu\text{Ci/ml}$. The highest airborne uranium recorded was 7.7E-12 uCi/ml, 1.5% (compared to 0.27% in 2015), 2016.

In 2016, no employee exceeded 10 CFR Part 20.1201(e) limits, ...*In addition to the annual dose limits, the licensee shall limit the soluble uranium intake by an individual to 10 milligrams in a week in consideration of chemical toxicity (see footnote 3 of appendix B to part 20).*

4.1.3.2 RADON PROGENY

In 2016, radon progeny sampling was conducted on a monthly basis and the concentration is being maintained ALARA. There were no occurrences at IR or CR where radon daughters exceeded 0.08 WL, which is 25% of the regulatory limit of 4WLM, or 0.33 WL in one month.



4.1.4 COMMITTED EFFECTIVE DOSE EQUIVALENT

The Committed Effective Dose Equivalent (CEDE) was calculated for employee for 2016, which is the combined internal dose due to inhalation of airborne uranium and radon progeny. Other routes of potential internal exposure such as ingestion or absorption in wounds are considered negligible as substantiated by surface and personnel contamination sampling, bioassay sampling, and implementation of good hygiene practices.

The average CEDE for all locations and employees that worked a full year for 2016 was 0.12 rem (0.114-2015; 0.111-2014)) rem, which included data from the dry pack area.

4.1.5 TOTAL EFFECTIVE DOSE EQUIVALENT

The Total Effective Dose Equivalent (TEDE) was calculated for employees for 2016 are shown in the tables located in 4.1 above. The TEDE is the sum of external (DDE) and internal (CEDE) doses. ALARA discussions are provided in the external and internal dose sections above.

4.1.6 RADIATION WORK PERMITS (RWPs)

In 2016, there were no incidents documented associated with RWPs. Fifty (50) RWPs were issued in 2016 and are primarily issued for maintenance related activities (not covered under an SOP) where a potential of an occupational exposure could occur. Depending on the task, data collected during an RWP may include air particulate for uranium or radon progeny, bioassay, and or surface contamination. The RWP is another method that supports the ALARA principle. The RSO is migrating tasks that have become routine and performed under a RWP to tasks with written SOPs.

4.1.7 DOSE TO THE PUBLIC

The off-shift operations personnel that utilize the man-camps for Irigaray and Christensen are used to demonstrate compliance with public dose limits. These individuals have been identified as the member of the public likely to receive the highest dose from Willow Creek operations. Monitoring indicates that potential doses to the public are far below allowable limits and ALARA.



In 2016, the highest Dose to the Public, measured at the Irigaray Man Camp location, was 13.4 mrem, 13.4% of the 100 mrem limit, compared to 2015 dose of 0.48 mrem. The elevated data in 2016 represent a change in calculating radon contribution on a quarterly basis vs. annual, which is a more conservative.

At the Christensen Man Camp location, Dose to the Public was documented at 5.04 mrem, 5% of the 100 mrem limit, compared to 2015 dose of 8.64 mrem.

2016 ANNUAL PUBLIC DOSE		
COMPONENT	IRIGARAY SITE	CHRISTENSEN SATELLITE SITE
RADON	11.9	4.6
GAMMA	1.5	0.37
URANIUM AIRBORNE PARTICULATE	0.0074	0.074*
ANNUAL PUBLIC DOSE, MREM	13.42	5.04

*NOTE: There is no environmental airborne radioactive sampling performed at the Christensen Satellite Facility, data utilized from the Irigaray Site to provide for a conservative estimate.

4.2 BIOASSAY RESULTS

Bioassay analyses are performed by a third party outside laboratory. Routine samples are typically collected on a monthly schedule from plant operators, technician and electrician when dryer maintenance is required, and when an RWP is issued. Routine bioassay samples are collected prior to the start of the first day on shift and 36 hours after completion of their last shift. During yellowcake drying operation, samples are collected once per shift rotation or every 4 days.

In 2016, 269 bioassay samples were submitted for uranium analysis. All, but one sample, were reported at less than (<) 5 ug/L. In November, one temporary employee's bioassay sample was reported as 22.1 ug/L, as uranium. U1 contacted the temporary service that provided the personnel and were not successful in obtaining a verification bioassay sample. The radiation safety staff investigated the incident and determined that the temporary employee did not follow the established bioassay sampling procedures and sample contamination was, most likely, due to inappropriate hygiene practices during the sampling event.

Spiked samples are prepared in accordance with RG 8.22, 1988 version, one at 10-20 ug/L and one 40-60 ug/L, and submitted monthly. The SOP (HP-4) was revised to reflect that the monthly sampling delivery group reflects Section 8.1 requirements of a specimen batch for spiked sample submittal, analytical rechecks, and protocol when the spikes are reported outside the prescribed 30% QA limit.



Regulatory Guide 8.22, May 2014, Revision 2, was revised to achieve better alignment with other industry standards. The NRC goal was to harmonize its guidance with international standards, to the extent practical. The May 2014 RG 8.22 removed the specific QAQC requirements previously identified in the 1988 version while referencing several industry publications. U1's bioassay program is robust and compliant with ALARA to monitor employee occupational exposures due to ingestion.

The bioassay program is compliant with SUA 1341 license conditions, referenced regulatory guidance and the ALARA principle.

4.3 REPORTS OF DAILY, WEEKLY, AND MONTHLY INSPECTIONS

4.3.1 DAILY WALK-THROUGH INSPECTION REPORTS

Daily walk-through inspections are accomplished as required and items are resolved in a timely manner.

4.3.2 WEEKLY INSPECTION REPORTS

Weekly inspections are accomplished as required and items are resolved in a timely manner.

4.3.3 MONTHLY RSO REPORTS

The RSO provides monthly reports to management to summarize employee exposure and other relevant radiation survey reports and items are resolved in a timely manner.

4.4 DOCUMENTED TRAINING PROGRAM ACTIVITIES

4.4.1 RADIATION PROTECTION

In 2016, employees and contractors were trained throughout the year, which included initial (new hire) and annual radiation safety refresher, DOT Hazmat, routine safety meetings (to include tailgate style meetings), and SOP training. In addition to standard site radiation safety, DOT and industrial safety training, Job Safety Analysis (JSA), industrial safety inspections and emergency drills are periodically performed. The radiation safety staff is compliant with their required training.

New employees at Willow Creek are trained in radiation protection prior to reporting to their workstation. Training is provided as described in NRC Regulatory Guide 8.31 and Willow Creek SOP S-2 1. Contractor training is tailored to the specific work task assigned to the contractor.

In 2016, annual radiation protection refresher training was completed in the first quarter; DOT HazMat, Respiratory Protection and First Aid training were completed in the third quarter; Defensive & winter driving training was completed in the fourth quarter.



In June of 2016, U1 performed an Emergency Response Drill. Staff was required to participate in the *hands on*, mock resin spill training event.

Larry Arbogast (Senior Radiation Safety Technician) and Scott Schierman (Radiation Safety Officer) are scheduled to participate in biennial health physics training in 2017.

4.4.2 DOT

DOT Hazmat training, 49 CFR Part 172, Subpart H, requires the following areas to be included: General Awareness/Familiarization, Function Specific, Safety Training, and Security. Annual DOT Hazmat training is provided to the operators and drivers associated with Hazmat material transportation. This schedule is compliant with the US DOT training requirements.

4.5 RADIATION SAFETY MEETING REPORTS

Meetings are documented and records are maintained on site.

4.6 RADIOLOGICAL SURVEY AND SAMPLING DATA

U1 survey programs are effectively used to maintain exposure ALARA.

4.6.1 PERSONAL AND EQUIPMENT CONTAMINATION SURVEYS

Personnel surveys are documented at scan stations and reviewed by radiation safety personnel. Spot checks (measurements) were performed on 25% of employees or vehicles per quarter and no contamination was found.

In 2016, no unusual monitoring incidences were identified.

4.6.2 SURFACE CONTAMINATION SURVEYS

Surface contamination surveys are conducted weekly in eating areas, change rooms, control rooms and offices as identified in RG 8.30. The RSO or designee will be notified if any samples exceed the action level 100 dpm/cm² so clean up can occur and the area can be resurveyed.

Shipping surveys, surveys in restricted and clean areas, and surveys for release of equipment for unrestricted use surveys are accomplished and documentation is maintained by radiation safety personnel.

There were no byproduct or yellowcake product shipments made in 2016.

In 2016, U1 had four (4) reportable spills (420 gallons or greater). All spills were remediated and it was determined to be operator error in all instances.



4.7 REPORTS ON OVEREXPOSURES OF WORKERS

There were no employee overexposures during the 2016 report period.

4.8 OPERATING PROCEDURES

The RSO reviews SOPs annually as required. The RSO tracks the status of updates and manages the review process. SOPs are a dynamic process and work continues to further add and improve SOPs to better provide guidance for staff to keep occupational exposures ALARA. In 2016, the radiation safety staff initiated the task of revising the SOPs to include more detail and photographs of the task description.

In 2016, the radiation safety staff reviewed the SOPs and documented the task.

4.9 EQUIPMENT FOR EXPOSURE CONTROL

Interviews with employees and radiation safety staff, and observation of equipment in use indicated that equipment was properly being utilized.

5.0 CONCLUSIONS AND RECOMMENDATIONS

The radiation safety staff continues to improve on engineering controls, monitoring and documentation to affect a more efficient transfer of information and data flow to the appropriate staff.

U1 has been in correspondence with the NRC regarding license condition 11.9, minimum detectable concentrations (MDC) and personnel contamination surveys and will incorporate procedures into their operations when approval is received.

A review and comparison of RG 8.22, 1988 vs. 2014 version, should be initiated. U1 may be able to modify its current bioassay QAQC program to conform to international standards.

5.1 SUMMARY OF RECOMMENDATIONS

The radiation safety staff is continuing to migrate forms and site documentation to a digital format. This was evident with the electronic format production of occupational exposure data presented during this audit. This is a dynamic process and will improve efficiency of collection, compilation, calculations and archiving required data. Staff should confirm that forms are consistent between programs and all data required is documented (surveyor, date, efficiency, etc.) correctly.

The radiation safety staff is in the process of improving and revising SOPs.