UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

NRC INSPECTION MANUAL

INSPECTION PROCEDURE 89001

IN-SITU LEACH (ISL) FACILITIES

PROGRAM APPLICABILITY: 2641

89001-01 INSPECTION OBJECTIVES

01.01 To determine if licensed activities are being conducted in a manner that will protect the environment, and the health and safety of workers and the general public.

01.02 To determine if licensed programs are being conducted in accordance with Nuclear Regulatory Commission requirements.

01.03 To determine whether the licensee is implementing a safety and environmental review program that conforms with the performance based license conditions.

89001-02 INSPECTION REQUIREMENTS

A review of the licensed activities will be commensurate with the scope of the licensee's program. A determination regarding safety and compliance with Nuclear Regulatory Commission requirements will be based on direct observation of work activities, interviews with workers, demonstrations by workers performing tasks regulated by the Nuclear Regulatory Commission, and independent measurements of radiation conditions at the facility, rather than exclusive reliance on a review of records.

A determination regarding compliance with environmental requirements contained in the license will be commensurate with the scope of the licensee's program. In addition to a review of records, a determination regarding environmental compliance against license commitments made in the license application will be based on direct observation of work activities. This should include interviews with workers, demonstrations by workers performing environmental tasks, and, if necessary, independent sampling and data analysis to confirm compliance with the license.

In reviewing the licensee's performance, the inspector should cover the period from the last to current inspections. However, older issues preceding the last inspection, such as incidents, noncompliance, or high radiation exposures, should be reviewed, if warranted by circumstances.

Most in-situ leach (ISL) licensees have been issued a performance based license (PBL) delegating the licensee's additional regulatory authority for various

aspects of license activities. The inspector should ensure if the proposed changes authorized under the PBL do not erode the basis for the Nuclear Regulatory Commission's licensing decision. In evaluating the changes made to the facility, inspectors should recognize that the reviews conducted by the licensee's evaluation panel is not a review of safety nor environmental acceptability. Rather the evaluation panel review under the PBL is a determination of whether the proposed changes require prior Nuclear Regulatory Commission review. Licensees are obligated to ensure that any change considered for the facility should be safe and environmentally acceptable. Then the evaluation panel is responsible for determining if the proposed change needs to be submitted to the Nuclear Regulatory Commission. There will be circumstances where the licensee finds that the proposed change is acceptable; however, it may still require a Nuclear Regulatory Commission review.

As a general set of guidelines, those changes that will require Nuclear Regulatory Commission review include changes to:

1. Those activities described in the application or subsequent submittals;

2. Procedures conditioned in license or outlined, summarized, or included in application; and

3. Something specifically conditioned in the license.

Additional guidance on the inspection of PBL activities undertaken by licensees can be found in Inspection Procedure (IP) 37001, "10 CFR 50.59 Safety Evaluation Program." Although this IP is applicable to 10 CFR Part 50 licenses, the basic philosophy and inspection process can be adopted to PBLs since the PBL concept was derived from 10 CFR 50.59.

Some of the following areas may not be applicable to all ISL licensees.

02.01 Preparation. The inspector should allow adequate time to prepare for the inspection. Preparation will include reviewing documents, making travel arrangements, coordinating with appropriate staff, notifying appropriate State agencies, and selecting necessary equipment. In particular, the inspector shall identify whether any license amendments have been issued since the last inspection, or whether the licensee has informed the Nuclear Regulatory Commission of any major program changes since the last inspection. The inspector shall also review any event files to determine if the licensee had any incidents or events since the last inspection.

02.02 Entrance Briefing. When the inspector arrives at the licensee's facility, he/she will inform an available senior management representative of the purpose and scope of the inspection.

02.03 General Overview

a. Organization. Interview cognizant licensee representatives about the current organization of the program. Examine the licensee's organization with respect to changes that have occurred in personnel, functions, responsibilities, and authorities since the previous inspection. Identify the reporting relationship and management structure between the licensee's executive management and the Radiation Safety Officer (RSO).

b. Scope of Program. Interview cognizant personnel to determine the scope of licensed activities, site status, staff size, etc.

c. Management Oversight. In the course of interviewing cognizant personnel, determine if management oversight is sufficient to provide the licensee staff with adequate resources and authority to administer the licensed program.

1. RSO - Determine whether the RSO has sufficient authority, and fulfills the appropriate duties commensurate with the size and scope of licensed activities.

2. Audits - Verify that audits are performed as required. Verify that the results of the audit are reviewed and addressed.

3. Safety and Environmental Review Panel (SERP) - Verify that the licensee had the required membership for the panel.

4. Determine that individuals who perform and/or supervise licensed activities are qualified, and perform an appropriate level of supervision, as required by the license or regulations.

02.04 Walk-Through Orientation Tour. Perform a walk-through tour of the licensed facility to make general observations on the condition of the facility and licensed activities being performed.

02.05 Facilities. Verify that the facilities, including well fields, impoundments, and the plant, conform to the description in the license application; that material receipt, use, and storage areas are secured; and that the licensee uses processes or other engineering controls to maintain doses as low as is reasonably achievable (ALARA).

02.06 Equipment and Instrumentation

a. Equipment. Verify that equipment and instrumentation are appropriate, operable, calibrated, adequately maintained, and conform to those described in the license.

b. Procedures. Verify that the licensee has established and implemented procedures to identify and report safety component defects per the requirements of 10 CFR Part 21.

02.07 Materials

a. Receipt and Transfer of Source Material. Verify that the licensee is receiving packages and making transfers of licensed material in accordance with Nuclear Regulatory Commission, applicable U.S. Department of Transportation (DOT) regulations, and license conditions.

b. Authorized Uses. Determine from observing the use of source material, discussing the activities with licensee personnel, and reviewing records, that the quantity of licensed material at the licensee's facility is authorized by the license. To the extent practical, ensure that the licensee's inventory is complete and accurate.

c. Material Security and Control. Verify that the licensee has established procedures for maintaining security and control of source material, and that these procedures are understood and implemented by appropriate personnel. Verify that source material, in storage, in controlled or unrestricted areas, is secure from unauthorized removal or access. Verify that source material, not in storage, in controlled or

unrestricted areas, is controlled and under constant surveillance. Verify that access to restricted areas is limited by the licensee.

02.08 Training

a. General Training. Verify that appropriate training and initial instructions are being accomplished as specified in the license and/or regulations.

b. Operating Procedures. Verify that operational procedures are being followed by observing licensee personnel perform tasks at selected work stations and by a comparison of their activities with established procedures. Through discussions with workers, verify that licensee personnel understand and implement the established procedures and are aware of procedural revisions. Document in the inspection report what activities the inspector observed.

02.09 Area Radiation and Contamination Control

a. Area Surveys. Verify, through observations and by direct measurements, that the radiation levels are within the limits of 10 CFR Part 20, and that these areas are properly posted.

b. Contamination Control. Verify that the licensee performs surveys for fixed and removable contamination at the required frequencies. If the licensee has had spills or other incidents of contamination exceeding the licensee's action levels, verify that the licensee has taken appropriate actions.

c. Protective Clothing and Equipment. Verify that radiation workers are provided with, and wear, the appropriate protective clothing and equipment commensurate with activities being performed.

02.10 Radiation Protection

a. Radiation Protection Program. Verify that a radiation protection program commensurate with the licensee's activities is being implemented and documented, and that the program is being reviewed at least annually, both for content and implementation.

b. Radiation Protection Procedures. Verify that changes in the radiological protection procedures made since the last inspection are consistent with regulations and license requirements. Inspection effort should be directed at verifying that written procedures have been established in a manner approved by management. The procedures should be readily available to any persons having responsibility for which the procedures apply, and in addition, ensure that up-to-date copies of written procedures are kept in the process areas to which they apply.

c. Instruments and Equipment. Verify that instruments and equipment are operable, have the proper alarm settings (if applicable), and are calibrated and checked for appropriate response in accordance with license requirements and licensee procedures.

d. Personnel Dosimeters. Verify that personnel dosimetry devices are worn by appropriate licensee personnel. Verify that dosimeters are processed by a National Voluntary Laboratory Accreditation Program approved and-accredited processor.

Verify that pursuant to 10 CFR 19.13(b) the licensee advises each worker annually of the worker's dose as shown in records maintained by the licensee pursuant to the provisions of 10 CFR 20.2106 ("Records of individual monitoring results").

e. Personnel Bioassay. Verify that personnel bioassays are being performed as required. Verify that the type of bioassay and the frequencies are appropriate for the activities at the site.

f. Exposure Calculations. Determine whether the method for calculating internal exposure to airborne radioactivity is technically correct. Evaluate the licensee's calculations for technical accuracy.

02.11 Environmental Protection

a. New Well-Field Design. Verify that pre-mining ground-water data have been appropriately collected and that pre-mining data indicate that the well field has been appropriately designed to prevent horizontal and vertical excursions.

b. Safe Well-Field Operation. Verify that the well fields are being operated to: (1) prevent vertical and horizontal excursions; (2) to identify any potential excursions; and (3) correct and clean up any ongoing excursions.

c. Pond Operation. Verify that: (1) ponds have been appropriately located and constructed so that they will not leak and fail; (2) the ground-water leak detection systems have been correctly constructed; (3) the ponds are being appropriately monitored for leaks; and (4) if any leaks have occurred, appropriate cleanup and corrective actions have been take.

d. Water Disposal. Verify that water disposal operations such as surface-water discharge, deep-well injection, or land disposal are being operated to conform with applicable license conditions.

e. Ground-Water Restoration. Verify that: (1) ground-water activities are being correctly implemented; (2) that the well field is being operated to identify any potential excursions; (3) the well field is being operated to correct and cleanup any existing excursions; (4) that ground-water data are being properly collected to determine if the ground water is being restored. Verify that post-restoration ground-water stability data are being properly collected.

02.12 Effluent Monitoring Program. Review and verify that process equipment, monitoring equipment, and/or administrative controls are adequate to maintain radioactive effluents within the limits established by the license and other regulatory requirements and are ALARA.

Determine the quality of the relevant procedures and the degree to which ALARA techniques are incorporated into them. Determine the extent to which process and engineering controls are used to minimize effluents.

Determine whether effluent monitoring systems and the associated analytical equipment are adequate to detect and quantify effluents with sufficient sensitivity, and whether they are maintained, calibrated, and operated in accordance with manufacturers' recommendations and good health physics practices.

Determine if all significant release pathways are monitored, all un-monitored pathways have been characterized, and all surveillance procedures for effluents are being implemented.

Verify that all liquid effluents from process buildings and other process waste streams, with the exception of sanitary wastes, are disposed of as required by license condition.

02.13 Air Sampling. Review and verify that process equipment, monitoring equipment, and/or administrative controls are adequate to maintain airborne radioactivity within the limits established by the license and other regulatory requirements and are ALARA.

Determine the quality of the relevant procedures and the degree to which ALARA techniques are incorporated into them. Determine the extent to which process and engineering controls are used to minimize airborne radioactivity in the workplace.

Determine whether monitoring systems and the associated analytical equipment are adequate to detect and quantify airborne radioactivity with sufficient sensitivity, and whether they are maintained, calibrated, and operated in accordance with manufacturers' recommendations and good health physics practices.

02.14 Financial Assurance. Review the licensee's financial assurance submittal to verify whether it was provided to the Nuclear Regulatory Commission as required. Verify whether radiological and environmental conditions at the facility have changed since the financial assurance instrument was submitted such that the document needs to be changed to address the new conditions. Examples of changes are radiological incidents such as spills or process changes. If the inspector identifies changes that may affect the financial assurance instrument, he/she should notify regional and Headquarters management.

02.15 Waste Management

a. Waste Storage and Disposal. Verify that the waste is stored and controlled in a secure and safe manner, and that radiation levels in unrestricted areas surrounding the storage area do not exceed the limits of 10 CFR 20.1301, "Dose limits for individual members of the public." Verify that the licensee is conducting appropriate surveys before disposing of the waste.

   Review the licensee's procedures and records to verify that each shipment of radwaste intended for offsite disposal is accompanied by a shipment manifest that includes all the required information.

b. Transfer. Verify that 11e.(2) wastes are transferred to an authorized recipient specifically licensed to receive 11e.(2) waste.

c. Records. Verify that records of waste storage, transfer, and disposal are maintained in accordance with the requirements of 10 CFR Part 20 and the license.

02.16 Transportation. Verify that the licensee's procedures and documentation are sufficient to ensure that source material is transported in accordance with 10 CFR Part 71 and DOT regulations for transportation of radioactive materials.

02.17 Posting and Labeling. Verify that the licensee has posted the appropriate documents, notices, forms, and caution signs as required. Also verify that containers of source material are labeled appropriately.

02.18 Generic Communications of Information. Confirm that the licensee is receiving the applicable bulletins, information notices, etc. Verify that the licensee has taken appropriate action in response to these notices.

02.19 Notifications and Reports. Determine compliance with the regulations and license requirements for notification and reports to the Nuclear Regulatory Commission.

02.20 Special License Conditions. Review the licensee's compliance with any special license conditions. For ISL licensees who have been issued a performance-based license condition (PBLC), review the effectiveness of the SERP activities. Review the licensee's records of any changes made pursuant to the PBLC. Verify the adequacy of the reviews made by the SERP.

02.21 Independent and Confirmatory Measurements. Compare and verify, on a sampling basis, survey results or data that are used by the licensee to show compliance with the regulations or license conditions. Conduct independent measurements to ascertain the radiological conditions of the facility. Conduct these independent measurements on all inspections under this IP, unless warranted by special circumstances.

02.22 Exit Meeting. The inspector will conduct an exit meeting with senior licensee management and the RSO, to discuss the preliminary inspection findings. These will include any apparent violations, safety-related concerns, and any unresolved items identified during the inspection.

02.23 Post-Inspection Actions. After an inspection, the inspector shall summarize the findings with his/her appropriate Nuclear Regulatory Commission supervisor. This is especially important if there are, or are expected to be, controversial issues arising from the findings.

Inspectors shall also contact Headquarters staff when any pertinent issues are raised during the inspection, when inspection findings impact on any licensing actions, or to give feedback on how the licensee has addressed recent licensing actions.

Additionally, in some instances, inspection findings will warrant communication with enforcement staff, Office of Investigations staff, State liaison staff, or Federal agencies with whom the Nuclear Regulatory Commission has Memoranda of Understanding (MOUs).

The inspector will ensure that inspection findings are clearly documented, and reported to the licensee as appropriate.

89001-03 INSPECTION GUIDANCE

General

An examination of the licensee's records should not be considered the primary part of the inspection program. Rather, observations of activities in progress, equipment, facilities and use areas, etc., will be a better indicator of the licensee's overall radiation safety program than a review of records alone.

Some of the requirement and guidance sections of this procedure instruct the inspector to "verify" the adequacy of certain aspects of the licensee's program. Whenever possible, verification should be accomplished through discussions, observations, and demonstrations.

In the records reviewed, look for trends such as increasing doses or effluent releases. Records such as surveys, waste disposal, effluent release (10 CFR 40.65 reports), transportation of source material, training, and air sampling may be examined randomly until the inspector is satisfied that the records are being maintained and are complete. Other records that are more closely related to health and safety (such as personnel bioassay records and radiation work permit records) should be examined in detail.

Retain a copy of each pertinent record that is needed to substantiate an inspection finding, such as a violation. When an inspector identifies an apparent violation, he/she should gather copies from the licensee, while on-site, of all records that are needed to support the apparent violation. In general, inspectors should use caution before retaining copies of licensee documents, unless they are needed to support apparent violations, expedite the inspection, or make the docket file more complete. In all cases where licensee documents are retained beyond the inspection, follow the requirements of Inspection Manual Chapter (IMC) 0620, "Inspection Documents and Records," (see IMC 0620, Section 04.06.b). Especially ensure that the licensee understands the retained record will become publicly available, and give the licensee the opportunity to request withholding the information pursuant to the requirements of 10 CFR 2.790(b)(1).

The inspector should keep the licensee apprised of the inspection findings throughout the course of the inspection and not wait until the exit meeting.

Whenever possible the inspector should keep Nuclear Regulatory Commission management informed of significant findings (e.g., safety hazards, willful violations, and other potential escalated enforcement issues) identified during the course of the inspection.

03.01 Preparation. Before the inspection, the inspector should do the following:

a. Review the applicable parts of Title 10 U.S. Code of Federal Regulations, the licensee's license application, and the facility license.

b. Review the licensee's previous inspection history (at a minimum review the past two inspections), the license, and the status of any allegations or incidents. Note the licensee's commitments in response to previous violations, for follow-up during the inspection.

c. Review event/incident files, and the docket file to determine whether the licensee was involved in any incidents or events. If the Nuclear Regulatory Commission did receive notification of an incident, review that incident during the inspection and document the licensee's follow up in the inspection report.

d. Discuss the licensee's program with previous inspector(s) and/or project manager as necessary.

e. Notify the appropriate State radiation control program personnel.

f. Review pending licensing actions.

g. Obtain a map of the area and/or directions.

i. Make travel arrangements and prepare itinerary.

j. Select calibrated instruments and perform source check.

k. Select appropriate documents.

l. Select appropriate equipment to take.

In selecting the appropriate documents, the inspector should consider taking the applicable regulations, field notes, generic communications, license, etc.

The equipment may include hard hats, safety glasses and safety shoes, sample containers, dosimeters, etc.

During the inspection, focus (among other areas) on whether the licensee is in compliance with the regulations, commitments made in the license application, and the facility license, including any license amendments issued since the last inspection or any program changes described by the licensee since the last inspection. This requires review of documentation submitted in support of the licensing action, before the inspection. For new license amendments, the inspection represents the Nuclear Regulatory Commission's first opportunity to verify whether the licensee has enacted the most recent changes to the license. In other areas, the inspection is an opportunity to verify the continued compliance with the regulations and the commitments made in the license application and submittals supporting existing license conditions.

03.02 Entrance Briefing. After arriving on site, the inspector should inform the licensee's management representative of the purpose and scope of the inspection to be performed. This notification should be made as soon as practical after arriving on site.

The purpose of the entrance briefing is to inform licensee management that an inspection is being conducted, and to indicate the tentative schedule for discussing or reviewing selected inspection items with various licensee staff personnel. In addition, apprise management that an exit briefing will be conducted, at the end of the inspection, which will detail the inspection findings.

This is often an opportune time for the inspector to identify personnel to be interviewed. Scheduling interviews will enhance inspector efficiency and give the licensee the opportunity to have the most knowledgeable individuals present to respond in the areas being inspected.

03.03 General Overview. The inspector will interview the cognizant licensee representatives to gain information concerning organization, scope, and management oversight of the radiation safety program.

a. Organization. The licensee's organizational structure will usually be found in the license application and may involve one or more individuals. Determine the reporting structure between executive management and the RSO. Determine whether the RSO has sufficient access to licensee management. Through discussions with licensee staff, the inspector should determine if changes in ownership or staffing have occurred. If the owner has changed, determine whether the licensee has submitted

appropriate notification to the Nuclear Regulatory Commission. Ask licensee management if organizational changes have occurred, or are anticipated. If there have been no changes in the organization since the previous inspection, there is no need to pursue this element in further detail.

The inspector should review any organizational change in the RSO position, authorities, responsibilities, and reporting chains. The inspector should be sensitive to changes that reduce the ability of the RSO to resolve concerns or issues related to the safe conduct of the radiation protection program. The inspector should ask licensee management and the RSO about the RSO's authority and about any changes that may impact on the RSO's duties, responsibilities, or effectiveness.

b. Scope of Program. Through discussions with licensee personnel, the inspector can obtain useful information about licensed activities, site status, and incidents, etc., which cannot always be gained by reviewing records alone. This is also an opportunity for the inspector to discern the actual size and scope of the licensee's program, and to determine if significant changes have occurred since the previous inspection.

c. Management Oversight. The inspection is a verification of the licensee's implementation of the required program. In the review to verify implementation, the inspector should pay particular attention to the scope of the program; frequency of licensee audits and inspections; the use of qualified staff; procedures for recording and reporting deficiencies to management; and methods and completion of follow-up actions by management.

1. RSO - The RSO is the individual, appointed by licensee management, who is responsible for implementing the radiation safety program. The inspector should verify that this individual has the authorities, responsibilities, and technical qualifications identified in Regulatory Guide 8.31 for health physics; is knowledgeable about the program; and ensures that activities are being performed in accordance with approved procedures and the regulations. The inspector should verify that, when deficiencies are identified, the RSO has sufficient authority to implement corrective actions, including termination of operations that pose a threat to health and safety.

2. Program Audits - The frequency and scope of audits of the licensed program will vary. However, note that at a minimum, licensees are required, by 10 CFR 20.1101(c) and by license condition, to review the radiation safety program content and implementation at least annually. The results of audits should be documented. Examine these records with particular attention to deficiencies identified by the auditors, and note any corrective actions taken as a result of deficiencies found. If no corrective actions were taken, determine why the licensee disregarded deficiencies identified during audits, and whether the lack of corrective actions caused the licensee to be in non-compliance with regulatory requirements.

3. SERP - The members of the SERP are specified in the license. The inspector should verify that the required membership is present at all SERP meetings. The inspector should determine that the SERP activities are being performed in accordance with approved procedures and license conditions. The results of SERP evaluations

should be documented. Examine these records with particular attention to the basis for the determination that the change is authorized by the license. (For additional inspection guidance, refer to IP 37001, "10 CFR 50.59 Safety Evaluation Program."

03.04 Walk-Through Orientation Tour. The inspector should make initial observations of licensed activities to determine that materials are being safely handled and that good health physics practices are followed. The inspector should look at areas of use (including wellfields and impoundments), storage, and disposal, to make an initial assessment of the licensee's ALARA program, with regard to facility design, engineering controls, house-keeping practices, etc., The inspector should ensure that observations of activities are documented in the inspection report.

03.05 Facilities. Descriptions of the facilities are generally found in the application, the license, and in subsequent amendments that are usually tied down to a license condition. The actual or as-built facility, wellfields, and impoundments should be configured to provide safe working areas separated from unrestricted areas and sufficient access controls to preclude unauthorized entry. The inspector should also be aware of potential industrial safety hazards, for referral to the U.S. Department of Labor's Mine Safety and Health Administration.

03.06 Equipment and Instrumentation

a. Calibration and Maintenance. Equipment and instrumentation should be appropriate to the scope of the licensed program. The inspector should verify that survey instrumentation has the appropriate range of use. The inspector should also verify that the survey instruments are calibrated at the appropriate frequency and checked for operability before use. All survey, sampling, and monitoring instruments should have current calibrations appropriate to the types and energies of radiation to be detected. The technical adequacy of calibration procedures at facilities that perform their own calibrations should be examined. Processing equipment, ventilation, and exhaust systems should be sufficient to provide safe use, handling, and storage of the materials in use.

b. Procedures. Inspectors should verify that licensees have procedures for reporting defects in accordance with 10 CFR Part 21. The complexity of the procedures will vary. Manufacturers should have detailed procedures to evaluate the safety significance of identified defects. Other licensees need only address identification and reporting requirements.

03.07 Materials

a. Receipt and Transport of Source Material. Procedures for the receipt and transport of source material should be found in the licensee's standard operation procedures. By discussions with the licensee, determine if the procedures have been changed or modified. Randomly examine procedures used by the licensee to determine if they are in accordance with applicable regulations. If radioactive shipments arrive or are being shipped during the course of an inspection, the inspector should, when practical, observe personnel perform the required shipment surveys.

b. Material Security and Control. Examine areas where source materials are used and stored. Storage areas should be locked and/or have limited and controlled access. Source material use areas should be under constant surveillance or physically secured. The licensee should have procedures

for access controls. The inspector should verify that adequate controls are in place and working effectively.

03.08 Training

General Training. Discuss with the licensee how, and by whom, training is conducted and the content of the training provided to workers.

Verify, pursuant to 10 CFR 19.12, that initial instructions have been given to workers who work in or frequent restricted areas. Under the basic instructions, it is management's responsibility to inform the workers of precautions to take when entering a restricted area, kinds and uses of source material in that area, exposure levels, and the types of protective equipment to be used. The workers should also be informed of the pertinent provisions of Nuclear Regulatory Commission regulations and the license, and the requirement to notify management of conditions observed that may, if not corrected, result in a violation of Nuclear Regulatory Commission requirements. Also verify that workers understand the mechanism for raising safety concerns.

Verify that the training program for all site personnel is as described in Regulatory Guide 8.31. One or more workers should be interviewed to determine that they have received the required training, both in the basic instructions, and in that specified in the license application. Note that the training should be provided to workers before the individual's performance of licensed activities.

Randomly examine records of training of personnel and attendant examinations or tests (if applicable) to the extent that the inspector is satisfied that the training program is being implemented as required. Where examinations are required, read a few of the examination questions to ascertain that they are indicative of what the worker should know to carry out his/her responsibilities.

The inspector should also observe related activities and discuss the radiation safety training received by selected individuals, to ensure that appropriate training was actually received by these individuals. Workers should understand the radiation protection requirements associated with their assigned activities. The licensee's radiation safety training may include, but is not limited to, demonstrations by cognizant facility personnel, formal lectures, testing, films, and "dry runs" for more complex or hazardous operations.

03.09 Area Radiation and Contamination Control

a. Area Survey. The inspector may ask the licensee to spot-check radiation levels in selected areas, using the licensee's own instrumentation. However, the inspector must use Nuclear Regulatory Commission's instruments for independent verification of the licensee's measurements. (The inspector's instruments shall be calibrated and source-checked before he/she leaves the regional office.)

If practical, observe how licensees conduct surveys, to determine the adequacy of surveys. Also, note the types of instruments used, and whether they are designed and calibrated for the type of radiation being measured.

The inspector should determine if workers take smears or instrument readings in areas that are readily accessible to facility personnel. The survey activities should be at a specified frequency in accordance with license conditions and related licensee procedures. The inspector should also perform independent measurements, as needed to verify licensee assumptions or measurements.

b. Contamination Control. The inspector should verify that the licensee's survey procedures and counting equipment are adequate to detect and control radio-nuclide contamination. The inspector may choose to examine the instrument calibration records (efficiency checks, lower limit of detection calculations, etc.). Additionally, when appropriate, the inspector should consider taking confirmatory wipe samples.

c. Protective Clothing and Equipment. If practical, the observation of the protective clothing and equipment that workers wear during their work activities should provide the inspector with an acceptable means of reviewing this requirement. Requirements for protective clothing and equipment may be found in the licensee's procedures, in radiation work permits, or on precautions posted at the entrance to controlled areas.

03.10 Radiation Protection. Specific guidance is set forth in IP 83822.

10 CFR 19.13(b) requires that each licensee shall advise each worker annually of the worker's dose as shown in dose records maintained by the licensee. Verify through discussions with workers and management, and through records review, that the licensee has advised workers of their doses annually. The licensee must advise all workers for whom monitoring is required (and, therefore, dose records are required). The licensee must advise these workers of internal and external doses from routine operations, and doses received during planned special exposures, accidents, and emergencies. The report to the individual must be in writing and must contain all of the information required in 10 CFR 19.13(a).

03.11 Environmental Protection

a. New Well-Field Design. Verify that pre-mining ground-water data have been appropriately collected and that pre-mining data indicate that the well field has been suitably designed to prevent horizontal and vertical excursions.

Verify that if the well field contains areas of previous conventional mining activities, that the well field has been suitably designed to detect and prevent vertical and horizontal excursions. Verify that the stratigraphic data indicate that there are adequate confining units to prevent vertical excursions. Verify that the geological data indicate that there are no features that could cause vertical excursions. If those data indicate that such structures exist, verify that the well field has been properly designed to detect and prevent excursions.

Verify that the well field is contained within the current licensed area. Verify that appropriate well completion techniques have been used and that well logs and well completion data confirm production, injection, and monitor wells have been correctly located to prevent and detect excursions. Verify well integrity testing has been correctly performed and that all injection and production wells have passed the integrity-test criteria.

Verify that baseline water quality data have been appropriately collected, analyzed, and evaluated to determine upper control limit values and ground-water restoration goals. Verify that upper control limits have been appropriately established for all excursion indicators. Verify that restoration target values been appropriately established to meet the primary restoration goal.

Verify that vertical and horizontal monitor wells have been correctly located to detect potential excursions from the well field. Verify that appropriate tests of hydrologic confinement have been performed and that the test results meet the criteria established to identify vertical interconnection. Verify that hydrologic tests have been successfully conducted to determine if the horizontal monitor wells have been completed in the mine zone aquifer. Verify that pre-mining hydrologic properties, such as transmissivity and storage coefficient have been correctly determined.

Verify that well field pressures are planned to be maintained below casing and formation rupture pressures. Verify that the licensee has appropriately considered these and any other relevant data in determining that: (1) the well field can be safely operated to maintain well field lixiviants in the zone of mining; (2) that baseline data has been correctly collected to establish upper control limits and ground-water restoration goals; and (3) that well fields have been appropriately designed to detect potential lixiviant movement from the well field.

Visually verify that pipelines and injection wells are not broken and are discharging on the surface or creating springs and weeps in and around the well fields. Verify that pipelines have been appropriately monitored for breakage and that appropriate corrective actions and regulatory notification occurred.

b. Safe Well-Field Operation. Verify that injection pressures are being maintained below casing and formation rupture pressures. Verify that the licensee is appropriately evaluating well-field injection and production rates and that appropriate levels of bleed are being maintained in the well fields to prevent excursions.

Verify that the correct monitor wells are being appropriately monitored for upper control limit values and that excursions are being reported to the Nuclear Regulatory Commission as required in the license. Verify that any ongoing excursions are being cleaned up, that the Nuclear Regulatory Commission is being appropriately informed, that they are being monitored, and that the licensee is following its excursion cleanup plan.

c. Pond Operation. Verify that ponds have been correctly located within the site boundary and constructed as required by the license. Visually verify that (1) there are no failures or breaks in pond embankments; (2) that there are no obvious tears in pond linings; (3) that there are no springs and seeps around pond embankments. Visually verify that the ground-water leak-detection and pond water-level monitoring systems are in place and are operational. From an inspection of the records and from interviews, verify that the ponds and pond monitoring systems have been correctly constructed so that they will not fail nor leak and that leaks can be detected. Verify that the licensee is conducting the appropriate level of visual inspections of pond integrity. Verify that the pond ground-water leak detection system is being monitored at an appropriate

frequency and for the correct indicator parameters. Verify that appropriate monitoring, cleanup, corrective actions, and regulatory notifications have been taken when pond fluids have been found in the pond ground-water leak-detection system

d. Water Disposal. Verify that the chemistry of land-disposal, surface-water discharge fluids conforms to licensed Nuclear Regulatory Commission water-quality requirements (i.e., either restoration, processing waters, or both). Verify the deep-well disposal operations conform to applicable license conditions.

e. Ground-Water Restoration. Verify that ground-water restoration activities conform to the ground-water restoration plan. Verify the status of well fields (i.e., mining, inactive, or restoration). Verify that inactive well fields are being restored in a timely manner.

Verify that: (1) ground-water activities are being correctly implemented; (2) that the well field is being operated to identify any potential excursions; (3) that the well field is being operated to correct and cleanup any existing excursions; and (4) that ground-water data are being appropriately collected to determine if the ground water is being restored. Verify that the well fields are being safely restored (all the concerns described for "Safe Well-Field Operation" should be applicable). Verify that ground-water samples are being appropriately collected during the restoration and post-restoration phases, to determine restoration success and post-restoration ground-water stability.

03.12 Effluent Monitoring Program. No inspection guidance provided.

03.13 Air Sampling. No inspection guidance provided.

03.14 Financial Assurance. No inspection guidance provided.

03.15 Waste Management

a. Waste Storage and Disposal. Verify that the waste is protected from fire and the elements, that package integrity is adequately maintained, that the storage area is properly ventilated, and that adequate controls are in effect to minimize the risk from other hazardous materials. Verify that the licensee has appropriate methods to track the items in storage.

For further inspection guidance, refer to IP 84850.

b. Effluents. Examine all annual or semiannual reports and all pertinent event reports generated since the last inspection, and a random selection of liquid and airborne effluent release records. Randomly select procedures for both liquid and airborne systems and verify that the licensee's procedures are being followed. The verification can be made by observations of an operation, a review of selected records, interviews with workers, etc.

Review the licensee's ALARA goals, and determine if they are sufficiently challenging, yet realistic. Determine if the licensee understands and implements these goals. Determine if the licensee has calculated annual doses resulting from air effluents and if the doses are: (1) within the licensee's ALARA goals (as described in its radiation protection program); (2) exceed the licensee's ALARA goals; or (3) uncertain because there is insufficient information or basis for determination. Review the

licensee's history in meeting ALARA goals, and its corrective actions when the goals were not met.

For further inspection guidance, refer to IP 87102.

c. Transfer. Ascertain if the licensee has an adequate method of determining that recipients of radioactive wastes are licensed to receive such waste (i.e., licensee obtains a copy of the waste recipient's current license before the transfer).

d. Decommissioning and Financial Assurance. The decommissioning record-keeping requirements are applicable to all source material licensees, and are specified in 10 CFR Part 40. These records should contain, among other information: (1) records of spills or other unusual occurrences involving the spread of contamination in and around the facility, equipment, or site (when contamination remains after cleanup, or when contaminates may have spread to inaccessible areas such as seepage into concrete); (2) as-built drawings and modifications of structures and equipment in restricted areas where radioactive materials are used and/or stored; and locations of possible inaccessible contamination (e.g., buried pipes).

The inspector should be aware of changes, in radiological, non-radiological, and environmental conditions, while inspecting a licensee's facility, that would necessitate a change in the financial assurance instrument and/or decommissioning plan, especially where the conditions deteriorate and the financial assurance instrument or decommissioning plan may no longer be sufficient. In preparation for the inspection, the inspector should determine the dates that the financial assurance instrument and decommissioning plan (if applicable) were submitted to the Nuclear Regulatory Commission. Then during the inspection, through observations, discussions with licensee personnel, and records review, the inspector should determine whether the conditions at the licensee's facility have changed since the documents were submitted to the Nuclear Regulatory Commission. If conditions have changed and the adequacy of the financial assurance instrument and/or decommissioning plan is in doubt, the inspector should immediately contact regional management from the licensee's site to discuss the situation.

03.16 Transportation. The inspector should review: the licensee's hazardous material training, if applicable; packages and associated documentation; vehicles (including placarding, cargo blocking, and bracing, etc.); shipping papers; and any incidents reported to DOT. This is an ideal area for the inspector to make observations of licensee practices. The DOT and Nuclear Regulatory Commission regulations for transportation of radioactive materials were recently revised, and the revisions generally became effective April 1, 1996.

For further inspection guidance, refer to IP 86740, "Inspection of Transportation Activities."

Inspectors should also refer closely to the "Nuclear Regulatory Commission Field Reference Charts" on hazard communications for transportation of radioactive materials, which contain references to the new transportation requirements, and are useful field references for determining compliance with the transportation rules on labeling, placarding, shipping papers, and package markings.

03.17 Posting and Labeling. The inspector should determine whether proper caution signs are being used at access points to areas containing source material, radiation areas, and those areas containing airborne radioactive materials. 10 CFR 20.1903 provides exceptions to posting caution signs. When applicable, the inspector should also randomly examine signals and alarms to determine operability. The inspector should also randomly observe labeling on shipping containers, to determine that proper information is recorded.

Areas with radiation hazards should be conspicuously posted, as required by 10 CFR 20.1902. Depending on the associated hazard, controls may include tape, rope, or structural barriers to prevent access. If volatile source material are used in an area, such an area should be controlled for airborne contamination. Areas occupied by radiation workers for long periods of time and common-use areas should be controlled in accordance with licensee procedures and be consistent with the licensee's ALARA program.

The inspector should also examine locations where notices to workers are posted. Applicable documents, notices, or forms should be posted in a sufficient number of places to permit individuals engaged in licensed activities to observe them on the way to or from any particular licensed activity location to which the postings would apply.

03.18 Generic Communications of Information. Through discussions with licensee management and the RSO, the inspector should verify that the licensee is receiving the applicable bulletins, information notices, etc., and that the information contained in these documents is disseminated to appropriate staff personnel. Also verify that the licensee has taken appropriate action in response to these Nuclear Regulatory Commission communications, when a response is required.

03.19 Notifications and Reports. The inspector should determine the licensee's compliance for notifications and reports to the Commission. The licensee may be required to make notifications after loss or theft of material, overexposures, incidents, and safety related equipment failure, etc.

Through discussions with licensee personnel, and by a review of representative records, the inspector should verify that notifications and/or reports were appropriately submitted to the Nuclear Regulatory Commission.

03.20 Special License Conditions. ISL licenses contain special license conditions that are unique to their licensed activities (e.g., performance based license conditions). In these instances, the inspector should verify that the licensee understands the additional requirements, and maintains compliance with the special license conditions. The inspector should also note that some special license conditions will state an exemption to a particular Nuclear Regulatory Commission requirement.

03.21 Independent and Confirmatory Measurements. The inspector should perform independent and confirmatory measurements in restricted and unrestricted areas of the licensee's facility. Independent measurements should be performed on all inspections, unless exceptional circumstances make it impossible to perform the measurements (e.g., inspector's detection equipment malfunctions during an inspection trip). Measurements of dose rates at the boundary of the unrestricted areas should be performed at the surface of the most accessible plane. Examples of measurements that may be performed include area radiation surveys, wipe samples, soil samples, air flow measurements, etc. These measurements should be taken in radioactive material use areas, storage areas, effluent release points, etc. Confirmatory measurements are those whereby the inspector compares his/her

measurements with those of the licensee's. Independent measurements are those performed by the inspector independently of the licensee's measurements.

03.22 Exit Meeting. When the inspection is over, there should be an exit meeting with the most senior licensee representative present at the facility. If a senior management representative is unavailable for the exit meeting, the inspector may hold a preliminary exit meeting with appropriate staff on site. However, there must be a formal exit meeting with a senior management representative (and the licensee's RSO, if not present at the preliminary exit meeting) as soon as practical after the inspection. This meeting will usually be held by telephone conference call.

During the exit meeting, the licensee representatives should be told the preliminary inspection findings -- including any apparent violations of regulatory requirements, safety-related concerns, or unresolved items identified during the inspection -- and the status of any previously identified violations. The licensee must immediately address any significant safety concerns.

If the inspector identifies safety concerns or violations of significant regulatory requirements that affect safe operation of a licensee facility, the licensee must initiate prompt corrective action. The inspector should not leave the site until the licensee fully understands the concern and has initiated corrective action. If the inspector and the licensee disagree over how significantly the concern impacts continued safe operation of the facility, regional management should be notified immediately.

03.23 Post-Inspection Actions. The inspector will review his or her inspection findings with his or her supervisor, following the guidance in IMC 2641, "In-Situ Leach Facilities Inspection Program." The inspector should discuss the findings in the detail that is commensurate with the scope of the licensee's program. Violations, items of concern, and unresolved items should be discussed in sufficient depth for management to make appropriate decisions regarding enforcement actions, referral to other State and Federal agencies, and decisions on the scheduling of future inspections of the licensee's facility.

The inspector should also discuss inspection findings with the appropriate Headquarter staff. This information exchange can be particularly useful if the licensee is having its license renewed or has recently submitted a license amendment request. The inspector should inform the Headquarters staff about how the licensee has addressed (or failed to address) special license amendments or recent licensing actions. Licensing information requested by the licensee should also be discussed with the Headquarters staff.

Inspectors should be aware that the Nuclear Regulatory Commission has entered into several MOUs, with other Federal agencies, that outline agreements on items such as exchange of information and evidence in criminal proceedings. The inspector should ensure that the exchange of information relevant to inspection activities is made in accordance with the appropriate MOU.

The inspector may report the results of inspections to the licensee by issuing an Nuclear Regulatory Commission inspection report to the licensee, following the guidance in IMC 0610. The inspector must also ensure that the findings are documented, in the inspection report, in sufficient detail for the reader to determine what requirement was violated, how it was violated, who violated the requirement, and when it was violated. The inspection report should be used to describe what procedures or activities were observed and/or demonstrated by the licensee during the inspection, and any items of concern identified that were not cited as a violation of regulatory requirements.

For further inspection guidance, refer to Inspection Manual Chapter 2641.

89001-04 REFERENCES

A listing of IPs applicable to the inspection program for ISL licensees can be found in the appendix of Inspection Manual Chapter 2641. Inspectors are to use these documents as guidelines in determining the inspection requirements for operational and radiological safety aspects of various types of licensee activities.

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