Texas Commission on Environmental Quality

INITIAL DRAFT RADIOACTIVE MATERIAL LICENSE

Pursuant to the Texas Radiation Control Act, Texas Commission on Environmental Quality, and Title 30 of the Texas Administrative Code (30 TAC), and in reliance on statements and representations heretofore made by the Licensee, a license is hereby issued authorizing the Licensee to receive, possess, use, store, dispose and transfer radioactive material listed below; and to use such radioactive material for the purpose(s) and at the place(s) designated below. This license is subject to all applicable rules, regulations and orders of the Texas Commission on Environmental Quality now or hereafter in effect and to any conditions specified below.

LICENSEE	This license is issued in response to an original application dated: August 3, 2004 signed by: Dean Kunihiro
1. Name: WASTE CONTROL SPECIALISTS, LLC ATTN: GUY CRAWFORD, Ph.D. 2. Address: THREE LINCOLN CENTER 5430 LBJ FREEWAY, SUITE 1700 DALLAS, TEXAS 75240	3. License Number: **RW4100** Amendment Number: **00** PREVIOUS AMENDMENTS ARE VOID
RADIOACTIVE MATERIAL AUTHORIZED	4. Expiration Date: 15 years from the Date of Issuance

5. Radioisotope	6. Form of Material	7. Maximum Volume and Radioactivity	8. Authorized Use
A. Low-level radioactive waste as defined at Texas Health and Safety Code Section 401.004. B. Low-level radioactive waste is limited to Compact Waste and Federal Facility Waste as defined at Texas Health and Safety Code Section 401.2005 C. Source material not to exceed 30,000 kilograms D. Special nuclear material not to exceed 350 grams total of U-235 or 200 grams of plutonium or any combination of these provided the sum of the ratios of the quantities does not exceed unity	A. Dry packaged low-level radioactive waste, except as authorized in this license	A. For the Compact Waste Facility: Total volume not to exceed 2,310,000 cubic feet and total radioactivity not to exceed 3,890,000 curies B. For the Federal Facility Waste Facility: Total volume of federal facility waste limited to 26,000,000 cubic feet and total radioactivity not be exceed 5,600,000 curies Of totals, not more than a total volume of 8,100,000 cubic feet (or 300,000 cubic yards) and total radioactivity of 5,500,000 curies of Class A Containerized, Class B, and Class C low-level radioactive waste, collectively.	A. Receipt of low-level radioactive waste from other persons for near-surface land disposal B. Receipt is limited to Compact Waste and Federal Facility Waste as defined at Texas Health and Safety Code Section 401.2005

RADIOACTIVE MATERIAL LICENSE	
License Number	Amendment Number
RW4100	00

General Requirements

9. This license authorizes the disposal of low-level radioactive waste, except Greater Than Class C low-level radioactive waste. No other material shall be accepted under this license. The receipt and/or disposal of spent fuel, high-level radioactive waste, by-product material, naturally-occurring radioactive material, hazardous waste, industrial solid waste, municipal solid waste, liquid waste, explosive or pyrophoric materials are specifically prohibited. Low-level radioactive waste intended for disposal shall be received, possessed, and disposed only at:

Site Number:	Location:
000	9998 West Highway 176, Andrews, Texas, 79714 - One mile north of State Highway 176; 250 feet east of the Texas and New Mexico State Line (30 miles west of Andrews, Texas).

10. The Licensee must comply with the provisions of 30 TAC Chapter 336, Subchapters A (General Provisions), B (Radioactive Substance Fees), C (General Disposal Requirements), D (Standards For Protection Against Radiation), E (Notices, Instructions and Report to Workers and Inspections), G (Decommissioning Standards), H (Licensing requirements for Near Surface Land Disposal of Low-Level Radioactive material), I (Compact Waste Disposal Facility Application Selection Process), J (Federal facility Waste Disposal Facility) and Chapter 37 (Financial Assurance).

11. Words and terms used in this license are defined in 30 TAC Chapter 336. The following words and terms, when used in this license, shall have the following meaning:

A. Buffer Zone – A portion of the disposal site that is controlled by the Licensee and that lies under the disposal units and between the disposal units and the boundary of the disposal site.

B. Bulk Material – Material that is soil or soil-like in its physical form.

C. Compact - The Texas Low-Level Radioactive Waste Disposal Compact established under Texas Health and Safety Code, §403.006 and Texas Low-Level Radioactive Waste Disposal Compact Consent Act, Public Law Number 105-236 (1998) (Compact).

D. Compact Waste - Low-level radioactive waste that is generated in Texas or a party state; or is not generated in Texas or a party state, but has been approved for importation to Texas by the Compact Commission under §3.05 of the Compact established under Texas Health and Safety Code, §403.006.

E. Compact Waste Disposal Facility – The low-level radioactive waste land disposal facility licensed by the Commission for the disposal of compact waste.

F. Commission – The Commissioners of the Texas Commission on Environmental Quality acting in their official capacity.

G. Commencement of Major Construction – Any clearing of land, excavation, or other substantial action that would adversely affect the environment of a land disposal facility. The term does not mean disposal site exploration, necessary roads for disposal site exploration, borings to determine foundation conditions, or other preconstruction monitoring or testing to establish background information related to the suitability of the disposal site or the protection of environmental values.

H. Container – A sealed, flexible or rigid drum, pail, box, sack, or similar container which does not tear, split, or rupture upon handling, placement, and compaction in the disposal unit; and which does not lose its structural strength and integrity when contacting water. Acceptable containers may include, but are not limited to, approved U.S. Department of Transportation containers.

RADIOACTIVE MATERIAL LICENSE	
License Number	Amendment Number
RW4100	00

General Requirements

I. Containerized – To be confined within a container.

J. Disposal Site – That portion of a land disposal facility which is used for disposal of waste. It consists of disposal units and a buffer zone.

K. Disposal Units – A discrete portion of the land disposal facility into which waste is placed for disposal. For near-surface disposal as authorized by this license, the disposal unit is a trench.

L. Excavation – Those subset of activities comprising Construction that involve the removal of native materials (e.g., soils) at the site for the construction of the Land Disposal Facility features, such as, the disposal units, receiving pad, contact water storage pad, decontamination building or any other structure.

M. Executive Director - The Executive Director of the Texas Commission on Environmental Quality (TCEQ), or any authorized individual designated to act for the Executive Director in the administration of the license and the rules of the TCEQ (for example, reporting, inspection, emergency response, etc.).

N. Federal Facility Waste - Low-level radioactive waste that is the responsibility of the federal government under the Low-Level Radioactive Waste Policy Act, as amended by the Low-Level Radioactive Waste Policy Amendments Act of 1985 (42 United States Code, §2021b - 2021j). Excluded from this definition is low-level radioactive waste that is classified as greater than Class C as defined in 30 TAC §336.362.

O. Federal Facility Waste Disposal Facility – low-level radioactive waste land disposal facility for the disposal of federal facility waste.

P. Land Disposal Facility - All land, buildings and structures, and equipment which are intended to be used for the disposal of low-level radioactive wastes into the subsurface of the land. For the purposes of the license, the term shall mean both the Compact Waste Disposal Facility and Federal Facility Waste Disposal Facility.

Q. Licensed site – Has the same meaning as the Land Disposal Facility.

R. Low-level radioactive waste – Radioactive material that is discarded or unwanted and is not exempt by a Texas rule adopted under the Texas Health and Safety Code, §401.106; is waste, as that term is defined by Title 10 Code of Federal Regulations (CFR) §61.2; and is subject to: concentration limits and disposal criteria established in 30 TAC Chapter 336. Low-level radioactive waste does not include: high-level radioactive waste defined by 10 CFR §60.2; spent nuclear fuel as defined by 10 CFR §72.3; transuranic waste as defined in 30 TAC Chapter 336; by-product material as defined in 30 TAC Chapter 336; naturally-occurring radioactive material (NORM) waste; or oil and gas NORM waste.

S. Operations – The receipt of low-level radioactive waste for disposal from other persons and/or the emplacement of low-level radioactive waste into a disposal unit and any other activities associated with the receipt and emplacement of low-level radioactive waste. A land disposal facility is in operation from the day that low-level radioactive waste is first received until the day final closure begins.

T. Restricted Area – Has the same meaning as Disposal Site.

U. Site – The contiguous land area where the land disposal facility or activity is physically located or conducted including adjacent land used in connection with the land disposal facility or activity, and includes soils and groundwater contaminated by radioactive material. Activity includes the receipt, storage, processing, or handling of radioactive material for purposes of disposal at a land disposal facility

V. Waste – Has the same meaning as Low-level radioactive waste.

RADIOACTIVE MATERIAL LICENSE	
License Number	Amendment Number
RW4100	00

General Requirements

12. The following are related to the designated Radiation Safety Officer under this license:

A. The individual proposed to be designated to perform the functions of Radiation Safety Officer (RSO) for activities covered by this license is to be Guy Crawford, Ph.D.

B. The RSO shall be the primary contact between the Licensee and the TCEQ for all matters relating to this license and radiation safety.

C. Any request for amendment of the license shall be submitted under the signature of the RSO.

D. The Licensee shall provide a resolution from its board of directors, attested by the secretary of the corporation, that the Licensee has delegated to the radiation safety officer position the authority to act for and on behalf of the Licensee in all matters relating to radiation safety matters and this radioactive material license.

E. The Licensee shall revise organizational chart and the description of the duties, responsibilities and authorities of the RSO submitted in the application to depict and specify that the designated RSO has a direct line of communication with the Licensee's President on all matters pertaining to radiation safety and compliance with the conditions of this license and the applicable rules.

F. The Licensee shall require and document the following qualifications of any person to be designated to serve as the RSO for this license:

(1) A bachelor's degree in the physical or biological sciences, industrial hygiene, or engineering from an accredited college or university or an equivalent combination of education and relevant experience in uranium recovery, waste processing or production facility radiation protection. Two years of relevant experience is considered equivalent to one (1) year of academic study.

(2) At least one (1) year of work experience relevant to low-level radioactive waste management and disposal operations in applied health physics, radiation protection, industrial hygiene, or similar work. This experience should involve directly working with radiation detection and measurement equipment, not strictly administrative work. This experience should be in addition to any experience that is used to meet the educational requirement.

(3) At least four (4) weeks of specialized classroom training in health physics specifically applicable to low-level radioactive waste management and disposal operations.

(4) The RSO should attend refresher training on low-level radioactive waste management and disposal operations related to health physics every two (2) years.

G. The RSO shall ensure that the radiation safety program provides, as a minimum, the same qualifications and same training as is provided to radiation safety technicians for all other positions at the land disposal facility involved with the administration and/or execution of the radiation safety program.

13. Copies of all active documents and records required by this license must be maintained for the Executive Director's review at 9998 West Highway 176, Andrews, Texas, 79714.

RADIOACTIVE MATERIAL LICENSE	
License Number	Amendment Number
RW4100	00

General Requirements

14. This license may be revoked, suspended, or modified, in whole or in part, for any material false statement in the application or any statement of fact required under provisions of the Texas Radiation Control Act (TRCA), or because of conditions revealed by any application or statement of fact or any report, record, or inspection or other means that would warrant the Commission to refuse to grant a license on the original application, or for failure to operate the facility in accordance with the terms of the license, or for any violation of or failure to observe any of the terms and conditions of the TRCA or other applicable law or the license or of any rule or order of the Commission.

15. The Licensee must confine possession and disposal of low-level radioactive waste to the locations and purposes authorized in the license.

16. The Licensee shall maintain records of the types, forms, and quantities of low-level radioactive waste and hazardous waste disposed at the site. This information shall be used during decommissioning and to update the dose modeling prior to license termination. This information shall be retained throughout the operating life of the facility and upon license termination, transferred to the custodial agency.

17. The Licensee must notify the Executive Director within seven (7) days of receipt of a citation, petition, summons, warrant or other notice of a civil, administrative, or criminal proceeding by a city, county, state, or federal authority relating to the site, land disposal facility, activities, Licensee, managers, or employees at the site.

18. The Licensee must notify the Executive Director within four (4) hours of any temporary or permanent closure of the facility or the occurrence of any event that causes the site to be closed beyond the regular schedule of operation.

19. The Licensee may not transfer the real property on which the Federal Facility Waste Disposal Facility is located except to the federal government. The Licensee may not use the property on which the land disposal facilities are located as security or collateral or otherwise subject the real property to foreclosure or possession by a person who is not the state or federal government or the Licensee.

20. Upon issuance of this license, the Licensee shall convey all right, title and interest in land and buildings for the Compact Waste Disposal Facility to the State of Texas together with requisite rights of access to the property.

21. The Licensee must cease any activity authorized under this license when directed to do so by the Executive Director or the resident inspector as necessary to protect the public health and safety and the environment.

22. The Licensee must submit an annual report to the Executive Director on the status of the land disposal facilities, including projection of the facilities' anticipated future capacity.

23. The Licensee has a duty to comply with all license conditions. Failure to comply with any license condition is a violation of the license and statutes under which the license is issued and is grounds for enforcement action, for license amendment, revocation, or suspension, or for denial of a license renewal application or an application for a license or permit for another facility.

24. The Licensee must apply for an amendment or renewal before the expiration of the existing license in order to continue a licensed activity after the expiration of the license. Authorization to continue such activity terminates upon the effective denial of said application.

25. It is not a defense in an enforcement action that it would have been necessary to halt or reduce the licensed activity to maintain compliance with the license conditions.

26. The Licensee must take all reasonable steps to minimize or prevent any discharge, disposal, or other license violation which has a reasonable likelihood of adversely affecting human health or the environment.

27. The Licensee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) installed or used by the Licensee to achieve compliance with the license conditions.

RADIOACTIVE MATERIAL LICENSE	
License Number	Amendment Number
RW4100	00

General Requirements

28. The Licensee must furnish to the Executive Director, upon request and within a reasonable time, any information to determine whether cause exists for amending, revoking, suspending, or terminating the license, and copies of records required to be kept by the license.

29. This provision is related to indemnification of TCEQ:

A. Upon license issuance, to the fullest extent permitted by law, Licensee shall indemnify and hold harmless the TCEQ and its officers, employees, agents, principals and assigns from and against all fines, penalties, claims, damages, losses, demands, judgments, settlements, punitive damages, costs of suit, attorneys' fees and delays to other contractors, whether arising in tort or otherwise, whether arising under the Texas Tort Claims Act or otherwise, and whether or not the parties are individually or jointly responsible for any damages, that arise out of or result from:

(1) Work performed in connection with this license by the Licensee or any of its agents, employees, subcontractors, or suppliers or their agents or employees, **whether or not such work is negligently or recklessly performed**;

(2) **Licensee's handling of a hazardous substance or performance of an inherently hazardous activity**;

(3) The negligent, reckless, or intentional acts or omissions of Licensee or any of its agents, employees, subcontractors, or suppliers or their agents or employees;

(4) The Licensee's failure to comply with any license requirement, covenant, warranty, or representation;

(5) **Any claim against the TCEQ relating to its issuing or not issuing this license, or regulatory enforcement or lack of enforcement of this license, or including or not including any terms, provisions, or requirements in this license**;

(6) **Personal injury or bodily injury (including death) to the Licensee's own employees, contractor's, or contractors' employees, subcontractors, or subcontractor's employees, suffered as a result of the Licensee's performance or lack of performance of any activities related to this license;**

(7). **The acts or omissions of negligence of Commission or any of TCEQ's officers or employees; or**

(8). **The acts or omissions of gross negligence of any TCEQ officer or employee arising out of or in connection with the Licensee's performance of any activities related to this license**.

(9)**. Any condition of tangible property on or related to the site, whether or not TCEQ owns or has control over the site or any of the conditions at the site.**

B. **This indemnity obligation shall NOT be apportioned according to contribution, in negligence or otherwise, but shall apply to the entire such claim, damage, loss, demand, judgment, expense, or attorneys fees, regardless of whether it is caused in whole or in part by a party indemnified hereunder (including the negligent act or omission of the TCEQ or its employees)**.

This indemnity obligation shall survive termination of the License. The Licensee must give notice to the Executive Director before physical alterations or additions to the licensed facility if such alterations or additions would require a license amendment or result in a violation of license requirements.

30. Authorization from the Executive Director is required before beginning any change in the licensed facility or activity that would result in noncompliance with other license requirements.

RADIOACTIVE MATERIAL LICENSE	
License Number	Amendment Number
RW4100	00

General Requirements

31. Unless subject to a different reporting requirement in this license or under 30 TAC §336.335 (relating to Reporting Requirements for Incidents), the Licensee must report any noncompliance to the Executive Director which may endanger human health or safety or the environment. Such information must be provided orally within twenty four (24) hours from the time the Licensee becomes aware of the noncompliance. A written submission must also be provided within five days of the time the Licensee becomes aware of the noncompliance. The written submission must contain a description of the noncompliance and its cause; the potential danger to human health or safety, or the environment; the period of noncompliance, including exact dates and times; if the noncompliance has not been corrected, the time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance, and to mitigate its adverse effects.

32. Inspection and entry must be allowed under Texas Water Code, Chapters 26 - 28 and 32, Texas Health and Safety Code, Sections 361.032, 361.033, 361.037, and 401.063, and Title 40 Code of Federal Regulations, Section 122.41(i). The statement in Texas Water Code, Section 26.014, that Executive Director entry of a facility must occur in accordance with an establishment's rules and regulations concerning safety, internal security, and fire protection is not grounds for denial or restriction of entry to any part of the facility, but merely describes the Executive Director's duty to observe appropriate rules and regulations during an inspection.

33. The license may not be transferred except on approval of the Commission.

34. All reports and other information requested by the Executive Director must be signed by the person and in the manner required by Title 30, Texas Administrative Code, Section 305.128.

35. This license may be amended, suspended and reissued, or revoked for cause. The filing of a request by the Licensee for a license amendment, suspension and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any license condition.

36. This license does not convey any property rights of any sort, or any exclusive privilege.

37. Monitoring results must be provided at the intervals specified in the license.

38. Where the Licensee becomes aware that it failed to submit any relevant facts in a license Application, or submitted incorrect information in an application, or in any report to the Executive Director, it must promptly submit such facts or information.

39. At any time before termination of the license, the Licensee must submit written statements under oath upon request of the Commission or the Executive Director to enable the Commission to determine whether or not the license should be modified, suspended or revoked.

40. The license or portion thereof will be transferred to the custodial agency only on the full implementation of the final closure plan as approved by the Commission, including post-closure observation and maintenance.

41. No waste may be disposed of until the Executive Director has inspected the facility and has found it to be in conformance with the description, design, and construction described in the application for the license. No waste may be received for disposal at the site until the Executive Director has approved financial assurance and disposal site ownership arrangements.

42. The Commission may incorporate in this license at the time of issuance, or thereafter, by appropriate rule or order, additional requirements and conditions with respect to the Licensee's receipt, possession, and disposal of wastes as it deems appropriate or necessary in order to: (1) protect the health and safety of the public and the environment; or (2) require reports and recordkeeping and to provide for inspections of activities under the license that may be necessary or appropriate to effectuate the purposes of the Texas Radiation Control Act and rules thereunder.

43. Ninety (90) days prior to the receipt of federal facility waste, the Licensee must indemnify the Commission, the state, and its officers and agents for any liability imposed on the Commission or state under state or federal law for damages, removal, or remedial action with respect to the land, the facility, or the federal waste accepted, stored, or disposed of. The Licensee may not receive federal facility waste until the Executive Director approves the indemnification in writing.

RADIOACTIVE MATERIAL LICENSE	
License Number	Amendment Number
RW4100	00

General Requirements

44. Notice of Bankruptcy.

(A) The Licensee must notify the Executive Director, in writing, immediately following the filing of a voluntary or involuntary petition for bankruptcy under any chapter of Title 11 (Bankruptcy) of the United States Code (11 USC) by or against:
(1) The Licensee;
(2) An entity (as that term is defined in 11 USC, Section 101(14)) controlling the Licensee or listing the license or Licensee as property of the estate;
(3) An affiliate (as that term is defined in 11 USC, Section 101(2)) of the Licensee; or
(4) Valhi, Inc.

(B) This notification must indicate:
(1) The name of the Licensee;
(2) The Licensee number(s);
(3) The bankruptcy court in which the petition for bankruptcy was filed; and
(4) The date of filing of the petition.

45. Any leases, contracts, or other arrangements between the Licensee and the Commission with respect to the ownership and use of the property on which the compact waste disposal facility is located are subject to the laws of the State of Texas and are independent of the regulatory and administrative processes applicable to low-level radioactive waste disposal. By granting this license, the Commission does not waive any rights with respect to the ownership and use of the property on which the compact waste disposal facility is located.

46. The Licensee shall not receive or dispose of any waste not specifically characterized in the application. There is a prohibition on additional waste streams, including but not limited to uranium hexafluoride (UF_6) conversion waste, depleted uranium or similar waste, until complete waste profiles, radionuclides information, total radioactivity, radionuclide concentrations, chemical constituents, and analysis of any impacts to members of the public and the environment are reviewed and approved by amendment to this license.

47. The Licensee shall provide, on or near the required signs and labels, additional information, as appropriate, to make individuals aware of potential radiation exposures and ways to minimize the exposures.

48. The Licensee must use any reasonable means, including but not limited to fencing and security personnel, to prevent unauthorized entry into the restricted area of the site.

49. Upon license renewal and/or amendment, the Licensee must furnish the Executive Director with an updated map and cross-referenced list of adjacent landowners.

Preconstruction Requirements

50. Prior to construction, the Licensee shall conduct and provide to the Executive Director an updated performance assessment that incorporates the conditions of this license, includes the most current waste characterization data, and demonstrates compliance with the performance objectives of Title 30, Texas Administrative Code, § 336.723. This shall include, but not be limited to, data used for demonstrating compliance, how the data was collected, development of a conceptual model consistent with validated site characterization data, defining scenarios and pathways, selection of appropriate mathematical models and codes, calibration of the models/codes and the data output from execution of the codes, sensitivity and uncertainty analyses, and a determination of site adequacy in meeting the performance objectives. In demonstrating compliance with the performance objectives, the Licensee shall use conservative values in the models or codes to provide a greater level of confidence in the results. The use of models or codes should be consistent with the site conceptual model and any subsequent data collected at the site.. Upon each anniversary date of the license, the Licensee shall provide a performance assessment report that updates the performance assessment based on changes of conditions, assumptions, received source term, or any information needed to benchmark against the original performance assessment.

RADIOACTIVE MATERIAL LICENSE	
License Number	Amendment Number
RW4100	00

Preconstruction Requirements

51. Prior to commencement of major construction, the Licensee shall verify the elevations of the top of Dockum formation within the site area with sufficient spatial resolution to support any modeling relying upon these elevations.

52. Prior to commencement of major construction, the Licensee must submit verification modeling to demonstrate that the buffer zones established for the land disposal facility will be unsaturated at all times. This verification shall incorporate representative current and future climatic parameters in the license application, into the appropriate computer models.

53. Prior to commencement of major construction, the Licensee must run the necessary geophysical logs to determine the condition of cement behind pipe on the Central Industrial Well and any currently active oil and/or gas wells adjacent to the 1,338-acre general facilities area, to evaluate the likelihood of these well bores providing a conduit for contaminant transport to lower aquifers. Based on the condition of the cement behind pipe, appropriate remedial action may be required to be undertaken by the Licensee after conferring with the Executive Director.

54. Prior to commencement of major construction, the Licensee must demonstrate that the potential for water to flow from the Ogallala/Antlers/Gatuña to the lateral drainage layer of the final constructed cover will not affect the performance of the Compact Waste Facility and Federal Facility Waste Disposal Facility.

55. Prior to commencement of major construction, the Licensee shall conduct predictive numeric modeling studies to verify future unsaturated conditions in the buffer zone. The modeling shall incorporate sensitivity studies and analyses of uncertainties of the locations of the Ogallala/Antlers/Gatuña "dry line" and the Dockum formation water table.

56. Prior to commencement of major construction, the Licensee must install, maintain, and monitor erosion pin arrays on the north side of the Federal Facility Waste Disposal Facility as close to the disposal site as possible.

    A. Quarterly measurements of erosion made at the pins shall be taken and reported to the Executive Director.

    B. If this data indicates erosion to be occurring over the operational life of the facility, the Licensee must confer with the Executive Director to determine if the final cover design and closure plans require revision to take erosion into account.

57. Prior to commencement of major construction, the Licensee must verify and provide to the Executive Director design calculations for the geotextile layers. Design calculations must be reviewed and approved by Executive Director. Geotextiles used as filters must meet filtration criteria. The ability of the geotextile fabric located between the sand filter material and the biobarrier layer to retain its integrity during installation must be confirmed.

58. Prior to commencement of major construction, the Licensee shall verify the matric potential of the subsurface Dockum formation at the land disposal facility to locate the top of the zone of saturation. The Licensee must allow for observation by the Executive Director any verification measurements or testing, provide data and interpretation of the results in a report to the Executive Director.

59. Prior to commencement of major construction, the Licensee must reconcile the differences in the descriptions of site drainage and site soils between the surficial geology report and the floodplain report provided in the license application. The reconcilation must be reviewed and approved by the Executive Director.

60. Prior to commencement of major construction, the Licensee must identify and report any changes to 100-year, 500-year, and Probable Maximum Precipitation (PMP) floodplains anticipated to arise as a result of future climatic conditions described in the license application. The reports must be reviewed and approved by the Executive Director.

RADIOACTIVE MATERIAL LICENSE	
License Number	Amendment Number
RW4100	00

Preconstruction Requirements

61. Prior to commencement of major construction, the Licensee shall perform and report the results for Executive Director review of the following verification and monitoring studies:

A. Installation and sampling of eight (8) additional borings inside the perimeter of the Compact Waste Disposal Facility, to verify unsaturated conditions immediately outside the disposal unit. These borings must be located as follows: one at each corner of the Compact Waste Disposal Facility, and one additional boring evenly spaced along each side of the disposal site, and to a depth of at least the upper one (1) foot of the Dockum formation.

The measurement methods selected should provide for verification of unsaturated conditions prior to construction, and for annual verification, thereafter. Should any of these measurements indicate saturated conditions, operations must cease to accommodate additional sampling, verification, or testing.

B. Installation and sampling of eight (8) additional borings inside the perimeter of the Compact Waste Disposal Facility, to verify unsaturated conditions immediately outside the disposal unit. These borings must be located as follows: one at each corner of the Compact Waste Disposal Facility, and one additional boring evenly spaced along each side of the disposal site, and to a depth of at least within one (1) foot of the bottom of the disposal unit as provided in this license.

The measurement methods selected should provide for verification of unsaturated conditions prior to construction, and for annual verification, thereafter. Should any of these measurements indicate saturated conditions, operations must cease to accommodate additional sampling, verification, or testing.

C. Installation and sampling of twelve (12) additional borings inside the perimeter of the Federal Facility Waste Disposal Facility, to verify unsaturated conditions immediately outside the disposal unit. These borings must be located as follows: one at each corner of the Federal Facility Waste Disposal Facility, and two additional borings evenly spaced along each side of the disposal site, and to a depth of at least the upper one (1) foot of the Dockum formation.

The measurement methods selected should provide for verification of unsaturated conditions prior to construction, and for annual verification, thereafter. Should any of these measurements indicate saturated conditions, operations must cease to accommodate additional sampling, verification, or testing.

D. Installation and sampling of twelve (12) additional borings inside the perimeter of the Disposal Facility, to verify unsaturated conditions immediately outside the disposal unit. These borings must be located as follows: one at each corner of the Federal Facility Waste Disposal Facility, and two additional borings evenly spaced along each side of the disposal site, and to a depth of at least within one (1) foot of the bottom of the disposal unit as provided in this license.

The measurement methods selected should provide for verification of unsaturated conditions prior to construction, and for annual verification, thereafter. Should any of these measurements indicate saturated conditions, operations must cease to accommodate additional sampling, verification, or testing.

E. Verification of the previous resistivity study to re-establish as closely as possible the original study, and extend to the south across the land disposal facility location. Borings must be installed and logged to calibrate the resistivity survey. If the survey indicates the Ogallala/Antlers/Gatuña formation “dry line” is located over the proposed facility, additional sampling, verification or testing must be proposed.

62. Prior to commencement of major construction, the Licensee shall complete seismic analyses demonstrating the structural stability of bulk and containerized waste during the operational phase of waste disposal, when the disposal units are open.

63. Prior to commencement of major construction, the Licensee shall verify and modify according to design changes in this license, the geographical coordinates of the area centroid and each of the four corners of each proposed disposal unit using global positioning system (GPS) with sub-meter accuracy.

RADIOACTIVE MATERIAL LICENSE	
License Number	Amendment Number
RW4100	00

Preconstruction Requirements

64. Prior to commencement of major construction, the Licensee shall verify the depictions of all existing and planned improvements on the site and revise the topographic maps relied upon accordingly.

65. Prior to commencement of major construction, the Licensee shall verify that salt dissolution will not impact the land disposal facility by placing one (1) boring and collecting core samples near the proposed land disposal facility from the lower part of Dockum formation group and into the salt-bearing section of the Salado Formation.

66. Prior to commencement of major construction, the Licensee shall verify the location of Quaternary faulting nearest to the land disposal facility.

67. Prior to commencement of major construction, the Licensee shall ensure that all applicable application materials and any subsequently provided information are in compliance with the Texas Engineering Practice Act, the Texas Geoscience Practice Act and the Texas Professional Land Surveying Practices Act.

68. Prior to commencement of major construction, the Licensee shall verify input parameters for native materials, including but not limited to, the lower boundary condition, of the infiltration computer models, HELP and VS2Di. Sensitivity analysis must be included in any verification runs incorporating all relevant parameters. Any revised analysis must be reviewed and approved by the Executive Director.

69. Prior to commencement of major construction, the Licensee must provide calculations originally contained in Appendix 3.0-3.14 of the application and implement this design, in order to reduce the possibility of localized erosion. The calculations must be consistent with NUREG 1623, using a design basis of the PMP.

70. Prior to commencement of major construction, the Licensee must verify the erosion modeling and include soil samples in a refined sampling grid to provide a better assessment of the regional erosion patterns. The erosion modeling must include sensitivity analysis. The modeling must be reviewed and approved by the Executive Director.

71. Prior to commencement of major construction, the Licensee must design a diversion ditch for "Area 1" and the seven (7) acre area that drains to the Compact Waste Disposal Facility in Volume 21, Appendix 3.0-3.1 of the application. The Licensee must also re-design the other surface water diversion ditches to include run-off from Areas 1 and Compact Waste Disposal Facility. All ditches must be designed to insure at least one foot (1') of freeboard and use riprap gravel to provide sufficient protection from scour. The revised design must be reviewed and approved by the Executive Director.

72. Prior to commencement of major construction, the Licensee shall ensure stormwater from the Federal Facility Waste Disposal Facility does not commingle with stormwater from the Compact Waste Disposal Facility. The Licensee's stormwater management plan should include drainage to a sedimentation pond sized to retain the 100-year storm event and an estimated volume of sediment produced by erosion over a ten (10) year period. The revised analysis and design of the various stormwater conveyances must be reviewed and approved by the Executive Director.

73. Prior to commencement of major construction, the Licensee must verify the adequacy of the leachate collection system, including but not limited to rise in hydraulic head of the drainage pipe at the center of the disposal unit in relation to the mounding equation used. Any design modification of the leachate collection system necessitated by the verification process, must use the 100-year, twenty four (24) hour storm event as the design basis for the leachate collection system in accordance with the application. The revised analysis and design must be reviewed and approved by the Executive Director.

Site Design and Construction Requirements

74. The Licensee must obtain written approval from the Executive Director prior to commencement of major construction of the land disposal facility.

75. The base of the disposal units within the Federal Facility Waste Disposal Facility must have a final elevation of no lower than 3370 feet mean sea level. The base of the disposal units is the lowest point at which waste will be disposed. The northernmost edge of the Federal Facility Waste Disposal Facility will be relocated to be at least 50 feet further from the Ogallala/Antlers/Gatuña "dry line" presented in the application. A revised design must be submitted for approval by the Executive Director.

RADIOACTIVE MATERIAL LICENSE	
License Number	Amendment Number
RW4100	00

Site Design and Construction Requirements

76. The Licensee shall maintain an individual buffer zone for both the Compact Waste Disposal Facility and the Federal Facility Waste Disposal Facility in a lateral perimeter of at least one hundred feet (100') around all disposed waste to allow monitoring for early detection of releases and to allow for remediation, if necessary. In the event that saturated conditions are detected in the buffer zone, the Licensee shall cease all waste disposal operations and notify the Executive Director immediately.

77. The Licensee shall maintain an individual buffer zone for both the Compact Waste Disposal Facility and the Federal Facility Waste Disposal Facility under the lowest point of disposed waste of adequate size to allow monitoring for early detection of releases and to allow for remediation, if necessary. In the event that saturated conditions are detected in the buffer zone, the Licensee shall cease all waste disposal operations and notify the Executive Director immediately.

78. The Compact Waste Disposal Facility and Federal Facility Waste Disposal Facility design and construction shall be in accordance with the application and specifications as modified by this license, and any applicable conditions of this license.

79. During excavation and construction of the disposal site, the Licensee shall provide weekly written reports and photographs to accommodate the Executive Director's inspection and observation of all excavation and construction activities and include a discussion of future construction activities. Particular attention must be directed to fractures, faults, any evidence of collapse features or groundwater flow, or unanticipated geologic features encountered. The Licensee shall cease excavation and construction when directed to do so by the Executive Director in order to sample, verify or test.

80. During excavation and construction of the disposal site, the Licensee shall perform geotechnical studies, and allow for observation by the Executive Director, to verify original geotechnical conditions by continuously monitoring parameters and features including, but not limited, to: soil moisture, bearing capacity, slope stability, and permeable soil stringers as construction progresses. The Licensee shall report verification results to the Executive Director and provide certification of geotechnical studies by a licensed geotechnical professional.

81. The Licensee shall verify during excavation and construction of the land disposal facility, by geotechnical sampling taken at the time of excavation and laboratory analysis, the original geotechnical soil design parameters and features including, but not limited to: soil moisture, bearing capacity, slope stability, and permeable soil stringers, as contained in the application. The Licensee shall cease excavation and construction when directed by the Executive Director in order to sample, verify or test.

82. During excavation and construction of the land disposal facility, the Licensee must conduct water level elevation measurements monthly on all wells completed in the Ogallala/Antlers/Gatuña formation, and report, in writing, these elevations to the executive director within ten (10) days, to monitor movement in the Ogallala/Antlers/Gatuña "dry line" as presented in the application. If the water level elevations are at or higher than the top of the Dockum formation at the facility, excavation shall cease in order to sample, verify or test.

83. During excavation and construction of the land disposal facility, the Licensee shall verify input parameters during excavation of materials and construction of disposal unit liners and covers of the infiltration computer models, HELP and VS2Di. Any revised analysis must be reviewed and approved by the Executive Director.

84. Disposal units under construction and partially filled units must be bermed to prevent water from entering the disposal unit. Low-level radioactive waste must not be placed into disposal units where water has accumulated.

85. All changes to the Compact Waste Disposal Facility and Federal Facility Waste Disposal Facility design must be authorized by the Executive Director. The Executive Director will review all the requests submitted by the Licensee for changes to the operations and facilities. The Comission may approve the changes by amending the license, as necessary.

86. The Licensee must obtain written authorization from the Executive Director prior to changing, adding, or deleting the codes and standards used for the design and construction of the facility as listed in the license application.

87. The Licensee must use American Water Works Association (AWWA) D102-06 for the inside coating and cathodic protection of all the leachate tanks serving the Compact Waste Disposal Facility and the Federal Facility Waste Disposal Facility.

88. The Licensee must provide additional thickness to the native conditioned layer in the evapotranspiration cover in order to

RADIOACTIVE MATERIAL LICENSE	
License Number	Amendment Number
RW4100	00

Site Design and Construction Requirements

support vegetation and store water as well as provide long term stability and protection from erosion. The cover design must be reviewed and approved by Executive Director prior to construction.

89. A minimum density of eighty five percent (85%) of the standard Proctor maximum dry density is specified for the native fine material layer in the evapotranspiration cover. The Licensee must specify a maximum density to ensure that the layer is not too dense to inhibit plant growth, including deeper rooted plants.

90. Any precipitation falling in the construction area of the disposal unit must be considered as leachate and managed according to the requirements in Title 30, Texas Administrative Code, Section 336.359, Appendix B, Table II.

91. The Licensee must measure hydraulic conductivities of the performance cover by taking at least one (1) measurement performed per 100 cubic yards of fill material. The Licensee must also measure maximum dry density of the performance cover by taking at least one (1) measurement performed per 200 cubic yards of fill material.

92. The Licensee must adhere to the design bases listed for all applicable design features and structures.

93. Sixty (60) days prior to the receipt of waste for disposal in the applicable disposal unit, the Licensee shall provide a final geotechnical report and "as-built" construction drawings for review by the executive director. The Licensee shall certify that the applicable disposal unit has been constructed in compliance with this license by a Texas registered professional engineer. Any deviation in the as-built drawings from the design and construction of and corresponding proposed modification to the applicable disposal unit as depicted in the license application must be explained and submitted for review and approval by the Executive Director prior to continuation of further construction activities. Deviations may require an amendment of the license.

94. The Licensee must install moisture content and pressure head monitors in the Compact Waste Disposal Facility and the Federal Facility Waste Disposal Facility liners and the covers. The monitoring system must be automated and capable of continuously transferring data. The monitoring system must be maintained and not be abandoned, as to be used for long term monitoring. Selection and placement of these monitors must be reviewed and approved by the Executive Director.

95. If a water level is found to exist in any well(s) considered previously dry, the Executive Director must be notified in writing within seven (7) days of the first occurrence of this condition, otherwise the reporting period must be quarterly.

96. Except as specifically provided for in this license, the Licensee is prohibited from further modifying surface water characteristics of the watershed without prior written approval from the Executive Director.

97. The Licensee shall mitigate the impact of the remaining portion of the playa located on the eastern edge of the Compact Waste Disposal Facility.

98. The Licensee must incorporate a more representative hydraulic conductivity for the native fine material layer into the technical specifications. Specifications must be verified by measurement during construction.

99. Any precipitation falling in the construction area of the disposal unit must be considered as leachate and must be managed according to the requirements in 30 TAC §336.359, Appendix B, Table II.

100. The Licensee shall submit verification, and any necessary modifications, of the following specifications relating to the construction of the land disposal facility to the Executive Director for approval.

A. The following are required specifications for the mechanical aspects of the buildings:

(1) The Licensee must verify that the operation of the air handling system in the general lab area contains and isolates any airborne contamination.

(2) The Licensee must resolve the conflict in the placement of the fire service entrance and domestic water booster pump and filtration system shown on the north wall and the lab equipment shown on the architectural drawings.

RADIOACTIVE MATERIAL LICENSE	
License Number	Amendment Number
RW4100	00

Site Design and Construction Requirements

(3) The outdoor 500 gallon above grade tempered water storage tank is insulated, but not heat-traced. The Licensee shall provide for freeze protection and tempered water. The same requirement applies to all above grade tempered water storage tanks.

(4) An acid neutralization tank is required for sanitary waste.

(5) The Licensee must control the variable air volume (VAV) system, including the sequence of operations on the VAV boxes and air handling unit, AHU-1. A DDC system with an Operator's Workstation must be provided to assist the Operations and Maintenance staff in monitoring, adjusting setpoints and troubleshooting the system.

(6) The calculated load of the RTU-1 Unit is 18.8 tons, which will require a nominal twenty (20) ton unit. This is a big enough load that a true VAV unit can be specified, instead of a VVT type of system that bypasses supply air back to the unit but keeps the supply fan volume column. The Licensee shall account for true VAV savings by being able to turn the supply fan speed down when in heating mode, typically down to fifty (50%). Since the fan hp is a cubic function of the fan speed, a 50% turn down in fan speed will reduce the fan energy by eighty eight (88%).

(7) The terminal box schedule provided in the application shows many of the VAV boxes with a minimum cubic foot per minute (CFM) of 0. The Licensee shall set the minimum CFM to correspond to the airflow required for heating, which is typically 50% of the maximum airflow. The sequence of operation for the VAV box should modulate the box to its minimum position upon a fall in space temperature, and upon a further fall in space temperature for the electric heating coil to stage as required to maintain space temperature. This allows the box to always provide enough CFM for heating, as well as ensure ventilation is always being provided.

(8) The terminal box schedule does not show any heating coils with the VAV boxes. The Licensee must specify how the boxes will provide individual comfort control.

(9) The Licensee shall ensure that the sanitary piping under the slab of the buildings shall not run through the spread footings. The Licensee shall encase the pipe in concrete if the pipe is running under the footer. The same requirement holds for the water service to the buildings.

(10) The Licensee shall provide a redundant fire pump.

(11) The Licensee shall require the VFD, in drawings M1.1 and M2.1 of the application, to be maintained at a differential pressure of 0.10 inches.

(12) The Licensee shall send water from the decontamination truck bay to a holding tank. The type of filter shall be provided.

(13) Regarding Drawings M1.5 and M2.6, the 12,000 gallon holding tank scales to a six foot by four foot (6' x 4') footprint. Because a 12,000 gallon tank is much larger, the Licensee shall confirm that a 12,000 gallon holding tank is being utilized.

(14) The Licensee shall not allow water to be used from the on-site fire protection storage tank for potable water. The Licensee shall keep these systems separated.

(15) Regarding Drawings M2.9 and M2.10, currently the building is not heated. Appendix 3.3, Fire Hazards

RADIOACTIVE MATERIAL LICENSE	
License Number	Amendment Number
RW4100	00

Site Design and Construction Requirements

Analysis of On-Site Facilities, 3.2.1 Heating, Ventilating, and Air Conditioning (HVAC), p. 16 states heat will not be provided. The Licensee shall require heating for operator comfort and freeze protection.

(16) Regarding Specification 23 06 90, a paragraph describes water balancing for Phases 1, 2, and 3. It appears the HVAC equipment in each building is DX and electric heat. The Licensee shall balance any HVAC hydronic systems.

(17) Regarding Specification 23 37 18, the schedule indicates cooling for the makeup air units. The Licensee shall provide cooling (DX coil, condensing unit) in the specification.

(18) Regarding Specification 23 31 00, 2.2.A, requires all ductwork to be galvanized steel, however, Appendix 3.0-1, WCS LLRW Disposal Engineering Report, Mechanical Narrative, p. 2 describes stainless steel ductwork for certain exhaust systems. The Licensee shall reconcile this conflict.

(19) Regarding Specification 23 09 01, the control specification does not provide information on what type of control system is required (DDC with operator workstation, standalone DDC, electric/electronic with panel mounted operator interface at the HVAC control panel). The Licensee shall specify the level of control required to assist in operating and maintaining the system.

(20) Regarding Specification 23 09 90, the Drawings and Schedules are referenced for the sequence of operations. References were found in the notes on the plan drawings to thermostatic control and interlocks. The Licensee shall include specifications for alarms, status lights, and HOA switches.

(21) Regarding Volume 23, Attachment 3.0-3.36, not all the values in the table on page 4 of the Calculation Detail seem to match the values in the preceding calculations on p. 3-4. The Licensee shall correct this inconsistency.

B. The following requirements pertain to the electrical aspects of the buildings:

(1) Regarding Appendix 3.2 (Codes and Standards), this section refers to a 2003 National Electrical Code (NEC). The last two NEC codes have been 2002 and 2005. The Licensee shall follow the 2005 code for this project.

(2) Regarding Specification 26 2913 (Motor Controllers), Paragraph 1.1B has an incorrect reference to Division 15 which does not exist. The Licensee shall correct this reference.

(3) Regarding Electrical Load Calculations (Calc No. 032-MF-E001), there appears to be an error in calculating the total facility load amps, however the selection of 200 amp overhead service cable is acceptable. The Licensee shall correct the calculation to 43 amps.

(4) Regarding Specification 26 09 00 (Control Devices), the Licensee shall add the level switches in this section consistent with how they are covered by a model number on the drawings.

C. The facility buildings or structures were reviewed for structural design compliance with the International Building Code 2003. The following requirements pertain to the structural aspects of the buildings:

(1) Regarding Appendix 3.2, Table 3.2-1 (References), the Licensee shall add “MBMA, Metal Building Manufacturer’s Association”.

(2) Regarding the Architectural Drawings, A0.02 thru A0.07 for the Administration Building, the Licensee shall

add building code data including but not limited to: Use Group Classification; Type of Construction; Allowable Floor Area; Largest Actual Floor Area; Roof Area, Number of Stories, Allowed; Number of Stories, Actual; Building Height, Allowable; Building Height, Actual; Occupant Load, Allowed; Occupant Load, Actual; Separation Required; Fire Suppression System Provided; and Public Access.

(3) Regarding Structural Drawing S0.2, this is a Pre-engineered Metal Building (PEMB). The Licensee shall show design loads assumed for design of foundations from PEMB. These will be compared to actual loads from building selected during construction.

(4) Regarding Architectural Drawings, A0.02 thru A0.15, A1.02 thru A1.12, and A2.02 thru A2.23, the Licensee shall add the building code data on the drawings.

(5) It appears that all of the on-site buildings are PEMB. The Licensee shall show design loads assumed for design of foundations from PEMB.

D. The following requirements pertain to the pavement design:

(1) The calculation of the equivalent eighteen kilopound (18-kip) single axle load is incorrect in the design. For example, the design calculation for the access road at the entrance shows that each application of a HS 20-44 vehicle would result in an 18-kip equivalency factor of 0.61. This is inconsistent with common engineering practice. A HS 20-44 design vehicle has 1 single axle of 8-kip and 2 tandem axles of 32-kip each. Furthermore, the 18-kip traffic equivalency factors for the aforementioned single and tandem axles are 0.036 and 0.843, individually using 1993 AASHTO guide. As a result, the 18-kip equivalency factor of one application of a HS 20-44 truck is equal to 1.72 (= 1 x 0.036 + 2 x 0.843). The existing thickness design underestimates damages caused by HS 20-44 trucks. Therefore, the Licensee shall verify the design thickness and re-design if necessary.

(2) The Licensee shall verify that the design is appropriate for the daily traffic (i.e. the anticipated daily applications of HS 20-44 trucks).

(3) The Licensee shall verify the design section of asphalt concrete pavement (i.e. four (4) inches asphalt concrete plus twelve (12) inches crushed stone base course) using the 1993 AASHTO guide for design of pavement structures. The submitted calculations show that an older AASHTO Interim Guide (1972) was used in the design.

(4) The Licensee shall provide calculations for the thickness design of gravel roads. The design thickness is based on an assumed design input (i.e. a structure number). The design procedures of aggregated-surfaced roads are covered in the 1993 AASHTO guide. It is recommended to use the section of low-volume road design to confirm that the proposed thickness (i.e. twelve (12) inches crushed stone) of gravel road is properly designed.

(5) For specification 31 80 00 (page 4), no requirements of sodium sulfate soundness loss, flat and elongated particles, and Los Angeles abrasion etc. are specified. Aggregates of suitable angularities and durability must be used in the base course. The Licensee shall provide these requirements in the specification.

(6) For specification 32 12 00 (page 2), the Licensee shall take a minimum of 3 samples for acceptance tests of density and thickness.

(7) For specification 32 12 00 (page 6), it is unclear to state that “don’t overheat the material or cause thermal damage.” The Licensee shall specify the temperature limits of hot asphalt mix (HMA) directly in the

RADIOACTIVE MATERIAL LICENSE	
License Number	Amendment Number
RW4100	00

Site Design and Construction Requirements

specification.

(8) For specification 32 12 00 (page 8), the maximum lift thickness of HMA for compaction is not specified. The Licensee shall provide a maximum of four (4) inch lift thickness in the specification, if the revised design thickness of asphalt concrete is over four (4) inches.

(9) For the common site layout (drawing #C0.01), the roadway width shown is inconsistent with the width indicated on the typical section (drawing #C0.06). The Licensee shall revise the typical section.

(10) For the Compact Waste Facility site layout (drawing #C1.01), the roadway width shown is inconsistent with the width indicated on the typical section (drawing #C1.02). The Licensee shall revise the typical section.

Receipt, Acceptance, and Inspection Requirements

101. The Licensee shall not commingle Compact Waste and Federal Facility waste. To that end, the Compact Waste Disposal Facility and Federal Facility Waste Disposal Facility shall have separate receipt, acceptance and disposal areas.

102. Prior to accepting waste, the Licensee must provide an agreement signed by the Secretary of the United States Department of Energy, and acceptable to the Executive Director, that the federal government will assume all right, title and interest in land and buildings for the disposal of federal facility waste. The written agreement must be provided prior to receipt and disposal of waste in the Federal Facility Waste Disposal Facility.

103. The Licensee shall not accept waste at the Federal Facility Waste Disposal Facility until the Licensee has begun accepting waste in compliance with this license at the Compact Waste Disposal Facility.

104. No shipment shall be accepted for disposal unless it has been inspected by the Executive Director's resident inspector. The Licensee shall notify the Executive Director's resident inspector within twenty four (24) hours of any shipments that do not comply with applicable law or this license.

105. Prior to accepting waste, the Licensee must provide detailed procedures for verification of waste packages and bulk waste at the Compact Waste Disposal Facility or the Federal Facility Disposal Waste Facility. The procedures must specify a minimum frequency of testing to verify package contents. The procedures must be reviewed and approved in writing by the Executive Director before waste shipments are accepted.

106. The Licensee must maintain records for each shipment of waste disposed of at the land disposal facility. The records must conform to the requirement of 30 TAC §336.740(a). All records and reports required by the license, rules, or orders must be complete and accurate.

107. The Licensee, during the operational period, shall maintain records of the types, forms, and quantities of radioactive waste and hazardous waste disposed at the land disposal facility. This information shall be used during decommissioning and to update the dose modeling prior to license termination. This information shall be retained throughout the operating life of the land disposal facility and upon license termination, transferred to the custodial agency.

108. The Licensee must not accept any waste by rail that is intended for disposal at the Compact Waste Disposal Facility or the Federal Facility Disposal Waste Facility. In order for waste to be shipped by the rail, the Licensee must prepare an evaluation and procedures for the receipt, handling, off-loading and acceptance of waste into the land disposal facility for Executive Director review and approval as a license amendment.

109. The Licensee must not accept low-level radioactive waste for storage or disposal that is in excess of seventy five cubic feet (75 ft^3) unless the shipper of low level radioactive waste has given the license holder written notice, with the information required by the TCEQ, of the shipment at least seventy two (72) hours before shipments to the Compact Waste Disposal Facility or the Federal Disposal Waste Facility begin.

RADIOACTIVE MATERIAL LICENSE	
License Number	Amendment Number
RW4100	00

Receipt, Acceptance, and Inspection Requirements

110. Sixty (60) days prior to accepting waste for disposal, the Licensee shall provide an inventory of any waste being stored at adjacent facilities that is intended for disposal in the Compact Waste Disposal Facility or the Federal Facility Waste Disposal Facility. During operations, the Licensee is prohibited from using any area outside of the land disposal facility for staging or managing waste intended for disposal.

111. The Licensee must follow all applicable Facility Operating Procedures, Radiation Safety Procedures, ALARA (as low as reasonable achievable) Program, and Waste Acceptance Procedures and Plans as provided in the application. The Licensee must not revise these programs, plans and procedures without written approval of the Executive Director.

112. The Licensee must maintain all records and shipment manifests pertinent to the transportation, receipt, and disposal of low-level radioactive waste of each shipment, until authorization is given by the Executive Director for transfer or disposal of such records.

113. Upon acceptance for disposal of each waste shipment, the Licensee must acknowledge receipt of the waste as soon as practicable, but no later than seven days following its acceptance for disposal, by returning a signed copy or equivalent documentation of the shipment manifest to the shipper. Indicating on the return copy any discrepancy between noted waste descriptions listed on the manifest and the waste materials received.

114. The Federal Facility Waste Disposal Facility may only accept low-level radioactive waste in compliance with 40 CFR Part 268. This license does not authorize the processing, treatment, storage or disposal of hazardous waste.

115. The Federal Facility Waste Disposal Facility Non-Canister Disposal Unit may only accept Class A low-level radioactive waste that meets the Waste Acceptance Plan except as provided by this license. The Licensee is prohibited from disposal of bulk waste in the Non-Canister Disposal Unit consisting of radionuclides with half-lives of greater than thirty-five (35) years and waste consisting of transuranic radionuclides in concentrations less than ten nanocuries per gram (<10nCi/g), unless specifically authorized by the Executive Director.

116. The Licensee is authorized to accept only bulk waste for disposal at the Federal Facility Waste Disposal Facility Non-Canister Disposal Unit that meets all the following criteria:

A. Soil/soil-like waste meets the classification as a Group A-1-A through A-4 soil in accordance with American Society for Testing and Materials (ASTM) D-3282/American Association of State Highway and Transportation Officials (AASHTO) M145;

B. The average, in-place organic content does not exceed five percent (5%) and the average, as received organic content of any individual waste shipment does not exceed ten percent (10%) by using ASTM D-2974/AASHTO T267; and

C. No debris is present in any waste shipment other than incidental items (no more than 1%) that conform with the limitations applicable to bulk debris.

117. The Licensee must containerize all rubble and debris waste until a demonstration has been reviewed and approved by the Executive Director that the stability requirements have been met.

118. The Licensee must notify the shipper and the Executive Director's resident inspector when it has been determined that a low-level radioactive waste shipment or part of a shipment cannot be accepted for disposal by the Licensee. The Licensee must notify the waste generator/shipper before the end of the next business day if a shipment has failed to arrive at the land disposal facility within the twenty four (24) hour time frame indicated in the advance notification or manifest.

RADIOACTIVE MATERIAL LICENSE	
License Number	Amendment Number
RW4100	00

Receipt, Acceptance, and Inspection Requirements

119. Bulk disposal in the Federal Facility Waste Disposal Facility Non-Canister Disposal Unit will meet the following requirements so that long-term volumetric stability is achieved:

A. Soil-like waste will be placed in lifts no thicker than twelve (12) inches and lift lots of no greater area than 10,000 square feet;

B. Except for Group A-1-a materials, soil-like waste will be compacted to ninety percent (90%) of Modified Proctor maximum density with moisture between plus or minus two percent (±2%) of optimum per American Society for Testing and Materials (ASTM) D1557 or American Association of State Highway and Transportation Officials (AASHTO) T180;

C. Density actually achieved will be determined with nuclear density gauge measurements per ASTM D-2922 or AASHTO T310 at the rate of one nuclear density gauge measurements per 1,000 square feet placed and compacted within a given lift but not less than one (1) such measurement per lift;

D. Sand cone test will be performed according to ASTM D1556 at the rate of one (1) sand cone density test for every five (5) nuclear density gauge measurements;

E. For the use nuclear density gauge measurements and sand cone testing, the Licensee will conduct the following additional testing:

(1) Modified proctor tests per ASTM D1557 or AASHTO T180 to determine the actual moisture/density relationship at the specific location where density is an issue;

(2) Nuclear density gauge measurements per ASTM D2922 or AASHTO T310 and sand cone test per ASTM D1556 repeated at the location; and

(3) Rework the deficient waste disposal lift and repeat verification testing until satisfactory results are achieved;

F. And the Licensee must submit a quarterly report to the Executive Director verifying the above conditions.

120. Low-level radioactive waste accepted for bulk disposal in the Federal Facility Waste Disposal Facility Non-Canister Disposal Unit, will meet all the following minimum requirements:

A. Class A low-level radioactive waste as defined by 30 TAC §336.362(a)(2);

B. Meets the stability requirements stated in 30 TAC §336.362(b)(1);

C. Dose rate less than 25 millirem per hour at thirty (30) centimeters;

D. No free liquids;

E. Waste must comply with 40 CFR Part 268; and

F. Organic Content must be less than ten percent (<10%).

121. Compaction of bulk waste using hand-operated tools or equipment is prohibited.

RADIOACTIVE MATERIAL LICENSE	
License Number	Amendment Number
RW4100	00

Receipt, Acceptance, and Inspection Requirements

122. The following provisions are related to potential freeze-thaw conditions:

A. Placement of soil-like waste under 32 degrees Fahrenheit is prohibited;

B. Once weather conditions return that allow current placement operations to resume, supplemental nuclear density gauge measurements will be performed on lift areas already placed before further placement of waste is undertaken; and

C. Emplaced bulk waste will be reworked, should supplemental nuclear density gauge measurements indicate unacceptable compaction after freezing conditions cease.

123. Void spaces within the bulk waste are reduced to the extent practicable through all the following actions:

(A) Voids are either exposed so they can be backfilled or are eliminated by cutting or crushing;

(B) Waste is placed loose in lifts no thicker than one (1) foot;

(C) Voids are backfilled with granular soils or soil-like waste; and

(D) Each lift, including backfill, is compacted to at least ninety percent (90%) of maximum density.

Radiation Safety Requirements

124. Any changes to the Radiation Safety Program must be approved in writing by the Executive Director.

125. All radiation staff must successfully complete a radiation safety course that has been reviewed and approved in writing by the Executive Director.

126. Written procedures incorporating operating instructions and appropriate safety precautions for licensed activities must be maintained and available for inspection at the licensed facility. The written procedures established must include the activities of the radiation safety program, the employees training program, operational procedures, analytical procedures and instrument calibrations. At least annually, the Licensee must review all procedures to determine their continued applicability.

127. Unless otherwise specified in the license, the Licensee will make no changes in the internal safety audits, ALARA procedures, waste acceptance criteria, or procedures governing these specific activities without written approval from the Executive Director.

128. The RSO or his or her designee must conduct and document weekly inspections of site operations and the restricted areas of the site for compliance with applicable conditions of this license.

129. The Licensee will document and maintain records of all accidental or unplanned releases of low-level radioactive waste during operations at the facility. Documentation of the events must be maintained for inspection until the site is transferred to the custodial agency.

130. In the event of an accidental or unplanned release of low-level radioactive waste, the Licensee must implement an emergency plan of the application and provide immediate notification to the Executive Director.

131. Records produced by the Quality Assurance and Quality Control programs must be reviewed by the Quality Assurance Manager at least annually. Deficiencies in the Quality Assurance and Quality Control program must be must be identified and corrected promptly.

RADIOACTIVE MATERIAL LICENSE	
License Number	Amendment Number
RW4100	00

Radiation Safety Requirements

132. The Licensee must not use nuclear density gauge equipment for soil compaction testing without an appropriate license. Only authorized Licensees may perform the required compaction testing needed for compliance to the rules for surface compaction and moisture measurements.

133. Visitors and contractors must complete an orientation and safety program approved by the Executive Director before entering the facility. Documentation of the orientation program will be maintained by the Licensee for inspection by the Executive Director.

134. The Licensee must conduct a bioassay program for all employees. A pre-employment bioassay must be conducted on all employees. Thereafter, bioassays must be conducted monthly for occupationally-exposed workers and quarterly for administrative staff, managers and site contractors. Annual whole body counts, in addition to monthly urinalysis and fecal analysis will be employed. All radioisotopes of interest for the land disposal facility must be evaluated in these bioassays.

135. The license must submit an annual report summarizing bioassay results for all employees. If any bioassay result exceeds ten percent (10%) of the occupational limit provided in 30 TAC Chapter 336, the Licensee shall notify the Executive Director within three (3) days of receiving the results.

136. The Licensee must comply with the following regarding training and operations:

A. Visitors to Compact Waste Disposal Facility or Federal Facility Waste Disposal Facility shall be escorted by personnel trained in the facility's safety procedures. A maximum of five (5) visitors may be escorted by a single trained person.

B. All clerical and office support staff shall be given safety training which may be an abridged version of that given to operations personnel. If any one of these employees transfers to other duties, the employee shall be given appropriate radiation safety training for his or her new assignments.

C. All female employees shall be given instruction concerning prenatal radiation exposure. D. The Licensee shall make a record of the training provided to all of the above. The record shall indicate the name of the individual receiving the training or instructions, the date the training or instruction is provided, the results of examinations for course material retention, and the name of the training course provider or instructor.

137. The Licensee must comply with the following regarding personnel dosimetry:

A. The Licensee must provide personnel dosimetry to all employees and contractors who enter the land disposal facility. Thermoluminescent dosimeters (TLDs) or optically stimulates luminescence dosimeters (OSLs) must be worn by all employees. A second badge will be issued to workers undergoing medical diagnostic or therapeutic procedures. This badge will be worn in addition to the individual's usual badge during the period of elevated body radiation levels.

B. The Licensee shall revise the procedures to include an instruction to the users of personnel dosimetry that personnel dosimetry must be worn at all times in the land disposal facility.

C. The Licensee shall comply with the following regarding the storage of dosimeters issued to employees when the dosimeters are not in use:

(1) The Licensee shall provide a place for storage of dosimeters issued to personnel when personnel exit the restricted area;

(2) The place for storage of issued dosimeters (when not in use) shall be in an area determined to be of natural-background radiation;

(3) A control dosimeter shall be located in the issued dosimeter storage area; and

(4) The control dosimeter for the issued dosimeter storage area shall be exchanged and processed at the same frequency as the dosimeters issued to personnel.

RADIOACTIVE MATERIAL LICENSE	
License Number	Amendment Number
RW4100	00

Radiation Safety Requirements

138. The laboratory conducting the bioassays must be National Environmental Laboratory Accreditation Conference certified. The laboratory's Quality Assurance program must be reviewed and approved in writing by the Executive Director.

139. The Licensee must conduct a respiratory protection program that has been reviewed and approved in writing by the Executive Director. Employees working with non-containerized low-level radioactive waste must wear breathing zone monitors and appropriate respiratory protection.

140. Respirators made available for reissuance or reuse must show no removable contamination in access of 100 dpm/100cm^2 alpha, and/or in excess of 1,000dpm/100cm^2 beta gamma (as determined by standard wipe or smear techniques), and no fixed beta-gamma contamination in access of 0.2 microRoentgen per hour (mR/hr) above background on contact.

141. Eating, drinking, and/or smoking shall not be allowed within the restricted area or in any area where radioactive material is handled, transferred, or processed.

142. The Licensee shall designate any area where the total airborne radioactivity, as determined by air sampling, exceeds 5 X 10^{-13} microcuries per milliliter total radioactivity as an airborne radioactivity area.

143. The Licensee must conduct monthly surveys for fixed and removable alpha, beta, or gamma contamination, by standard wipe or smear technique, in all eating areas, shower and change areas, administrative offices, control rooms, and laboratories in accordance with Table 1 below. Any positive results in wipes taken in these areas must elicit an immediate investigation as to cause. Surfaces which have removable contamination greater than the limits stated in 30 TAC §336.364, Appendix G must be decontaminated.

Table 1: Contamination Surveys

A. Gamma Radiation Levels	Laboratory	Weekly
	Office Area(s)	Weekly
	Lunch/Change Area(s)	Weekly
	Transport Vehicles	Upon vehicle arrival at site and before departure
	Low-Level Waste Processing Area(s)	Weekly
	Decontamination Facilities	Weekly
B. Contamination Wipes	Laboratory	Weekly
	Office Area(s)	Weekly
	Lunch/Change Area(s)	Weekly
	Transport Vehicles	Once before release
	Decontamination Facilities	Weekly
	Low-Level Waste Processing Areas	Weekly
C. Employee and Personnel Survey	Skin and Personal Clothing	Prior to exiting restricted area
D. Gamma Survey	Administrative Building(s)	Quarterly

144. Step-off pads shall be located outside of the restricted area and must be surveyed every four (4) hours. Surface levels more than twice background beta-gamma or removable contamination greater than greater than the limits stated in 30 TAC §336.364, Appendix G must be considered contaminated and replaced.

145. Gamma surveys must be conducted quarterly at all work stations and areas that contain or have contained low-level radioactive wastes.

RADIOACTIVE MATERIAL LICENSE	
License Number	Amendment Number
RW4100	00

Radiation Safety Requirements

146. Each employee (including temporary and contract workers) who works in areas where contact with low-level radioactive waste is possible must be surveyed before leaving the work site. Removable contamination greater than the limits stated in 30 TAC §336.364, Appendix G must be decontaminated.

147. All radiation workers must receive at least forty (40) hours of classroom training following the Technical Topics listed in the application.

148. The outer surfaces of each shipping container must be wipe tested for removable contamination upon receipt. Each shipping container must also be surveyed individually to assess the external radiation fields present and a record made of the readings.

149. Radiation Safety Meetings must be held monthly with all employees. Unannounced RSO employee reviews will be conducted monthly. The Licensee through the RSO shall conduct audits of the radiation safety program in accordance with the following:

A. At intervals not to exceed 12 months;

B. Include all of the items listed in the procedures provided in the application as activities conducted to evaluate specific components of an audit; and

C. Include observation of the performance of radiation safety procedures as a part of an audit of the radiation safety program.

150. Any material to be disposed of or released for unrestricted use which is not identified as low-level radioactive waste must be surveyed for contamination. Contamination must not exceed the limits specified by the 30 TAC §336.364 and §336.356.

151. The RSO must review the following areas of the Radiation Safety Program at least quarterly:

A. health physics authority and responsibility;

B. operating procedures (involving the handling, processing and/or disposal);

C. audits, inspections, and surveys conducted by the facility RSO (for timeliness and the resolution of any problems);

D. radiation protection including employee exposure records; bioassay procedures and results; quarterly, semiannual, and annual surveys and inspections; radiological survey and sampling data; and any changes in operating procedures;

E. radiation safety training;

F. respiratory protection program;

G. facility and equipment design including ventilation rates within various portions of the facility, and fire control;

H. control of airborne low-level radioactive wastes;

I. compliance with applicable federal and state regulations and the conditions of this license; and

J. audit of receipt procedures.

152. The RSO must prepare an annual report summarizing the reviews and audit. The report must be submitted for review by the Executive Director within thirty (30) days after completion of the audit.

RADIOACTIVE MATERIAL LICENSE	
License Number	Amendment Number
RW4100	00

Radiation Safety Requirements

153. Along with complying with all confined space entry requirements and before any work, including maintenance, repair, cleaning, dismantling or other such activities, is performed within closed tanks on the licensed facility which may contain or have contained radioactive materials, radiation work permits (or their equivalent) shall be submitted to the RSO. The RSO shall survey all tank interiors using radiological measuring and detection instruments and wipe methods to determine if contamination is present prior to any work being performed. If contamination exceeding 220,000 dpm/100 cm^2 is found or if the RSO does not perform such a survey, then protective clothing and respiratory protection shall be worn by employees during the performance of operations.

General Packaging

RADIOACTIVE MATERIAL LICENSE	
License Number	Amendment Number
RW4100	00

General Packaging

154. The following are minimum requirements for all classes of waste to be disposed at the land disposal facility:

A. Waste must not be packaged for disposal in cardboard or fiberboard or wood boxes.

B. Liquid waste must be solidified or packaged in sufficient absorbent material to absorb twice the volume of the liquid.

C. Solid waste containing liquid must contain as little free-standing and non-corrosive liquid as is reasonably achievable, but in no case must the liquid exceed one percent (1.0%) of the volume.

D. Waste must not be readily capable of detonation or of explosive decomposition or reaction at normal pressures and temperatures or of explosive reaction with water.

E. Waste must not be pyrophoric. Pyrophoric materials contained in waste must be treated, prepared, and packaged to be nonflammable.

F. Waste must not contain, or be capable of generating, quantities of toxic gases, vapors, or fumes harmful to persons transporting, handling, or disposing of the waste. This does not apply to radioactive gaseous waste packaged at an absolute pressure that does not exceed one and a half (1.5) atmospheres at twenty (20) degrees Celsius. Total radioactivity must not exceed one hundred (100) curies per container.

G. Waste containing hazardous, biological, pathogenic, or infectious material must be treated to reduce to the maximum extent practicable the potential hazard from the nonradiological materials. In addition, waste containing biological, pathogenic, or infectious material shall be doubly packaged as follows:

(1) The inner container having the capacity of 55 gallon or less shall have a water tight liner at least four (4) mils thick hermetically sealed after filling;

(2) The biological material shall be thoroughly layered in the inner container in a ratio of thirty (30) parts biological material to at least one (1) part slaked lime and ten (10) parts absorbent, which shall be agricultural grade four (4) vermiculite or medium grade diatomaceous earth, or other absorbents that have received approval by the Executive Director by volume. The addition of formaldehyde is prohibited.

(3) The closure on the inner container shall be a standard lid with securely attached ring and bolt. Lever locks are prohibited.

(4) Unless otherwise authorized by the Executive Director, the outer container, which shall have a volume of at least one and one-half (1.5) times the inner container shall be filled initially with at least four inches (4”) of absorbent material, the inner container in an upright position, and the remaining volume filled with the absorbent material, then securely closed and properly sealed.

H. The maximum weight percent of chelating agent is eight percent (8%) for all waste streams.

I. Sealed sources or special form radioactive material are prohibited, in any form, for disposal in the Federal Facility Waste Disposal Facility Non-Canister Disposal Unit. All sealed sources or special form radioactive material disposed of in the Federal Facility Waste Disposal Facility Canister Disposal Unit or the Compact Waste Disposal Facility shall be doubly packaged and encased in concrete or similar inert material within the outer package.

RADIOACTIVE MATERIAL LICENSE	
License Number	Amendment Number
RW4100	00

General Packaging

155. Low-level radioactive waste must be packaged in such a manner that waste containers received at the land disposal facility are not deformed, there is no loss or dispersal of contents, there is no increase in the external radiation levels as recorded on the manifest (within instrument tolerances), and there is no degradation due to rust or other chemical reaction which results in a loss of container integrity.

156. The Licensee is not authorized to open any package or shipping container except for the following purposes:

(A) Inspecting to insure compliance with this license and/or confirming package contents;

(B) Repairing or repackaging damaged containers; or

(C) Returning outer shielding or shipping containers.

157. Void spaces within the waste and between the waste and its package must be reduced to the extent practicable in accordance with 30 TAC §336.362(b)(2)C). Void spaces between the modular concrete containers must be reduced to the maximum extent practicable.

158. If a shipping container is dented, damaged or defective when received, the Licensee shall, if necessary, repair or repackage the shipping container and shall contact the generator or processor to perform required remedial action. Shipping containers that fail to comply with United States Department of Transportation and Texas Department of State Health Services transportation regulations are prohibited from being released for shipment.

159. Waste accepted for disposal shall not be removed from the land disposal facility except as authorized in writing by the Executive Director for the purposes of repackaging or reprocessing or as provided in 30 TAC Chapter 336.

160. All low-level radioactive waste must be packaged and transported in accordance with applicable statutes and regulations of United States Department of Transportation, United States Nuclear Regulatory Commission, United States Environmental Protection Agency, Texas Department of State Health Services, the Commission and the requirements of this license.

Waste Characteristics and Waste Forms

161. Waste that contains special nuclear material (SNM), as defined in 30 TAC §336.2(127), may be accepted for disposal in quantities not sufficient to form a critical mass - uranium enriched in the radioisotope 235 in quantities not exceeding 350 grams of contained uranium-235; uranium-233 in quantities not exceeding 200 grams; plutonium in quantities not exceeding 200 grams; or any combination of these in accordance with the following formula: For each kind of SNM, determine the ratio between the quantity of that special nuclear material and the quantity specified above for the same kind of special nuclear material. The sum of such ratios for all of the kinds of special nuclear material in combination must not exceed one (1).

162. In accordance with 30 TAC §336.229 no person may reduce the concentration of radioactive constituents by dilution to meet exemption levels established under the Texas Health and Safety Code, §401.106, or change the waste's classification or disposal requirements. Low-level radioactive waste that has been diluted as a result of processing, stabilization, mixing, or treatment, including, but not limited to, 40 CFR Part 268, or for any other reason, must be subject to the disposal regulations it would have been subject to prior to dilution.

163. The Licensee may not accept any unstable waste forms for disposal that do not meet the requirements of 30 TAC §336.362(b). Prior to receipt of waste, the Licensee must demonstrate, by engineering analysis, that the stability requirements of 30 TAC §336.362(b) have been met.

RADIOACTIVE MATERIAL LICENSE	
License Number	Amendment Number
RW4100	00

Waste Characteristics and Waste Forms

164. The Licensee must not accept low-level radioactive waste that contains hazardous listed chemicals or exhibits hazardous characteristics as defined by 40 CFR Part 261 for disposal at the Compact Waste Disposal Facility. Unless otherwise authorized by Executive Director, the Licensee is authorized to accept only the following waste streams in Table 2 below, and as described in the license application, at the Compact Waste Disposal Facility:

Table 2: Authorized Waste Streams

Waste Source	Waste Stream Description	Waste Group	Classification
Utility	Condensate Filter Sludge	CONDFSL	A and B
Utility and Non-utility	Compactible Trash	COTRASH	A
Utility	Decontamination Resins	DECONRS	A
Utility	Floor Drain Filter Sludge	FLDRFSL	A
Utility	Fuel Pool Skimmer Filter Sludge	FPFILSL	A and C
Utility	Non-Compactible Trash	NCTRASH	A
Utility	Non-fuel Reactor Components	NFRCOMP	C
Utility	Process Filters	PROCFIL	C
Utility	Reactor Water Cleanup Resins	RWCUPRS	B
Utility	Reactor Water Demineralization Resins	RWDMRES	A and B
Non-utility	Absorbed Liquids	ABSLIQD	A
Non-utility	Biological Wastes	BIOWAST	A
Non-utility	High Activity Waste	HIGHACT	A
Non-utility	Low Activity Waste	LOWASTE	A
Non-utility	Non-compactible Trash	NCTRASH	A and B
Non-utility	Sealed Sources	SOURCES	A, B, and C
Reactor Decommissioning	Decommission Waste - PWR	D&D BWR	A, B, & C

Disposal Operations

165. The Licensee must manage all stormwater and wastewaters, including leachate, during operations and the post-closure period in accordance with the Effluent Concentration Limits specified in 30 TAC §336.359, Appendix B, Table II for radionuclides and a Texas Pollutant Discharge Elimination System permit for all other regulated constituents of concern.

166. A monthly site receipt and disposal activities report must be submitted no later than the seventh (7^{th}) day of month for the previous month's activities to the Executive Director.

167. The Licensee must not exhume previously buried waste unless specifically authorized by the Executive Director.

168. The top of the all waste must be a minimum of five (5) meters below the top surface of the cover or must be disposed of with intruder barriers that are designed to protect against an inadvertent intrusion for at least 500 years in accordance with 30 TAC §336.730(b)(3).

169. The Federal Facility Waste Disposal Facility Canister Disposal Unit may only accept Class A, B and C low-level radioactive waste for disposal in reinforced modular concrete canisters and inside an additional reinforced concrete barrier. Large components that will not fit into the reinforced modular concrete canisters as provided in the application must be evaluated by the Executive Director on a case-by-case basis prior to disposal. Large components must be backfilled with sand, or grout, if necessary, to ensure the voids are filled.

RADIOACTIVE MATERIAL LICENSE	
License Number	Amendment Number
RW4100	00

Disposal Operations

170. Disposal of low-level radioactive waste into disposal units with standing water must immediately cease until corrective action is taken.

171. The Licensee must implement measures to reduce the potential for desiccation and cracking of the performance cover during operation and closure, with special emphasis on areas not overlain by a geomembrane. The Licensee must conduct periodic surveillance to verify that the measures are effective.

172. During operations and closure, the Licensee shall measure the geotechnical properties of the cover system materials to verify the initial design values. The Licensee shall report any deviations and propose any necessary design modifications that may affect cover system performance to the Executive Director.

173. The Licensee must manage all stormwater as leachate. This management of stormwater must include, but is not limited to, the collection and conveyance of all stormwater and wastewater, and be subjected to the radionuclide effluent concentration limits, as specified in 30 TAC §336.359, Appendix B, Table II.

174. The Licensee will sample and perform radionuclide analyses on all wastewaters planned for re-use. Wastewaters with radionuclide concentrations greater than those listed Title 30, Texas Administrative Code, Section 336.359, Appendix B, Table II will be disposed as low-level radioactive waste and may not be used for dust suppression or any other activity that increases the risk to human health or the environment.

175. The Compact Waste Disposal Facility may only accept Class A, B and C low-level radioactive waste for disposal in reinforced modular concrete canisters and inside an additional reinforced concrete barrier. Large components (e.g., steam generators, reactor vessels, reactor primary system components) that will not fit into the reinforced modular concrete canisters as provided in the application must be evaluated by the Executive Director on a case-by-case basis prior to disposal. Large components must be backfilled with sand, or grout, if necessary, to ensure the voids are filled.

176. The Licensee will initiate an investigation as to the nature, extent, and cause of any leachate collected, in which the radionuclide concentrations are fifty percent (50%) of the effluent concentration limits specified in 30 TAC §336.359, Appendix B, Table II and take appropriate corrective action. The Licensee will notify the Executive Director within ten (10) days of any such occurrence.

177. The Licensee shall not handle, store or dispose of waste, or engage in any waste-related activities in the buffer zone. The Licensee shall only conduct environmental monitoring and routine maintenance in the buffer zone; any other activity in the buffer zone shall require written approval of the Executive Director.

178. The Licensee shall pre-position concrete canisters in the disposal unit for emplacement of waste packages. After waste packages have been placed in the concrete canister, grout shall be placed around the packages to reduce voids. Packages shall be emplaced to permit voids between packages to be filled with grout. Temporary lids shall be placed on canisters until they are filled and the permanent canister lid has been cast in place. Once canisters are filled, grouted and the canister lids are constructed, native backfill consisting of dry, free-flowing, cohesionless natural material shall be placed around the canisters.

179. The Licensee shall handle and emplace waste in the disposal units in a manner that maintain package integrity. Waste packages and concrete canisters shall be protected from any land disposal facility operations which may cause damage to them.

180. Land disposal facility operations shall proceed from the up-gradient end to the down-gradient end of each disposal unit.

Environmental Surveillance

RADIOACTIVE MATERIAL LICENSE	
License Number	Amendment Number
RW4100	00

Environmental Surveillance

181. The Licensee must conduct environmental surveillance of the facilities as follows:

A. General Provisions. The Licensee must conduct the radiological and non-radiological environmental monitoring specified in this license.

B. Environmental samples shall be analyzed by a NELAC certified laboratory. As part of sample radioanalytical analysis, all runs performed by a laboratory, must include blanks, matrix spikes, and duplicates.

C. Duplicate Samples. The Licensee must provide the Executive Director an opportunity to obtain duplicate samples concurrently with the Licensee's data collection schedule.

D. Monitoring Records. The Licensee must maintain records of all monitoring activities.

E. Monitoring Well Installation. All monitoring wells must be constructed and maintained in accordance with the requirements of the Texas Occupations Code, Chapter 1901 and in accordance with ASTM D 4448-85a (1992). Monitor well clusters will consist of one (1) well screened in the Ogallala/Antlers/Gatuña formation, one (1) well screened at the top of the 225-foot Sandstone, one (1) well screened at the bottom of the 225-foot Sandstone, and one (1) well screened at the bottom in the 125-foot Sandstone. Testing should be performed on unfiltered as well as sample filtered with a 0.45 micron membrane filter.

F. Evaluation of Data. The Licensee must evaluate monitoring data using a two-tiered environmental monitoring response system. Investigation levels and action levels will be specified as described in the license Application. The results of the evaluation must be included in the annual report to the Executive Director submitted before March 31 of following year.

182. The Licensee must provide updates to the Executive Director every five years of site topography in the form of maps and all supporting data.

183. The Licensee must obtain written documentation from the Texas Parks and Wildlife Department and/or the United States Fish and Wildlife Service regarding the likelihood of threatened/endangered species occurring near the site.

184. The Licensee must recognize Baker Springs as a perennial water body and conduct appropriate aquatic surveys to establish baseline conditions and to identify the supported species, including aquatic and benthic invertebrates. In addition, routine sampling of Baker Spring must be incorporated into the Ecological Monitoring Plan for determination of potential site impacts to species and for evaluation of surface water and sediment quality.

185. Before the Licensee takes any action regarding site playas, the Licensee shall obtain and provide to the Executive Director a site-specific "no jurisdiction" determination from the U.S. Army Corps of Engineers.

186. Regarding the Ecological Monitoring Plan, the Licensee must use the most recent update of the TCEQ ecological risk assessment guidance that contains the screening levels for non-radiological constituents in surface water, sediment, and soil.

RADIOACTIVE MATERIAL LICENSE	
License Number	Amendment Number
RW4100	00

Environmental Surveillance

187. The Licensee shall implement the following radiological environmental monitoring programs:

A. At a minimum, conduct the Modified Natural Radiation Monitoring Program, specified in Attachment A of this license. The Modified Natural Radiation Monitoring Program maybe run concurrently with the Modified Baseline Monitoring Program, specified in Attachment B of this license. These programs must be conducted for a minimum of twelve (12) consecutive months. No low-level radioactive waste may be received at the Compact Waste Disposal Facility or the Federal Facility Waste Disposal Facility until these programs are concluded, and the evaluation of the program reviewed by the Executive Director.

B. Baseline monitoring data and monitoring conducted at the site since 1996 in addition to the Modified Baseline Monitoring Program, will be used to establish background for the site.

C. Chemical constituents listed in HW-50358 Permit Application , Attachment VI, Appendix 6.62, Table 1, as amended, will also be evaluated on all soil, vegetation, surface water, and monitor well samples for a twelve (12) month consecutive period before low-level radioactive waste can be brought to the site for disposal. Thereafter, all sampling will be conducted annually, except the monitor well chemical constituents will be sampled quarterly or other monitoring specifically required by this license.

D. The Licensee must conduct a Pre-operational, a Construction and an Operational Environmental Monitoring Program specified in Attachment C of this license. Concentrations of the key radionuclides listed in the application will be evaluated. The Pre-operational Program will continue at least twelve consecutive months.

E. The Licensee must submit a report presenting and analyzing all data collected in the Modified Natural Radiation Monitoring Program and the Modified Baseline Monitoring Program within sixty (60) days after the completion of the programs.

188. Prior to beginning the Modified Natural Radiation Monitoring Program and the Modified Baseline Monitoring Program, the Licensee must submit the revised figures to the Executive Director for review approval to add new upgradient and downgradient Ogallala/Antlers/Gatuña wells. The new wells must be spaced no more than 150 feet apart.

189. The Modified Baseline Environmental Monitoring Program is based on all previous sample results obtained at the site(s) and Program parameters described in Attachment B of this license.

190. The Modified Natural Background Environmental Monitoring Program must sample and analyze parameters as described in Attachment A of this license.

200. The Licensee must conduct a Pre-Operational, Construction, and Operational Monitoring as described in Attachment C of this license.

201. The Licensee must provide *State of Texas Well Reports* for all new monitor, piezometer, and other water wells on the site to the Texas Department of Licensing and Regulation. Copies will also be provided to the Executive Director within sixty (60) days of well completion.

202. The Licensee is to continue erosion monitoring and report annually to the Executive Director after the commencement of major construction. Prior to the commencement of major construction, quarterly measurements of erosion shall be taken and reported to the Executive Director. The Licensee must also install a weather/climate station in the immediate proximity of erosion monitoring in Ranch House Draw and the location of additional erosion pin arrays.

203. The Licensee must perform air-sampling using high-volume samplers.

204. The Licensee must provide for a transitional environmental monitoring period whenever program components, including sampling locations, equipment, techniques, or laboratories, are changed. This transitional period must include parallel monitoring with both the old and new conditions for at least one (1) sampling period or as directed by the Executive Director.

RADIOACTIVE MATERIAL LICENSE	
License Number	Amendment Number
RW4100	00

Environmental Surveillance

205. The Licensee must develop control charts and/or nonparametric prediction limits for all environmental media measurements which will be used to determine investigative limits and action limits for determining whether contamination may be migrating from the site as seen by increasing trends in the periodic analyses. For whichever statistical monitoring method is used, it will require one (1) year of Commission-approved environmental media data for each parameter under review. The specific methods, sample analyses for each baseline measurement which were incorporated into the charts, and the final control charts which contains all baseline environmental data, measurements must be approved by the Executive Director prior to accepting waste.

206. The Licensee must submit annual meteorological reports updated to include data from the previous year. The report must be submitted no later than the end of the first quarter of the year.

Closure Requirements

207. Prior to closure and license termination, the Licensee shall re-evaluate the impacts or activities of nearby facilities in order to ensure that the performance objectives of 30 TAC §336.723 will continue to be met after closure.

208. General requirements for Closure of the facilities are listed as follows:

A. The Licensee must not store, process, or dispose of mixed wastes defined in 30 TAC §336.2(80) unless authorized by a TCEQ hazardous waste permit in accordance with 30 TAC Chapter 335.

B. In addition to the compliance with the decommissioning standards in 30 TAC Chapter 336, Subchapter G, the Licensee must comply with the closure requirements of a TCEQ hazardous waste permit in accordance with 30 TAC Chapter 335.

C. Changes made to the Decommissioning and Site Closure Plan included in the license application may only be made through a license amendment authorized by the Commission.

D. After completion of the final cover for each disposal unit(s), the Licensee must submit certification of proper construction of the final cover, signed, sealed, and dated by a Texas licensed professional engineer. Each final cover certification must be accompanied by a certification report which contains the results of all tests performed to verify proper construction. The Licensee must conduct whatever tests, inspections, or measurements are necessary in the judgment of the professional engineer to certify that the final cover has been constructed in conformance with the design and construction specifications of this license and associated license application. The certification report must, at a minimum, contain the following engineering plans and test results:

(1) Scaled plan-view and east-west and north-south cross-sections which accurately depict the area boundaries and dimensions of the cover; surrounding natural ground surface elevations; minimum, maximum, and representative elevations of the base on which the interim cover was placed; minimum, maximum, and representative elevations of the upper surface of the interim and final covers; thickness, extent, and materials of component parts of the cover system.

(2) All observations tests, and analyses required to ensure that the installation has been completed with the terms of this license and the incorporated design plans.

E. One (1) year before final closure of the disposal site, or as otherwise directed by the Executive Director, the Licensee must submit an application to amend the license for closure. The amended closure application must include a final revision and specific details of the disposal site closure plan and decommission plan included as part of the license Application submitted under 30 TAC §336.708(a) that includes each of the following in accordance with 30 TAC

RADIOACTIVE MATERIAL LICENSE	
License Number	Amendment Number
RW4100	00

Closure Requirements

§336.719(a):

(1) Any additional geological, geochemical, hydrological, or other site data obtained during the operational period pertinent to the long-term containment of emplaced wastes;

(2) The results of tests, experiments, or any other analyses relating to backfill of excavated areas, closure and sealing, waste migration and interaction with emplacement media, or any other tests, experiments, or analyses pertinent to the long-term containment of emplaced waste within the land disposal facility;

(3) Any proposed revision of plans for:

(a) decontamination and/or dismantlement of surface facilities;

(b) backfilling of excavated areas; or

(4) Stabilization of the land disposal facility for post-closure care; and

(5) Any significant new information regarding the environmental impact of closure activities and long-term performance of the land disposal facility.

F. Upon review and consideration of an application to amend the license for closure submitted in accordance with subsection 30 TAC §336.719(a), the Commission may issue an amendment authorizing closure if there is reasonable assurance that the long-term performance objectives of 30 TAC §336.723 will be met.

209. Temporary disposal unit boundary markers and disposal unit identification markers shall be erected upon completion of backfill operations until permanent markers are installed.

210. Permanent monuments shall be installed within 120 days of the disposal unit closure and completion of the disposal unit cover. The information below shall be inscribed on each monument:

A. Total radioactivity in curies, excluding source material; total amount of source material in pounds; and total amount of special nuclear material in grams;

B. Disposal unit number or other means of identification;

C. Date of opening and closing the disposal unit;

D. Volume and class of waste in the disposal unit; and

E. Dimensions of the disposal unit.

211. General requirements for post-closure are as follows:

A. Post-closure care for the Compact Waste Disposal Facility must be performed in accordance with the license application and 30 TAC §336.720(a).

B. Post-closure care for the Federal Facility Waste Disposal Facility must be performed in accordance with the license application and 30 TAC §336.720(a) and §335.174.

C. In addition to compliance with license conditions for environmental surveillance specified in Attachments A through C to this license, the Licensee must comply with the following conditions:

RADIOACTIVE MATERIAL LICENSE	
License Number	Amendment Number
RW4100	00

Closure Requirements

(1) Maintain all storm water conveyance structures in good functional condition.

(2) Maintain the cover on the Compact Waste Disposal Facility and Federal Facility WasteDisposal Facility such that the cover promotes drainage, prevents ponding, minimizes surface water infiltration, and minimizes erosion of the cover. Any desiccation cracks, settlement, erosion, gullying, or other damage must be repaired upon observance.

(3) Maintain the cover to promote natural growth of native vegetation.

(4) Maintain all benchmarks at the land disposal facility.

(5) Maintain the land disposal facility perimeter fence, manned or locked gates, and warning signs in good functional condition.

(6) Ensure that all entrances to the land disposal facility have manned or locked gates.

(7) Ensure that the Executive Director has access to the land disposal facility.

(8) Perform all post-operational radiological and non-radiological monitoring in accordance with the license application's Radiological Environmental Monitoring Plan and Non-Radiological Environmental Monitoring Plan, respectively, with the following exceptions:

(a) In addition to monitoring wells shown in the license application, the Licensee must install additional wells as provided in Attachment C to this license.

(b) Annual fauna samples must be collected.

(9) Collect and remove pumpable liquids in the leak detection and leachate collection system sumps to minimize the head on the bottom of the liner.

(10) Manage all liquids removed from the leachate collection and leak detection systems in accordance with this license and 30 TAC Chapters 336 and 335.

(11) Maintain a record of the amount of liquids removed from each leak detection system sump at least monthly during the post-closure period, except that the Licensee may record the amount of liquids removed from the each leak detection system sump quarterly during the post-closure period, after the final cover is installed, provided that the liquid level in the sump stays below the pump operating level for two (2) consecutive months.

(12) If at any time during the post-closure period the pump operating level is exceeded at units on quarterly recording schedules, the Licensee return to monthly recording of amounts of liquids removed from each leak detection system sump until the liquid level again stays below the pump operating level for two consecutive months.

(13) The Licensee must establish an Action Leakage Rate (ALR) pursuant to 40 CFR §264.302 for the disposal unit receiving mixed waste, as defined in 30 TAC §336.2(80). The Licensee must determine if the ALR, given in gallons per acre per day, for each sump has been exceeded by converting the weekly or monthly flow rate from the monitoring data obtained to an average daily flow rate in gallons per acre per day for each sump. The Licensee must calculate the average daily flow rate for each landfill sump on a weekly basis

during the active life and closure period.

(14) Prior to receipt of waste, the Licensee must have in place an approved Response Action Plan (RAP) which meets the requirements of 40 CFR §264.304. The RAP must set forth the actions to be taken if the ALR is exceeded.

(15) The Licensee must determine if the ALR, established in accordance with license condition 211. C(13) above, has been exceeded by converting the monthly flow rate from the monitoring data obtained under license condition 211. C(11) above, to an average daily flow rate in gallons per acre per day for each sump. The Licensee must calculate the average daily flow rate for each sump on a monthly basis during the post-closure care period.

(16) If the ALR is exceeded at any time during the post-closure period, the Licensee must perform the following minimum activities:

(a) Notify the Executive Director in writing of the exceedence within seven (7) days of the determination;

(b) Submit a preliminary written assessment to the Executive Director within fourteen (14) days of the determination, as to the amount of liquids, likely sources of liquids, possible location, size, and cause of any leaks, and short-term actions taken and planned;

(c) Determine to the extent practicable the location, size, and cause of any leak;

(d) Determine whether any waste should be removed from the unit for inspection, repairs, or controls;

(e) Determine any other short-term and longer-term actions to be taken to mitigate or stop any leaks; and

(f) Within thirty (30) days after the notification that the ALR has been exceeded, submit to the Executive Director the results of the evaluations specified in license conditions 211.C(16)(c),(d), and e. above, the results of actions taken, and actions planned. Monthly thereafter, as long as the flow rate in the leak detection system exceeds the action leakage rate, the Licensee must submit to the Executive Director a report summarizing the results of any remedial actions taken and actions planned.

(17) To make the leak and/or remediation determinations in license conditions 211.C(16)(c), (d), and (f) above, the Licensee must:

(a) Assess the source of liquids and amounts of liquids by source;

(b) Conduct a fingerprint, hazardous constituent, or other analyses of the liquids in the leak detection system to identify the source of liquids and possible location of any leaks, and the hazard and mobility of the liquid; and

(c) Assess the seriousness of any leaks in terms of potential for escaping into the environment; or

(d) Document why such assessments are not needed.

212. Prior to closure and license termination the Licensee, as part of decommissioning, must decontaminate all ancillary facilities,

RADIOACTIVE MATERIAL LICENSE	
License Number	Amendment Number
RW4100	00

Closure Requirements

surfaces, and equipment in accordance with 30 TAC §336.364, Acceptable Surface Contamination Limits. The results of all surveys and decontamination activities must be included in the decommissioning plan.

213. The Licensee must prepare a final site closure plan in accordance with 30 TAC §336.719. Visual inspections will be preformed quarterly during operations and closure, and annually thereafter.

214. The Licensee must apply for an amendment to transfer the license to the Commission upon fulfillment of all applicable requirements under laws for closure and for post-closure observation and maintenance.

215. Upon completion of all decommissioning requirements and before the transfer of the license can occur, the Licensee shall convey to the federal government all right, title and interest in land and buildings of the Federal Facility Waste Disposal Facility and convey all right, title and interest in federal facility waste to the federal government.

216. Upon application to transfer the license, the Licensee shall acknowledge the conveyance to the State of Texas of all right, title and interest in compact waste located in the Compact Waste Disposal Facility.

Financial Assurance and Qualifications

217. In order to verify financial qualifications before commencement of major construction, the Licensee must update the financial model to reflect any changes to the cost estimates. The Licensee shall demonstrate financial viability in the form of a commitment letter from the parent, Valhi, in the amount of the estimated costs to cover all licensed activities over the planned operating life of the land disposal facility. The updated financial model and any commitment letter must be reviewed and approved by the Executive Director.

218. In order to verify financial qualifications, the Licensee must provide a financial guarantee equal in quantity to that provided by Valhi, Inc. by any new parent or sibling company should Valhi seek to divest itself of Waste Control Specialists, LLC (WCS). Operations and construction must cease until an acceptable financial guarantee has been provided to the Executive Director.

219. The Licensee must fully fund all financial assurance mechanisms prior to the sale of any controlling interest in WCS or sale of any portion of the land disposal facility.

220. In order to verify financial qualifications, the Licensee must provide additional financial guarantees from WCS's parent company should the ten million dollar ($10,000,000.00) working capital allowance prove insufficient to allow the proposed enterprise to prosper.

221. The Licensee must update the cost estimates to reflect changes based on license requirements, as well as unforeseen additional costs.

222. Prior to commencement of major construction, the Licensee must update and finalize a letter of credit and associated cover letter.

RADIOACTIVE MATERIAL LICENSE	
License Number	Amendment Number
RW4100	00

Financial Assurance and Qualifications

223. Sixty (60) days prior to accepting waste, the Licensee shall provide financial assurance in an amount described below and in a form acceptable to the Executive Director. Financial assurance acceptable to the Executive Director in amount and form shall be maintained until license termination has been approved by the Executive Director and the United States Nuclear Regulatory Commission, except for the corrective action financial assurance and for the institutional control.

A. Financial assurance in the amount of eighty-five million dollars ($85,000,000.00) in 2006 dollars for decommissioning and closure, thirty-five million dollars ($35,000,000.00) in 2006 dollars for five-years of post-operational surveillance, and twenty-five million dollars ($25,000,000.00) in 2006 dollars for institutional control must be provided initially by the Licensee to the Executive Director. These amounts must be converted to current dollars, by use of the methodology cross-referenced in 30 TAC Chapter 37, Subchapter T, prior to receipt of low-level radioactive waste and posting of financial assurance with the Executive Director.

B. The amount of twenty-five million dollars ($25,000,000.00) in 2006 dollars for corrective action must be provided initially by the Licensee to the Executive Director as financial assurance sufficient to address unplanned events that pose a risk to public health, safety and the environment that may occur after the decommissioning and closure of the land disposal facility. The amount must be converted to current dollars, by use of the methodology cross-referenced in 30 TAC Chapter 37, Subchapter T, prior to receipt of low-level radioactive waste and posting of financial assurance with the Executive Director. At least sixty (60) days prior to the anniversary date of the first establishment of the financial assurance mechanism, this amount shall be increased as acceptable to the Executive Director to account for the cumulative waste received at the land disposal facility each successive year. This annual additional amount shall not be less than one million dollars ($1,000,000).

C. The Licensee shall annually increase the cost estimates for inflation as described in30 TAC Chapter 37, Subchapter T , in addition, the Licensee shall submit a revision to the cost estimates for the land disposal facility to the Commission for approval on the anniversary date of the financial instrument each year, and upon amendment to the license. Commission approval may be demonstrated by either amendment of this license or by order of the Commission to specify the current dollar amount. Within sixty (60) days of the Commission's determination of the amount, the Licensee shall change the level of funding of the financial assurance and submit the revised financial instrument for approval.

D. The Licensee shall provide financial assurance for bodily injury and property damage to third parties caused by sudden and non-sudden accidental occurrences arising from operations of the Compact Waste Disposal Facility and the Federal Facility Waste Disposal Facility in a manner that meets the requirements of 30 TAC Chapter 37, Subchapter T.

Additional Requirements

224. Except as specifically provided otherwise by this license, the Licensee must possess and disposed of low-level radioactive waste authorized by the license in accordance with statements, representations, and procedures contained in the following:

Original application dated August 3, 2004, and subsequent amendments.

RADIOACTIVE MATERIAL LICENSE	
License Number	Amendment Number
RW4100	00

225. All written submissions to the executive director as required by this license shall be made to the following:

A. For submissions by U. S. Postal Service:

Attn: Susan Jablonski, P.E., Director
Radioactive Materials Division
Texas Commission on Environmental Quality
Mail Code – 233
P. O. Box 13087
Austin, Texas 78711-3087

B. For Submissions by facsimile transmission the transmission should be addressed to the attention of the Radioactive Material Licensing Section, Radioactive Materials Division and sent to the following number:

(512) 239-6464

C. For submission of portable document file (pdf) documents by electronic mail, address to the following:

sjablons@ tceq.state.tx.us

If there is a conflict between a condition of this license, statements contained in the application materials, applicable provisions of Title 30 of TAC, the most stringent provision shall prevail.

FOR THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Date

RADIOACTIVE MATERIAL LICENSE	
license Number	Amendment Number
RW4100	00

Attachment A

Modified Natural Radiation Monitoring Program				
Sample	**Station/Location Reference**	**Method**	**Frequency**	**Type of Analysis**
Air - Particulate	6 - Northwest Facility Fence Line 27 - Southeast of Facility 28 - Southwest of Facility	High-Volume Sampler	Composite, weekly samples by location each month	Total Alpha, Total Beta, Alpha isotopic, Gamma spec, Liquid Scintillation
Air - Particulate Tritiated water vapor	6 - Northwest Facility Fence Line 27 - Southeast of Facility 28 - Southwest of Facility		Continuous with weekly changes	Tritium
Air - Other vapor, gases	6 - Northwest Facility Fence Line 27 - Southeast of Facility 28 - Southwest of Facility		Continuous with weekly changes	C-14, I-129, Krypton-85, Ra-222
Precipitation	26 - 1 perimeter location		Monthly	Gamma Spec
Radon	6 - Northwest Facility Fence Line 27 - Southeast of Facility 28 - Southwest of Facility	Track-etch detector	Quarterly	Radon
Direct Radiation	6 - Northwest Facility Fence Line 27 - Southeast of Facility 28 - Southwest of Facility	TLD, Survey reading	Quarterly	Direct gamma radiation measurements taken at each location
Soil	6 - Northwest Facility Fence Line 27 - Southeast of Facility 28 - Southwest of Facility	Grab Surface, 0-6”, 6-12”	Quarterly	Gross Alpha, Gross Beta, Alpha isotopic, Gamma Spec, Liquid Scintillation, Pu-238, Pu-239/Pu-240, Pu-241, Ra-226
Soil	6 - Northwest Facility Fence Line 27 - Southeast of Facility 28 - Southwest of Facility	Grab 0-6”	Quarterly	Chemical Analysis (per HW-50358 Application Attachment VI, Appendix 6.62, Table 1, Revision 5, January 20, 2005)
Vegetation	6 - Northwest Facility Fence Line 27 - Southeast of Facility 28 - Southwest of Facility	Grab	Semi-annually	Gross Alpha, Gross Beta, Alpha isotopic, Gamma Spec, Liquid Scintillation, Ra-226
Vegetation	6 - Northwest Facility Fence Line 27 - Southeast of Facility 28 - Southwest of Facility	Grab	Semi-annually	Chemical Analysis (per HW-50358 Application Attachment VI, Appendix 6.62, Table 1, Revision 5, January 20, 2005)

RADIOACTIVE MATERIAL LICENSE	
license Number	Amendment Number
RW4100	00

Attachment A

Modified Natural Radiation Monitoring Program				
Sample	**Station/Location Reference**	**Method**	**Frequency**	**Type of Analysis**
Surface Water	Baker Springs	Grab	Quarterly	Gross Alpha, Gross Beta, Alpha isotopic, Gamma Spec, Liquid Scintillation, Ra-226, Sr-90, H-3, Tc-99, I-129, Cs-137, Pb-210, Ra-228, Th-230, Th-232, Carbon-14, Pu-238, Pu-239/Pu-240, Pu-241 Alpha Spec: U-238, U-235, U-234
Surface Water	Baker Springs	Grab	Quarterly	Chemical Analysis (per HW-50358 Application Attachment VI, Appendix 6.62, Table 1, Revision 5, January 20, 2005)
Sediment	Baker Springs	Grab	Quarterly	Gross Alpha, Gross Beta, Alpha isotopic, Gamma Spec, Liquid Scintillation
Fauna	General Site Area	Grab	Annually	Gross Alpha, Gross Beta, Alpha isotopic, Gamma Spec, Liquid Scintillation
Monitor Well Cluster OAG, 225 Top, 225 Bottom, 215 Foot	6 - Northwest Facility Fence Line	Grab	Quarterly	Gross Alpha, Gross Beta, Alpha isotopic, Gamma Spec, Liquid Scintillation, Ra-226, Sr-90, H-3, Tc-99, I-129, Cs-137, Pb-210, Ra-228, Th-230, Th-232, Carbon-14, Alpha Spec: U-238, U-235, U-234

RADIOACTIVE MATERIAL LICENSE	
license Number	Amendment Number
RW4100	00

Attachment A

Modified Natural Radiation Monitoring Program				
Sample	**Station/Location Reference**	**Method**	**Frequency**	**Type of Analysis**
Monitor Well Cluster OAG, 225 Top, 225 Bottom, 215 Foot	6 - Northwest Facility Fence Line	Grab	Quarterly	Chemical Analysis (per HW-50358 Application Attachment VI, Appendix 6.62, Table 1, Revision 5, January 20, 2005)

RADIOACTIVE MATERIAL LICENSE	
license Number	Amendment Number
RW4100	00

Attachment A

Figure X

RADIOACTIVE MATERIAL LICENSE	
license Number	Amendment Number
RW4100	00

Attachment B

Modified Baseline Environmental Monitoring Program				
Sample	**Station/Location Reference**	**Method**	**Frequency**	**Type of Analysis**
Air - Particulate	FWF-30 - Northwest corner FWF FWF-31 - North-center FWF FWF-32 - Northeast FWF FWF-33 - Southeast FWF FWF-34 - Southwest FWF FWF-35 - West FWF FWF-36 - East FWF CFW-11 - West CFW CFW-16 - Northwest CWF CFW-17 - Northeast CFW CFW-18 - South CFW	High-Volume Sampler	Composite, weekly samples by location each month	Total Alpha, Total Beta, Alpha isotopic, Gamma- ray spec, Liquid Scintillation
Air Tritiated water vapor	FWF-30 - Northwest corner FWF FWF-31 - North-center FWF FWF-32 - Northeast FWF FWF-33 - Southeast FWF FWF-34 - Southwest FWF FWF-35 - West FWF FWF-36 - East FWF CFW-11 - West CFW CFW-16 - Northwest CWF CFW-17 - Northeast CFW CFW-18 - South CFW		Continuous with weekly changes	Tritium
Air - Other vapor, gases	FWF-30 - Northwest corner FWF FWF-31 - North-center FWF FWF-32 - Northeast FWF FWF-33- Southeast FWF FWF-34 - Southwest FWF FWF-35 - West FWF FWF-36 - East FWF CFW-11 - West CFW CFW-16 - Northwest CWF CFW-17 - Northeast CFW CFW-18 - South CFW	Cartridge	Continuous with weekly changes	C-14, I-129, Krypton-85, Ra-222
Precipitation	26 - 1 perimeter location		Monthly	Gamma Spec
Radon	FWF-30 - Northwest corner FWF FWF-31 - North-center FWF FWF-32 - Northeast FWF FWF-33 - Southeast FWF FWF-34 - Southwest FWF FWF-35 - West FWF FWF-36 - East FWF CFW-11 - West CFW CFW-16 - Northwest CWF CFW-17 - Northeast CFW CFW-18 - South CFW	Track-etch detector	Quarterly	Radon

RADIOACTIVE MATERIAL LICENSE	
license Number	Amendment Number
RW4100	00

Attachment B

Modified Baseline Environmental Monitoring Program				
Sample	**Station/Location Reference**	**Method**	**Frequency**	**Type of Analysis**
Direct Radiation	FWF-30 - Northwest corner FWF FWF-31 - North-center FWF FWF-32 - Northeast FWF FWF-33 - Southeast FWF FWF-34 - Southwest FWF FWF-35 - West FWF FWF-36 - East FWF CFW-11 - West CFW CFW-16 - Northwest CWF CFW-17 - Northeast CFW CFW-18 - South CFW	TLD, Survey reading	Quarterly	Direct gamma radiation measurements taken at each location quarterly, a one-time μR meter survey on a 50 meter grid of entire site. (Application 12c, Volume 18, Section D, Table 11)
Soil	50 meter grid of entire Site Application 12c, Volume 18, Section D, Table 11)	Grab Surface, 0-6", 6-12"	One time	Gross Alpha, Gross Beta, Alpha isotopic, Gamma Spec, Liquid Scintillation, Ra-226, Pu-238, Pu-239/Pu-240, Pu-241
Soil	50 meter grid of entire Site Application 12c, Volume 18, Section D, Table 11)	Grab surface	Quarterly for twelve consecutive months. Annually thereafter at air sampler locations	Chemical Analysis (per HW-50358 Application Attachment VI, Appendix 6.62, Table 1, Revision 5, January 20, 2005)
Vegetation	GW-1 -Stock pond GW-2 -Baker Springs GW-3- Playa West of Byproduct Facility GW-4- Playa North of FWF GW-5 - Playa Northeast of CWF GW-6 - Playa East of CWF	Grab	Semi-annually	Gross Alpha, Gross Beta, Alpha isotopic, Gamma Spec, Liquid Scintillation, Ra-226
Vegetation	GW-1 -Stock pond GW-2 -Baker Springs GW-3- Playa West of Byproduct Facility GW-4- Playa North of FWF GW-5 - Playa Northeast of CWF GW-6 - Playa East of CWF	Grab	Quarterly for twelve consecutive months. Annually thereafter at air sampler locations	Chemical Analysis (per HW-50358 Application Attachment VI, Appendix 6.62, Table 1, Revision 5, January 20, 2005)

RADIOACTIVE MATERIAL LICENSE	
license Number	Amendment Number
RW4100	00

Attachment B

Modified Baseline Environmental Monitoring Program				
Sample	**Station/Location Reference**	**Method**	**Frequency**	**Type of Analysis**
Surface Water	GW-1 -Stock pond GW-2 -Baker Springs GW-3- Playa West of Byproduct Facility GW-4- Playa North of FWF GW-5 - Playa Northeast of CWF GW-6 - Playa East of CWF	Grab	Quarterly	Gross Alpha, Gross Beta, Alpha isotopic, Gamma Spec, Liquid Scintillation, Ra-226, Sr-90, H-3, Tc-99, I-129, Cs-137, Pb-210, Ra-228, Th-230, Th-232, Carbon-14 Alpha Spec: U-238, U-235, U-234
Surface Water	GW-1 -Stock pond GW-2 -Baker Springs GW-3- Playa West of Byproduct Facility GW-4- Playa North of FWF GW-5 - Playa Northeast of CWF GW-6 - Playa East of CWF	Grab	Quarterly for twelve consecutive months. Annually thereafter	Chemical Analysis (per HW-50358 Application Attachment VI, Appendix 6.62, Table 1, Revision 5, January 20, 2005)
Fish	GW-1 -Stock pond GW-2 -Baker Springs GW-3- Playa West of Byproduct Facility GW-4- Playa North of FWF GW-5 - Playa Northeast of CWF GW-6 - Playa East of CWF	Grab	Annually	Gross Alpha, Gross Beta, Alpha isotopic, Gamma Spec, Liquid Scintillation, Ra-226, Sr-90, H-3, Tc-99, I-129, Cs-137, Pb-210, Ra-228, Th-230, Th-232, Carbon-14 Alpha Spec: U-238, U-235, U-234
Sediment	GW-1 -Stock pond GW-2 -Baker Springs GW-3- Playa West of Byproduct Facility GW-4- Playa North of FWF GW-5 - Playa Northeast of CWF GW-6 - Playa East of CWF	Grab	Quarterly	Gross Alpha, Gross Beta, Alpha isotopic, Gamma Spec, Liquid Scintillation

RADIOACTIVE MATERIAL LICENSE	
license Number	Amendment Number
RW4100	00

Attachment B

Modified Baseline Environmental Monitoring Program				
Sample	**Station/Location Reference**	**Method**	**Frequency**	**Type of Analysis**
Fauna	General Site Area	Grab	Annually	Gross Alpha, Gross Beta, Alpha isotopic, Gamma Spec, Liquid Scintillation
Monitor Well Cluster, OAG, 225 Top, 225 Bottom, 215 Foot	FWF-21 - North center FWF FWF -22 - East FWF FWF -23 - Northeast corner FWF FWF -24 - Northeast FWF FWF -25 - Northeast FWF FWF -26 - Northwest FWF FWF -27 - Northwest corner FWF FWF -28 - East FWF FWF -29 - 800 feet North of Byproduct Material Landfill CFW-13 - Northwest corner CFW CFW-14 - North Center CFW CFW-15 - Northeast corner CFW GW-1 -Stock pond (OAG only) GW-2 -Baker Springs (OAG only) GW-3- Playa West of Byproduct Facility (OAG only) GW-4- Playa North of FWF (OAG only) GW-5 - Playa Northeast of CWF (OAG only) GW-6 - Playa East of CWF (OAG only)	Grab	Quarterly	Gross Alpha, Gross Beta, Alpha isotopic, Gamma Spec, Liquid Scintillation, Ra-226, Sr-90, H-3, Tc-99, I-129, Cs-137, Pb-210, Ra-228, Th-230, Th-232, Carbon-14 Alpha Spec: U-238, U-235, U-234
Monitor Well Cluster, OAG, 225 Top, 225 Bottom, 215 Foot	FWF -21 - North center FWF FWF -22 - East FWF FWF -23 - Northeast corner FWF FWF -24 - Northeast FWF FWF -25 - Northeast FWF FWF -26 - Northwest FWF FWF -27 - Northwest corner FWF FWF -28 - East FWF FWF -29 - 800 feet North of Byproduct Material Landfill CFW-13 - Northwest corner CFW CFW-14 - North Center CFW CFW-15 - Northeast corner CFW GW-1 -Stock pond (OAG only) GW-2 -Baker Springs (OAG only) GW-3- Playa West of Byproduct Facility (OAG only) GW-4- Playa North of FWF (OAG only) GW-5 - Playa Northeast of CWF (OAG only) GW-6 - Playa East of CWF (OAG only)	Grab	Quarterly	Chemical Analysis (per HW-50358 Application Attachment VI, Appendix 6.62, Table 1, Revision 5, January 20, 2005)

RADIOACTIVE MATERIAL LICENSE	
license Number	Amendment Number
RW4100	00

Attachment B

Figures Y

RADIOACTIVE MATERIAL LICENSE	
License Number	Amendment Number
RW4100	00

Attachment C

Pre-Op, Construction, Operational Environmental Monitoring:				
Sample	**Station/Location Reference**	**Method**	**Frequency**	**Type of Analysis**
Air - Particulate	FWF -30 - Northwest corner FWF FWF -31 - North-center FWF FWF -32 - Northeast FWF FWF -33 - Southeast FWF FWF -34 - Southwest FWF FWF -35 - West FWF FWF -36 - East FWF 11 - West CFW 16 - Northwest CWF 17 - Northeast CFW 18 - South CFW 1 - East of Guard House 4 - Southwest corner of FWF 6 - Northwest of Facility fence line 7 - North fence line center of RCRA permit area 9 - Control station 26 - Center of East edge of RCRA permit area 27 - Southeast of facility P2 - South of CWF P3 - North of CWF P5 - North center of FWF P11 - West side FWF P31 - Southeast of the facilities P32- Railroad spur	High-Volume Sampler	Composite, weekly samples by location each month	Total Alpha, Total Beta, Alpha isotopic, Gamma- ray spec, Liquid Scintillation
Air - Particulate tritiated water vapor	FWF -30 - Northwest corner FWF FWF -31 - North-center FWF FWF -32 - Northeast FWF FWF -33 - Southeast FWF FWF -34 - Southwest FWF FWF -35 - West FWF FWF -36 - East FWF CFW-11 - West CFW CFW-16 - Northwest CWF CFW-17 - Northeast CFW CFW-18 - South CFW 1 - East of Guard House 4 - Southwest corner of FWF 6 - Northwest of Facility fence line 7 - North fence line center of RCRA permit area 9 - Control station 26 - Center of East edge of RCRA permit area 27 - Southeast of facility P2 - South of CWF P3 - North of CWF P5 - North center of FWF P11 - West side FWF P31 - Southeast of the facilities		Continuous with Weekly changes	C-14, I-129, Krypton-85, Ra-222

RADIOACTIVE MATERIAL LICENSE	
License Number	Amendment Number
RW4100	00

Attachment C

Pre-Op, Construction, Operational Environmental Monitoring:				
Sample	**Station/Location Reference**	**Method**	**Frequency**	**Type of Analysis**
Precipitation	26 - 1 perimeter location	Precipitation, Temperature, Evaporation, Transpiration, Wind Speed, Atmospheric Stability	Monthly	Gamma Spec
Radon	FWF -30 - Northwest corner FWF FWF -31 - North-center FWF FWF -32 - Northeast FWF FWF -33 - Southeast FWF FWF -34 - Southwest FWF FWF -35 - West FWF FWF -36 - East FWF CFW-11 - West CFW CFW-16 - Northwest CWF CFW-17 - Northeast CFW CFW-18 - South CFW 1 - East of Guard House 4 - Southwest corner of FWF 6 - Northwest of Facility fence line 7 - North fence line center of RCRA permit area 9 - Control station 26 - Center of East edge of RCRA permit area 27 - Southeast of facility P2 - South of CWF P3 - North of CWF P5 - North center of FWF P11- West side FWF P31 - Southeast of the facilities	Track-etch detector	Quarterly	Radon

RADIOACTIVE MATERIAL LICENSE	
License Number	Amendment Number
RW4100	00

Attachment C

Pre-Op, Construction, Operational Environmental Monitoring:				
Sample	**Station/Location Reference**	**Method**	**Frequency**	**Type of Analysis**
Direct Radiation	FWF -30 - Northwest corner FWF FWF -31 - North-center FWF FWF -32 - Northeast FWF FWF -33 - Southeast FWF FWF -34 - Southwest FWF FWF -35 - West FWF FWF -36 - East FWF CFW-11 - West CFW CFW-16 - Northwest CWF CFW-17 - Northeast CFW CFW-18 - South CFW 1 - East of Guard House 4 - Southwest corner of FWF 6 - Northwest of Facility fence line 7 - North fence line center of RCRA permit area 9 - Control station 26 - Center of East edge of RCRA permit area 27 - Southeast of facility P2 - South of CWF P3 - North of CWF P5 - North center of FWF P11 - West side FWF P31 - Southeast of the facilities	TLD, Survey reading	Quarterly	Direct gamma radiation measurements taken at each location quarterly
Soil	Air Monitoring Sites	Grab Surface, 0-6”, 6-12”	Quarterly at air sampling sites	Gross Alpha, Gross Beta, Alpha isotropic, Gamma Spec, Liquid Scintillation, Ra-226, Pu-238, Pu-239/Pu-240, Pu-241
Soil	Air Monitoring Sites	Grab surface	Annually at air sampler locations	Chemical Analysis (per HW-50358 Application Attachment VI, Appendix 6.62, Table 1, Revision 5, January 20, 2005)
Vegetation	GW-1 -Stock pond GW-2 -Baker Springs GW-3- Playa West of Byproduct Facility GW-4- Playa North of FWF GW-5 - Playa Northeast of CWF GW-6 - Playa East of CWF Air Monitoring Sites	Grab	Semi-annually	Gross Alpha, Gross Beta, Alpha isotropic, Gamma Spec, Liquid Scintillation, Ra-226

RADIOACTIVE MATERIAL LICENSE	
License Number	Amendment Number
RW4100	00

Attachment C

Pre-Op, Construction, Operational Environmental Monitoring:				
Sample	**Station/Location Reference**	**Method**	**Frequency**	**Type of Analysis**
Surface Water	GW-1 -Stock pond GW-2 -Baker Springs GW-3- Playa West of Byproduct Facility GW-4- Playa North of FWF GW-5 - Playa Northeast of CWF GW-6 - Playa East of CWF	Grab	Quarterly	Gross Alpha, Gross Beta, Alpha isotopic, Gamma Spec, Liquid Scintillation, Ra-226, Sr-90, H-3, Tc-99, I-129, Cs-137, Pb-210, Ra-228, Th-230, Th-232, Carbon-14 Alpha Spec: U-238, U-235, U-234
Surface Water	GW-1 -Stock pond GW-2 -Baker Springs GW-3- Playa West of Byproduct Facility GW-4- Playa North of FWF GW-5 - Playa Northeast of CWF GW-6 - Playa East of CWF	Grab	Annually	Chemical Analysis (per HW-50358 Application Attachment VI, Appendix 6.62, Table 1, Revision 5, January 20, 2005)
Fish	GW-1 -Stock pond GW-2 -Baker Springs GW-3- Playa West of Byproduct Facility GW-4- Playa North of FWF GW-5 - Playa Northeast of CWF GW-6 - Playa East of CWF	Grab	Annually	Gross Alpha, Gross Beta, Alpha isotopic, Gamma Spec, Liquid Scintillation, Ra-226, Sr-90, H-3, Tc-99, I-129, Cs-137, Pb-210, Ra-228, Th-230, Th-232, Carbon-14 Alpha Spec: U-238, U-235, U-234
Sediment	GW-1 -Stock pond GW-2 -Baker Springs GW-3- Playa West of Byproduct Facility GW-4- Playa North of FWF GW-5 - Playa Northeast of CWF GW-6 - Playa East of CWF	Grab	Quarterly	Gross Alpha, Gross Beta, Alpha isotopic, Gamma Spec, Liquid Scintillation

RADIOACTIVE MATERIAL LICENSE	
License Number	Amendment Number
RW4100	00

Attachment C

Pre-Op, Construction, Operational Environmental Monitoring:				
Sample	**Station/Location Reference**	**Method**	**Frequency**	**Type of Analysis**
Fauna	General Site Area	Grab	Annually	Gross Alpha, Gross Beta, Alpha isotopic, Gamma Spec, Liquid Scintillation
Septic, Process Water	All Buildings on Site	Grab, Solids and Liquid	Quarterly or prior to disposal	Gross Alpha, Gross Beta, Alpha isotopic, Gamma Spec, Liquid Scintillation
Monitor Well Cluster, OAG, 225 Top, 225 Bottom, 215 Foot	FWF-21- North center FWF FWF-22- East FWF FWF-23- Northeast corner FWF FWF-24- Northeast FWF FWF-25- Northeast FWF FWF-26- Northwest FWF FWF-27- Northwest corner FWF 28- East FWF FWF-29- 800 feet North of Byproduct Material Landfill CFW-13- Northwest corner CFW CFW-14- North Center CFW CFW-15- Northeast corner CFW GW-1 (OAG only) GW-1 -Stock pond (OAG only) GW-2 -Baker Springs (OAG only) GW-3- Playa West of Byproduct Facility (OAG only) GW-4- Playa North of FWF (OAG only) GW-5 - Playa Northeast of CWF (OAG only) GW-6 - Playa East of CWF (OAG only)	Grab	Quarterly	Gross Alpha, Gross Beta, Alpha isotopic, Gamma Spec, Liquid Scintillation, Ra-226, Sr-90, H-3, Tc-99, I-129, Cs-137, Pb-210, Ra-228, Th-230, Th-232, Carbon-14 Alpha Spec: U-238, U-235, U-234
Monitor Well Cluster, OAG, 225 Top, 225 Bottom, 215 Foot	FWF-21- North center FWF 22- East FWF FWF-23- Northeast corner FWF FWF-24- Northeast FWF FWF-25- Northeast FWF FWF-26- Northwest FWF FWF-27- Northwest corner FWF 28- East FWF FWF-29- 800 feet North of Byproduct Material Landfill CFW-13- Northwest corner CFW CFW-14- North Center CFW CFW-15- Northeast corner CFW GW-1 -Stock pond (OAG only) GW-2 -Baker Springs (OAG only) GW-3- Playa West of Byproduct Facility (OAG only) GW-4- Playa North of FWF (OAG only) GW-5 - Playa Northeast of CWF (OAG only)	Grab	Quarterly	Chemical Analysis (per HW-50358 Application Attachment VI, Appendix 6.62, Table 1, Revision 5, January 20, 2005)

RADIOACTIVE MATERIAL LICENSE	
License Number	Amendment Number
RW4100	00

Attachment C

Pre-Op, Construction, Operational Environmental Monitoring:				
Sample	**Station/Location Reference**	**Method**	**Frequency**	**Type of Analysis**
RCRA Monitor Wells	5EA- North of RCRA TP-46- Southeast RCRA DW35A- Southwest RCRA	Grab	Quarterly	Gross Alpha, Gross Beta, Alpha isotopic, Gamma Spec, Liquid Scintillation, Ra-226, Sr-90, H-3, Tc-99, I-129, Cs-137, Pb-210, Ra-228, Th-230, Th-232, Carbon-14 Alpha Spec: U-238, U-235, U-234
RCRA Monitor Wells	5EA- North of RCRA TP-46- Southeast RCRA DW35A- Southwest RCRA	Grab	Quarterly	Chemical Analysis (per HW-50358 Application Attachment VI, Appendix 6.62, Table 1, Revision 5, January 20, 2005)

RADIOACTIVE MATERIAL LICENSE	
License Number	Amendment Number
RW4100	00

Attachment C

Figure Z