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Subject: **Response to Portion of NRC Request for Additional Information Letter No. 35 Related to ESBWR Design Certification Application – Solid Waste Management System – RAI Numbers 11.4-1 through 11.4-11**

Enclosure 1 contains GE's response to the subject NRC RAIs transmitted via the Reference 1 letter. This completes GE's response to RAI Letter No. 35.

If you have any questions about the information provided here, please let me know.

Sincerely,

Kathy Sedney for

David H. Hinds
Manager, ESBWR

D068

Reference:

1. MFN 06-199, Letter from U.S. Nuclear Regulatory Commission to David Hinds, *Request for Additional Information Letter No. 35 Related to ESBWR Design Certification Application,* June 22, 2006

Enclosure:

1. MFN 06-218 – Response to Portion of NRC Request for Additional Information Letter No. 35 Related to ESBWR Design Certification Application – Solid Waste Management System – RAI Numbers 11.4-1 through 11.4-11

cc:

WD Beckner	USNRC (w/o enclosures)
AE Cubbage	USNRC (with enclosures)
LA Dudes	USNRC (w/o enclosures)
GB Stramback	GE/San Jose (with enclosures)
eDRF	0000-0055-3862

Enclosure 1

MFN 06-218

Response to Portion of NRC Request for

Additional Information Letter No. 35

Related to ESBWR Design Certification Application

Solid Waste Management System

RAI Numbers 11.4-1 through 11.4-11

NRC RAI 11.4-1

DCD Tier 2, Section 11.4 states that the four subsystems of the solid waste management system (SWMS) are depicted on Fig. 11.4-1. A review of Figure 11.4-1 indicates that the container storage subsystem is not shown in this figure. Update DCD text and figure accordingly.

GE Response

Figure 11.4-1 and Section 11.4 have been revised to include the container storage subsystem. Attached to this RAI is Draft DCD Section 11.4, Rev. 02, including Figure 11.4-1, Rev. 02, for your review and use.

NRC RAI 11.4-2

The design bases section (DCD Tier 2, Section 11.4.1) does not acknowledge the acceptance criteria of SRP Chapter 11.4.II. The following criteria are not listed nor addressed:

Part 20.1302;

Part 20 Appendix B effluent concentrations;

Part 20 Appendix G;

Part 20.1406;

Part 50.34a;

Part 50.36a;

Part 50 Appendix A GDC 60, 61, 63, and 64;

Parts 61.55 and 61.56;

SRP BTP (ESTB) 11-3;

SRP Appendix 11.4-A;

40 CFR Part 190;

Regulatory Guide 8.10;

IE Bulletin No. 80-10; and

Process Control Program (see Generic Letter 89-01, Suppl. 1 and NUREG-1302).

Address the applicability of these criteria either as part of the design of structures, systems, and components (SSC), or as the responsibility of the COL applicant.

Revise DCD Section 11.4.1 to include applicable design criteria, update descriptions of associated SSCs in Section 11.4.2; update the safety evaluation of DCD Section 11.4.3; revise testing and inspection requirements of DCD Section 11.4.4; update instrumentation requirements of Section 11.4.5; and identify information to be provided by the COL applicant in DCD Section 11.4.6.

Update references in DCD Section 11.4.7 accordingly.

GE Response

The listed items were either included, delineated as COL responsibility or referral was made to the applicable sections of the ESBWR DCD. Attached to this RAI is Draft DCD Section 11.4, Rev. 02 for your review and use.

NRC RAI 11.4-3

The provision for onsite storage of radwaste stated in DCD Tier 2, Section 11.4.1 is inconsistent with SRP 11.4.II and SRP Appendix 11.4-A. The SRP refers the need to consider radwaste storage capabilities for several years (up to 5 years). The guidance places emphasis on the future availability or accessibility to low-level waste disposal sites, and safety considerations in the storing, handling and eventual disposition of radwaste. Accordingly, describe the design features of the SWMS facility with a provision for storing radwaste up to 5 years. Alternatively, state whether the design and construction of a long-term radwaste storage facility is the responsibility of the COL applicant. Update the provision for onsite storage of radwaste stated in DCD Section 11.4.1 to be consistent with SRP 11.4.II and SRP Appendix 11.4-A.

GE Response

The DCD was revised to allow the COL holder to request up to 5 year storage per the guidelines of SRP Appendix 11.4-A. Attached to this RAI is Draft DCD Section 11.4, Rev. 02 for your review and use.

NRC RAI 11.4-4

Part 20.1406 describes requirements on how design features and operational procedures will minimize, to the extent practicable, contamination of the facility and the environment, facilitate decommissioning, and minimize the generation of radioactive wastes. A review of DCD Section 12.6 indicates that design features and operational procedures described there focus on permanently installed systems. However, this discussion should describe how design features and operational procedures will be implemented with mobile and portable SWMS systems. Update DCD Tier 2 Section 11.4.1 to describe design features addressing the requirements of Part 20.1406 as they apply to the installation and use of portable/mobile SWMS and describe in Section 11.4.6 the information to be provided by the COL applicant.

GE Response

Section 11.4.1 was updated to describe design features addressing the requirements of Part 20.1406 as they apply to the installation and use of portable/mobile SWMS and Section 11.4.6 describes the information to be provided by the COL holder. Attached to this RAI is Draft DCD Section 11.4, Rev. 02 for your review and use.

NRC RAI 11.4-5

DCD Tier 2, Section 11.4.2.1 notes that there will be no liquid discharges from the plant, but Section 11.2.2 assumes that such discharges will occur and provides dose estimates based on liquid effluent discharge rates. Reconcile this internal inconsistency by clarifying whether such types of liquid wastes will be routinely discharged or processed and reused, as discussed in Section 11.2.3. Update the DCD text in Sections 11.4.2.1, 11.2.2, and 12.2.3 accordingly.

GE Response

These sections discuss different issues and no inconsistencies exist. Section 11.4.2.1 has been updated to describe that SWMS liquids are processed through LWMS. Attached to this RAI is Draft DCD Section 11.4, Rev. 02 for your review and use.

NRC RAI 11.4-6

A review of DCD Tier 2, Section 11.4.2.2 describing the operations of the dry waste accumulation and conditioning subsystem indicates that compaction is not considered as a mean of reducing the volumes of compressible and compactible dry active wastes. SRP BTP ETSB 11-3 and Appendix 11.4-A recommend the use of waste volume reduction methods to reduce the amounts of waste shipped offsite for disposal and maximize the utilization of space at onsite radwaste storage facilities. Provide a discussion on the use of waste volume reduction technologies by types of radwastes and how such methods will be incorporated in the design of the Radwaste Building and facility operations in controlling effluent releases and occupational exposures. Update equipment descriptions in DCD Table 11.4-1 and revise DCD Table 11.4-2 projected radwaste volumes to the reflect the application of waste volume reduction technologies.

GE Response

Generally, the waste reduction and removal functions are contracted out to other parties. A footnote to Table 11.4-2 was provided to indicate that waste reduction/volume reduction will be considered and determined by the COL holder depending on the type and level of waste. Attached to this RAI is Draft DCD Table 11.4-2, Rev. 02 for your review and use.

NRC RAI 11.4-7

DCD Tier 2, Section 11.4.2.2 does not address the waste classification requirements of Part 61.55 and waste characteristics of Part 61.56 for disposal. Provide a discussion addressing the expected distribution of Class A, B, C, and greater-than-C wastes expected to be generated under the provisions of Part 61.55. Provide a discussion of the expected waste characteristics shipped for disposal under the provisions of Part 61.56. Provide a discussion on how waste acceptance criteria of radwaste disposal facilities will be met using SWMS subsytems and update DCD Section 11.4.2.2 accordingly.

GE Response

DCD Section 11.4.2.2 and Section 11.4.6 were clarified so that the COL holder will classify waste and meet the requirements of Parts 61.55 and 61.56 accordingly. Attached to this RAI is Draft DCD Section 11.4, Rev. 02 for your review and use.

NRC RAI 11.4-8

DCD Tier 2, Section 11.4.2.2 does not address the waste classification guidance of Regulatory Guide 1.143 in designing radwaste systems. Provide a discussion addressing how the three safety classes or classifications for radwaste management facilities were addressed in the proposed design of the SWMS and update DCD Section 11.4.2.2 accordingly.

GE Response

The requested information is provided in Section 11.4.1 and Chapter 3 relative to Regulatory Guide 1.143 compliance. Regulatory Guide 1.143 references Regulatory Guide 8.8 for design guidance on systems, structures and components. Chapter 12 provides information regarding the compliance with regulatory Guide 8.8 for systems, structures and component design. The mobile transport of radwaste was noted as being the responsibility of the COL holder. Attached to this RAI is Draft DCD Section 11.4, Rev. 02 for your review and use.

NRC RAI 11.4-9

A review of the types of dry wastes described in DCD Tier 2, Section 11.4.2.2 indicates that spent charcoal is not included in the description. The proposed design of the Charcoal Vault (See DCD Sections 11.2 and 11.3) indicates that over 30,000 kg of charcoal will be contained in tanks. Given that the spent charcoal will be periodically replaced, provide an estimate the amounts of spent charcoal that will be generated yearly as radwaste from the turnover of the guard beds (2 tanks) and main parallel trains (8 tanks), and describe the provisions that will be used to manage and ship spent charcoal for disposal. Update equipment descriptions in DCD Table 11.4-1 and revise DCD Table 11.4-2 to include an annual estimate of the projected amounts of spent charcoal shipped as radwaste.

GE Response

DCD Section 11.4.2.2 includes a discussion that the off-gas system activated carbon is regenerated on-stream as required. The system design does not preclude the removal and replacement of charcoal, if desired, as a special maintenance task. Attached to this RAI is Draft DCD Section 11.4, Rev. 02 for your review and use.

NRC RAI 11.4-10

A review of DCD Tier 2, Table 11.4-2 indicates that the basis of a waste volume reduction factor is missing. Provide the basis for the stated waste volume reduction factor of two for the "LWMS Concentrated Waste" stream. Describe the type of waste volume reduction technology that would be used to achieve such a volume reduction. Update DCD Table 11.4-2 accordingly.

GE Response

A footnote was added to Table 11.4-2 to address moisture evaporation. Attached to this RAI is Draft DCD Table 11.4-2, Rev. 02 for your review and use.

NRC RAI 11.4-11

A review of DCD Tier 2, Section 11.4.3 indicates that the text does not identify provisions, systems, or procedures addressing the detection of radioactivity in non-radioactive systems (as interface) to prevent unmonitored and uncontrolled releases of radioactive materials in the environment. See regulatory positions from Regulatory Guide 1.143 and IE Bulletin No. 80-10 for details. Describe system design features and operational procedures to ensure that inter connections between plant systems and mobile processing equipment will avoid the contamination of non-radioactive systems or uncontrolled and/or unmonitored releases of radioactivity in the environment. Update DCD Section 11.4-3 accordingly.

GE Response

DCD Section 11.4.3 was revised to state that the mobile collection services are the responsibility of the COL holder and will comply with the guidelines of IE Bulletin 80-10. Attached to this RAI is Draft DCD Section 11.4, Rev. 02 for your review and use.

- The seismic and quality group classification and corresponding codes and standards that apply to the design of the SWMS components and piping, and the structures housing the SWMS are discussed in Section 3.2.
- On-site storage space for 6-month's volume of packaged waste is provided in the radwaste building. Depending on the availability and accessibility of adequate waste repositories in the future, NUREG-0800, Standard Review Plan, 11.4 Solid Waste Management System, DRAFT Rev. 3 – April 1996, Appendix 11.4-A, Design Guidance for Temporary Storage of Low Level Radioactive Waste provides guidance for construction and management of a temporary storage facility including up to five years waste storage. This temporary storage facility and an associated overall site waste management plan is intended to allow the station to operate while considerations for further waste minimization and volume reduction are adopted, such as the design and construction of additional volume reduction facilities, as necessary, and then the processing of the wastes that may have been stored during the construction of those facilities. Additionally, the five-year duration is to allow time for the regional state compacts to create additional low-level waste disposal sites.
- All atmospheric collection and storage tanks are provided with an overflow connection at least the size of the largest inlet connection. The overflow is connected below the tank vent and above the high level alarm setpoint. Each tank room is designed to contain the maximum liquid inventory in the event that the tank ruptures.

SWMS consists of mobile systems and permanent plant systems. The SWMS mobile systems are housed within the radwaste building and are connected to permanent radwaste systems. Mobile systems maximize the processing efficiency and minimize the generation of radwaste by incorporating modular state of the art radwaste processing sub-systems and equipment onto the permanently installed radwaste systems.

Radionuclides influent to the SWMS are presented in Section 12.2, including Table 12.2-14a and Table 12.2-14b. Any resultant gaseous and liquid wastes are routed to other plant sections. Gaseous radionuclides from the SWMS are processed by the monitored radwaste building ventilation system. The monitored ventilation system is described in Section 9.4 and Section 12.3.3.2.4. Liquid waste is processed by the monitored LWMS system as described in Section 11.2. Process and effluent radiological monitoring systems are described in Section 11.5.

Section 12.3 describes systems to detect conditions that may result in excessive radiation levels per Title 10 Code of Federal Regulations Part 50, Appendix A, General Design Criteria 63. Section 11.5 describes systems to monitor the effluent discharge paths for radioactive material per Title 10 Code of Federal Regulations Part 50, Appendix A, General Design Criteria 64.

A description of the SWMS design features addressing Part 20.1406 requirements for permanently installed systems is in Section 12.6. The COL holder is responsible for discussing the implementation of operational procedures and design features of the mobile and portable systems in meeting Part 20.1406. The COL holder is responsible for describing how design features and operational procedures, as they apply to the installation and use of portable/mobile SWMS, minimize, to the extent practicable, contamination of the facility and the environment, facilitate decommissioning and minimize the generation of radioactive wastes.

The Area Radiation Monitors for the Radwaste Building Wet Solid Radioactive Waste Treatment Area, the Radwaste Building Dry Solid Waste Treatment Area and the Radwaste Building Packaged Waste Staging Area are depicted on Figure 12.3-41 and discussed in Section 12.3.4. The radwaste building seismic capability is described in Section 3.8.

The portable/mobile SWMS equipment is located within the permanently installed SWMS systems, and further located within the radwaste building as previously referenced and described. The location of the SWMS equipment within the radwaste building with monitored process effluents ensures compliance with Title 10 Code of Federal Regulations Part 20.1302, Part 20 Appendix B effluent concentrations, Part 50.34a, Part 50, Appendix A, General Design Criteria 60 and General Design Criteria 61 as they relate to radioactive materials released in gaseous and liquid effluents to unrestricted areas.

11.4.2 System Description

11.4.2.1 Summary Description

The SWMS controls, collects, handles, processes, packages, and temporarily stores solid waste generated by the plant prior to shipping the waste offsite. The SWMS processes the filter backwash sludges and bead resins generated by the Liquid Waste Management System (LWMS), Reactor Water Cleanup/Shutdown Cooling System (RWCU/SDC), Fuel and Auxiliary Pools Cooling System (FAPCS) and the Condensate Purification System. Contaminated solids such as high efficiency particulate air (HEPA) and cartridge filters, rags, plastic, paper, clothing, tools, and equipment are also disposed of in the SWMS.

The SWMS is capable of receiving, processing, dewatering the solid radioactive waste inputs for permanent off-site disposal. Liquids from SWMS operations are sent to the appropriate LWMS section for processing as depicted in Figure 11.4-1 and described in Section 11.2.

11.4.2.2 System Operation

Waste will be classified as A, B, or C and meet the requirements of the waste treatment facility or repository per Title10 Code of Federal Regulations, Parts 61.55 and 61.56.

The SWMS complies with Regulatory Guide 1.143, Revision 2, November 2001, as noted in Section 11.4.1. Construction of the radwaste building to meet the requirements of Regulatory Guide 1.143 regarding safety classification is located in Section 3.8.4 and Section 3.8.4.1.5. Regulatory Guide 1.143, Section 4.1, instructs that the design of radioactive waste management systems, structures and components should follow the direction in Regulatory Guide 8.8. Compliance with Regulatory Guide 8.8, Revision 3, June 1978 is located in Section 12.1.1.3 and Section 12.3.1. The COL holder is responsible to ensure that mobile systems comply with the requirements of Regulatory Guide 1.143 Revision 2, November 2001.

The SWMS consists of four process subsystems:

Wet Solid Waste Collection Subsystem

The wet solid waste collection subsystem collects the spent bead resin slurry, filter and tank sludge slurry and concentrated waste into the one of the five tanks in accordance with the waste characteristics.

Excess water is removed from the HIC and sent by a resin pump to the high activity resin holdup tank or a low activity phase separator that is in the receiving mode by a resin pump. Sufficient water is removed to ensure there is very little or no free standing water left in the HIC. Drying of the HIC contents may also be performed with heated air.

The fill head is then removed and placed in a laydown area. The closure head is then placed on the HIC. The HIC is vented just prior to being shipped off-site for disposal to ensure that pressure is not building up. Radiation shielding is provided around the HIC stations.

The estimated annual shipped waste volumes from processing wet solid wastes are presented in Table 11.4-2.

Dry Solid Waste Accumulation and Conditioning Subsystem

Dry solid wastes consist of air filters, miscellaneous paper, rags, etc., from contaminated areas; contaminated clothing, tools, and equipment parts that cannot be effectively decontaminated; and solid laboratory wastes. The off gas system activated carbon is rejuvenated by the off gas system and does not normally generate dry solid waste. Project specific actions will be developed regarding the removal, replacement, and processing of off gas activated carbon in the unlikely event that significant quantity of off gas system activated carbon requires replacement during the life of the plant. The activity of the dry solid waste is low enough to permit handling by contact. These wastes are collected in containers located in appropriate areas throughout the plant, as dictated by the volume of wastes generated during operation and maintenance. The filled containers are sealed and moved to controlled-access enclosed areas for temporary storage.

Most dry waste is expected to be sufficiently low in activity to permit temporary storage in unshielded, cordoned-off areas. Dry active waste will be sorted and packaged in a suitably sized container that meets DOT requirements for shipment to either an off-site processor or for ultimate disposal. The dry active waste is separated into three categories: non-contaminated wastes (clean), contaminated metal wastes, and the other wastes, i.e., clothing, plastics, HEPA filters, components, etc.

In some cases, large pieces of miscellaneous waste are packed into larger boxes. Because of its low activity, this waste can be stored until enough is accumulated to permit economical transportation to an off-site burial ground for final disposal.

The capability exists to bring a shipping container into the truck bay during periods of peak waste generation. Bagged dry active waste can be directly loaded into the shipping container for burial or processing in off-site facilities. A truck scale is provided to ensure optimum shipping/disposal weight of the shipping container.

Cartridge filters that are not placed in HICs are placed in suitability-sized containers meeting DOT requirements.

The estimated shipped waste volumes from processing dry active wastes are presented in Table 11.4-2.

Container Storage Subsystem

On-site storage space for 6-months volume of packaged waste is provided. Packaged waste includes HICs, shielded filter containers and 55-gallon (200-liter) drums as necessary. The container storage schemes and sequencing is shown in Figure 11.4-1

11.4.2.3 Detailed System Component Description

The major components of the SWMS are as follows:

Pumps

Two types of pumps are utilized in the SWMS.

The SWMS process pumps are centrifugal pumps constructed of materials suitable for the intended service.

Air-operated, double-diaphragm type pumps are utilized in dewatering stations.

Tanks

Tanks are sized to accommodate a sufficient volume of waste sludges or bead resin to fill a HIC. The SWMS tanks are sized for normal plant waste volumes with sufficient excess capacity to accommodate equipment downtime and expected maximum volumes that may occur. The tanks are constructed of stainless steel to provide a low corrosion rate during normal operation. They are provided with mixing eductors and/or air spargers. The capability exists to sample all SWMS tanks. All SWMS tanks are vented through a filtration unit and the exhausted air is eventually discharged into the plant vent. The SWMS tanks are designed in accordance with ASME Section III, Class 3; API 620; API 650 or AWWA D-100.

The vent and overflow nozzles of the spent resin tank are equipped with fine mesh screens to minimize spread of particulate contamination to the radwaste tank vent system.

Piping

Piping used for hydraulic transport of slurries such as ion exchange resins, filter backwash (sludge), and waste tank sludge are specifically designed to assure trouble-free operation. Pipe flow velocities are sufficient to maintain a flow regime appropriate to the slurry being transported (ion exchange resins, filter backwash, or tank sludge). An adequate water/solids ratio is maintained throughout the transfer. Slurry piping is provided with automatic flushing with a sufficient water volume to flush the pipe clean after each use, e.g., at least two pipe volumes.

Venting

Makeup and exhaust ventilation is described in Section 9.4.

Mobile Systems

Solid radwaste processing is performed using mobile systems. These mobile systems are typically comprised of unit operations and chemical reactors intended to enhance the versatility, efficiency and yield in radwaste processing and waste minimization. State of the art processing equipment for the first mobile systems is depicted on Figure 11.4-1 and could include pumps, tanks, dewatering equipment, dryers, packaging equipment, sorting equipment, and ancillary equipment. The mobile processing equipment is anticipated to be modernized as more effective technologies are discovered and proved throughout the life of plant operation. To effect this modernization, the various systems, structures and components associated with the mobile systems may be grouped or associated on or in skids or assemblies, perhaps with process, instrumentation, electrical, support system, and/or mounting connections, or be stand alone pieces of equipment. The mobile systems work in conjunction with permanent radwaste

equipment and should be sized accordingly, both physically and as per processing capability. Solid waste system permanent equipment is described throughout Section 11.4. Liquid waste processing is described in Section 11.2. Ventilation is described in Section 9.4. The radwaste building structure is described in Section 3.8. Instrumentation requirements are described in Section 11.4.5. The COL holder is responsible for reviewing that the systems, structures, components and operation of the initial, and then subsequently updated future, mobile systems comply with the requirements of NUREG-0800 Draft Rev. 3 – April 1996, Section 11.4 Solid Waste Management Systems, including Branch Technical Position – ETSB 11-3, Regulatory Guide 1.143, Regulatory Guide 8.8 and Regulatory Guide 8.10. The COL holder is responsible for evaluating the initial, and then subsequently updated future, mobile systems per the guidance and information in IE Bulletin 80-10, May 6, 1980 for the express purpose of identifying and rectifying connections that are considered as nonradioactive, but could become radioactive through interfaces with radioactive systems, i.e., a nonradioactive system that could become contaminated due to leakage, valving errors or other operating conditions in radioactive systems. The COL holder is responsible for developing, and updating, as necessary, for the initial, and subsequently updated future, mobile systems, a Process Control Program as described in Generic Letter 89-01, January 31, 1989, specifically, Enclosure 3, Section 6.13 Process Control Program (PCP).

11.4.3 Safety Evaluation

The SWMS has no safety-related function. There is no liquid plant discharge from the SWMS. Failure of the subsystem does not compromise any safety-related system or component nor does it prevent shutdown of the plant. No interface with the Class 1E electrical system exists.

As mobile waste processes are selected for use, during the design stage before installation of final hook-up and connection with the permanent plant SWMS systems, the issues of IE Bulletin No. 80-10, dated May 6, 1980, will be evaluated by the COL holder for the express purpose of ensuring that systems considered as nonradioactive, but could become radioactive through interfaces with radioactive systems, remain nonradioactive.

11.4.4 Testing and Inspection Requirements

The SWMS is given a pre-operational test as discussed in Chapter 14. Thereafter, portions of the subsystems are tested as needed.

The COL holder is responsible for testing new and subsequent mobile systems. These tests should include provisions of Regulatory Guide 8.8, as applicable.

During initial testing of the system, the pumps and the other equipment will be performance tested to demonstrate conformance with design flows and process capabilities. An integrity test is performed on the system upon completion.

Provisions are made for periodic inspection of major components to ensure capability and integrity of the subsystems.

11.4.5 Instrumentation Requirements

The SWMS is operated and monitored from the radwaste control room or local operating stations within the facility. Major system parameters, i.e., tank levels, process flow rates, etc., are

indicated (recorded and alarmed as required) to provide operational information and performance assessment. Key system alarms are repeated in the main control room. Instruments, including back flushing provisions, are located in low radiation areas when possible, as described in Section 12.3.1.1.2. These back flushing provisions are designed within the direction of IE Bulletin 80-10.

11.4.6 COL Information

The COL holder is responsible for updating Table 11.4-1 to reflect mobile system component capacities.

The COL holder is responsible for updating Section 11.4 to include new figures and/or update existing figures to depict the process flow diagram representative of each mobile system, as applicable.

Mobile Systems

The solid radwaste processing is performed using mobile systems. These mobile systems are typically comprised of unit operations sections and chemical reactors intended to enhance the versatility, efficiency and yield in radwaste processing and waste minimization. State of the art processing equipment for the first mobile systems is depicted on Figure 11.4-1 and could include pumps, tanks, dewatering equipment, dryers, packaging equipment, sorting equipment, and ancillary equipment. The mobile processing equipment is anticipated to be modernized as more effective technologies are discovered and proved throughout the life of plant operation. To effect this modernization, the various systems, structures and components associated with the mobile systems may be grouped or associated on or in skids or assemblies, perhaps with process, instrumentation, electrical, support system, and/or mounting connections, or be stand alone pieces of equipment. The mobile systems work in conjunction with permanent radwaste equipment and should be sized accordingly, both physically and as per processing capability. Solid waste system permanently installed equipment is described throughout Section 11.4. Liquid waste processing is described in Section 11.2. Ventilation is described in Section 9.4. The radwaste building structure is described in Section 3.8. Instrumentation requirements are described in Section 11.4.5. The COL holder is responsible for reviewing that the systems, structures, components and operation of the initial, and then subsequently updated future, mobile systems comply with the requirements of NUREG-0800 Draft Rev. 3 – April 1996, Section 11.4 Solid Waste Management Systems, including Branch Technical Position – ETSB 11-3, Regulatory Guide 1.143, Regulatory Guide 8.8 and Regulatory Guide 8.10. The COL holder is responsible for evaluating the initial, and then subsequently updated future, mobile systems per the guidance and information in IE Bulletin 80-10, May 6, 1980 for the express purpose of identifying and rectifying connections that are considered as nonradioactive, but could become radioactive through interfaces with radioactive systems, i.e., a nonradioactive system that could become contaminated due to leakage, valving errors or other operating conditions in radioactive systems. The COL holder is responsible for developing, and updating, as necessary, for the initial, and subsequently updated future, mobile systems, a Process Control Program as described in Generic Letter 89-01, January 31, 1989, specifically, Enclosure 3, Section 6.13 Process Control Program (PCP).

The COL holder is responsible for developing and maintaining programs identified in the administrative controls section of the Technical Specifications per the requirements of Title 10

Code of Federal Regulations Part 50.36a, as described in the Standard Review Plan 11.4, Draft Rev 3 – April 1996, Section III.9.

The COL holder is responsible for testing new and subsequent mobile systems. These tests should include provisions of Regulatory Guide 8.8, as applicable.

The inclusion of a temporary storage facility and an overall site management plan per NUREG-0800 Standard Review Plan 11.4, Draft Rev 3-April 1996, Appendix 11.4-A may be required.

The COL holder is responsible to include site-specific information in Section 11.4.1 describing how the implementation of operating procedures and design features for installation and operation of the mobile/portable SWMS will address the requirements of Part 20.1406. Specifically the operational procedures and design of the mobile/portable SWMS should minimize, to the extent practicable, contamination of the facility and the environment, facilitate decommissioning, and minimize the generation of radioactive wastes. This information may be placed into Section 12.6 provided applicable referencing is included in Section 11.4.1.

It is assumed the COL holder will compact waste using a third party service. The Table 11.4-2 waste volume reduction will be considered and determined by the COL holder depending on the type and level of waste and the waste compacting equipment and resulting compaction performance.

Waste will be classified as A, B, or C and meet the requirements of the waste treatment facility or repository per Title10 Code of Federal Regulations, Parts 61.55 and 61.56.

The COL holder is responsible to ensure that mobile systems comply with the requirements of Regulatory Guide 1.143 Revision 2, November 2001.

The COL holder is responsible for the mobile transport of radwaste, including compliance with Title 20 Code of Federal Regulations, Part 20 Appendix G and Title 40 Code of Federal Regulations, Part 190.

As mobile waste processes are selected for use, during the design stage before installation of final hook-up and connection with the permanent plant SWMS systems, the issues of IE Bulletin No. 80-10, dated May 6, 1980, will be evaluated by the COL Holder for the express purpose of ensuring that systems considered as nonradioactive, but could become radioactive through interfaces with radioactive systems, remain nonradioactive.

11.4.7 References

11.4-1 NUREG-0800, Standard Review Plan, 11.4 Solid Waste Management System, DRAFT Rev. 3 – April 1996

11.4-2 Regulatory Guide 1.143 Revision 2, November 2001

11.4-3 Regulatory Guide 8.8, Revision 3, June 1978

11.4-4 Regulatory Guide 8.10, Revision 1-R, September 1975

11.4-5 Title10 Code of Federal Regulations, Part 20.1302

11.4-6 Title10 Code of Federal Regulations, Part 20.1406

11.4-7 Title10 Code of Federal Regulations, Part 20 Appendix B

11.4-8 Title10 Code of Federal Regulations, Part 20 Appendix G

11.4-9 Title10 Code of Federal Regulations, Part 50.34a

11.4-10 Title10 Code of Federal Regulations, Part 50.36a

11.4-11 Title10 Code of Federal Regulations, Part 50 Appendix A General Design Criteria 60

11.4-12 Title10 Code of Federal Regulations, Part 50 Appendix A General Design Criteria 61

11.4-13 Title10 Code of Federal Regulations, Part 50 Appendix A General Design Criteria 63

11.4-14 Title10 Code of Federal Regulations, Part 50 Appendix A General Design Criteria 64

11.4-15 Title10 Code of Federal Regulations, Part 61.55

11.4-16 Title10 Code of Federal Regulations, Part 61.56

11.4-17 Title 40 Code of Federal Regulations, Part 190

11.4-18 IE Bulletin 80-10, May 6, 1980

11.4-19 Generic Letter 89-10, January 31, 1989, specifically, Enclosure 3, Section 6.13 Process Control Program, PCP

Table 11.4-2

Annual Shipped Waste Volumes♦

Waste Type	Estimated Annual Waste Generation m^3/yr (ft^3/yr)	Estimated Shipped Volume* m^3/yr (ft^3/yr)
Dry Active Solids (DAW):		
Combustible waste:	225 (7,951)	225 (7,951)
Compactable waste:	38 (1,343)	38 (1,343)
Other waste:	100 (3,534)	100 (3,534)
DAW Total	363 (12,827)	363 (12,827)
Wet Solid Wastes:		
RWCU Spent Bead Resin:	7.6 (269)	7.6 (269)
FAPCS Spent Bead Resin:	8.0 (283)	8.0 (283)
Condensate Purification System Spent Bead Resin:	33.8 (1,194)	33.8 (1,194)
LWMS Spent Bead Resin:	5.4 (191)	5.4 (191)
Condensate Purification System Filter Sludge:	5.2 (184)	5.2 (184)
LWMS Filter Sludge:	0.8 (28.3)	0.8 (28.3)
LWMS Concentrated Waste:◊	50 (1,767)	25 (883)
Wet Solid Waste Total	111 (3,922)	85.8 (3,032)

♦ It is assumed the COL holder will compact waste using a third party service. The waste volume reduction will be considered and determined by the COL holder depending on the type and level of waste and the waste compacting equipment and resulting compaction performance.

* Note the goal value is a long term average of resins and sludges in the dewatered condition and all other wastes packaged for shipment. The values for resins and sludges in the above table are volumes packaged for shipment.

◊ The volume reduction is based on LWMS Concentrated Waste moisture removal. An estimate of 50% volume reduction is thought to be conservative based on current moisture removal technologies, such evaporation and membrane-based operations.

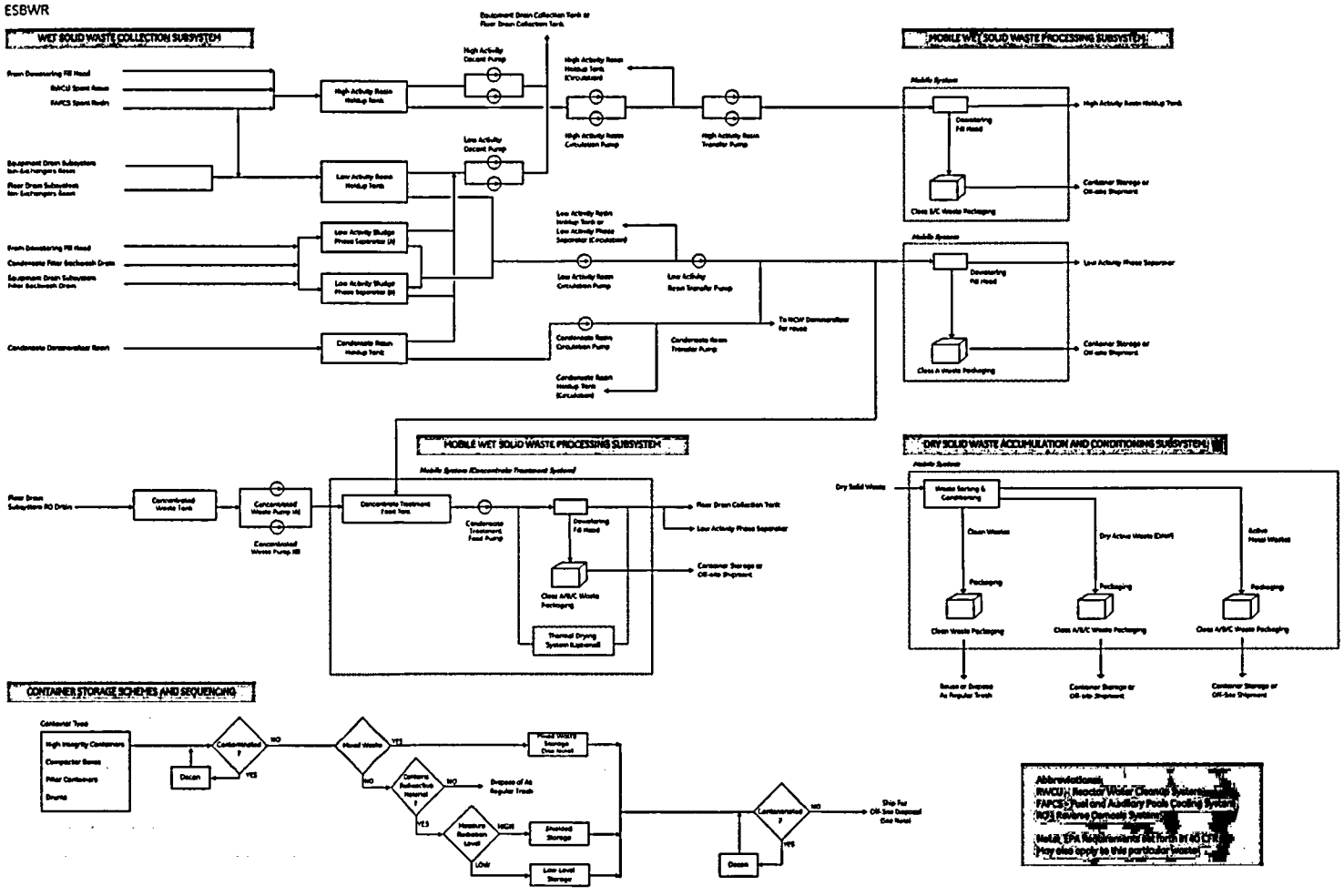

Figure 11.4-1. Solid Waste Management System Process Diagram