

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Environmental Permits, Region 4

1130 North Westcott Road, Schenectady, NY 12306-2014

P: (518) 357-2069 | F: (518) 357-2460

www.dec.ny.gov

September 5, 2024

David Delwiche
Environment, Safety and Health Program Manager
US Department of Energy Naval Reactors Laboratory Field Office
PO Box 1069
Niskayuna, NY 12301
Transmitted by email: David.delwiche@nrp.doe.gov

RE: Part 373 Permit Renewal
Knolls Atomic Power Laboratory
NYSDEC ID# 4-4224-00024/00001
EPA I.D. No.: NY6890008992
2401 River Road
Niskayuna, Schenectady County

Dear David Delwiche,

Enclosed please find a renewed Hazardous Waste Management Permit which was issued in accordance with the applicable provisions of the Environmental Conservation Law. Questions regarding the terms of the permit should be directed to the RCRA project manager, Frank Zhang, at frank.zhang@dec.ny.gov or 518-402-8755.

Please note that it is the responsibility of the permittee and the agents to read and comply with all permit conditions. The permit is valid only for the activities expressly authorized in the permit. Failure to comply with the terms and conditions of the permit may be treated as a violation of the Environmental Conservation Law.

Issuance of the enclosed permit does not eliminate the need to obtain all necessary approvals from other local, state or federal agencies.

Please be advised that the Uniform Procedures Regulations (6 NYCRR Part 621) provide that an applicant may request a public hearing if a permit is denied or contains conditions which are unacceptable to them. Any such request must be made in writing within 30 calendar days of the date of permit issuance and must be addressed to the Regional Permit Administrator at the letterhead address. A copy should also be sent to the Chief Administrative Law Judge at NYSDEC, 625 Broadway, 1st Floor, Albany, NY 12233-1550.

Thank you,



Kate Malcolm
Regional Permit Administrator

Encls: Part 373 Hazardous Waste Management Permit Renewal

Ecc: R. Clarkson, NYSDEC
L. Winterberger, NYSDEC
F. Zhang, NYSDEC,



Department of
Environmental
Conservation

B. Maglienti, NYSDEC, Region 4
E. Floto, USEPA, Region 2
A. Everett, USEPA, Region 2
A. Park, USEPA, Region 2
C. Ng, USEPA, Region 2



PERMIT
Under the Environmental Conservation Law (ECL)

Permittee and Facility Information

Permit Issued To:

UNITED STATES DEPARTMENT OF
ENERGY – NAVAL REACTORS
LABORATORY FIELD OFFICE
PO BOX 1069
SCHENECTADY, NY 12301-1069
(518) 395-6366

Facility:

KNOLLS ATOMIC POWER LABORATORY
2401 RIVER ROAD
NISKAYUNA, NY 12309

Facility Location: in NISKAYUNA in SCHENECTADY COUNTY

Facility Principal Reference Point: NYTM-E: 592.5 NYTM-N: 4741.6
Latitude: 42°49'16.8"N Longitude: 73°52'5.3"W

Authorized Activity: Continued operation of a hazardous and mixed waste container storage facility.
The total container storage capacity for hazardous and mixed waste is 17,700 gallons.

Permit Authorizations

Resource Conservation and Recovery Act - Under Article 27, Title 9

Permit ID 4-4224-00024/00001

Renewal

Effective Date: 9/5/2024

Proposed Expiration Date: 9/4/2034

NYSDEC Approval

By acceptance of this permit, the permittee agrees that the permit is contingent upon strict compliance with the ECL, all applicable regulations, and all conditions included as part of this permit.

Permit Administrator: KATE MALCOLM, Regional Permit Administrator

Address: NYSDEC Region 4
 1130 North Wescott Rd
 Schenectady, NY 12306

Authorized Signature: K. Malcolm

Date: 9 / 5 / 2024



Permit Components

RESOURCE CONSERVATION AND RECOVERY ACT PERMIT CONDITIONS

GENERAL CONDITIONS, APPLY TO ALL AUTHORIZED PERMITS

NOTIFICATION OF OTHER PERMITTEE OBLIGATIONS

RESOURCE CONSERVATION AND RECOVERY ACT PERMIT CONDITIONS

- 1. Permit Assumes that Permit Renewal Application is Complete and Accurate** The permit is based on the information contained in the permit application submitted by USDOE-NRLFO in January 2022 and all subsequent revisions. The permit is based on the assumption that the information submitted by USDOE-NRLFO in the application documents is complete and accurate and the facility will be operated as specified in the application. Any inaccuracies or incompleteness found in the information may be grounds for the termination or modification of this permit and potential enforcement action.
- 2. Permittee Shall Comply with Permit** The permittee must comply with all terms and conditions of this permit. This permit consists of the conditions contained herein (including those in any attachments and incorporated documents) and the applicable regulations contained in 6 NYCRR (Parts 370 through 373-2, 376, 621 and 624).
- 3. Notify the Department of any Deviations** The Permittee shall immediately notify the Department of any deviation from or changes in the information contained in the application which would affect the Permittee's ability to comply with the regulations or permit conditions.
- 4. Potential Conflicts with Permit** In the event of a discrepancy between this Permit and any regulation, order on consent or any other Permit, the more stringent requirement applies.
- 5. Modules, Attachments and Incorporated Documents** The Permittee shall operate the facility in strict accordance with the modules, attachments and incorporated documents to this permit as specified below:

Modules:

- I General Provisions
- II Corrective Action Requirements
- III Storage in Containers
- XI Scheduled Dates

Attachments:

- A RCRA Part A Application
- B Facility Description
- C Waste Characteristics
- D Process Description
- E Corrective Action



- F Procedures to Prevent Hazards
- G Contingency Plan
- H Personnel Training
- I Closure Plan
- J Other Federal and State Laws
- K Certification
- M Permit Modification Log

7. QA/QC Procedures The Permittee is responsible for verifying that the Quality Assurance/Quality Control Program (QA/QC) followed by laboratories used by the Permittee to carry out analysis of the waste streams, conform to the QA/QC procedures approved in the permit and thus ensure the validity of the analytical data provided by the laboratories.

8. Laboratories Shall be ELAP Certified As required by ECL 03-0119, any laboratory (Permittee or contract), used by the Permittee to perform analysis pursuant to this Permit shall be certified by the New York State Department of Health Environmental Laboratory Approval Program (ELAP) in the appropriate categories of analysis, if ELAP issues certifications in such categories. If the Permittee uses an ELAP approved contract laboratory to perform the analysis required by this Permit, then the Permittee shall inform the laboratory in writing that it must operate under the waste analysis and quality assurance provisions of this Permit.

GENERAL CONDITIONS - Apply to ALL Authorized Permits:
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1. Facility Inspection by The Department The permitted site or facility, including relevant records, is subject to inspection at reasonable hours and intervals by an authorized representative of the Department of Environmental Conservation (the Department) to determine whether the permittee is complying with this permit and the ECL. Such representative may order the work suspended pursuant to ECL 71- 0301 and SAPA 401(3).

The permittee shall provide a person to accompany the Department's representative during an inspection to the permit area when requested by the Department.

A copy of this permit, including all referenced maps, drawings and special conditions, must be available for inspection by the Department at all times at the project site or facility. Failure to produce a copy of the permit upon request by a Department representative is a violation of this permit.

2. Relationship of this Permit to Other Department Orders and Determinations Unless expressly provided for by the Department, issuance of this permit does not modify, supersede or rescind any order or determination previously issued by the Department or any of the terms, conditions or requirements contained in such order or determination.

3. Applications For Permit Renewals, Modifications or Transfers The permittee must submit a separate written application to the Department for permit renewal, modification or transfer of this permit. Such application must include any forms or supplemental information the Department requires. Any renewal, modification or transfer granted by the Department must be in writing. Submission of applications for permit renewal, modification or transfer are to be submitted to:



Regional Permit Administrator
NYSDEC Region 4
1130 North Wescott Rd
Schenectady, NY 12306

4. Submission of Renewal Application The permittee must submit a renewal application at least 180 days before permit expiration for the following permit authorizations: Resource Conservation and Recovery Act.

5. Permit Modifications, Suspensions and Revocations by the Department The Department reserves the right to exercise all available authority to modify, suspend or revoke this permit. The grounds for modification, suspension or revocation include:

- a. materially false or inaccurate statements in the permit application or supporting papers;
- b. failure by the permittee to comply with any terms or conditions of the permit;
- c. exceeding the scope of the project as described in the permit application;
- d. newly discovered material information or a material change in environmental conditions, relevant technology or applicable law or regulations since the issuance of the existing permit;
- e. noncompliance with previously issued permit conditions, orders of the commissioner, any provisions of the Environmental Conservation Law or regulations of the Department related to the permitted activity.

6. Permit Transfer Permits are transferrable unless specifically prohibited by statute, regulation or another permit condition. Applications for permit transfer should be submitted prior to actual transfer of ownership.

NOTIFICATION OF OTHER PERMITTEE OBLIGATIONS

Item A: Permittee Accepts Legal Responsibility and Agrees to Indemnification

The permittee, excepting state or federal agencies, expressly agrees to indemnify and hold harmless the Department of Environmental Conservation of the State of New York, its representatives, employees, and agents ("DEC") for all claims, suits, actions, and damages, to the extent attributable to the permittee's acts or omissions in connection with the permittee's undertaking of activities in connection with, or operation and maintenance of, the facility or facilities authorized by the permit whether in compliance or not in compliance with the terms and conditions of the permit. This indemnification does not extend to any claims, suits, actions, or damages to the extent attributable to DEC's own negligent or intentional acts or omissions, or to any claims, suits, or actions naming the DEC and arising under Article 78 of the New York Civil Practice Laws and Rules or any citizen suit or civil rights provision under federal or state laws.

Item B: Permittee's Contractors to Comply with Permit

The permittee is responsible for informing its independent contractors, employees, agents and assigns of their responsibility to comply with this permit, including all special conditions while acting as the permittee's agent with respect to the permitted activities, and such persons shall be subject to the same



sanctions for violations of the Environmental Conservation Law as those prescribed for the permittee.

Item C: Permittee Responsible for Obtaining Other Required Permits

The permittee is responsible for obtaining any other permits, approvals, lands, easements and rights-of-way that may be required to carry out the activities that are authorized by this permit.

Item D: No Right to Trespass or Interfere with Riparian Rights

This permit does not convey to the permittee any right to trespass upon the lands or interfere with the riparian rights of others in order to perform the permitted work nor does it authorize the impairment of any rights, title, or interest in real or personal property held or vested in a person not a party to the permit.

**RCRA PART 373 PERMIT
EXECUTIVE SUMMARY/FACILITY FACT SHEET**

**U.S. Department of Energy
Knolls Atomic Power Laboratory
NY6890008992**

**Niskayuna, New York
Schenectady County**

September 2024

1.0 FACILITY PERMIT AND GENERAL INFORMATION

1.1 Facility Permit Information

Permittee Name:	USDOE-Naval Reactors Laboratory Field Office
Facility Name:	USDOE Knolls Atomic Power Laboratory – Knolls Laboratory
Facility Location:	2401 River Road, Niskayuna, NY 12309
EPA ID No.:	NY6890008992
DEC Permit No.:	4-4224-00024/00001
DEC DER No.:	447017
Commercial/Non-Commercial TSDF:	Non-comm
Facility Contact:	David A. Delwiche david.delwiche@nrp.doe.gov 518-398-6366
DEC Contact/Responsible Permit Writer:	Frank Zhang frank.zhang@dec.ny.gov 518-402-8755
Initial/Renewal Permit (Permit type):	Renewal (Operating)
Permit Term:	10 years
Estimated Closure Cost:	N/A
Estimated Post-Closure Care Cost:	N/A
Estimated Corrective Action Cost:	N/A
Estimated Financial Assurance Cost:	N/A
On-site Environmental Monitor(s):	N/A

1.2 General Description

The Knolls Laboratory is owned by the U. S. Department of Energy (USDOE) and operated for the Government under contract. The principal function of the Knolls Laboratory is research and development in the design and operation of naval nuclear propulsion plants. The Knolls Laboratory consists of laboratory buildings, offices, a warehouse, shops, cooling towers, a boiler house for centralized heating, and a river pumping station for non-contact cooling water. The Knolls Laboratory also consists of roads and parking lots paved with asphalt and concrete. The Knolls Laboratory's operations are located in two principal areas. The larger area is at the top of the bluff on the northwesterly section of the property and is called the "upper level." The smaller area is located on the "lower level" bench adjacent to the Mohawk River and encompasses the DOE-EM SPRU facility. The two areas occupy about 60 acres (35%) of the property. The balance of the Laboratory consists of woods and fields. The surrounding area is a mixture of open land, other research and development/light industry, parks, municipal facilities, and low-density suburban residential housing.

Various types of both hazardous waste and mixed waste are produced at the Knolls Laboratory. The sources of these wastes are primarily from either byproducts from work in the research and development laboratories or resultant from demolition and refurbishment operations that occur throughout the Knolls Laboratory. Information regarding all chemicals managed at the site are within the Part A application and manifest data.

1.3 Background Information

The Facility is currently operating as a storage facility for hazardous waste.

The hazardous and mixed wastes that are generated during normal operations are managed within four units at the Knolls Laboratory for periods exceeding 90-days. There is no disposal of hazardous or mixed waste at the Knolls Laboratory. The Knolls Laboratory only stores and processes all of the hazardous/mixed waste it manages for shipment to off-site, licensed/permitted treatment, storage and/or disposal facilities.

1.4 Site Maps

The following figures are attached to this executive summary/permit:

- Figure ES-1. General Location Map
- Figure ES-2. Facility Boundary Map

1.5 Other Facility Permits

The following federal, state and local permits and registrations are applicable to the facility:

- NYSDEC SPDES Permit No. NY0005851;
- NYSDEC SPDES MS4 Permit No. GP-0-24-001;
- NYSDEC SPDES Construction Activity Permit No. GP-0-20-001;
- NYSDEC Air State Facility Permit No. E-4-4224-00024/00039;
- NYSDEC Water Withdrawal Non-public Permit No. E-4-4224-00024/00052;
- NYS Canal Corp. Real Estate Permit No. C-OC-201800134;
- NYS Cana Corp. Canal Work Permit No. C-WK-202200051;
- EPA NESHAPS Permit No. KAPL-2012-003

2.0 RCRA PERMITTED UNITS

(Operating Permit Language) The following table is a summary of RCRA-permitted Operating Units by unit type (S-Storage; T-Treatment; D-Disposal)

Unit Type ¹	No. of Areas/Units	Activity Type	Waste Type ²	Quantity
Containers (S01)	4 units	Storage	Solid & Liquid Hazardous and Mixed Wastes	17,700 gallons

Footnotes:

1. Unit codes are as described in the Part A Application.
2. Specific waste types and waste codes are presented in Attachment C – Waste Characteristics of this Permit.

3.0 CORRECTIVE ACTION SUMMARY

The following table summarizes the ongoing corrective action activities occurring at the facility:

Location Name / Designation	Activity Description
Entire Facility	Monitoring of soil and groundwater is required for the entire Facility.
Q3 Yard Area	RFI/ICM activities are in progress in this area.
Land Disposal Area	A final remedy has been selected and is being implemented for the land disposal area, which consists of multiple SWMUs outside and east of the Site's upper level.
H1 Cooling Tower	RFI Work Plan preparation is ongoing and RFI activities are planned for this area near-term.
H2-G2 Area	ICM Work Plan preparation is ongoing and ICM activities are planned for this area near-term.

4.0 SITE MANAGEMENT

4.1 Institutional Controls

The Facility is managed under this Permit and various other environmental permits as described above to prevent exposure to contamination and/or restrict migration of contamination.

4.2 Engineering Controls

The developed portion of the site is covered with asphalt and enclosed with a fence.

5.0 ISSUES AND CONCERNS

The following sections describe any potential issues or concerns for the facility related to its hazardous waste permit. Additionally, it includes information on any major changes made between the last issued permit and this renewal permit.

5.1 Environmental Risk Assessment

The Facility was investigated as part of the 1998 RCRA Facility Assessment Preliminary Review - Visual Site Inspection (RFA PR-VSI), included in Module II, Appendix E of the Permit, and subsequent RCRA Facility Investigations (RFIs). Based on these investigations, it was determined that contamination at the Facility did not pose imminent danger to human health or the environment, but that corrective action was required to control risks to health and environment.

Corrective action programs have been implemented to clean up, restrict migration of, and prevent exposure to contamination.

5.2 Climate Leadership and Community Protection Act (CLCPA)

Pursuant to the requirements of Section 7(2) of the CLCPA, during its review of the permit renewal application the DEC has taken into consideration information regarding the facility's consistency with the CLCPA.

5.3 Climate Risk and Resilience Act (CRRA)

The Facility has demonstrated to the DEC that future physical climate risk, not limited to sea-level rise, storm surge and flood, was considered during the permit renewal process. The DEC has made a tentative assessment that the Facility is not at risk of adverse climate change impacts due to extreme weather events, and no additional actions are necessary at this time to improve the resiliency at the facility.

5.4 Unresolved Issues and Concerns

There are no unresolved issues or concerns with the Facility.

5.5 Compliance Schedule Items

The Permittee has not proposed to incorporate any items into the Permit renewal.

5.6 Public Participation

A public notice comment period was held from 06/18/2024 to 08/05/2024. No comments were received. As such, no Responsiveness Summary will be issued.

5.7 Significant Permit Modifications

Corrective action responsibilities for all SWMUs and AOCs previously transferred to DOE-EM management except for SWMU-085, which is remaining under DOE-EM management under DEC Permit #4-4224-00024/00055, have been reassigned to the Permittee (DOE-NRLFO).

5.8 Upcoming Construction/Closure Activities

Various non-RCRA related construction is occurring at the Facility, and any necessary corrective action as a result will be covered under this Permit. Construction of the soil cover for the Land Disposal Area will be occurring. There are no anticipated closures of any operating units during the life of this Permit.

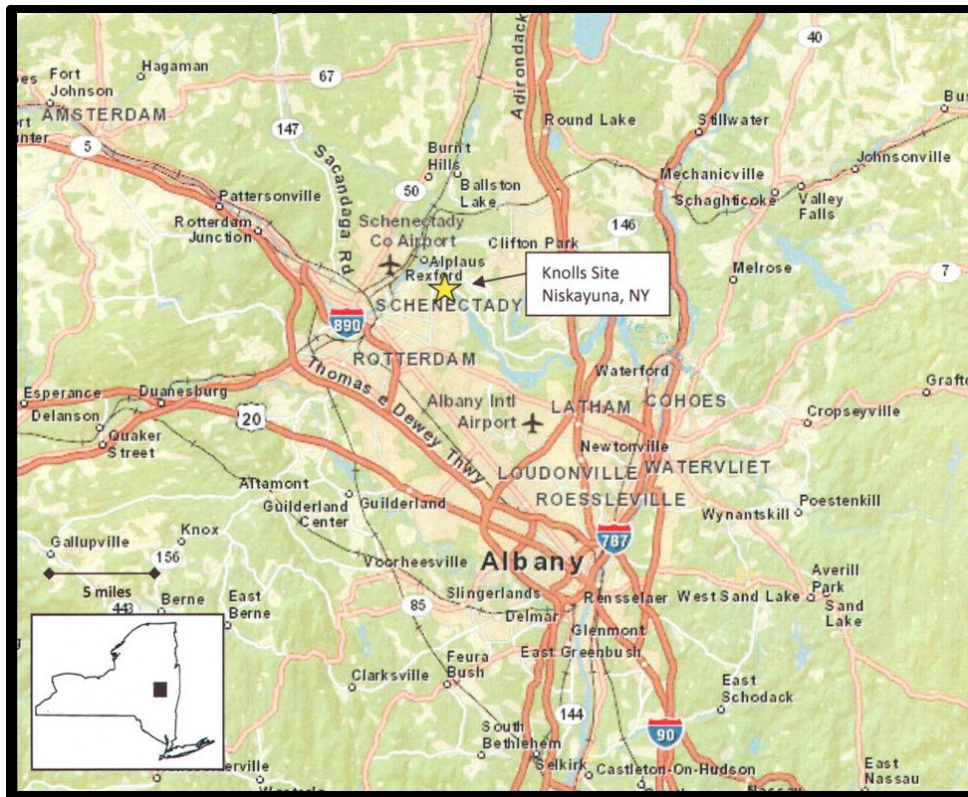


Figure ES-1. General Location Map

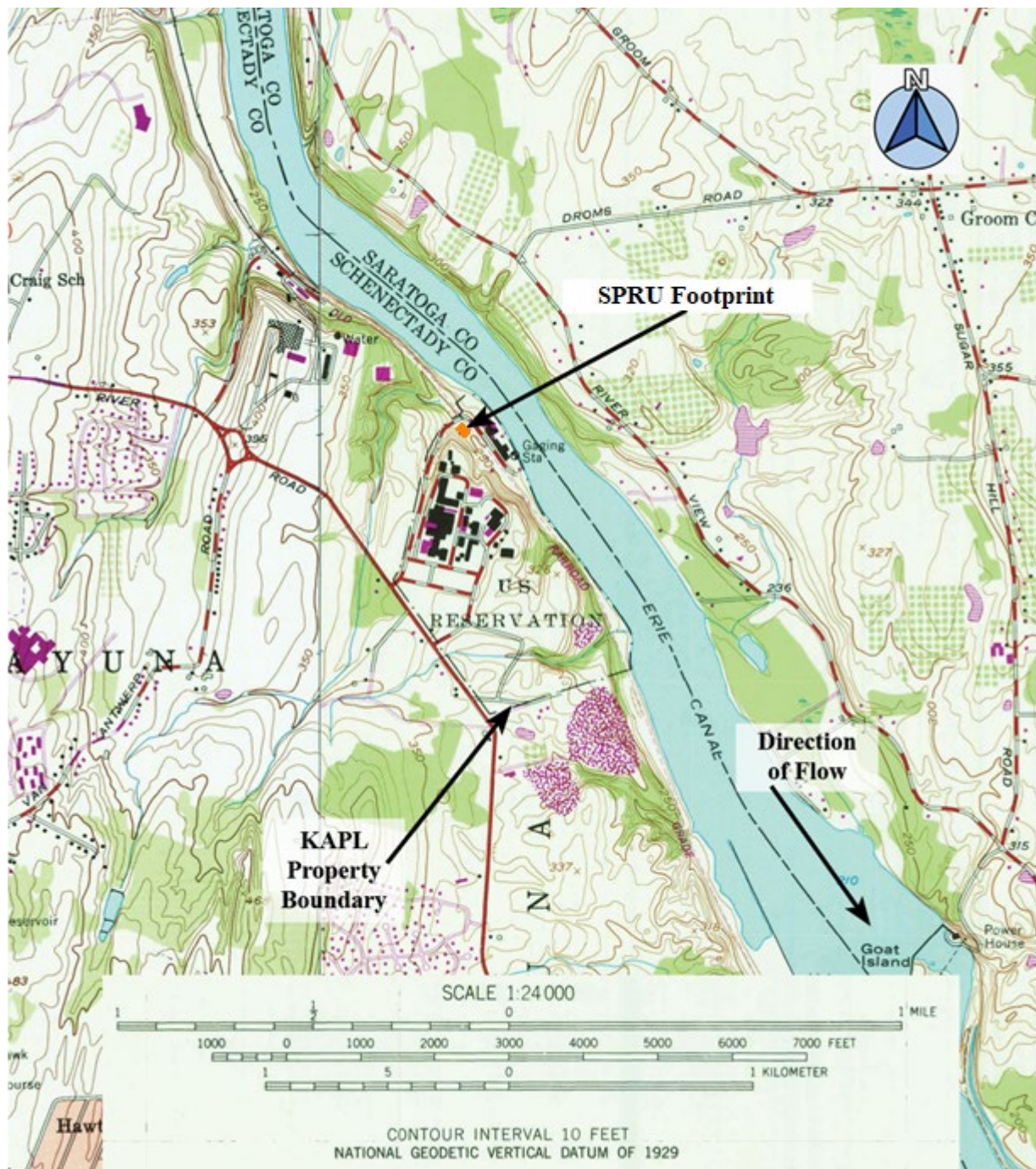


Figure ES-2. Facility Boundary Map (SPRU Property in orange)

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

DIVISION OF MATERIALS MANAGEMENT

PART 373 PERMIT MODULE I - GENERAL PROVISIONS

U.S. Department of Energy
Knolls Atomic Power Laboratory
NY6890008992

Niskayuna, New York
Schenectady County

This Permit authorizes only the hazardous waste units identified in this Permit as permitted units. This Permit does not authorize other units to operate. If this Permit conflicts with regulations that are in effect on the date of final issuance of this Permit, the more stringent requirement applies.

A. EFFECT OF PART 373 PERMIT

The Permittee must comply with all terms and conditions of this Permit. This Permit consists of: the conditions contained herein, the attachments to this Permit, sections of the Permit Application referenced herein, any subsequent Department-approved changes to the attachments and referenced sections of that application, and the applicable regulations contained in 6 NYCRR Parts 370 through 374, 376, 621 and 624. The applicable regulations or requirements are those which are in effect on the date of final issuance of this Permit. Compliance with this permit during its term constitutes compliance, for the purposes of enforcement, with the applicable regulations or requirements, except for those requirements not included in the Permit which:

1. Become effective by statute, including amendments thereto;
2. Are promulgated under 6 NYCRR Part 376, as modified (Land Disposal Restrictions);
3. Are promulgated under 6 NYCRR 373-2.27 (not applicable to the facility at the time of Permit issuance), 373-2.28 (not applicable to the facility at the time of Permit issuance), and 373-2.29, as modified (air emission standards); and
4. Are other requirements promulgated under 6 NYCRR 373-1.6(e).

The following Guidance Documents and Commissioner Policies are potentially relevant to this Permit. The Permittee shall consider applicable DEC guidance and policies when conducting activities required by this Permit.

DER-10 - Technical Guidance for Site Investigation and Remediation

DER-31 - Green Remediation

DER-33 - Institutional Controls: A Guide to Drafting and Recording Institutional Controls

CP-29 - Environmental Justice and Permitting

CP-39 - Use of Enforcement Discretion for Discarded Mercury-containing Equipment

CP-43 - Groundwater Monitoring Well Decommissioning

CP-44 - Natural Resource Damages

CP-51- Soil Cleanup Guidance

The Permittee is authorized to store hazardous waste and mixed waste in containers, and is required to conduct corrective action in accordance with the conditions of this Permit. Any storage, treatment, or disposal of hazardous waste and/or mixed waste not authorized in this Permit is prohibited unless exempt from 6 NYCRR Part 373. Issuance of this Permit does not authorize any injury to persons or property, any invasion of other private rights, or any infringement of federal, State or local laws or regulations.

The hazardous waste and mixed waste management units, activities and types and quantities of hazardous and mixed wastes to be managed, which are authorized by this Permit, are listed in Module III of this Permit, and summarized below:

UNIT	WASTE TYPE	TYPICAL CONTAINER VOLUME	TOTAL VOLUME CAPACITY OF WASTE MANAGEMENT UNIT
Building Q1	Refer to Attachment C, Tables 1, 2, & 3	< 1 to 202 gallons	6,600 gallons
E11 Truck Bay Modular Addition	Refer to Attachment C, Tables 1, 2, & 3	< 1 to 95 gallons	1,320 gallons

E11 Waste Processing Facility	Refer to Attachment C, Tables 1, 2, & 3	< 1 to 718 gallons	7,180 gallons
E4-Extension Floor Vaults (numbered 2, 3, 5, & 6)	Refer to Attachment C, Tables 1, 2, & 3	< 1 to 95 gallons	2,600 gallons

The Permittee is authorized to store only the hazardous wastes/mixed wastes identified in Attachment C of the approved Part 373 Permit Application that are generated at the Permittee's facility.

All plans, specifications and schedules required by the terms of this Permit and all subsequent amendments to those documents are incorporated by reference into this Permit, upon approval, when required, or acceptance by the Department, unless the Department specifies otherwise in writing. Upon incorporation, the provisions of each such document will be binding upon the Permittee and have the same legal force and effect as the requirements of this Permit.

B. PERMIT DOCUMENTS

The Permittee's Hazardous Waste Part A Permit Application is attached to and incorporated by reference into this Permit. The Permit Application documents listed below are also incorporated by reference into this Permit. These documents are made part of this Permit, are binding upon the Permittee and have the same legal force and effect as the requirements of this Permit.

Modules

- I General Provisions
- II Corrective Action Requirements
- III Storage in Containers
- IV RESERVED
- V RESERVED
- VI RESERVED
- VII RESERVED
- VIII RESERVED
- IX RESERVED
- X RESERVED
- XI RESERVED
- XII RESERVED
- XIII Scheduled Dates

DOCUMENTS ATTACHED TO THIS PERMIT:

PERMIT APPLICATION ATTACHMENT	APPLICATION DOCUMENT ¹
A	RCRA Part A Application
B	Facility Description
C	Waste Characteristics
D	Process Description
E	Corrective Action
F	Procedures to Prevent Hazards
G	Contingency Plan
H	Personnel Training
I	Closure Plan
J	Other Federal and State Laws
K	Certification
M	Permit Modification Log

1. All application documents are attached as revised through 04/2024 and will include any modifications approved during the life of the Permit.

Future modifications to this Permit, including modifications to the Permit Application documents incorporated into this Permit, shall be addressed according to 6 NYCRR 373-1.7. The Permittee must submit copies to the Regional Permit Administrator and as required in Section H of this Module, of the replacement: pages, sections, and/or attachments to the permit application along with the application request for a permit modification. The Permittee shall place a revision date on all pages submitted as part of the proposed permit modification application.

The Permittee must provide and maintain a log of all modifications made to this Permit, including modifications made to the Permit Application documents that are made part of this Permit. The log shall contain at a minimum the following information regarding an approved modification: (1) the name of the specific documents being modified (e.g., contingency plan, security requirements, hazardous waste unit operations, etc.); (2) the pertinent page, section, and/or attachment of this Permit and Permit Application documents subject to modification;

(3) the revision date of the modifications; (4) a brief statement regarding the nature of the modifications; and (5) the effective date of the modification to this Permit. The Permittee shall incorporate the log as Attachment M of the Permit Application.

Upon receipt of a permit modification issued by the Department, the Permittee must update the log and replace the pages, sections, and/or attachments in the Permit and Permit Application with the modified pages, sections, and/or attachments in the permit copy maintained by the Permittee.

C. GENERAL REQUIREMENTS FOR THIS PART 373 PERMIT

The Permittee must comply with 6 NYCRR Subpart 373-1 as follows:

1. General 6 NYCRR 373-1.1
 - a) 6 NYCRR 373-1.1(b) - Applicability.
 - b) 6 NYCRR 373-1.1(c) - Safeguarding Information: The Permittee may claim confidential any information required to be submitted by this Permit in accordance with 6 NYCRR 370.1(b). All documentation which the Permittee believes justifies its claims of confidentiality must be submitted in accordance with 6 NYCRR Part 616 with any such claim of confidentiality. Access to restricted data, national security information or other sensitive military information protected under federal law or regulation shall be in accordance with applicable DOE information security requirements. Notwithstanding the foregoing, all information, whether restricted by information security requirements or not, that is necessary to fulfill the requirements of this Permit, or in regards to this Permit, shall be released to the Department. The Permittee shall have the ability to justify its claims of confidentiality under all applicable state and federal laws and regulations, including but not limited to 6 NYCRR 370.1(b), 6 NYCRR 616, 42 USC 2077 and 10 CFR 810, but shall not withhold from disclosure to the Department information necessary to fulfill the requirements of this Permit;
 - c) 6 NYCRR 373-1.1(d) - Exemptions: Based on the Permittee's August 29, 2001 regulatory variance request per 6 NYCRR 373-1.1(e), the Permittee may operate exempt hazardous/mixed waste management units in accordance with 6 NYCRR 373-1.1(d)(1)(iii) in lieu of 6 NYCRR 373-1.1(d)(1)(iv), with the exception that secondary containment systems for these units shall be provided and operated by the Permittee in accordance with 6 NYCRR 373-1.1(d)(1)(iv), and according to the storage quantities specified therein. Past, current and future hazardous/mixed waste management units subject to exemption per 6 NYCRR 373-1.1(d), and as currently listed, either singly or by grouping, in Module II (Corrective Action Requirements for Solid Waste Management Units and Areas of Concern), Condition A.3.(c), Module II, Table 1 of this Permit, or specified for future inclusion per Module II, Condition C of this Permit, shall be addressed in accordance with Module II of this Permit.
 - d) 6 NYCRR 373-1.1(f) - Uniform Procedures;

- e) 6 NYCRR 373-1.1(g) - Enforcement;
- f) 6 NYCRR 373-1.1(h) - Severability; and
- g) 6 NYCRR 373-1.1(i) - Terms Used

2. Requirement for Permit 6 NYCRR 373-1.2

6 NYCRR 373-1.2(d) requires owners and operators of hazardous waste management facilities to have a Part 373 permit during the active life of a unit(s), including the closure period and during the post-closure care period, with few exceptions. See section D.7. of this Permit Module below.

3. Signatories to Permit Applications and Reports 6 NYCRR 373-1.4(a)(5)

- a) 6 NYCRR 373-1.4(a)(5)(i) - Applications;
- b) 6 NYCRR 373-1.4(a)(5)(ii) - Reports;
- c) 6 NYCRR 373-1.4(a)(5)(iii) - Changes to authorization; and
- d) 6 NYCRR 373-1.4(a)(5)(iv) - Certification.

4. Recordkeeping 6 NYCRR 373-1.4(g)

5. Permit Conditions 6 NYCRR 373-1.6

- a) 6 NYCRR 373-1.6(a) - Conditions applicable to all permits;
- b) 6 NYCRR 373-1.6(a)(1) - Duty to comply;
- c) 6 NYCRR 373-1.6(a)(2) - Duty to reapply;
- d) 6 NYCRR 373-1.6(a)(3) - Need to halt or reduce activity not a defense;
- e) 6 NYCRR 373-1.6(a)(4) - Duty to mitigate;
- f) 6 NYCRR 373-1.6(a)(5) - Proper operation and maintenance;
- g) 6 NYCRR 373-1.6(a)(6) - Permit actions;
- h) 6 NYCRR 373-1.6(a)(7) - Property rights;
- i) 6 NYCRR 373-1.6(a)(8) - Duty to provide information;
- j) 6 NYCRR 373-1.6(a)(9)(i) through (iv) - Inspection and entry: Access to the Knolls site shall be conducted in accordance with established DOE security clearances and in compliance with all posted notices and warning signs. However, in extraordinary circumstances where the Department deems that site access is necessary to protect human health and the environment, the Permittee shall grant access, where necessary, to uncleared Department personnel possessing United States citizenship;
- k) 6 NYCRR 373-1.6(a)(10)(i) through (iii) - Monitoring and records;
- l) 6 NYCRR 373-1.6(a)(11) - Signatory Requirements;
- m) 6 NYCRR 373-1.6(a)(12)(i) through (xi) - Reporting requirements: Non-compliance events which are minor in nature (loose cap, labeling deficiencies, etc.) are not intended to be reported under this Module Condition;

- n) 6 NYCRR 373-1.6(a)(13) - Information repository (also see section C.9.a)(3) of this Permit below);
 - o) 6 NYCRR 373-1.6(c) - Establishing Permit conditions;
 - p) 6 NYCRR 373-1.6(d)(1)(i) through (iii) - Schedules of compliance; The Permittee must comply with the compliance schedules listed in Module II - Corrective Action Requirements, and all previously established compliance schedules as revised through 5/24.
 - q) 6 NYCRR 373-1.6(d)(2)(i) through (iv) - Alternative schedules of compliance.
6. Requirements For Recording and Reporting of Monitoring Results 6 NYCRR 373-1.6(b)

The Permittee must comply with the recording, reporting, and monitoring requirements listed in this Permit.

The Permittee must use, maintain, and install monitoring equipment and methods and report monitoring results as specified in this Permit (including the permit application) and 6 NYCRR Subpart 373-2. The Permittee must conduct required monitoring with the type, intervals and frequency sufficient to yield data which are representative of the monitoring activity including, when appropriate, continuous monitoring.

7. Permit Modifications 6 NYCRR 373-1.7

- a) 6 NYCRR 373-1.7(a) - Transfer of Permits;
- b) 6 NYCRR 373-1.7(b) - Modification of Permits;
- c) 6 NYCRR 373-1.7(c) - Minor modification of RCRA-delegated permits;
- d) 6 NYCRR 373-1.7(d) - Major Modifications;
- e) 6 NYCRR 373-1.7(e) - Announcement of Determinations;
- f) 6 NYCRR 373-1.7(f) - Temporary Authorizations; and
- g) 6 NYCRR 373-1.7(g) - Newly Regulated Wastes and Units.

8. Expiration and Continuation of Permits 6 NYCRR 373-1.8

The Permit shall be in effect for a fixed term not to exceed ten years.

Complete applications for permit renewal must be submitted at least 180 days before the expiration date of this Permit pursuant to 6 NYCRR 373-1.8(b) to the addresses in Section H of this Permit Module below. Renewal applications with a significant change (as defined in paragraph 373-1.10(a)(1) of this Subpart) are subject to the requirements of section 373-1.10 of this Subpart, (also see section C.9., Public Participation, of this Permit Module below).

Prior to processing the renewal application, the Department will determine whether the application is complete. In order for the renewal application to be complete, the Permittee must:

- a) Satisfy the general requirements for complete application contained in 6 NYCRR Part 621 (Uniform Procedure Regulations)
- b) Include all information required, both general and specific to the type of the facility in accordance with the laws, regulations and analytical requirements in effect at the time.

At any time during the review of the renewal application, the Department may request in writing any additional information that is necessary for determining the completeness of the application. Failure to provide such information by the date specified in the request may be grounds for denial of the application and the extension allowed pursuant to Section 401.2. of the State Administrative Procedures Act.

Should the Permittee cease the hazardous/mixed waste management activities allowed by this Permit prior to the expiration of this Permit, then, the Permittee must continue to comply with the applicable corrective action conditions and requirements stipulated in this Permit (refer to Module II, Corrective Action). In addition, the Permittee shall submit a renewal application pursuant to 6 NYCRR Subpart 373-1.8(b) prior to this Permit's expiration unless and until all the Permittee's corrective action obligations have been completed. In the alternative, the Permittee may execute an order on consent for corrective action pursuant to Environmental Conservation Law (ECL) Section 71-2727(3) with the Commissioner at least 180 days prior to the expiration date of this Permit.

9. Public Participation (including 6 NYCRR 373-1.10)

a) Expanded Public Participation (6 NYCRR 373-1.10)

(1) 6 NYCRR 373-1.10(a) Pre-application Public Meeting and Notice

For a new unit or for a permit renewal application that proposes a significant change in operations, the Permittee is required to hold a pre-application public meeting and a Public Notice for the Part 373 Permit application is required.

(2) 6 NYCRR 373-1.10(b) Public Notice Requirements at the Application Stage

(3) 6 NYCRR 373-1.10(c) Information Repository.

The Permittee shall establish and maintain an Information Repository at the Schenectady County Library, Niskayuna Branch, 2400 Nott Street East, Niskayuna New York, (518) 386-2249. The Permittee shall provide the Department with thirty (30) days' notice of any change to the location of the repository. The Permittee will continue to maintain the information repository for the life of the Permit or until otherwise notified by the Department. No sooner than six months after the effective date of the Permit, the Permittee may request the Department to consider closure of the

information repository.

The repository shall contain a copy of the final approved Part 373 Permit application, approved documents such as plans, reports, risk assessments, etc., the Part 373 Permit Fact Sheet, public notices pertaining to the Part 373 Permit, copies of correspondence including enclosures and attachments from the effective date of the Permit between the Department and the Permittee pertaining to the Permit or to compliance. Certain portions of the permit, and other information within the repository, may be redacted as necessary to protect national security or due to public sensitivity. Those redacted portions may be made available based upon request and subsequent Department of Energy evaluation of a need to know.

The Permittee shall provide a written notice of the availability of the information repository to all individuals on the facility mailing list within one month from the effective date of this Permit (except to those previously notified within 1 year prior to the effective date of the Permit) and to all individuals on the facility mailing list one year before the expiration date of this Permit.

b) Other public participation activities to consider to maintain good community relations:

(1) Public Meetings

(2) Citizens Advisory Group Meetings

D. FINAL STATUS STANDARDS FOR THIS PART 373 PERMIT

The Permittee must comply with 6 NYCRR Subpart 373-2, and the referenced sections of the Permit Application, as follows:

1. General 6 NYCRR 373-2.1

- a) 6 NYCRR 373-2.1(a) - Purpose, Scope and Applicability; and
- b) 6 NYCRR 373-2.1(c) - Imminent Hazard Action.

2. General Facility Standards 6 NYCRR 373-2.2

- a) 6 NYCRR 373-2.2(a) - Applicability;
- b) 6 NYCRR 373-2.2(b) - Facility ownership transfer;
- c) 6 NYCRR 373-2.2(d) - Required Notices;
- d) 6 NYCRR 373-2.2(e) - General Waste Analysis (Attachment C of the Permit Application);
- e) 6 NYCRR 373-2.2(f) - Security (Attachment F of the Permit Application);
- f) 6 NYCRR 373-2.2(g) - General inspection requirements (Attachment F of the Permit Application).

- Application);
- g) 6 NYCRR 373-2.2(h) - Personnel training (Attachment H of the Permit Application);
 - h) 6 NYCRR 373-2.2(i) - General requirements for ignitable, reactive, or incompatible wastes (Attachment F of the Permit Application);
 - i) 6 NYCRR 373-2.2(j) - Location standards (not applicable to the KAPL-Knolls site at the time of Permit issuance); and
 - j) 6 NYCRR 373-2.2(k) - Construction quality assurance program.

3. Preparedness and Prevention 6 NYCRR 373-2.3

The Permittee must comply with Attachment F of the Permit Application and 6 NYCRR 373-2.3 as follows:

- a) 6 NYCRR 373-2.3(a) - Applicability;
- b) 6 NYCRR 373-2.3(b) - Design and operation of facility;
- c) 6 NYCRR 373-2.3(c) - Required equipment;
- d) 6 NYCRR 373-2.3(d) - Testing and maintenance of equipment;
- e) 6 NYCRR 373-2.3(e) - Access to communications or alarm system;
- f) 6 NYCRR 373-2.3(f) - Required aisle space; and
- g) 6 NYCRR 373-2.3(g) - Arrangements with local authorities.

4. Contingency Plan and Emergency Procedures 6 NYCRR 373-2.4

The Permittee must comply with Attachment G of the Permit Application and 6 NYCRR 373-2.4 as follows:

- a) 6 NYCRR 373-2.4(a) - Applicability;
- b) 6 NYCRR 373-2.4(b) - Purpose and implementation of contingency plan;
- c) 6 NYCRR 373-2.4(c) - Content of contingency plan;
- d) 6 NYCRR 373-2.4(d) - Copies of contingency plan;
- e) 6 NYCRR 373-2.4(e) - Amendment of contingency plan;
- f) 6 NYCRR 373-2.4(f) - Emergency coordinator; and
- g) 6 NYCRR 373-2.4(g) - Emergency Procedures.

5. Manifest System, Recordkeeping and Reporting 6 NYCRR 373-2.5

- a) 6 NYCRR 373-2.5(a) - Applicability;
- b) 6 NYCRR 373-2.5(b) - Manifest requirements;
- c) 6 NYCRR 373-2.5(c) - Operating record;
- d) 6 NYCRR 373-2.5(d) - Availability, retention, and disposition of records;
- e) 6 NYCRR 373-2.5(e) - Annual report;
- f) 6 NYCRR 373-2.5(f) - Unmanifested waste report; and

- g) 6 NYCRR 373-2.5(g) - Additional reports.

The Permittee must retain for inspection by the Department the permit modification log required by Section B of this Permit Module, the operating record, the referenced sections of the Permit Application that are made part of this Permit, and any subsequent Department approved changes to the contents of that Application.

These documents include, but are not limited to, the most recent Department approved: waste analysis plan; contingency plan; closure plan(s); groundwater monitoring plan(s); security, inspection, and personnel training requirements; and final engineering documents for all hazardous waste treatment, storage, and disposal units subject to this Permit and for all ongoing corrective action remedies pertinent to solid waste management units and areas of concern either remediated or being remediated pursuant to this Permit.

6. Releases from Solid Waste Management Units 6 NYCRR 373-2.6

The Permittee must comply with all the applicable provisions stipulated in 6 NYCRR 373-2.6(a) through (k) for regulated units and with 6 NYCRR 373-2.6 (l) for corrective action at solid waste management units; and comply with the conditions stipulated in Module II - Corrective Action Requirements for Solid Waste Management Units and Areas of Concern; including all subsequent revisions approved by the Department that address the means to implement and achieve compliance with the aforementioned conditions for site-wide contaminated groundwater.

7. Closure and Post-Closure 6 NYCRR 373-2.7

The Permittee must comply with Attachment I of the Permit Application and 6 NYCRR 373-2.7 for the closure and post-closure care of the hazardous/mixed waste management unit(s), as follows: Container storage areas Building Q1, Building E11 Truck Bay Modular Addition, Building E11 Waste Processing Facility, and Building E4-Extension Floor Vaults (# 2, 3, 5, and 6).

- a) 6 NYCRR 373-2.7(a) - Applicability;
- b) 6 NYCRR 373-2.7(b) - Closure performance standard;
- c) 6 NYCRR 373-2.7(c) - Closure plan; amendment to plan;
- d) 6 NYCRR 373-2.7(d) - Closure; time allowed for closure: The Permittee shall manage mixed waste in compliance with the provisions outlined in the Federal Facility Compliance Act (FFCA). Under the terms of the FFCA and as approved by the Department, closure of the mixed waste portions of the facility shall begin within ninety (90) days after the final shipment of mixed waste for treatment and/or disposal at an offsite facility permitted to receive such wastes;
- e) 6 NYCRR 373-2.7(e) - Disposal or decontamination of equipment, structures and soils;
- f) 6 NYCRR 373-2.7(f) - Certification of closure and survey plat;

- g) 6 NYCRR 373-2.7(g) - Post-closure care and use of property (Not Applicable);
- h) 6 NYCRR 373-2.7(h) - Post-closure plan; amendment of plan (Not Applicable);
- i) 6 NYCRR 373-2.7(i) - Post-closure notices; and (Not Applicable);
- j) 6 NYCRR 373-2.7(j) - Certification of completion of post-closure care (Not Applicable).

The final and specific choice of sampling points, number of samples, type of sampling to be performed and analysis for verification of the effectiveness of decontamination will be determined at the time of closure by the Department. These determinations will be based upon the past history of operating practices and types of wastes handled at the facility. The operating record, the record of spills, the types of waste released, location of spills in the facility and the condition of secondary containment systems will also provide data to be used in these determinations. This approach will allow compliance with closure regulations and requirements that will be in effect at the time of closure. Sampling procedures and the locations and the total number of samples required will be determined based on the information gathered at the time of closure. The verification of decontamination will be based on the Department's regulatory cleanup standards at the time of closure.

8. Financial Requirements 6 NYCRR 373-2.8

Not applicable. This is a federal facility.

9. Air Emission Standards 6 NYCRR 373-2.27, 373-2.28 and 373-2.29

The Permittee must comply with Attachment C of the Permit Application and all applicable requirements of 6 NYCRR 373-2.27, 373-2.28 and 373-2.29 as follows:

- a) 6 NYCRR 373-2.27 Air Emission Standards for Process Vents (not applicable to the facility at time of Permit issuance);
- b) 6 NYCRR 373-2.28 Air Emission Standards for Equipment Leaks (not applicable to the facility at time of Permit issuance);
- c) 6 NYCRR 373-2.29 Air Emission Standards for Tanks, Surface Impoundments, and Containers.

The Permittee may not manage hazardous/mixed waste in a manner that would subject the facility to 6 NYCRR 373-2.27 and/or 373-2.28.

E. LAND DISPOSAL RESTRICTIONS

The Permittee must comply with all applicable provisions, as qualified below, in the current 6 NYCRR Part 376 for the land disposal of hazardous/mixed waste except for hazardous/mixed waste generated by remediation or corrective action activities for placement in an on-site corrective action management unit (CAMU) approved by the Commissioner.

Pursuant to the Federal Facility Compliance Act of 1992 (FFCA), the Permittee has developed a Site Treatment Plan to identify specific treatment facilities and schedules for the treatment of the Permittee's mixed waste. The Site Treatment Plan was approved by the Department on October 24, 1995. The Site Treatment Plan is governed by an Administrative Order (Order) between the Permittee and the Department, which also became effective on October 24, 1995.

The FFCA provides that the Permittee will not be subject to fines and penalties for land disposal storage restriction violations for mixed waste as long as it is in compliance with an approved and effective treatment plan and an order requiring compliance with such plan. The regulations regarding the storage of mixed waste are set forth in 6 NYCRR Part 376. 6 NYCRR Part 376.5 sets forth prohibitions on the storage of waste restricted from land disposal. In order to facilitate proper recovery, treatment or disposal, the Permittee expects to accumulate and store mixed waste for a period of greater than one year in accordance with 6 NYCRR Part 376.5(a)(3).

F. WASTE ANALYSIS AND QUALITY ASSURANCE

The Permittee must obtain representative samples of wastes and other materials to be analyzed pursuant to this Permit. The Permittee must perform the sampling and analysis required by this Permit in accordance with "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW-846 (latest approved revision), hereinafter referred to as SW-846; Appendix 19 of 6 NYCRR Part 371; or an equivalent method approved by the Department.

The Permittee shall conduct a quality assurance program to ensure that the sampling, analysis and monitoring data are technically accurate and statistically valid. The quality assurance program must be in accordance with Chapter One and the requirements of applicable method(s) of SW-846, or an equivalent method approved by the Department.

As required by ECL 03-0119, any laboratory (Permittee or contract) used by the Permittee to perform analysis pursuant to this Permit must be certified by the New York State Department of Health Environmental Laboratory Approval Program (ELAP) in the appropriate categories of analysis, if ELAP issues certifications in such categories. If the Permittee uses a contract laboratory to perform analysis required by this Permit, then the Permittee shall inform the laboratory in writing that it must operate under the waste analysis and quality assurance provisions of this Permit.

G. ORAL REPORTS

The oral reports required by 6 NYCRR 373-1.6(a)(12)(vi) and 373-2.4(g)(4)(ii) must be made to both the Department using the New York State 24-hour oil and hazardous material spill notification number (800) 457-7362 and, where appropriate, the National Response Center using its 24-hour number (800) 424-8802, or any designated telephone numbers which may subsequently replace those listed above.

Note: Any spill that contains the Reportable Quantity (RQ) for any of the hazardous substance listed in 6 NYCRR Part 597.3 must be reported to the Department within 2 hours of discovery per 6 NYCRR Part 597.4. If a release has been reported pursuant to 6 NYCRR Part 597.4, that would satisfy the above requirement for an oral report to the Department.

H. PLANS, REPORTS, SPECIFICATIONS, IMPLEMENTATION, RENEWAL AND MODIFICATION APPLICATIONS, AND OTHER SUBMITTALS

1. All submittals required by the Permit must be submitted to the addresses listed below, in the quantities and form(s) specified (below). All electronic submittals shall be made according to Department requirements for the submittal of electronic documents.

a) One (1) electronic copy of all submittals pertaining to the permitted hazardous/mixed waste management units & corrective action documents and groundwater monitoring plans to:

Project Manager, HW Corrective Action and Post Closure
Bureau of Hazardous Waste and Radiation Management
Division of Materials Management
New York State Department of Environmental Conservation
625 Broadway
Albany, New York 12233-7256
c/o Frank.Zhang@dec.ny.gov

Regional Materials Management Engineer
New York State Department of Environmental Conservation
Region 4 Office
1130 North Westcott Road
Schenectady, New York 12306
c/o Brian.Maglianti@dec.ny.gov

Chief, Land and Redevelopment Programs Branch
U.S. EPA Region II
c/o everett.adolph@epa.gov

b) One (1) electronic copy of all submittals specific to the waste reduction requirements of Section I, below, to:

Director, Bureau of Waste Reduction and Recycling
Division of Materials Management
New York State Department of Environmental Conservation

625 Broadway
Albany, New York 12233-7253
c/o HW.ReductionPlanning@dec.ny.gov

Project Manager, HW Corrective Action and Post Closure
Bureau of Hazardous Waste and Radiation Management
Division of Materials Management
New York State Department of Environmental Conservation
625 Broadway
Albany, New York 12233-7256
c/o Frank.Zhang@dec.ny.gov

Chief, Land and Redevelopment Programs Branch
U.S. EPA Region II
c/o everett.adolph@epa.gov

- c) One (1) electronic copy of applications to renew or modify this Permit must be submitted to:

Regional Permit Administrator
New York State Department of Environmental Conservation
Region 4 Office
1130 North Westcott Road
Schenectady, New York 12306
c/o Brian.Maglienti@dec.ny.gov

Supervisor, HW Corrective Action and Post Closure
Bureau of Hazardous Waste and Radiation Management
Division of Materials Management
New York State Department of Environmental Conservation
625 Broadway
Albany, New York 12233-7256
c/o Lynn.Winterberger@dec.ny.gov

Chief, Land and Redevelopment Programs Branch
U.S. EPA Region II
c/o everett.adolph@epa.gov

- d) One (1) electronic copy of all other submittals to:

Regional Materials Management Engineer
New York State Department of Environmental Conservation

Region 4 Office
1130 North Westcott Road
Schenectady, NY 12306
c/o Brian.Maglianti@dec.ny.gov

Project Manager, HW Corrective Action and Post Closure
Bureau of Hazardous Waste and Radiation Management
Division of Materials Management
New York State Department of Environmental Conservation
625 Broadway
Albany, NY 12233-7256
c/o Frank.Zhang@dec.ny.gov

Chief, Land and Redevelopment Programs Branch
U.S.EPA Region II
c/o everett.adolph@epa.gov

- e) Where additional Department staff are copied on the above submittals, the Permittee shall submit these copies electronically. In addition, the Permittee shall provide hard copies of any of the above submittal(s) when specifically requested by the Department.
- 2. The Permittee shall submit plans, reports, specifications, implementation schedules and any subsequent amendments required by this Permit to the Department for review and comment. If the Department determines that any plan, report, specification, schedule or respective amendment required by this Permit is deficient either in whole or in part, the Permittee shall either promptly respond to the comments or make revisions to the submission consistent with the Department's comments. Within a reasonable time frame specified by the Department, a final plan, report, specification, schedule or respective amendment shall be submitted to the Department for approval. An extension of the due date for any submittal may be granted by the Department based on the Permittee's documentation that sufficient justification for the extension exists.

I. WASTE REDUCTION REQUIREMENTS

The Permittee shall comply with the requirements of Article 27, Title 9, Section 27-0908 of the New York State Environmental Conservation Law and 6 NYCRR 373-2.5(c)(2)(ix). All reports and submittals required by Section 27-0908 to be submitted to the Commissioner shall be sent to the addresses specified in Section H above.

J. DEFINITIONS

For the purpose of this Permit, terms used herein shall have the same meaning as those in 6

NYCRR 370 through 374 and 376 and the terms defined in this Permit, unless this Permit specifically states otherwise. Where terms are not otherwise defined, the meaning associated with such terms shall be as defined by a standard dictionary reference or the generally accepted scientific or industrial meaning of the term.

1. Action Levels. For purposes of this Permit, action levels are hazardous constituent concentrations for a specific environmental medium which if exceeded indicate a potential threat to human health or the environment. The exceedance of action levels may trigger further investigations, studies, and corrective measures. Where available, action levels are based on appropriate promulgated standards established for a specific environmental medium. When promulgated standards are not available, action levels can be media-specific hazardous constituent concentrations derived from non-promulgated human health risk data or environmental risk data with the latter levels being protective of aquatic life or wildlife. An action level may be set at the background level for a hazardous constituent for which data are inadequate to set a human health or environmental health-based level.
2. Areas of Concern (AOC). Pursuant to the authority granted by 6 NYCRR 373-1.6(c)(2), an area of concern has been defined for purposes of this Permit to mean an area at the facility, or an off-site area, which is not at this time known to be a solid waste management unit (SWMU), where hazardous and/or mixed waste and/or hazardous constituents are present, or are suspected to be present, as a result of a release from the facility. The term shall include areas of potential or suspected contamination as well as actual contamination. Such area(s) may require study and a determination of what, if any, corrective action may be necessary. All permit references to and conditions for SWMUs shall apply to areas of concern.
3. Commissioner. For purposes of this Permit, “Commissioner” shall mean the Commissioner of the New York State Department of Environmental Conservation (Department), their designee or authorized representative.
4. Corrective Action. For the purposes of this Permit, corrective action is a process that includes all activities related to the investigation, characterization and cleanup of a release of hazardous wastes or hazardous constituents from a solid waste management unit (SWMU) at a permitted or interim status treatment, storage and disposal facility (TSDF) to any environmental medium (including groundwater). See Module II for a more in-depth discussion of the corrective action process.
5. Department. For the purposes of this Permit, “Department” shall mean the New York State Department of Environmental Conservation.
6. Environment. Pursuant to ECL Article 27, Title 9, Section 27-0901, “environment”

means any water, water vapor, any land including land surface or subsurface, air, fish, wildlife, biota and all other natural resources.

7. Facility. All contiguous land, structures, other appurtenances, and improvements on the land used for treating, storing, or disposing of hazardous waste. A facility may consist of several treatment, storage, or disposal operation units (e.g., one or more landfills, surface impoundments or combination of them). For the purpose of implementing corrective action, “facility” means all contiguous property under the control of the owner or operator seeking a 6 NYCRR Part 373 permit.
8. Federal Facility Compliance Act of 1992 (FFCA). The FFCA, which became effective October 6, 1992, subjects federal facilities to administrative enforcement actions in the same manner and under the same circumstances as an action would be initiated against another person. In addition, the FFCA required the Department of Energy (DOE) to prepare plans for developing treatment capacity and technologies for any site at which the DOE generates or stores mixed waste. The plans were needed because DOE did not have adequate capacity for treating all of its mixed waste to standards required by the Land Disposal Restriction regulations of the Resource Conservation and Recovery Act. (See Site Treatment Plan)
9. Hazardous Constituents. Those constituents listed in Appendix 23 to 6 NYCRR Part 371 or any constituent listed in Appendix 33 to 6 NYCRR Subpart 373-2.
10. Hazardous Waste. Pursuant to ECL Article 27, Title 9, Section 27-0901, hazardous waste means a solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may: cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed.
11. Mixed Waste. Mixed waste is waste that contains both hazardous waste and radioactive material (source, special nuclear, or by-product material regulated by the Atomic Energy Act of 1954 [42 U.S.C. 2011 et seq.]).¹

¹ The Department of Energy's Naval Nuclear Propulsion Program (NNPP) has regulatory authority for radioactivity pertaining to naval nuclear propulsion (including that in mixed waste). This authority is granted pursuant to the Atomic Energy Act of 1954 and Executive Order 12344 (codified by 50 U.S.C. §§2406, 2511).

12. Release. For purposes of this Permit, release includes, but is not limited to, any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping or disposing into the environment of any hazardous waste, including hazardous constituents, unless expressly authorized under the terms of this Permit or otherwise permitted under law (e.g., SPDES permitted discharges).
13. Site Treatment Plan (STP). Prepared pursuant to the FFCA to describe the treatment capacities and technologies for treating mixed waste. The STP identifies specific treatment facilities for treating each of the Permittee's mixed waste streams and identifies schedules for treatment.
14. Solid Waste Management Unit (SWMU). For purposes of this Permit, SWMU includes any discernible waste management unit at which solid wastes have been placed and/or released at any time, irrespective of whether the unit was intended for the management of hazardous or solid wastes as those terms are defined in 6 NYCRR Part 371 and Subpart 373-2. These units include, but are not limited to: landfills, surface impoundments, waste piles, land treatment units, tanks, elementary neutralization units, transfer stations, container storage areas, incinerators, injection wells, recycling units, and closed and abandoned units. Certain areas associated with production processes which have become contaminated as a result of routine and systematic releases of wastes or hazardous constituents from wastes are also considered SWMUs.

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

DIVISION OF MATERIALS MANAGEMENT

PART 373 PERMIT MODULE II - CORRECTIVE ACTION
REQUIREMENTS FOR SOLID WASTE MANAGEMENT
UNITS AND AREAS OF CONCERN

U.S. Department of Energy
Knolls Atomic Power Laboratory
NY6890008992

Niskayuna, New York
Schenectady County

A. APPLICABILITY

1. Statute and Regulations. Article 27, Title 9, Section 27-0913, and 6 NYCRR 373-2.6(l) requires corrective action, including Corrective Action beyond the facility boundary where necessary to protect human health and the environment, for all releases of hazardous and/or mixed wastes, including hazardous constituents, from any solid waste management unit ("SWMU") at a storage, treatment or disposal facility seeking a 6 NYCRR Part 373 permit, regardless of the time at which waste was placed in such unit. Pursuant to 6 NYCRR 373-1.6(c)(2) the Commissioner may impose permit conditions as the Commissioner determines necessary to protect human health and the environment (e.g., Areas of Concern (AOC(s))).
2. Summary of Corrective Action Process. Corrective action implementation authorized by 6 NYCRR 373-2.6 includes: (a) the RCRA Facility Assessment ("RFA"); (b) the RCRA Facility Investigation ("RFI"); and (c) Corrective Measures ("CM"). The RFA is a three phase process that includes: a Preliminary Review ("PR"); a Visual Site Inspection ("VSI"); and a Sampling Visit ("SV"). The PR is a review of all available information on the individual SWMU(s) and AOC(s). During the PR, and in subsequent phases of the RFA, all of the media (i.e., soil, groundwater, surface water/sediment, air and subsurface gas) that could potentially be impacted by release(s) of hazardous and/or mixed waste, including hazardous constituents, are evaluated. Based on this evaluation, the SWMU(s)/AOC(s) will be characterized as to release potentials.

Following the PR, a VSI is conducted during which all of the SWMU(s)/AOC(s) either previously or newly-discovered, are observed. While performing this reconnaissance, any signs of spills or leakage, stained soil, stressed vegetation, unit deterioration, or any other conditions that may be indicative of a release are

assessed. By means of these observations and the findings of the PR, the Commissioner may require the facility to conduct a Sampling Visit (SV) at the unit(s)/area(s) where the release(s) would be suspected.

The SV can involve any or all of the previously described media at any given SWMU and/or Area of Concern (AOC). For those units/areas where releases are clearly demonstrated in the PR and/or VSI, the SV can be avoided leaving the unit(s)/area(s) to be addressed in the RFI.

The RFA includes preparing the RFA report. This report includes the findings of the various RFA activities and recommendations for further action at those units and areas with demonstrated releases of hazardous and/or mixed wastes, including hazardous constituents. In some cases, where an immediate threat to human health or the environment exists, interim corrective measures (ICMs) may be required. When there is no immediate threat, ICMs may also be used to expedite the Corrective Action process.

If the RFA concludes that there is a need for further investigative work, the Permittee shall be required to pursue phase two of corrective action, an RFI. The RFI may address a single SWMU/AOC or combination thereof. The purpose of the RFI is to determine the nature, extent, direction and rate of migration of hazardous and/or mixed wastes, including hazardous constituents, in soils, groundwater, surface water/sediment, subsurface gas and/or air. From these multimedia analyses, the types and concentrations of contaminants present, the boundaries of any contamination (e.g., plumes), and the rate and direction of contaminant movement shall be determined in each of the impacted media. Sufficient data shall be generated during the RFI to allow proper assessment of corrective measure alternatives, including implementation of ICMs. This may require bench and/or pilot studies to be implemented as part of the RFI. Once all analyses are reviewed, a RFI report is prepared that provides a summation of the data and recommendations for any needed corrective measures.

The culmination of the Corrective Action Program is Corrective Measures ("CM"). The initial stage of the corrective measures phase is the preparation of a Corrective Measures Study ("CMS"). A CMS may be required if concentrations of hazardous constituents in an aquifer, in surface water/sediment, in soils, or in air exceed their corresponding action levels. Such a study may also be required if individual concentrations of hazardous constituents are at or below their action levels, but they still may pose a threat to human health or the environment due to site-specific exposure conditions. The CMS may address a single SWMU/AOC or a combination thereof. The CMS will address alternative corrective measure strategies that are technologically feasible and reliable and which effectively mitigate and minimize damage to, and provides adequate protection of, human health and the environment. The Permittee will develop the site-specific CMS using target clean-up levels chosen by the Commissioner to be protective of

human health and the environment. Where available, promulgated standards must be used. Where promulgated standards are not available, the Commissioner may use health-based levels, based on Risk-Specific Doses ("RSD") for carcinogens and Reference Doses ("RFD") for systemic toxicants, or concentration levels protective of the environment, that have undergone scientific review. The CMS report shall discuss the alternative corrective measure strategies studied, addressing technical, institutional, public health, and environmental issues, and develop the conceptual engineering for the alternative action proposed by the facility. The CMS may not require extensive evaluation of a number of remedial alternatives where a solution is straightforward or only a few solutions exist. Such situations could require the Permittee to submit a highly focused CMS.

Following completion of the CMS, the Commissioner will select the corrective measure(s) from the corrective measure alternatives evaluated in the CMS. The Commissioner will then initiate a permit modification for the selected corrective measure(s).

Permit modification for the approved corrective measure(s) will initiate the final stage of corrective measures, Corrective Measures Implementation ("CMI"). The CMI will address the final design, construction, operation, maintenance, and monitoring of the corrective measure or measures selected.

3. A detailed history of corrective action at all SWMUs/AOCs is contained in Attachment E of this Permit.
4. Solid Waste Management Units and Areas of Concern. The conditions of this Module apply to:
 - (a) All the SWMU(s) and AOC(s) listed in this Module individually or in combinations;
 - (b) Any additional SWMU(s) and AOC(s) identified during the course of groundwater monitoring, field investigations, environmental audits or other means as described in Module II Condition C, below;
 - (c) The following known SWMU(s) and AOC(s) located on-site and/or off-site:

Table II-1
U.S. Department of Energy - Naval Reactors Laboratory Field Office
Solid Waste Management Units
(SWMUs)

I. Container Storage Areas

1. Current Hazardous Waste Storage Facility, Building Q1 (SWMU- 010)
2. Building Q3 Temporary Hazardous Waste Storage Facility (SWMU- 011)
3. Former Container Storage Area, Building Z7 (SWMU-012)
4. Former Temporary Waste Storage Facilities (SWMU-032)
5. Former Slurry Drum Storage Area (SWMU-035)
6. Former K6 Storage Pad (SWMU-036)
7. Former K7 Storage Pad (SWMU-037)
8. Railroad Staging Area (SWMU-038)
9. RML Mixed Waste Storage Pits (SWMU-042)
10. Former RML Chemical Waste Pit (SWMU-043)
11. RML In-Floor Storage (SWMU-045)
12. RML Building E2 Cask Storage Pit (SWMU-046)
13. RML Cask Storage Facility (SWMU-047)
14. Building E1 Cask Storage Pit (SWMU-048)
15. Former M4 Test Specimen Storage (SWMU-049)
16. H2MA Mixed Waste Storage Unit (SWMU-050)
17. Former Q4 Drum Pit (SWMU-051)
18. M10 Storage Facility (SWMU-052)
19. Nuclear Material Storage Vault (SWMU-066)
20. E11 Mixed Waste Modular Additions (SWMU-068)
21. Q1 \leq 90 Day Waste Accumulation Area (SWMU-070)
22. L9 \leq 90 Day Waste Accumulation Area (SWMU-071)
23. F4 \leq 90 Day Waste Accumulation Area (SWMU-072)
24. H2 \leq 90 Day Waste Accumulation Area (SWMU-073)
25. Miscellaneous \leq 90 Day Waste Accumulation Areas (SWMU-079): This SWMU consists of active \leq 90 Day Areas that have been or will be established subsequent to original permit issuance (7/20/98). As such, this SWMU excludes both SWMU-070 through -073 listed above, as well as \leq 90 Day Areas that were established since original permit issuance and subsequently closed. The Permittee shall keep an updated list of these individual areas in the facility operating record, and shall provide the Department with this list on an annual basis, and/or when requested by the Department.
26. SPRU Mixed Waste Storage Area (SWMU-085) - See Table II-2

27. Conex Box SWMU (SWMU-086)

II. Land Disposal Units

1. Closed Landfill (SWMU-001)
2. Former Landfill (SWMU-002)
3. Mercury Disposal Area (SWMU-003)
4. North Field (SWMU-004)
5. Pyrophoric Area (SWMU-005)
6. West Field (SWMU-006)
7. Construction and Demolition Debris Area No. 1 (SWMU-007)
8. Construction and Demolition Debris Area No. 2 (SWMU-008)

III. Storage/Treatment Tanks

1. Building K4 Boiler Blowdown Storage Tank (SWMU-013)
2. Building K4 Wastewater Neutralization Tank (SWMU-014)
3. Former C2/E1 Yard Wastewater Treatment Tank Site (SWMU-015)
4. E1/G1 Wastewater Treatment Tanks (SWMU-016)
5. Building L3 Holding Tanks, Experimental Engineering (SWMU-017)
6. Building L6 Equalization Tank, Experimental Engineering (SWMU-018)
7. Building L6 Holding Tank, Experimental Engineering (SWMU-019)
8. Building D3 Neutralization Tank, Pickling Facility (SWMU-020)
9. Building K3 Former Oil/Water Separator Site (SWMU-021)
10. G2 Wastewater Concentrator (SWMU-026)
11. Former K3 Fuel Oil Tank Site (SWMU-029)
12. H2 Tank Farm (SWMU-031)
13. SPRU Tank 527 (SWMU-058)
14. SPRU Tank 531 (SWMU-059)
15. SPRU Tank 532 (SWMU-060)
16. SPRU Tank 534 (SWMU-061)
17. SPRU Tank 551 (SWMU-062)
18. SPRU Tank 536 (SWMU-063)
19. SPRU Tank 316 (SWMU-064)
20. FCPE Discharge Tank (SWMU-065)
21. K4 Holding Tank (SWMU-069)
22. PTR Hold Tank (SWMU-074)
23. Former CWA Hold Tank (SWMU-075)
24. Former CWTA Hold Tank (SWMU-076)
25. Former ATR Hold Tanks (SWMU-077)
26. Fractionation Tanks 1 (SWMU-081)
27. Fractionation Tanks 2 (SWMU-082)
28. K4 West Wastewater Tank (SWMU-083)

29. K4 Annex Wastewater Tank (SWMU-084)

IV. Incinerators

1. Former J3 Incinerator Site (SWMU-022)
2. Former Pilot Incinerator/Storage Facility (SWMU-033)

V. Sewers

1. Industrial Drain System (SWMU-053)
2. Wastewater Drain System (SWMU-054)
3. Laundry Drain System (SWMU-055)
4. Storm Water Drain System (SWMU-056)
5. Pipe Tunnels (SWMU-057)

VI. Miscellaneous

1. Scrap Metal Management Areas (SWMU-009)
2. High Yard Area (SWMU-023)
3. J7 Scrap and Salvage (SWMU-024)
4. Former L3 Sodium Treatment Area (SWMU-025)
5. K4 Pit (SWMU-027)
6. Site Boilers (SWMU-028)
7. H2 Processing Facility (SWMU-030)
8. L7 Waste Processing Facility (SWMU-034)
9. K4 Laundry Wastewater Pit (SWMU-039)
10. K5 Retention Basin (SWMU-040)
11. J4 Filter Bed (SWMU-041)
12. RML Cobalt Pit (SWMU-044)
13. E11 Waste Processing Facility (SWMU-067)
14. Steam Condensate Return System: Discharge Areas (SWMU-078)
15. Canberra Q2 Unit, Building E11 (SWMU-80)
16. Building P9 Cooling Tower Blowdown Neutralization Tank (SWMU-087)

Areas of Concern
(AOCs)

1. Hillside Area (AOC-001)
2. Former PCB-Containing Transformers (AOC-002)
3. Lower Level Parking Lot (AOC-003)
4. Z5 Sanitary Sewer/CSMA Soil Pile & Copper Release/CSMA Soil Pile (AOC-004)
5. Q3 Yard (AOC-005)

6. Red Pines Area (AOC-006)
 7. H1 Cooling Tower (AOC-007)
 8. G2 Area of Concern (AOC-008)
 9. T1 North (AOC-009)
- (d) All Corrective Action responsibilities for the SWMUs and AOCs listed in Table II-2 below are assigned to the U.S. Department of Energy - Environmental Management (DOE-EM), originally DOE-Oakland Operations Office (EPA ID No. NYR000096859), as described in Department Permit # 4-4224-00024/00055 for the former Separations Process Research Unit (SPRU) operation. This has resulted in a shift of technical and administrative responsibility for these waste management units/areas and associated work activities within the Department of Energy. The Permittee retains liability in the event of default by DOE-EM and will be responsible under this Permit to satisfy all DOE-EM permit requirements at the time DOE-EM defaulted. The Commissioner will inform the Permittee in writing of the default and their obligations to continue the corrective action activities previously required of DOE-EM.

Table II-2

U.S. Department of Energy - Environmental Management
(DOE-EM)

Solid Waste Management Units
(SWMUs)

I. Container Storage Areas

1. SPRU Mixed Waste Storage Area (SWMU-085)

B. STANDARD CONDITIONS FOR CORRECTIVE ACTION

1. Work Plans. All work plans submitted pursuant to this Module shall include:
 - (a) Quality Assurance/Quality Control protocols to ensure that data generated is valid and supported by documented procedures;
 - (b) Other plans (e.g., Quality Assurance Project Plan (QAPP), specifications and protocols, as applicable;
 - (c) A schedule for starting specific tasks, completing the work and submitting progress and final reports; and

- (d) Plans for the treatment, storage, discharge or disposal of wastes to be generated by activities described therein.
- 2. Quality Assurance/Quality Control.
 - (a) Any laboratory to be used pursuant to such work plans required by this Module must be approved by the Commissioner prior to work plan implementation. Certification by the New York State Department of Health Environmental Laboratory Approval Program in the relevant analytical services is required.
 - (b) The minimum Quality Assurance/Quality Control data and information, that shall be delivered with all sample analyses required by this Module, are described in Appendix II-A of this Permit Module.
- 3. Health/Safety Plans. The Permittee shall develop, according to applicable Federal, State and local requirements, and submit to the Commissioner, health and safety plans that will be implemented to ensure that the health and safety of project personnel, plant personnel and the general public are protected. These plans are not subject to approval by the Commissioner. For non-intrusive work and sampling/monitoring activities for which there is no exposure concern, the Permittee may request that the Department suspend the requirement to submit a Health and Safety Plan for that specific activity. If the Department concurs with the request, the Permittee shall include any necessary health and safety measures within a separate section of the activity's work plan. Department approval of the work plan in no way constitutes approval of any health and safety elements therein.
- 4. Guidance Documents. When preparing the submissions described in this Permit Module, the Permittee shall take account of applicable guidance documents issued by the U.S. Environmental Protection Agency and the New York State Department of Environmental Conservation (Department) in a manner reflecting reasonable technical considerations.
- 5. Prior Submissions. The Permittee may have already submitted portions of information, plans, or reports required by this Permit Module and its Appendices to the Commissioner pursuant to the terms of previous applications, consent orders, or plans. For those items the Permittee contends were submitted to the Commissioner, the Permittee may cite the specific document(s) it believes adequately addresses each of the individual items requested by this Permit Module and its Appendices. The references, by document(s), shall be placed in the appropriate sections of the submissions that require the referenced information and data. If the Commissioner determines that the Department does not possess any of the referenced information, plans, or reports that the Permittee claims were previously submitted, the

Commissioner will notify the Permittee and the Permittee shall submit the referenced documents within the time frame specified within the notification.

6. Determination of No Further Action.

- (a) Based on the results of an RFI for a particular SWMU, an AOC, or combination of SWMUs, and/or AOCs, and other relevant information, the Permittee may submit an application to the Commissioner for a major permit modification in accordance with 6 NYCRR Part 373 permit modification regulations identified in Module I of this Permit to terminate the subsequent corrective action requirements of this Module. This permit modification application must contain information demonstrating no release(s) of hazardous and/or mixed wastes, including hazardous constituents, from the SWMU(s) and/or AOC(s) pose a threat to human health or the environment.
- (b) If, based upon review of the Permittee's request for a permit modification, the results of the RFI, and other information, including comments received during the forty-five (45) calendar day public comment period required for permit modifications, the Commissioner determines that the release(s) or the suspected release(s) investigated either are non-existent or do not pose a threat to human health or the environment, the Commissioner may grant the requested modification.
- (c) A determination of no further action shall not preclude the Commissioner from implementing the following actions:
 - (i) Modifying this Permit at a later date to require the Permittee to perform such investigations as necessary to comply with the requirements of this Permit Module and its Appendices if new information or subsequent analysis indicates that there are, or are likely to be, releases from SWMUs/AOCs that may pose a threat to human health or the environment; and
 - (ii) Requiring continual or periodic monitoring of air, soil, groundwater, or surface water/sediment or subsurface gas, if necessary, to protect human health and the environment, when site-specific circumstances indicate the release(s) of hazardous and/or mixed waste, including hazardous constituents, are likely to occur from any SWMU(s) and/or AOC(s).

7. Compliance Schedule For Reporting And Submissions.

- (a) Due to routine interface with the Department by the Permittee, signed progress reports are not required; however, the Department may reinstate

the requirement for signed progress reports at any time. If progress reporting is required, the Permittee shall submit, to the Commissioner, signed progress reports, as specified in approved work plans pursuant to this Permit, of all activities (i.e., SWMU Assessment, Interim Measures, RCRA Facility Investigation, Corrective Measures Study) conducted pursuant to the provisions of the Corrective Action Compliance Schedules of this Permit Module, beginning no later than thirty (30) calendar days after the Permittee is first required to begin implementation of any requirement herein. These reports shall contain:

- (i) A description of the work completed during the reporting periods;
 - (ii) Summaries of all findings made during the reporting period;
 - (iii) Summaries of all changes made during the reporting period;
 - (iv) Summaries of all contacts made with representatives of the local community and public interest groups during the reporting period;
 - (v) Summaries of all problems or potential problems encountered during the reporting period and actions taken to rectify problems;
 - (vi) Changes in personnel conducting or managing the corrective action activities during the reporting period;
 - (vii) Projected work for the next reporting period; and
 - (viii) Copies of daily reports, inspection reports, laboratory/monitoring data, etc., generated during the reporting period.
- (b) Upon request, copies of other relevant reports and data not identified in Module II Condition B.7.(a) shall be made available to the Commissioner.
- (c) The Commissioner may require the Permittee to conduct new or more extensive assessments, investigations, or studies, based upon information provided in the progress reports referred to in Module II Condition B.7.(a) above, or upon other supporting information.
- (d) All work plans, reports, studies, designs and schedules required by the conditions of this Permit Module and its appendices are upon approval of the Commissioner, incorporated into this Permit by reference and become an enforceable part of this Permit. Any noncompliance with such approved work plans, reports, studies, designs and schedules shall constitute noncompliance with this Permit. Extensions of the specified final compliance dates for submissions may be granted by the Commissioner in accordance with the major permit modification procedures stipulated in Module I of this Permit.

8. Compliance with Governmental Requirements. During investigative activities, interim corrective measures, and final corrective measures, (including, but not limited to, equipment decommissioning, excavation and unit demolition) required under this Module, the Permittee shall ensure that the transportation, treatment, storage, discharge, and disposal of all contaminated materials generated as a result of such activities (including, but not limited to, soils, sediments, liquids, tanks, pipes, pumps, rubble, debris, and structural materials) are performed in an environmentally sound manner pursuant to all applicable Federal, State and local requirements and that is protective of public health and the environment. Nothing in this Module shall be construed to require the Permittee to proceed in a manner which is in violation of any such requirements.
9. Notifications.
- (a) Notification of groundwater contamination. If at any time the Permittee discovers that hazardous constituents in groundwater that may have been released from a SWMU or AOC at the facility have migrated beyond the facility boundary in concentrations that exceed action levels, the Permittee shall, within fifteen (15) calendar days of discovery, provide written notice to the Commissioner and any person who owns or resides on the land which overlies the contaminated groundwater.
- (b) Notification of air contamination. If at any time the Permittee discovers that hazardous constituents in air that may have been released from a SWMU or AOC at the facility have or are migrating to areas beyond the facility boundary in concentrations that pose a threat to human health, and that residences or other places at which continuous, long-term exposure to such constituents might occur are located within such areas, the Permittee shall:
- (i) Immediately initiate any actions that may be necessary to provide notice to all individuals who have been, may have been or may become subject to such exposure; and
- (ii) Within fifteen (15) calendar days of such discovery, provide written notification to the Commissioner.
- (c) Notification of residual contamination. If hazardous and/or mixed wastes or hazardous constituents in solid waste management units or areas of concern, or which have been released from a SWMU or AOC, will remain in or on the land, including groundwater, after the term of the permit has expired, the Commissioner may require the Permittee to record a notation in the deed to the facility property or in some other instrument which is normally examined during title search that will, in perpetuity, notify any potential purchaser of the property of the types, concentrations, and locations of such hazardous wastes or hazardous constituents. The

Commissioner may require such notice as part of the corrective measures selection process.

10. SWMU/AOC Current Conditions Report. Every 5 years or when requested by the Department, the Permittee shall submit to the Department a SWMU/AOC Current Conditions Report providing current information regarding the status of investigations or remedial work for all SWMUs and AOCs. The report must include, at a minimum, information regarding physical and operational description, waste types/characteristics, any known or suspected releases, and current status of corrective action, including beginning and completion dates of each applicable phase.

C. COMPLIANCE SCHEDULE FOR ASSESSMENT OF NEWLY IDENTIFIED SWMUS AND AOCS.

1. Notification of Assessment. The Permittee shall notify the Commissioner, in writing, of any additional SWMU(s) and/or AOC(s) not listed in this Module, which are identified during the course of groundwater monitoring, field investigations, environmental audits, or other means (e.g., newly installed Solid Waste Management Unit) within fifteen (15) calendar days after identification. For new units managing solid waste only, or for other new unit(s), the Permittee may seek clarification from the Department as to whether the unit constitutes a SWMU requiring notification under this permit condition. Should the Department determine that such notification is required, the Permittee will provide notification to the Department within fifteen (15) calendar days after the Department's determination. Once such notification has been made, a newly installed Solid Waste Management Unit (SWMU), i.e. new use with no history of release, will receive a determination of no further action and will be processed by the Department as a notification. Should a subsequent release occur at such a unit, then the full notification, assessment and reporting procedures of this Module Condition will apply.
2. SWMU/AOC Assessment Report. Within forty-five (45) calendar days after notifying the Commissioner, the Permittee shall submit a SWMU/AOC Assessment Report. This Report must provide, at a minimum, the following information for each newly identified SWMU/AOC:
 - (a) Type and function of unit/area;
 - (b) Location of each unit/area on a topographic map of appropriate scale;
 - (c) Dimensions, capacities, and structural descriptions of the unit/area (supply available engineering drawings);
 - (d) Dates that the unit/area was operated;

- (e) Description of the wastes that were placed or spilled at the unit/area;
 - (f) Description of any known releases from the unit/area (to include groundwater data, soil analyses, air monitoring data, and/or surface water/sediment data);
 - (g) The results of any sampling and analysis required for the purpose of determining whether releases of hazardous and/or mixed wastes, including hazardous constituents, have occurred, are occurring, or are likely to occur from the unit/area; and
 - (h) Whether this unit/areas, individually or in combination with other units/areas described in Module II Condition A.4. is a significant source of contaminant release.
3. SWMU/AOC Sampling and Analysis Plan. Within thirty (30) calendar days after submittal of the SWMU/AOC Assessment Report required in Module II Condition C.2., the Permittee shall submit to the Commissioner for approval a schedule for the preparation of SWMU/AOC Sampling and Analysis Plan in accordance with the most recent version of EPA SW-846 for any sampling and analysis of groundwater, land surface and subsurface strata, surface water/sediment or air, as necessary to determine whether a release of hazardous waste, including hazardous constituents, from such unit(s) and/or area(s) has occurred, is likely to have occurred, or is likely to occur. As deemed appropriate, the Department's DER-10 and other applicable guidance and policy may also be used in the development of the Plan. All such work shall proceed in accordance with the approved schedule. The SWMU/AOC Sampling and Analysis Plan shall include an Implementation Schedule and a QAPP. If, however, the Commissioner determines that the submitted schedule for the preparation of the Sampling and Analysis Plan and the Implementation Schedule are not acceptable, the Permittee shall be required to make modifications consistent with specific deficiencies to be identified in a notice, within a time period to be determined by the Commissioner. The Commissioner shall have final approval of the SWMU/AOC Sampling and Analysis Plan preparation schedule and the Implementation Schedule.

The SWMU/AOC Sampling and Analysis Plan must demonstrate that the sampling and analyses program, if applicable, is capable of yielding representative samples and must include parameters sufficient to identify migration of hazardous and/or mixed waste, including hazardous constituents, from the newly-discovered SWMU(s) and/or AOC(s) to the environment.

4. Subsequent Assessment Actions. Following submission of the SWMU/AOC Assessment Sampling and Analysis Plan set forth in Module II Condition

C.3., subsequent activities for the Plan shall proceed in accordance with the following schedule:

- (a) Meeting between the Permittee and the Department to discuss Plan comments, as appropriate; and
 - (b) Submission of a revised Plan to the Commissioner for approval within thirty (30) calendar days of the above-described meeting or in accordance with the approved Sampling and Analysis Plan Schedule of Condition C.3. (If the above referenced meeting is determined not to be necessary, the Permittee shall submit a revised Plan to the Commissioner, according to a schedule specified by the Department, not to exceed forty-five (45) calendar days after Permittee's receipt of Plan comments from the Commissioner, or in accordance with the approved Sampling and Analysis Plan Schedule of Condition C.3.); and
 - (c) Begin implementation of the SWMU/AOC Sampling and Analysis Plan in accordance with the time period provided in the approved Implementation Schedule of Condition C.3.
5. SWMU/AOC Sampling and Analysis Report. In accordance with the time period provided in the approved Implementation Schedule of Condition C.3., the Permittee shall follow reporting requirements in the approved Plan and submit a SWMU/AOC Sampling and Analysis Report to the Commissioner. The Report shall describe all results obtained from the implementation of the approved Plan.
6. Assessment Conclusions. Based on the results of the SWMU/AOC Sampling and Analysis Report, the Commissioner shall determine the need for further investigations at the specific unit(s) covered in the SWMU/AOC Assessment Report. If the Commissioner determines that such investigations are needed, the Commissioner shall, by written notification, require the Permittee to prepare and submit for approval a RCRA Facility Investigation Work Plan, including an Implementation Schedule, in accordance with Module II Condition E.5., et seq. Following the implementation of the RFI Work Plan the Permittee shall submit for approval the RFI Report. If the Commissioner, after reviewing the RFI Report determines that a Corrective Measures Study (CMS) or an Interim Corrective Measures (ICM) is required, the Commissioner shall by written notification require the Permittee to prepare and submit for approval the CMS and/or ICM, including Implementation Schedules. All approved submissions submitted pursuant to this Permit condition shall be made part of this Permit.

D. COMPLIANCE SCHEDULE AND NOTIFICATION REQUIREMENTS FOR NEWLY DISCOVERED RELEASES AT SWMUS AND AOCs

The Permittee shall notify the Commissioner, in writing, of any release(s) of hazardous and/or mixed wastes, including hazardous constituents, discovered during the course of groundwater monitoring, field investigation, environmental auditing, or other activities no later than fifteen (15) calendar days after discovery. Such newly-discovered release(s) may be from the newly-identified unit(s)/area(s), from the unit(s)/area(s) for which, based on the findings of the RFA, the Commissioner had previously determined that no further investigation was necessary, or from the unit(s)/area(s) investigated as part of an RFI. Based on the information provided in the notification, the Commissioner shall determine the need for further investigation of the release(s). If the Commissioner determines that such investigations are needed, the Commissioner shall, by written notification, require the Permittee to prepare a RCRA Facility Investigation Work Plan, including an Implementation Schedule, in accordance with Module II Condition E.5., et seq. Following the implementation of the RFI Work Plan, the Permittee shall submit for approval the RFI Report. If the Commissioner after reviewing the RFI Report determines that a Corrective Measures Study (CMS) or an Interim Corrective Measures (ICM) is required the Commissioner shall, by written notification, require the Permittee to prepare and submit for approval the CMS and/or ICM, including implementation schedules. All approved documents submitted pursuant to this Permit condition shall be made part of this Permit.

E. CORRECTIVE ACTION REQUIREMENTS

1. No Action Requirement.

- (a) On the basis of the revised RCRA Facility Assessment Preliminary Review – Visual Site Inspection Report, dated July 20, 1998 (Appendix II-E of this Permit Module), and/or subsequent information, the Commissioner has determined that there is either: 1) no evidence at this time of the release(s) of hazardous and/or mixed waste(s) and/or constituent(s) that threaten human health or the environment, or: 2) documentation that remediation in accordance with Department-approved work plans and objectives has been performed, from/at the following SWMU(s) and/or AOC(s) identified in Module II Condition A.4.:
1. Closed Landfill (SWMU-001)
 2. Construction and Demolition Debris Area No. 2 (SWMU-008)
 3. Scrap Metal Management Areas (SWMU-009)
 4. Current Hazardous Waste Storage Facility, Building Q1 (SWMU-010)
 5. Building Q3 Temporary Hazardous Waste Storage Facility (SWMU- 011)
 6. Former Container Storage Area, Building Z7 (SWMU-012)
 7. Building K4 Boiler Blowdown Storage Tank (SWMU-013)
 8. Building K4 Wastewater Neutralization Tank (SWMU-014)
 9. Former C2/E1 Yard Wastewater Treatment Tank Site (SWMU-015)
 10. E1/G1 Wastewater Treatment Tanks (SWMU-016)

11. Building L3 Holding Tanks (SWMU-017)
12. Building L6 Equalization Tank (SWMU-018)
13. Building L6 Holding Tank (SWMU-019)
14. Building D3 Neutralization Tank, Pickling Facility (SWMU-020)
15. Building K3 Former Oil/Water Separator Site (SWMU-021)
16. Former J3 Incinerator Site (SWMU-022)
17. G2 Wastewater Concentrator (SWMU-026)
18. Site Boilers (SWMU-028)
19. Former K3 Fuel Oil Tank Site (SWMU-029)
20. L7 Waste Processing Facility (SWMU-034)
21. K4 Laundry Wastewater Pit (SWMU-039)
22. RML Mixed Waste Storage Pits (SWMU-042)
23. RML Cobalt Pit (SWMU-044)
24. Building E1 Cask Storage Pit (SWMU-048)
25. H2MA Mixed Waste Storage Unit (SWMU-050)
26. M10 Storage Facility (SWMU-052)
27. SPRU Tank 527 (SWMU-058)
28. SPRU Tank 531 (SWMU-059)
29. SPRU Tank 532 (SWMU-060)
30. SPRU Tank 534 (SWMU-061)
31. SPRU Tank 551 (SWMU-062)
32. SPRU Tank 536 (SWMU-063)
33. SPRU Tank 316 (SWMU-064)
34. FCPE Discharge Tank (SWMU-065)
35. Nuclear Material Storage Vault (SWMU-066)
36. E11 Waste Processing Facility (SWMU-067)
37. E11 Mixed Waste Modular Additions (SWMU-068)
38. K4 Holding Tank (SWMU-069)
39. Q1 \leq 90 Day Waste Accumulation Area (SWMU-070)
40. L9 \leq 90 Day Waste Accumulation Area (SWMU-071)
41. F4 \leq 90 Day Waste Accumulation Area (SWMU-072)
42. H2 \leq 90 Day Waste Accumulation Area (SWMU-073)
43. PTR Hold Tank (SWMU-074)
44. Former CWA Hold Tank (SWMU-075)
45. Former CWTA Hold Tank (SWMU-076)
46. Former ATR Hold Tanks (SWMU-077)
47. Steam Condensate Return System: Discharge Areas (SWMU-078)
48. Z5 Sanitary Sewer/CSMA Soil Pile & Copper Release/CSMA Soil Pile (AOC-004)
49. Former PCB-Containing Transformer Area G (AOC-002)
50. J7 Scrap and Salvage (SWMU-024)
51. Former K6 Storage Pad (SWMU-036)
52. Former K7 Storage Pad (SWMU-037)
53. Miscellaneous \leq 90 Day Waste Accumulation Areas (SWMU-079)
54. Canberra Q2 Unit (Building E11) (SWMU-80)

55. Railroad Staging Area (SWMU-038)
56. K5 Retention Basin (SWMU-040)
57. Lower Level Parking Lot (AOC-003)
58. Red Pines Area (AOC-006)
59. High Yard Area (SWMU-023)
60. H2 Processing Facility (SWMU-030)
61. H2 Tank Farm (SWMU-031)
62. Former Slurry Drum Storage Area (SWMU-035)
63. Former M4 Test Specimen Storage (SWMU-049)
64. Pipe Tunnels (SWMU-057)
65. G2 Area of Concern (AOC-008)
66. T1 North (AOC-009)
67. K4 West Wastewater Tank (SWMU-083)
68. K4 Annex Wastewater Tank (SWMU-084)
69. SPRU Mixed Waste Storage Area (SWMU-085) – See Table II-2
70. Conex Box SWMU (SWMU-086)
71. Building P9 Cooling Tower Neutralization Tank (SWMU-087)

- (b) The Permittee need not undertake corrective action at any aforementioned SWMU(s) and/or AOC(s) identified in Module II Condition E.1.(a) as long as there is no evidence of the release(s) of hazardous waste(s) and/or mixed waste(s) or constituent(s) from the SWMU(s) and/or AOC(s) threatening human health or the environment. This permit condition does not apply to any other stipulation specified in other Modules or Conditions of this Permit.
- (c) A determination of no further action shall not preclude the Commissioner from modifying this Permit at a later date to require further investigations, studies, monitoring, or corrective measures, if new information or subsequent analysis indicates the release(s) or likelihood of release(s) from SWMU(s) and/or AOC(s) identified in Module II Condition E.1.(a) that could pose a threat to human health or the environment.
- (d) Prior Interim Corrective Measures ("ICMs") which have been performed at SWMU(s)/AOC(s) listed in Module II Condition E.1.(a) will be subject to evaluation, in terms of final corrective measures for the facility, per the criteria and provisions of Module II Conditions E.11. and E.12.

2. Compliance Schedule for RCRA Facility Assessment ("RFA") Sampling Visit Work Plan

- (a) On the basis of the revised RCRA Facility Assessment Preliminary Review Visual Site Inspection Report dated July 20, 1998 (Appendix II-E of this Permit Module), and subsequent documentation, the Commissioner has determined that there is the potential for the release(s) of hazardous and/or mixed waste(s) and/or constituents to have occurred from the following SWMU(s) and/or AOC(s) identified in Module II Condition A.4. that requires implementation of a RFA Sampling Visit:
- (i) Former L3 Sodium Treatment Area (SWMU-025)
 - (ii) K4 Pit (SWMU-027)
 - (iii) Former Temporary Waste Storage Facilities (SWMU-032)
 - (iv) Former Pilot Incinerator/Storage Facility (SWMU-033)
 - (v) J4 Filter Bed (SWMU-041)
 - (vi) Former RML Chemical Waste Pit (SWMU-043)
 - (vii) Industrial Drain System (SWMU-053)
 - (viii) Wastewater Drain System (SWMU-054)
 - (ix) Laundry Drain System (SWMU-055)
 - (x) Storm Water Drain System (SWMU-056)
- (b) The Permittee shall adhere to the Permit Corrective Action Work Plan Compliance Schedule for the preparation of a RCRA Facility Assessment - Sampling Visit (“RFA-SV”) Work Plan for the SWMU(s)/AOC(s) identified in Module II Condition E.2.(a) as requiring performance of a RCRA Facility Assessment (“RFA”). All such work shall proceed in accordance with the approved schedule, and/or in accordance with revisions to the schedule as approved by the Department. The RCRA Facility Assessment Sampling Visit (“RFA-SV”) Work Plan shall include an Implementation Schedule. If, however, the Commissioner determines that the submitted schedule for the preparation of the RFA-SV and the Implementation Schedule are not acceptable, the Permittee shall be required to make modifications consistent with specific deficiencies to be identified in a notice, within a time period to be determined by the Commissioner. The Commissioner shall have final approval of the RCRA Facility Assessment - Sampling Visit Work Plan preparation schedule and the Implementation Schedule.
- The Permittee shall develop the RFA-SV Work Plan in accordance with the Sewer Assessment Work Plan Outline (specified in Appendix II-D of this Permit Module) and the most recent version of EPA SW-846 with supplementation, as deemed appropriate, by applicable Department guidance and policy; the Work Plan shall include a QAPP.
- (c) Following submission of the RFA-SV Work Plan set forth in Module II Condition E.2.(b) for the SWMU(s) and/or AOC(s) identified in

Module II Condition E.2.(a), subsequent activities for the Plan shall proceed in accordance with the following schedule:

- (i) Meeting between the Permittee and the Department to discuss Plan comments, as appropriate; and
 - (ii) Submission of a revised Plan to the Commissioner for approval within forty-five (45) calendar days of the above-described meeting, or in accordance with the approved RFA-SV Work Plan Schedule of Condition E.2.(b). (If the above-referenced meeting is determined not to be necessary, the Permittee shall submit a revised Plan to the Commissioner, according to a schedule specified by the Department, not to exceed forty-five (45) calendar days after Permittee's receipt of Plan comments from the Commissioner, or in accordance with the approved RFA-SV Work Plan Schedule of Condition E.2.(b).)
- (d) On the basis of the revised RCRA Facility Assessment Preliminary Review – Visual Site Inspection Report dated July 20, 1998 (Appendix II-E of this Permit Module), and subsequent documentation, the Commissioner has determined that there is a potential for release of hazardous waste and/or constituents from the following inaccessible SWMU(s) and/or AOC(s) identified in Module II Condition A.4.:
- (i) RML In-Floor Storage (SWMU-045)
 - (ii) RML Building E2 Cask Storage Pit (SWMU-046)
 - (iii) RML Cask Storage Facility (SWMU-047)
 - (iv) Former Q4 Drum Pit (SWMU-051)
 - (v) Wastewater Drain System (SWMU-054): Building Q4

For the areas so designated, the Permittee shall submit to the Commissioner for approval a schedule for the preparation of a RCRA Facility Assessment- Sampling Visit (“RFA-SV”) Work Plan, no later than one-hundred and eighty (180) calendar days prior to the date when the SWMU(s) and/or AOC(s) becomes accessible for such an investigation. Accessibility to the SWMU(s)/AOC(s) shall be considered achievable when the impediment to the SV (e.g. buildings, utilities) is demolished, abandoned, or is altered in a manner that would allow access to the SWMU(s)/AOC(s). All such work shall proceed in accordance with the approved schedule. The RCRA Facility Assessment-Sampling Visit Work Plan shall include an Implementation Schedule. If, however, the Commissioner determines that the submitted schedule for the preparation of the RFA-SV and Implementation Schedule are not acceptable, the Permittee shall be required to make modifications consistent with specific deficiencies to be identified in a notice, within a time period to be determined by the Commissioner. The Commissioner

shall have final approval of the RCRA Facility Assessment-Sampling Visit Work Plan preparation schedule and the Implementation Schedule.

The Permittee shall develop the RFA-SV Work Plan in accordance with the most recent version of EPA SW-846 with supplementation, as deemed appropriate, by applicable Department guidance and policy; the Work Plan shall include a QAPP.

Following submission of the RFA-SV Work Plan set forth in this Module Condition, subsequent activities for the Plan shall proceed in accordance with the following schedule:

- (i) Meeting between the Permittee and the Department to discuss Plan comments, as appropriate; and
- (ii) Submission of a revised Plan to the Commissioner for approval within forty-five (45) calendar days of the above-described meeting, or in accordance with the approved RFA-SV Work Plan Schedule. (If the above-referenced meeting is determined not to be necessary, the Permittee shall submit a revised Plan to the Commissioner, according to a schedule specified by the Departments, not to exceed forty-five (45) calendar days after Permittee's receipt of Plan comments from the Commissioner, or in accordance with the approved RFA-SV Work Plan Schedule).

3. Compliance Schedule For RFA-SV Work Plan Implementation.

Begin implementation of the RFA-SV Work Plan for the SWMU(s) and/or AOC(s) identified in Module II Conditions E.2.(a) and E.2.(d) in accordance with the time period provided in the approved Implementation Schedules of Conditions E.2.(b) and E.2.(d), respectively.

4. Compliance Schedule For RFA-Sampling Visit Report.

- (a) In accordance with the time period provided in the approved Implementation Schedule of Conditions E.2.(b) and E.2.(d), the Permittee shall submit a final report to the Commissioner on the SV for the SWMU(s) and/or AOC(s) identified in Module II Condition E.2.(a) and E.2.(d), respectively. The report shall follow reporting requirements in the approved work plan and describe all results, of validated analytical data generated under the approved RFA-SV Plan, obtained from the implementation of the approved Plan.
- (b) Based on the results of the RCRA Facility Assessment-Sampling Visit Report submitted pursuant to Module II Condition E.4.(a), the

Commissioner shall determine the need for further investigations at specific unit(s) and/or area(s) covered in the RFA-SV Report. If the Commissioner determines that such investigations are needed, the Commissioner shall, by written notification, require the Permittee to prepare and submit for approval a RCRA Facility Investigation Work Plan in accordance with Module II Condition E.5. et seq.

5. Compliance Schedule For RCRA Facility Investigation (“RFI”) Work Plan at Accessible SWMUs and AOCs.

- (a) On the basis of the revised RCRA Facility Assessment Preliminary Review - Visual Site Inspection Report dated July 20, 1998 (Appendix II-E of this Permit Module), and subsequent documentation, the Commissioner has determined that there has been a release of hazardous and/or mixed waste and/or constituents from the following SWMU(s), or combination of SWMU(s), and/or AOC(s) identified in Module II Condition A.4.:
 - (i) Q3 Yard (AOC-005)
 - (ii) H1 Cooling Tower (AOC-007)
- (b) Within sixty (60) calendar days after the effective date of this Permit for the SWMU(s) and/or AOC(s) identified in Module II Condition E.5.(a), the Permittee shall submit to the Commissioner for approval a schedule for the preparation of a RCRA Facility Investigation Task I Report on Current Conditions required by the RFI Scope of Work included in Appendix II-B of this Permit Module, and all such work shall proceed in accordance with the approved schedule. A schedule for the preparation of a Task I Report shall be submitted for approval within sixty (60) calendar days after the written notification by the Commissioner that an RFI is required pursuant to Module II Conditions C.6., D. and/or E.4.(b), and all such work shall proceed in accordance with the approved schedule. If, however, the Commissioner determines that the submitted schedule for the preparation of a RCRA Facility Investigation Task I Report is not acceptable, the Permittee shall be required to make modifications consistent with specific deficiencies to be identified in a notice, within a time period to be determined by the Commissioner. The Commissioner shall have final approval of the RCRA Facility Investigation Task I Report Schedule. In certain instances, previously approved reports associated with the unit(s) subject to the RFI will fulfill the requirements of Task I reporting.
- (c) Within sixty (60) calendar days of the effective date of this Permit for the SWMU(s) and/or AOC(s) identified in Module II Condition E.5.(a), the Permittee shall submit to the Commissioner for approval a schedule

for the preparation of a RCRA Facility Investigation Task II Report on the Pre- Investigation Evaluation of Corrective Measures Technologies required by the RFI Scope of Work included in Appendix II-B of this Permit Module, and all such work shall proceed in accordance with the approved schedule. A schedule for the preparation of a Task II Report shall be submitted for approval within ninety (90) calendar days after the written notification by the Commissioner that an RFI is required pursuant to Module II Conditions C.6., D. and/or E.4.(b)., and all such work shall proceed in accordance with the approved schedule. If, however, the Commissioner determines that the submitted schedule for the preparation of a RCRA Facility Investigation Task II Report is not acceptable, the Permittee shall be required to make modifications consistent with specific deficiencies to be identified in a notice, within a time period to be determined by the Commissioner. The Commissioner shall have final approval of the RCRA Facility Investigation Task II Report Schedule. In certain instances, Task II reporting requirements shall be incorporated into the Task IV Work Plan.

- (d) Within one-hundred and twenty (120) calendar days of the effective date of this Permit for the SWMU(s) and/or AOC(s) identified in Module II Condition E.5.(a)., the Permittee shall submit to the Commissioner for approval a schedule for the preparation of a RCRA Facility Investigation Work Plan, inclusive of an Implementation Schedule. All such work will proceed in accordance with the approved schedule. A schedule for the preparation of a RCRA Facility Investigation Work Plan, inclusive of an Implementation Schedule, will be submitted for approval within sixty (60) calendar days after written notification by the Commissioner that an RFI is required pursuant to Module II Conditions C.6., D. and/or E.4.(b)., and all such work shall proceed in accordance with the approved schedule. If, however, the Commissioner determines that the submitted schedule for the preparation of a RCRA Facility Investigation Work Plan is not acceptable, the Permittee shall be required to make modifications consistent with specific deficiencies to be identified in a notice, within a time period to be determined by the Commissioner. The Commissioner shall have final approval of the Work Plan preparation schedule and the Implementation Schedule.

The Work Plan must address all necessary activities or include descriptions to meet the requirements of the Scope of Work for a RCRA Facility Investigation included in Appendix II-B of this Permit Module, including Tasks III through V. In addition, the Permittee must follow the most recent version of EPA SW-846, with supplementation, as deemed appropriate, by applicable Department guidance and policy; the Work Plan shall include a QAPP.

The Permittee may determine that any of the items required by Tasks III through V of the Scope of Work in Appendix II-B of this Permit Module have already been submitted or completed and, therefore, the resubmittal of those items is not necessary for completing the RFI. The Permittee shall request, within sixty (60) calendar days of any notification by the Commissioner that an RFI is required, that the Commissioner review for approval the Permittee's determination. At the time of the request, the Permittee must provide the following information: (1) description of the items and/or summary of findings; (2) description of investigations addressing the items, documents/reports of the investigations with dates, and summary of the findings; and (3) copies of the documents/reports. Upon the Commissioner's approval of any previously performed items, the Permittee may delete these from the RFI Work Plan. However, upon the Commissioner's disapproval of items submitted by the Permittee, all activities necessary for the items must be included in the RFI Work Plan.

- (e) Following submission of the RFI Work Plan, subsequent activities for the Plan shall proceed in accordance with the following schedule:
 - (i) Meeting between the Permittee and the Department to discuss Plan comments, as appropriate; and
 - (ii) Submission of a revised Plan to the Commissioner for approval within forty-five (45) calendar days of the above-described meeting. (If the above-referenced meeting is determined not to be necessary, the Permittee shall submit a revised Plan to the Commissioner, according to a schedule specified by the Department, not to exceed forty-five (45) calendar days after Permittee's receipt of Plan comments from the Commissioner, or in accordance with the approved RFI Work Plan Schedule of Condition E.5.(d).)
- (f) The Commissioner shall review for approval, as part of the RFI Work Plan, any plans developed pursuant to Module II Condition C.6., addressing further investigations of newly - identified SWMUs and/or AOCs, or Module II Condition D., addressing newly discovered releases from units and/or areas. The Commissioner shall modify the Compliance Schedule of this Permit Module according to the permit modification procedures stipulated in Module II Condition E.13. of this Permit Module to incorporate these units and areas and releases into the RFI Work Plan.

6. Compliance Schedule For RCRA Facility Investigation ("RFI") Work Plan Implementation, RFI Report And Summary Report Submissions.

- (a) In accordance with the time period provided in the approved schedule of Module II Condition E.5.(d), the Permittee shall begin implementation of the Plan according to the Implementation Schedule(s) made part of the

approved RFI Work Plan. The RFI shall be conducted in accordance with the approved RFI Work Plan.

- (b) In accordance with the time period provided in the approved Implementation Schedule of Condition E.5.(d), the Permittee shall submit to the Commissioner for approval the RFI Final Report and Summary Reports. The RFI Final Report must contain adequate information to support further corrective action decisions at the facility and/or off-site, should such actions be necessary. The RFI Final Report shall describe the procedures, methods, and results of all facility investigations of SWMUs and AOCs and their releases, including information on the type and extent of contamination at the facility and/or off-site, sources and migration pathways, and actual or potential receptors. It shall present all information gathered under the approved RFI Work Plan. The Summary Report shall describe more briefly the procedures, methods, and results of the RFI.
 - (c) Following submission of the RFI Report and Summary Report set forth in Module II Condition E.6.(b), subsequent activities for the Reports shall proceed in accordance with the following schedule:
 - (i) Meeting between the Permittee and the Department to discuss Report comments, as appropriate; and
 - (ii) Submission of a revised RFI Final Report to the Commissioner for approval within forty-five (45) calendar days of the above-described meeting, or in accordance with the approved RFI Implementation Schedule of Module II Condition E.5.(d). (If the above-referenced meeting is determined not to be necessary, the Permittee shall submit revised Reports to the Commissioner, according to a schedule specified by the Department, not to exceed forty-five (45) calendar days after Permittee's receipt of Report comments from the Commissioner, or in accordance with the approved RFI Implementation Schedule of Module II Condition E.5.(d).)
 - (d) After the Commissioner approves the RFI Final Report and Summary Report, the Permittee shall mail the approved Summary Report to all individuals on the facility mailing list established by the Permittee, within thirty (30) calendar days of receipt of approval.
7. Compliance Schedule for RCRA Facility Investigation ("RFI") Work Plan at Inaccessible SWMUs and AOCs.
- (a) On the basis of the revised RCRA Facility Assessment Preliminary Review - Visual Site Inspection Report dated July 20, 1998, and subsequent documentation, the Commissioner has determined that there has been a release of hazardous and/or mixed waste and/or constituents

from the following inaccessible SWMU(s) and/or AOC(s) identified in Module II Condition A.4.:

- (i) Hillside Area (AOC-001): D3/D4 Yard
 - (ii) Former PCB-Containing Transformers (AOC-002)
- (b) For the applicable SWMU(s)/AOC(s) identified in Module II Condition E.7.(a), the Permittee shall submit to the Commissioner, for approval, a schedule for the preparation of RFI Task I and II Reports and a RFI Work Plan, no later than one-hundred and eighty (180) calendar days prior to the date when the SWMU(s) and/or AOC(s) become accessible for investigation. Accessibility to the SWMU(s) and/or AOC(s) shall be considered achievable when the impediment to further investigation (e.g. building, utilities) is demolished, abandoned, or is altered in a manner that would allow access to the SWMU(s)/AOC(s). The Commissioner may, at any point prior to that time, require additional investigations and/or monitoring should it become apparent that residual contamination at the SWMU(s)/AOC(s) may impact human health and/or the environment. All such work shall proceed in accordance with the approved Permit Corrective Action Work Plan Compliance Schedule, and/or subsequent amendments deemed necessary and/or acceptable by the Commissioner. The RFI Work Plan shall include an Implementation Schedule. If, however, the Commissioner determines that the submitted schedule for the preparation of the RFI Work Plan and Implementation Schedule are not acceptable, the Permittee shall be required to make modifications consistent with specific deficiencies to be identified in a notice, within a time period to be determined by the Commissioner. The Commissioner shall have final approval of the RFI Work Plan preparation schedule and the Implementation Schedule. The Permittee shall develop the RFI Work Plan in accordance with Module II Conditions E.5.
- (c) For the applicable SWMU(s)/AOC(s) identified in Module II Condition E.7.(a), the Permittee shall submit to the Commissioner, for approval, a schedule for the preparation of a Report which evaluates previous Corrective Measures, in terms of the final remedial goals specified in Module II Condition A.2., sixth paragraph, and others as provided by the Commissioner, no later than one-hundred and eighty (180) calendar days prior to the date when the SWMU(s) and/or AOC(s) become accessible for investigation. Accessibility to the SWMU(s) and/or AOC(s) shall be considered achievable when the impediment to further investigation (e.g. building, utilities) is demolished, abandoned, or is altered in a manner that would allow access to the SWMU(s)/AOC(s). The Commissioner may, at any point prior to that time, require additional investigations and/or monitoring should it become apparent that residual contamination at the SWMU(s)/AOC(s) may impact

human health and/or the environment. As a result of the above-referenced Evaluation Report, the Commissioner may require performance of a Corrective Measures Study (CMS) for the AOC, as per Module II Condition E.9. and according to the schedules therein, and according to the protocols detailed in Appendix II-C of this Permit Module.

- (d) Inaccessible SWMU(s) and/or AOC(s) deemed by the Commissioner to be subject to RFI which are either discovered during the course of, and/or are incidental to, Permit Corrective Action will, after having been subject to the notification procedures under Conditions C. or D. of this Permit Module, as appropriate, will become subject to Module II Conditions E.5. and E.6. no later than one-hundred and eighty (180) calendar days prior to the date when the SWMU(s) and/or AOC(s) becomes accessible for such an investigation. Accessibility to the SWMU(s)/AOC(s) shall be considered achievable when the impediment to the SV (e.g. buildings, utilities) is demolished, abandoned, or is altered in a manner that would allow access to the SWMU(s)/AOC(s). All such work shall proceed in accordance with the approved Permit Corrective Action Work Plan Compliance Schedule, and/or subsequent amendments deemed necessary and/or acceptable by the Commissioner. The RFI Work Plan shall include an Implementation Schedule. If, however, the Commissioner determines that the submitted schedule for the preparation of the RFI Work Plan and Implementation Schedule are not acceptable, the Permittee shall be required to make modifications consistent with specific deficiencies to be identified in a notice, within a time period to be determined by the Commissioner. The Commissioner shall have final approval of the RFI Work Plan preparation schedule and the Implementation Schedule. The Permittee shall develop the RFI Work Plan in accordance with Module II Condition E.5.
- (e) Following submission of the RFI Work Plan set forth in this Module Condition, subsequent activities for the Plan shall proceed in accordance with the following schedule:
 - (i) Meeting between the Permittee and the Department to discuss Plan comments, as appropriate; and
 - (ii) Submission of a revised Plan to the Commissioner for approval within forty-five (45) calendar days of the above-described meeting, or in accordance with the approved RFI Work Plan Schedule. (If the above-referenced meeting is determined not to be necessary, the Permittee shall submit a revised Plan to the Commissioner, according to a schedule specified by the Department, not to exceed forty-five (45) calendar days after

Permittee's receipt of Plan comments from the Commissioner, or in accordance with the approved RFI Work Plan Schedule).

8. Compliance Schedule For Interim Corrective Measures ("ICMs").

- (a) For the following SWMU(s)/AOC(s) identified in Module II Condition A.4., the Commissioner has determined that ICM(s) are to be implemented by the Permittee:
 - (i) Hillside Area (AOC-001)
- (b) The Permittee shall submit a schedule for the implementation of the Interim Corrective Measures for approval. All such work shall proceed in accordance with the approved schedule. The Implementation Schedule shall include the submittal of a report documenting confirmatory sampling results. If, however, the Commissioner determines that the submitted schedule for the implementation of the Interim Corrective Measures is not acceptable, the Permittee shall be required to make modifications consistent with specific deficiencies to be identified in a notice, within a time period to be determined by the Commissioner. The Commissioner shall have final approval of the Interim Corrective Measures Implementation Schedule. A separate schedule need not be provided for those SWMUs and AOCs where an Interim Corrective Measures Work Plan has been submitted to the Commissioner which contains such a schedule. Implementation of the current Interim Corrective Measures listed above shall proceed in accordance with the Permit Corrective Action Work Plan Compliance Schedule. The Permittee shall develop the ICM Work Plan in accordance with applicable Department guidance and policy.
- (c) If at any time it is determined by the Commissioner that a release or, based on site-specific circumstances, a threatened release of hazardous and/or mixed wastes, including hazardous constituents from a SWMU, an AOC or a combination of SWMUs and/or AOCs poses a threat to human health or the environment, or that such condition jeopardizes the Permittee's ability to comply with any governmental permit, a focused interim corrective measures study shall be submitted to the Commissioner for approval within thirty (30) calendar days of notice of such a determination. This study shall consider, among other relevant factors, the character, the extent, direction, the rate of release, the proximity to population, the exposure pathways, the effects of delayed action, and the evaluations of appropriate ICM(s) or the selection of a pragmatic and presumptive ICM. Upon approval of the study by the Commissioner, the Permittee shall implement the required ICM as specified by the Commissioner. Should a selected ICM involve an engineered action (e.g.,

pump and treat), then its design, implementation schedule and subsequent construction completion certification shall require approvals by the Commissioner. Nothing herein precludes the Permittee from taking immediate action to address the conditions described herein and promptly notifying the Commissioner.

- (d) In the event the Permittee discovers a release or, based on site-specific circumstances, a threatened release of hazardous and/or mixed waste, including hazardous constituents, from a SWMU, an AOC, or a combination of SWMUs and/or AOCs, that poses a threat to human health or the environment, the Permittee shall identify interim corrective measures to mitigate this threat. The Permittee shall immediately summarize the nature and magnitude of the actual or potential threat and nature of the ICM being considered and notify the Commissioner. Within thirty (30) calendar days of notifying the Commissioner, the Permittee shall submit to the Commissioner, for approval, a focused interim corrective measures study and follow the progression of events identified in Module II Condition E.8.(c).
- (e) The following factors may be considered by the Commissioner or the Permittee in determining the need for interim corrective measures:
 - (i) Time required to develop and implement a final corrective measure;
 - (ii) Actual and potential exposure of human and environmental receptors;
 - (iii) Actual and potential contamination of groundwater and sensitive ecosystems;
 - (iv) Concentration of hazardous constituents, in soils that have the potential to migrate to the air, groundwater or surface water; and
 - (v) Other situations that may pose threats to human health and the environment.
- (f) The Permittee may propose Interim Corrective Measures for releases from SWMUs/AOCs, which do not pose an immediate threat, based upon the results of a RCRA Facility Assessment (RFA)-Sampling Visit or RCRA Facility Investigation. The RFA-Sampling Visit Report (Module II Condition E.4.) or the RCRA Facility Investigation Report (Module II Condition E.6.) may contain Interim Corrective Measure recommendations. Within thirty (30) calendar days of the Commissioner's approval of the Interim Corrective Measure recommendation, the Permittee shall submit for the Commissioner's approval a schedule for the preparation and implementation of an Interim Corrective Measures Work Plan.

9. Requirements For Corrective Measures Study (“CMS”).

- (a) Should a CMS that evaluates alternative remedies be required, the Commissioner shall notify the Permittee in writing as to when the CMS will be submitted. The submission time will take into consideration the extent of the remediation that needs to be implemented. The notice shall identify the hazardous constituent(s) which have exceeded target cleanup level(s) that are considered a threat to human health and the environment, given site specific exposure conditions or due to additive exposure risk. The notification shall specify the target cleanup levels for hazardous constituents detected in each medium of concern, and may also specify corrective measure alternatives to be evaluated by the Permittee during the CMS. The CMS must address the items required by the CMS Scope of Work included in Appendix II-C of this Permit Module.
- (b) The Permittee will not need to prepare and submit for approval a CMS that evaluates remedial alternatives when the Department and the Permittee agree to impose a presumptive remedy. The Permittee shall instead submit a schedule for the preparation of a focused CMS, that includes a conceptual design for this presumptive remedy and explain how it meets the pertinent requirements of Condition E.11., within sixty (60) calendar days following notification by the Commissioner. The focused CMS shall contain and Implementation Schedule which will be subject to approval by the Commissioner.

10. Compliance Schedule For Corrective Measures Study (“CMS”).

- (a) The CMS will be considered complete upon completion of Tasks I through IV required by the CMS Scope of Work included in Appendix II-C of this Permit Module. Within forty-five (45) calendar days after a notification required by Module II Condition E.9.(a), the Permittee shall submit a schedule for the preparation of Task I to the Commissioner for approval, and all such work shall proceed in accordance with the approved schedule. If, however, the Commissioner determines that the schedule for the preparation of the Task I Report is not acceptable, the Permittee shall be required to make modifications consistent with specific deficiencies to be identified in a notice, within a time period to be determined by the Commissioner. The Commissioner shall have final approval of the Task I Report Schedule. The Permittee shall submit to the Commissioner a Task I report and documents, if any, relevant to the subsequent Tasks required by the CMS Scope of Work included in Appendix II-C of this Permit Module.
- (b) The Permittee shall submit for approval a schedule for the preparation of a CMS Plan to the Commissioner within forty-five (45) calendar days after a

notification required by Module II Condition E.9.(a), and all such work shall proceed in accordance with the approved schedule. If, however, the Commissioner determines that the schedule for the preparation of the CMS Plan is not acceptable, the Permittee shall be required to make modifications consistent with specific deficiencies to be identified in a notice, within a time period to be determined by the Commissioner. The Commissioner shall have final approval of the CMS Plan Schedule.

- (i) The CMS Plan shall provide:
 - (1) A description of the general approach to investigating and evaluating potential corrective measure;
 - (2) A definition of the overall objectives of the study;
 - (3) The specific plans for evaluating corrective measure to ensure compliance with corrective measure standards;
 - (4) The schedules for conducting the study; and
 - (5) The proposed format for the presentation of information.
 - (ii) The CMS Plan must address, at a minimum, all necessary activities to complete Tasks II and III required by the CMS Scope of Work included in Appendix II-C of this Permit Module.
- (c) Following submission of the CMS Plan set forth in Module II Condition E.10.(b), subsequent activities for the Plan shall proceed in accordance with the following schedule:
- (i) Meeting between the Permittee and the Department to discuss Plan comments, as appropriate; and
 - (ii) Submission of a revised Plan to the Commissioner for approval within thirty (30) calendar days of the above-described meeting, or in accordance with the approved CMS Plan Schedule of Condition E.10.(b). (If the above-referenced meeting is determined not to be necessary, the Permittee shall submit a revised Plan to the Commissioner, according to a schedule specified by the Department, not to exceed forty-five (45) calendar days after the Permittee's receipt of Plan comments from the Commissioner, or in accordance with the approved CMS Plan Schedule of Condition E.10.(b)).
- (d) No later than thirty (30) calendar days after the Permittee has received written approval from the Commissioner for the CMS Plan, the Permittee shall begin to implement the CMS according to the schedule specified in the CMS Plan. The CMS shall be conducted in accordance with the approved Plan submitted pursuant to Module II Condition E.10.(b).

- (e) In accordance with the approved CMS Implementation Schedule of Condition E.10.(d), the Permittee shall submit for approval a CMS Final Report (Task IV) to the Commissioner. The CMS Final Report shall:
 - (i) Summarize the results of the investigations and, if applicable, of any bench-scale or pilot tests conducted;
 - (ii) Provide a detailed description of the corrective measures evaluated and include an evaluation of how each corrective measure alternative meets the standards set forth in Module II Condition E.11.;
 - (iii) Contain any additional information to support the Commissioner in the corrective measure selection decision-making process described under Module II Condition E.11.;
 - (iv) Address, at a minimum, all items necessary to demonstrate completion of Tasks II and III required by the CMS Scope of Work included in Appendix II-C of this Permit Module.
- (f) Following submission of the CMS Final Report, subsequent activities for the CMS shall proceed in accordance with the following schedule:
 - (i) Meeting between the Permittee and the Department to discuss the CMS comments, as appropriate; and
 - (ii) Submission of a revised CMS Report to the Commissioner for approval within forty-five (45) calendar days of the above-described meeting, or in accordance with the approved CMS Plan Schedule of Condition E.10.(b). (If the above referenced meeting is determined not to be necessary the Permittee shall submit a revised CMS Report to the Commissioner, according to a schedule specified by the Department, not to exceed forty-five (45) calendar days after Permittee's receipt of CMS comments from the Commissioner, or accordance with the approved CMS Implementation Schedule of Condition E.10.(d)).

11. Corrective Measure(s) Selection.

- (a) Based on the information presented in the CMS Report, and any further evaluations of additional corrective measures under this study, the Commissioner shall select the corrective measure(s) that at a minimum will meet the following standards:
 - (i) Be protective of human health and the environment;
 - (ii) Attain media target cleanup levels selected by the Commissioner during the corrective measures selection process;
 - (iii) Control the source(s) of release(s) so as to reduce or eliminate, to the maximum extent practicable, further releases of hazardous

- waste, including hazardous constituents, that might pose a threat to human health and the environment; and
- (iv) Meet all applicable waste management requirements.
- (b) In selecting the corrective measure(s) which meets the standards for corrective measures established under Module II Condition E.11.(a), the Commissioner shall consider the following evaluation factors, as appropriate:
- (i) Long-term reliability and effectiveness. Any potential corrective measure(s) may be assessed for the long-term reliability and effectiveness it affords, along with the degree of certainty that the corrective measure(s) will prove successful. Factors that shall be considered in this evaluation include:
 - (1) Magnitude of residual risks in terms of amounts and concentrations of hazardous waste, including hazardous constituents, remaining following implementation of the corrective measure(s), considering the persistence, toxicity, mobility and propensity to bioaccumulate of such hazardous wastes, including hazardous constituents;
 - (2) The type and degree of long-term management required, including monitoring and operation and maintenance;
 - (3) Potential for exposure of humans and environmental receptors to remaining hazardous wastes, including hazardous constituents, considering the potential threat to human health and the environment associated with excavation, transportation, re-disposal or containment;
 - (4) Long-term reliability of the engineering and institutional controls, including uncertainties associated with land disposal of untreated hazardous wastes, including hazardous constituents, and their residuals; and
 - (5) Potential need for replacement of the corrective measure(s).
 - (ii) Reduction of toxicity, mobility or volume. A potential corrective measure(s) may be assessed as to the degree to which it employs treatment that reduces toxicity, mobility or volume of hazardous and/or mixed wastes, including hazardous constituents. Factors that shall be considered in such assessments include:
 - (1) The treatment processes the corrective measure(s) employs and materials it would treat;

- (2) The amount of hazardous and/or mixed wastes, including hazardous constituents, that would be destroyed or treated;
 - (3) The degree to which the treatment is irreversible;
 - (4) The residuals that will remain following treatment, considering the persistence, toxicity, mobility and propensity to bioaccumulate of such hazardous and/or mixed wastes, including hazardous constituents; and
 - (5) All concentration levels of hazardous and/or mixed waste, including hazardous constituents, in each medium that the corrective measure(s) must achieve to be protective of human health and the environment.
- (iii) The short-term effectiveness of a potential corrective measure(s) may be assessed considering the following:
- (1) Magnitude of reduction of existing risks;
 - (2) Short-term risks that might be posed to the community, workers, or the environment during implementation of such a corrective measure(s), including potential threats to human health and the environment associated with excavation, transportation, and redisposal or containment; and
 - (3) Time until full protection is achieved.
- (iv) Implementability. The ease or difficulty of implementing a potential corrective measure(s) may be assessed by considering the following types of factors:
- (1) Degree of difficulty associated with constructing the technology;
 - (2) Expected operational reliability of the technologies;
 - (3) Need to coordinate with and obtain necessary approvals and permits from other agencies;
 - (4) Availability of necessary equipment and specialists;
 - (5) Available capacity and location of needed treatment, storage and disposal services; and
 - (6) Requirements for removal, decontamination, closure, or post-closure of units, equipment, devices or structures that will be used to implement the corrective measure(s).
- (v) Cost. The types of costs that may be assessed include the following:
- (1) Capital costs;
 - (2) Operation and maintenance costs;

- (3) Net present value of capital and operation and maintenance costs; and
- (4) Potential future corrective measure costs.

12. Permit Modification for Corrective Measure(s).

Based on information the Permittee submits in the RFI Report, the CMS Report and other information, the Commissioner will propose the final corrective measure(s) and public notice a major permit modification in accordance with 6 NYCRR Part 373 permit modification regulations identified in Module I of this Permit. The major permit modification and a Statement of Basis (SB) discussing the proposed final corrective measure(s) will be issued for public notice together. The modification shall include a schedule for initiating and completing all major technical features and milestones of the corrective measure(s).

13. Modification of the Compliance Schedules.

- (a) If at any time the Permittee determines that modification of any Compliance Schedule of this Permit Module is necessary because such schedules cannot be met, the Permittee must:
 - (i) Notify the Commissioner in writing within fifteen (15) calendar days of such determination; and
 - (ii) Provide an explanation why the current schedule cannot be met.
- (b) The Commissioner shall notify the Permittee in writing of the final decision regarding the Permittee's proposed modification to the Compliance Schedule.
- (c) Modifications to the Compliance Schedule for non-specific final compliance dates pursuant to this procedure do not constitute a re-issuance of this Permit. However, any modification to extend a specific final compliance date will be considered a major permit modification and will be processed in accordance with 6 NYCRR Part 373 permit modification regulations identified in Module I of this Permit.
- (d) All other modifications to this Permit Module must be made in accordance with Module I of this Permit.

14. Corrective Action Through Post-Closure.

Not applicable at this time.

15. Corrective Action Through Closure.

Not applicable at this time.

16. Corrective Action Through Orders-on-Consent.

Not applicable at this time.

17. Groundwater Monitoring Plan.

- (a) This Condition applies to groundwater monitoring plans prepared in conjunction with or subsequent to Corrective Action (e.g., ICMs) performed pursuant to this Module. It shall not apply to Department-approved agreements with the Permittee for interim generation and reporting of specific groundwater monitoring data from a sitewide program, which is conducted by the Permittee outside the purview of this Permit. Such agreements may be ultimately replaced by the following activities: 1) an approved Department plan(s) for long-term monitoring subsequent to Corrective Measure/Interim Corrective Measure, 2) by a determination of no further action for the respective Solid Waste Management Units/Areas of Concern, or 3) other action approved by the Department. The term “Groundwater Monitoring Plan” as used in this Module, shall mean either individual plans approved by the Department in the course of the fulfillment of the requirements in this Module of the Permit by the Permittee, or a comprehensive plan which includes the requirements of the individual plans, such as may be required subsequent to remediation of individual areas requiring long-term groundwater monitoring.

Groundwater monitoring plans shall include elements such as: a description of the monitoring well network, sampling frequency, sampling and analysis, evaluation criteria, and reporting requirements. Once approved, these plans and the required reports are part of this Permit.

The Permittee shall ensure that all appropriate personnel, including outside contractors, are experienced in groundwater sampling and properly trained in the application of the Groundwater Monitoring Plan and that the Plan is followed whenever groundwater samples are obtained at the site.

- (b) If the Permittee can demonstrate that all monitoring objectives are being met, and that certain wells are providing information that is redundant and does not add to the technical understanding of the site, the Permittee may submit a proposal for a modification in the number of monitoring wells, or of monitoring requirements. Proposals may be submitted as part of the reports required by approved Groundwater Monitoring Plans.

- (c) Decommissioning of any wells or piezometers in the monitoring network shall be in accordance with Department-approved procedures such as the Department's CP-43. Decommissioning of any wells in the monitoring well network established in specific Groundwater Monitoring Plans must be approved by the Department prior to decommissioning.
- (d) Groundwater monitoring and corrective measures shall continue until sampling of groundwater monitoring wells demonstrates, for a period of three (3) consecutive years of Pre-Termination Monitoring, or as determined by the Department, that the concentrations of hazardous constituents have not exceeded Groundwater Protection Concentrations.

PART 373 APPENDIX II-A

COMPONENTS REQUIRED FOR RCRA ANALYTICAL DATA SUBMITTED TO NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

U.S. Department of Energy
Knolls Atomic Power Laboratory
NY6890008992

Niskayuna, New York
Schenectady County

A data deliverables package is to be supplied with all analytical data, as specified in the approved Quality Assurance Project Plan (QAPP) or work plan. Category B or CLP data deliverables, as specified in the latest version of the Department's Analytical Service Protocol (ASP), are required unless otherwise specified in an approved QAPP or work plan. The Category B and CLP data deliverables packages are specified in Exhibit B of the ASP. Copies of the ASP, on CD, are available from the Standards and Analytical Support Section in the Bureau of Water Assessment and Management in the Division of Water. The ASP data package shall be provided to the Department in electronic format in ASP format as a PDF or other read only document. In addition, the laboratory must be certified by NYSDOH ELAP for the category and parameters of interest as per 6 NYCRR 370.1(f).

Category B or CLP data deliverables are generally expected for corrective action sampling, characterization groundwater monitoring and closures. Exception to this is made for the Department-approved agreements with the Permittee, as specified in Appendix II-G of this Module, for interim generation and reporting of specific groundwater monitoring data from a sitewide program, which is conducted by the Permittee outside the purview of this Permit. For the purposes of activities required by this Module, such agreements may be replaced by an approved Department plan for long term groundwater monitoring subsequent to Corrective Measure/Interim Corrective Measure, by a determination of no further action for the respective Solid Waste Management Units/Areas of Concern, or other action as approved by the Department. For long term groundwater monitoring conducted via a Department-approved plan pursuant to this Module, an abbreviated data package (e.g. Category A or other Department-approved data package) may suffice, with prior Department quality assurance approval, since the variability of the data with time can be used as a quality control check. A facility may request a change to the data deliverables package, and may propose modifications to the QAPP accordingly. Modifications to the data deliverables criteria must be approved by the Department prior to implementation.

For Category B and CLP data deliverables, a Data Usability Summary Report (DUSR) must be prepared and submitted per the most recent version of Appendix 2B, Section 2.0 of the Division of Environmental Remediation Guidance document DER-10, "Technical Guidance for Site Investigation and Remediation." Where all applicable elements of the DUSR guidance are addressed by an independent data validation report, the latter may be submitted in lieu of a

DUSR. Data evaluation/validation requirements will be defined in individual work plans/QAPPs subject to Department approval. Per DER-10, a data applicability report must be prepared for a Category A (or equivalent) package, in lieu of a DUSR.

In addition to the above, the Permittee shall provide all analytical data generated pursuant to this Permit in the Department-approved Electronic Data Deliverable (EDD) format. Exception to this is made for the Department-approved agreements with the Permittee for interim generation and reporting of specific groundwater monitoring data from a sitewide program, which is conducted by the Permittee outside the purview of this Permit; and for the discretion of the Department Project Manager for ongoing monitoring projects initiated prior to this Permit. The schedule for submittal of EDDs shall be included in plans subject to Department approval. Formatting of EDDs shall be in conformance with Department requirements.

PART 373 APPENDIX II-B

SCOPE OF WORK FOR A RCRA FACILITY INVESTIGATION

U.S. Department of Energy
Knolls Atomic Power Laboratory
NY6890008992

Niskayuna, New York
Schenectady County

I. INTRODUCTION

The Permittee shall undertake a RCRA Facility Investigation ("RFI") that should include the development of several component plans and supporting reports relevant to the specific investigations to be undertaken pursuant to this Permit. Component plans and reports must be prepared and submitted in accordance with the Compliance Schedules in Module Condition II.E.

The purpose of this RFI is to characterize the nature, extent, direction, rate, movement and concentration of releases of hazardous waste and/or constituents from Solid Waste Management Units and Areas of Concern at the facility including areas off-site impacted by the release(s) from the facility and to gather all necessary data to support the Corrective Measures Study. This Appendix is to serve as guidance for conducting an RFI. Therefore, all of the material addressed in this Appendix may not apply to the units or areas to be investigated by the Permittee. The Permittee should consult with Department representatives before beginning the RFI process regarding which Appendix items need to be addressed during the investigations. The Permittee shall furnish all personnel, materials, and services necessary for, or incidental to, performing the RCRA Facility Investigation.

The RFI Scope of Work includes several tasks:

Task I: A report on the Description of Current Conditions.

Task II: A report on the Pre-Investigation Evaluation of Corrective Measures.

Task III: RFI Management Plans including:

- A. The Project Management Plan;
- B. The Data Management Plan;
- C. The Quality Assurance Project Plan;
- D. The Health and Safety Plan; and
- E. The Community Relations Plan.

Task IV: The Facility Investigation.

Task V: Investigative Analysis.

Task VI: Laboratory, Bench Scale, and Pilot Studies.

Task VII: Reports.

The report on Description of Current Conditions should comprise all available and relevant information and data on the facility's background, SWMU(s) and AOC(s) characterization, nature and extent of contamination, potential receptors, and prevailing corrective action implementation. Data and information gathered during any previous investigations, remediations, or inspections and other relevant data should be included in the submittal. That information and data may then be used to focus subsequent field investigations and development of the respective work plans for the SWMU(s) and AOC(s) to be investigated as part of this Permit. If the Permittee maintains that relevant information and data has been submitted, the Permittee should cite such submittal(s). The Permittee shall refer to Module Condition II.B.5. on addressing prior submittals.

The report on Pre-Investigation Evaluation of Corrective Measures will identify potential technologies that may be considered by the Permittee for subsequent implementation. These alternative technologies will focus the RFI to collect the necessary data for their proper evaluation.

The RFI Management Plans shall provide the necessary information that will assure that the following objectives are met:

- Proper management of all aspects of the RFI project including tracking of project milestones. Schedules and tracking methods shall be established for RFI tasks and report submittals (Project Management Plan);
- Satisfactory presentation of data and results developed by the RFI. Data management procedures shall be established to effectively process data such that relevant data descriptions are readily accessible and accurately maintained (Data Management Plan);
- Generation of valid data during the RFI investigation. QA/QC procedures shall be established to describe and document data quality (Quality Assurance Project Plan);
- Implementation of appropriate health and safety measures during the RFI. Health and safety procedures shall be established to ensure the health and safety of the investigative team(s) and the general public during the RFI (Health and Safety Plan); and
- Provision for informing the community of the results of the RFI (Community Relations Plan).

The Facility Investigation shall focus on procedures and techniques that will be utilized during field investigations to characterize the environmental setting and the contaminant release(s) from the SWMU(s) and AOC(s). Characterization of the environmental setting will be necessary to determine monitoring locations and to aid in defining the boundaries of the contaminated unit(s) and area(s). The Permittee shall characterize each environmental medium, as deemed necessary by the Department, to provide information that can be used to determine the rate and extent of the contaminant release(s). Characterization of the contaminant release(s) from the SWMU(s) and AOC(s) will be necessary to determine the nature, extent, direction, rate, movement and concentration of the contaminant plume(s).

Since a potentially broad spectrum of situations involving information on a specific release(s) may exist at the beginning of the RFI, a flexible, phased approach for the release investigation may be necessary. The Permittee may begin with an evaluation of existing data and propose the collection of additional data as necessary to characterize the release. The Permittee may consider incorporating appropriate screening techniques, i.e., soil gas, geophysical methods, as the initial phase of field investigation for the RFI.

Based on existing data and/or data collected by appropriate screening techniques, the Permittee may develop a conceptual model of the release. This model may then be used to plan and develop subsequent investigations. The Permittee shall then develop work plans for the subsequent investigative program(s), as deemed necessary by the Department, utilizing conventional monitoring techniques capable of release(s) verification and/or characterization.

An Investigative Analysis shall be carried-out on the data generated by the Facility Investigation. The analysis shall focus on the quality of data generated and on establishing the nature, extent, direction, rate, movement and concentration of contamination.

Laboratory and/or Bench Scale Studies shall be performed to assess corrective measure technologies that may be applicable for remediating the SWMU(s), the AOC(s), and the environmental contamination investigated by the Permittee. The information gathered from such studies will assist the Permittee in selecting the alternative technologies for evaluation during the Corrective Measures Study.

Progress reports on the Facility Investigation and Laboratory Bench Scale Studies shall be submitted quarterly in addition to a final RFI Report and Summary Report.

II. TASK I: DESCRIPTION OF CURRENT CONDITIONS

The Permittee shall submit a report for Task I containing available and relevant information and data on the facility's background, SWMU(s), AOC(s), contamination, receptors, and remediation undertaken pertinent to the specific SWMU(s) and AOC(s) to be investigated as part of this Permit.

A. Facility Background

The Permittee shall summarize the regional location, pertinent boundary features, general facility physiography, geology, hydrogeology, and historical use of the facility for the treatment, storage or disposal of solid and hazardous waste. The information shall include:

1. Map(s) depicting the following:
 - (a) General geographic location;
 - (b) Property lines, with the owners of all adjacent property clearly indicated;
 - (c) Topography and surface drainage depicting all waterways, wetlands, floodplains, water features, drainage patterns, and surface-water containment areas;
 - (d) All above and underground tanks, buildings, utilities, paved areas, easements, rights-of-way, and other features;
 - (e) All known past and present solid or hazardous waste treatment, storage or disposal areas;
 - (f) All process sewers;
 - (g) Surrounding land uses (residential, commercial, agricultural, recreational); and
 - (h) The locations of all production, withdrawal, and groundwater monitoring wells at the facility and within the vicinity of the facility. These wells shall be clearly labeled and ground and top of casing elevations and construction details included (these elevations and details may be included as an attachment).

All maps shall be consistent with the requirements set forth in 6 NYCRR Subpart 373-1.5(a)(2)(xix) and be of sufficient detail and accuracy to locate and report all current and future work performed at the site.

2. A history and description of ownership and operation, solid and hazardous waste generation, treatment, storage and disposal activities at the facility.
3. Approximate dates or periods and description of past product, raw material, and waste spills; identification of the materials spilled; the amount spilled; the location where spilled; and a description of the response actions conducted

(local, state, or federal response units or private parties), including any inspection reports or technical reports generated as a result of the response.

B. SWMU and AOC Characterization

The Permittee shall submit available and relevant information that will characterize the wastes, the SWMU(s) and the AOC(s) where wastes have been placed, collected or removed including: type; quantity; physical state; disposition (containment or nature of deposits); and facility characteristics affecting the release(s) (e.g., facility security, and engineered barriers). The information should include:

1. SWMU and AOC Characteristics:

- (a) Location of unit/area (located on facility map);
- (b) Type of unit/area;
- (c) Design features;
- (d) Operating practices (past and present);
- (e) Period of operation;
- (f) Age of unit/area; and
- (g) General physical conditions.

2. Waste Characteristics:

- (a) Type of waste placed in the unit/area:
 - (i) Hazardous classification (e.g., flammable, reactive, corrosive, oxidizing or reducing agent);
 - (ii) Quantity; and
 - (iii) Chemical composition (e.g., Resource Conservation and Recovery Act (RCRA) Appendix VIII hazardous constituents).
- (b) Physical and chemical characteristics of waste and its constituents:
 - (i) Physical state (solid, liquid, gas);
 - (ii) Physical description (e.g., powder, oily sludge);
 - (iii) Temperature;

- (iv) pH;
 - (v) General chemical class (e.g., acid, base, solvent);
 - (vi) Molecular weight;
 - (vii) Density;
 - (viii) Boiling point;
 - (ix) Viscosity;
 - (x) Solubility in water;
 - (xi) Cohesiveness of the waste;
 - (xii) Vapor pressure;
 - (xiii) Flash point; and
 - (xiv) Other relevant properties.
- (c) Migration and dispersal characteristics of the waste constituents and procedures used in making the determination:
- (i) Sorption;
 - (ii) Biodegradability, bioconcentration, biotransformation;
 - (iii) Photodegradation rates;
 - (iv) Hydrolysis rates;
 - (v) Chemical transformations; and
 - (vi) Volatilization rates.

C. Nature, Extent, Direction, Rate, Movement and Concentration of Contamination

The Permittee shall submit available and relevant information on the nature, extent, direction, rate, movement and concentration of the release(s) from the SWMU(s) and the AOC(s). This information and data should include:

1. Summary of available monitoring data and qualitative information on locations and levels of contamination at the facility and within the vicinity of the facility if contamination has migrated off-site.

2. Summary of all potential contaminant migration pathways including available information on geology, hydrogeology, physiography, hydrology, water quality, meteorology, and air quality.

D. Potential Receptors

The Permittee shall submit available and relevant information describing the human populations and environmental systems that are susceptible to exposure by the contaminant release(s) from the SWMU(s) and the AOC(s). Data on observable effects or bioassays for ecosystems should accompany this submittal if available. The information shall include:

1. Local uses and possible future uses of groundwater:
 - (a) Type of use (e.g., drinking water source: municipal or residential, agricultural, domestic/non-potable, and industrial);
 - (b) Location of groundwater users including wells and discharge areas (identify on a map); and
 - (c) The well(s) pump rate(s) and the well(s) depth(s).
2. Local uses and possible future uses of surface waters draining from the facility:
 - (a) Domestic and municipal (e.g. potable and lawn/gardening watering);
 - (b) Recreational (e.g. swimming, fishing);
 - (c) Agricultural;
 - (d) Industrial; and
 - (e) Environmental (e.g. fish and wildlife propagation).
3. Human use of or access to the facility and adjacent lands, including, but not limited to:
 - (a) Recreation;
 - (b) Hunting;
 - (c) Residential;
 - (d) Commercial;

- (e) Zoning; and
 - (f) Relationship between population locations and prevailing wind direction.
4. A description of the biota in surface water bodies on, adjacent to, or affected by the facility.
 5. A description of the ecology overlying and adjacent to the facility.
 6. A demographic profile of the people who use or have access to the facility and adjacent land, including, but not limited to: age; sex; and sensitive subgroups.
 7. A description of any endangered or threatened species near the facility.

E. Corrective Action Implementation

The Permittee shall submit documentation on corrective measures (remedial measures) undertaken on-site or off-site at the facility. Remedial actions should include any interim corrective measures, RCRA closures, State or Federal Superfund activities. This documentation shall include:

1. Objectives of the remediation and how it is mitigating a potential threat to human health and the environment and/or is consistent with and integrated into any long term solution at the facility;
2. Design, construction, operation, and maintenance requirements;
3. Schedules for design, construction and monitoring; and
4. Schedule for progress reports.

III. TASK II: PRE-INVESTIGATION EVALUATION OF CORRECTIVE MEASURES

The Permittee shall submit a report for Task II that identifies the potential corrective measure technologies that may be used on-site or off-site for the containment, treatment, remediation, and/or disposal of contamination. This report shall also identify any field data that needs to be collected in the facility investigation to facilitate the evaluation and selection of the final corrective measure or measures (e.g., compatibility of waste and construction materials, information to evaluate effectiveness, treatability of wastes, etc.).

IV. TASK III: RFI MANAGEMENT PLANS

The Permittee shall submit RFI Management Plans as part of the RFI Work Plan. The Plans shall address the methods and procedures necessary to manage the RFI, to describe data developed by the RFI, to gather and ensure valid RFI data, to protect the health and

safety of investigators and the general public, and to keep the community informed about the RFI.

A. Project Management Plan

The Permittee shall prepare a Project Management Plan that shall include a discussion of the management approach, schedules, and personnel utilized during the RFI. That Plan shall include a description of qualifications of personnel performing or directing the RFI, including contractor personnel. This Plan shall also document the overall management approach to the RCRA Facility Investigation that will assure adherence to tasks and reporting schedules. The schedule for completing the RFI should reflect the schedules set forth in Module Condition II.E. The schedule shall reflect dates for submittal of various RFI Work Plan components, dates for starting and accomplishing specific tasks associated with the RFI, and dates for reporting information from specific tasks to the Department.

B. Data Management Plan

The Permittee shall prepare a Data Management Plan to document and track investigation data and results. This Plan shall identify and set up data documentation materials and procedures, project file requirements, and project-related progress reporting procedures and documents. The Plan shall also provide the format to be used to present the raw data and conclusions of the investigation.

1. Data Record

The data record shall include, but not be limited to the following:

- (a) Unique sample or field measurement code;
- (b) Sampling or field measurement location and sample or measurement type;
- (c) Sampling or field measurement raw data;
- (d) Laboratory analysis ID number;
- (e) Property or component measured; and
- (f) Result of analysis (e.g., concentration).

2. Tabular Displays

The following data shall be presented in tabular displays:

- (a) Unsorted (raw) data;

- (b) Results for each medium, or for each constituent monitored;
- (c) Data reduction for statistical analysis;
- (d) Sorting of data by potential stratification factors (e.g., location, soil layer, topography); and
- (e) Summary data.

3. Graphical Displays

The following data shall be presented in graphical formats (e.g., bar graphs, line graphs, area or plan maps, isopleth plots, cross-sectional plots or transects, three dimensional graphs, etc.):

- (a) Display sampling location and sampling grid;
- (b) Indicated boundaries of sampling area, and areas where more data are required;
- (c) Display levels of contamination at each sampling location;
- (d) Display geographical extent of contamination;
- (e) Display contamination levels, averages, and maxima;
- (f) Illustrate changes in concentration in relation to distance from the source, time, depth or other parameters; and
- (g) Indicate features affecting intramedia transport and show potential receptors.

C. Quality Assurance Project Plan (QAPP)

The Permittee shall prepare a QAPP to document each phase of investigative work and all sampling and monitoring procedures to be implemented during the RFI. The following activities shall be covered in the QAPP: sampling, field measurements and sample analysis performed during the investigations. This Plan shall ensure that all information, data, and resulting decisions are technically sound, statistically valid, and properly documented. The QAPP(s) shall be developed in accordance with the most recent version of EPA SW-846. In addition, preparation of the QAPPs may be supplemented, as appropriate, by the Department's DER-10/Technical Guidance for Site Investigation and Remediation. A summary of the QA/QC elements that shall be in the Plan is found in the subsequent paragraphs.

1. Data Quality Objectives

The QAPP shall include, but not be limited to the following:

- (a) Description of the intended uses for the data, and the necessary level of precision and accuracy for these intended uses;
- (b) Description of methods and procedures to be used to assess the precision, accuracy and completeness of the measurement data;
- (c) Description of the rationale used to assure that the data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, a process condition or an environmental condition; and
- (d) Description of the measures to be taken to assure that data sets can be compared to each other.

2. Sampling and Field Measurements

The QAPP shall include, but not be limited to the following:

- (a) Sampling and field measurement locations, depths, etc.;
- (b) Collecting all necessary ancillary data;
- (c) Conditions under which sampling and field measurements should be conducted;
- (d) Media to be sampled and addressed by field measurements (e.g., groundwater, air, soil, sediment, etc.);
- (e) Parameters to be measured and where;
- (f) The frequency of sampling and field measurements and length of sampling period;
- (g) The types of sample (e.g., composites vs. grabs) and number of samples to be collected;
- (h) Measures to be taken to prevent contamination of the sampling equipment and cross contamination between sampling points;
- (i) Documenting field sampling and measurement operations and procedures, including;
 - (i) Documentation of procedures for preparation of reagents or supplies which become an integral part of the sample (e.g., filters, and adsorbing reagents);

- (ii) Procedures and forms for recording raw data and the exact location, time, and specific considerations associated with sample and data acquisition;
 - (iii) Documentation of specific sample preservation method;
 - (iv) Calibration of field devices;
 - (v) Collection of replicate samples and measurements;
 - (vi) Submission of field-biased blanks, where appropriate;
 - (vii) Potential interferences present at the facility;
 - (viii) Construction materials and techniques, associated with monitoring wells and piezometers;
 - (ix) Field equipment listing and sample containers;
 - (x) Sampling and field measurement order; and
 - (xi) Decontamination procedures.
- (j) Selecting appropriate sample containers;
- (k) Sample preservation; and
- (l) Chain-of-Custody, including:
 - (i) Standardized field tracking reporting forms to establish sample custody in the field prior to and during shipment; and
 - (ii) Pre-prepared sample labels containing all information necessary for effective sample tracking.

3. Sample Analysis

The QAPP shall include, but not be limited to the following:

- (a) Chain-of-custody procedures, including:
 - (i) Identification of a responsible party to act as sample custodian at the laboratory facility authorized to sign for incoming field samples, obtain documents of shipment,

and verify the data entered onto the sample custody records;

- (ii) Provision for a laboratory sample custody log consisting of serially numbered standard lab-tracking report sheets; and
 - (iii) Specification of laboratory sample custody procedures for sample handling, storage, and disbursement for analysis.
- (b) Sample storage procedures and storage times;
- (c) Sample preparation methods;
- (d) Analytical procedures, including:
- (i) Scope and application of the procedure;
 - (ii) Sample matrix;
 - (iii) Potential interferences;
 - (iv) Precision and accuracy of the methodology; and
 - (v) Quantitation limits.
- (e) Calibration procedures and frequency;
- (f) Data reduction, validation and reporting;
- (g) Internal quality control checks, laboratory performance and systems audits and frequency, including:
- (i) Method blank(s);
 - (ii) Laboratory control sample(s);
 - (iii) Calibration check sample(s);
 - (iv) Replicate sample(s);
 - (v) Matrix-spikes sample(s);
 - (vi) "Blind" quality control sample(s);
 - (vii) Control charts;

- (viii) Surrogate samples;
- (ix) Zero and span gases; and
- (x) Reagent quality control checks.
- (h) Preventive maintenance procedures and schedules;
- (i) Corrective action (for laboratory problems); and
- (j) Turnaround time.

D. Health and Safety Plan

The Permittee shall prepare a Health and Safety Plan for the protection of the investigative team(s), workers, and general public which may be exposed to hazards. For non-intrusive work and sampling/monitoring activities for which there is no exposure concern, the Permittee may request that the Department suspend the requirement to submit a Health and Safety Plan for that specific activity. If the Department concurs with the request, the Permittee shall include any necessary health and safety measures within a separate section of the activity's work plan. Department approval of the work plan in no way constitutes approval of any health and safety elements therein.

1. The Health and Safety Plan shall include, but not be limited to the following:
 - (a) Facility description including availability of resources such as roads, water supply, electricity and telephone service;
 - (b) Describe the known hazards and evaluate the risks associated with the incident and with each activity conducted;
 - (c) List key personnel and alternates responsible for site safety, response operations, and for protection of public health;
 - (d) Delineate work areas;
 - (e) Describe levels of protection to be worn by personnel in work areas;
 - (f) Establish procedures to control site access;
 - (g) Describe decontamination procedures for personnel and equipment;
 - (h) Establish site emergency procedures;

- (i) Address emergency medical care for injuries and toxicological problems;
 - (j) Describe requirements for an environmental surveillance program;
 - (k) Specify any routine and special training required for responders; and
 - (l) Establish procedures for protecting workers from weather-related problems.
2. The Facility Health and Safety Plan shall be consistent with:
- (a) NIOSH Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (1985);
 - (b) EPA Order 1440.1 - Respiratory Protection;
 - (c) EPA Order 1440.3 - Health and Safety Requirements for Employees engaged in Field Activities;
 - (d) Facility Contingency Plan;
 - (e) EPA Standard Operating Safety Guide (1984);
 - (f) OSHA regulations, particularly in 29 CFR 1910 and 1926;
 - (g) State, local, and other federal agency (e.g., DOD, DOE) regulations; and
 - (h) Other EPA guidance as provided.

E. Community Relations Plan

The Permittee shall prepare a plan on disseminating information to the public regarding investigation activities and results. The plan should identify who will be notified and will receive summary RFI reports.

V. TASK IV: THE FACILITY INVESTIGATION

The Permittee shall submit a work plan that shall address the techniques and procedures necessary to characterize the environmental setting at and within the vicinity of the facility and the media-specific contamination resulting from the release(s) by the SWMU(s) and the AOC(s). The part of the work plan that addresses field sampling and measurement activities shall meet the sampling plan requirements, as deemed appropriate, by the Department's DER-10/Technical Guidance for Site Investigation and Remediation.

A. Environmental Setting

The Permittee shall submit an appropriate plan on collecting information to supplement existing information on the environmental setting at the facility and in the vicinity of the facility. Sufficient information shall be collected by the Permittee to characterize only those environmental media impacted by the release(s) from the SWMU(s) and the AOC(s):

1. Hydrogeology

The Permittee shall conduct a program to characterize the hydrogeologic conditions at the facility and the off-site areas where contamination has migrated. The program shall provide relevant information on geology and hydrogeology that should include, but not be limited to the following facts:

- (a) A description of the regional and facility specific geologic and hydrogeologic characteristics which affect groundwater flow both beneath and within the vicinity of the facility, including:
 - (i) Regional and facility specific geomorphology and stratigraphy: description of strata including strike and dip, identification of stratigraphic contacts;
 - (ii) Structural geology: description of local and regional structural features (e.g., folds, faults, joints, and fractures);
 - (iii) Identification and characterization of areas and amounts of recharge and discharge;
 - (iv) Regional and facility specific groundwater flow patterns; and
 - (v) Characterize seasonal variations in the groundwater flow regime.
- (b) An analysis of any topographic features that might influence the groundwater flow system.
- (c) Based on field data, tests, and cores, a representative and accurate classification and description of the hydrogeologic units which may be part of the migration pathways (i.e., the aquifers and any intervening saturated and unsaturated units), including:
 - (i) Hydraulic conductivity and porosity (total and effective);
 - (ii) Lithology, grain size, sorting, degree of cementation;

- (iii) An interpretation of hydraulic interconnections between saturated zones; and
 - (iv) The attenuation capacity and mechanisms of the natural earth materials (e.g., ion exchange capacity, organic carbon content, mineral content etc.).
- (d) Based on field studies and cores, structural geology and hydrogeologic cross sections, a description of the extent (depth, thickness, lateral extent) of hydrogeologic units which may be part of the migration pathways, including:
 - (i) Sand and gravel deposits in unconsolidated deposits;
 - (ii) Zones of fracturing or channeling in consolidated or unconsolidated deposits;
 - (iii) Zones of higher permeability or low permeability that might direct and restrict the flow of contaminants;
 - (iv) The uppermost aquifer: geologic formation, group of formations, or part of a formation capable of yielding a significant amount of groundwater to wells or springs; and
 - (v) Water-bearing zones above the first confining layer that may serve as a pathway for contaminant migration including perched zones of saturation.
- (e) Based on data obtained from groundwater monitoring wells and piezometers installed upgradient and downgradient of the potential contaminant source, a representative description of water level or fluid pressure monitoring including:
 - (i) Water-level contour and/or potentiometric maps;
 - (ii) Hydrologic cross sections showing vertical gradients;
 - (iii) The flow system, including the vertical and horizontal components of flow; and
 - (iv) Any temporal changes in hydraulic gradients, for example, due to tidal or seasonal influences.
- (f) A description of man-made influences that may affect the hydrogeology, identifying:

- (i) Active and inactive local water-supply and production wells with an approximate schedule of pumping; and
- (ii) Man-made hydraulic structures (sewers, pipelines, French drains, ditches, unlined ponds, septic tanks, outfalls, retention areas, etc.).

2. Soils

The Permittee shall conduct a program to characterize the soil and rock units above the water table in the vicinity of the contaminant release(s). The program shall provide relevant information on soil characterization that should include, but not be limited to the following facts:

- (a) USCS soil classification;
- (b) Surface soil distribution;
- (c) Soil profile, including ASTM classification of soils;
- (d) Transects of soil stratigraphy;
- (e) Hydraulic conductivity (saturated and unsaturated);
- (f) Relative permeability;
- (g) Bulk density;
- (h) Porosity;
- (i) Soil sorptive capacity;
- (j) Cation exchange capacity (CEC);
- (k) Soil organic content;
- (l) Soil pH;
- (m) Particle size distribution;
- (n) Depth of water table;
- (o) Moisture content;

- (p) Effect of stratification on unsaturated flow;
- (q) Infiltration;
- (r) Evapotranspiration;
- (s) Storage capacity; and
- (t) Mineral content.

3. Surface Water and Sediment

The Permittee shall conduct a program to characterize the surface-water bodies in the vicinity of the contaminant release(s). The program shall provide relevant information on surface water and sediment characterization that should include, but not be limited to the following facts:

- (a) Description of the temporal and permanent surface-water bodies including:
 - (i) For lakes and estuaries: location, elevation, surface area, inflow-outflow characteristics, depth, temperature stratification, and volume;
 - (ii) For impoundments: location, elevation, surface area, depth, volume, inflow-outflow characteristics, freeboard, and purpose of impoundment;
 - (iii) For rivers, streams, ditches, drains, swamps and channels: location, elevation, flow, velocity, depth, width, inflow-outflow characteristics, seasonal fluctuations, and flooding tendencies (i.e., 100 year event);
 - (iv) Drainage patterns; and
 - (v) Evapotranspiration.
- (b) Description of the chemistry of the surface water. This includes determining the pH, total dissolved solids, total suspended solids, biological oxygen demand, alkalinity, conductivity, dissolved oxygen profiles, nutrients (NH_3 , $\text{NO}_3^-/\text{NO}_2$, PO_4^{-3}), chemical oxygen demand, total organic carbon, and specific contaminant concentrations.
- (c) Description of sediment characteristics including:

- (i) Deposition area;
- (ii) Thickness profile; and
- (iii) Physical and chemical parameters (e.g., grain size, density, organic carbon content, ion exchange capacity, and pH).

4. Air

The Permittee shall conduct a program to characterize the climate at the facility and in the vicinity of the facility when contamination migrates off-site. The program shall provide relevant information on climatic conditions that should include, but not be limited to the following facts:

- (a) A description of the following parameters:
 - (i) Annual and monthly rainfall averages;
 - (ii) Monthly temperature averages and extremes;
 - (iii) Wind speed and direction;
 - (iv) Relative humidity/dew point;
 - (v) Atmospheric pressure;
 - (vi) Evaporation data;
 - (vii) Development of inversions; and
 - (viii) Climate extremes that have been known to occur in the vicinity of the facility, including frequency of occurrence.
- (b) A description of topographic and man-made features which affect air flow and emission patterns, including:
 - (i) Ridges, hills or mountain areas;
 - (ii) Canyons or valleys;
 - (iii) Surface-water bodies (e.g., rivers, lakes, bays, etc.);
 - (iv) Wind breaks and forests;

- (v) Buildings; and
- (vi) Existing man-made air emission sources (e.g., industrial processes, residences, etc.).

B. Contamination Characterization Plan

The Permittee shall submit a work plan on collecting analytical data to supplement existing data on groundwater, soils, surface water, sediment, air and subsurface gas contamination. This data shall be sufficient to define the nature, extent, origin, direction, and rate of movement of contaminant plume(s) in the environmental medium impacted by the release(s) from the SWMU(s) and AOC(s).

1. Groundwater Contamination

The Permittee shall conduct a program to characterize any plume(s) of contamination at the facility and any plume(s) that have migrated off-site. The program shall provide relevant information on groundwater contamination that should include, but not be limited to the following facts:

- (a) A description of the horizontal and vertical extent of any immiscible or dissolved plume(s);
- (b) The horizontal and vertical direction of contamination movement;
- (c) The velocity of contaminant movement;
- (d) The horizontal and vertical concentration profiles of contaminant constituents in the plume(s);
- (e) An evaluation of factors influencing the plume movement, specific contaminant movement, and specific contaminant transformation (e.g., physical, chemical, biological, etc.); and
- (f) An extrapolation of future contaminant movement.

2. Soil Contamination

The Permittee shall conduct a program to characterize the contamination of the soil and rock units above the water table in the vicinity of the contaminant release(s). The program shall provide relevant information on soil contamination that should include, but not be limited to the following facts:

- (a) A description of the vertical and horizontal extent of contamination.
- (b) A description of relevant contaminant chemical properties within the contaminant source area and plume. This includes contaminant

solubility, speciation, adsorption, leachability, exchange capacity, biodegradability, hydrolysis, photolysis, oxidation and other factors that might affect contaminant migration and transformation.

- (c) Specific contaminant concentrations.
- (d) The velocity and direction of contaminant movement.
- (e) An extrapolation of future contaminant movement.

3. Surface-Water and Sediment Contamination

The Permittee shall conduct a program to characterize the contamination in surface-water bodies resulting from the contaminant release(s) at the facility. The program shall provide relevant information on surface water and sediment contamination that shall include, but not be limited to the following facts:

- (a) A description of the horizontal and vertical extent of any immiscible or dissolved plume(s) originating from the facility, and the extent of contamination in underlying sediments;
- (b) The horizontal and vertical direction of contaminant movement;
- (c) The contaminant velocity;
- (d) An evaluation of the physical, biological and chemical factors influencing contaminant movement;
- (e) An extrapolation of future contaminant movement; and
- (f) The toxicity of the sediment and adjacent water column to aquatic life.

4. Air Contamination

The Permittee shall conduct a program to characterize the particulate and gaseous contaminants released into the atmosphere. The program shall provide relevant information on air emissions that should include, but not be limited to the following facts:

- (a) A description of the horizontal and vertical direction and velocity of contaminant movement;
- (b) The rate and amount of the release; and
- (c) The chemical and physical composition of the contaminant(s) released, including horizontal and vertical concentration profiles.

5. Subsurface Gas Contamination

The Permittee shall conduct a program to characterize subsurface gas contamination in the soil. The program shall provide relevant information on subsurface gas contamination that should include, but not be limited to the following facts:

- (a) A description of the horizontal and vertical extent of subsurface gas migration;
- (b) The chemical composition of the gases being emitted;
- (c) The rate, amount, and density of the gases being emitted; and
- (d) Horizontal and vertical concentration profiles of the subsurface gases emitted.
- (e) Effect on indoor air quality, if any is anticipated.

VI. TASK V: INVESTIGATION ANALYSIS

The Permittee shall prepare an analysis and summary of all facility investigations and their results. The objective of this task shall be to ensure that the investigation data are sufficient in quality (e.g., quality assurance procedures have been followed) and quantity to describe the nature, rate, and extent of contamination, potential threat to human health and/or the environment, and to support the Corrective Measures Study.

A. Data Analysis

The Permittee shall analyze all facility investigation data outlined in Task IV and prepare a report on the nature, rate, and extent of contamination at the facility including sources and migration pathways. The report shall describe the nature and extent of contamination (qualitative/ quantitative) in relation to background levels indicative for the area.

B. Protection Standards

The Permittee shall identify all relevant and applicable standards and action levels (e.g., health based guidance values) for the protection of human health and the environment.

VII. TASK VI: LABORATORY AND BENCH SCALE STUDIES

The Permittee shall conduct laboratory and/or bench scale studies to determine the applicability of a corrective measure technology or technologies to facility conditions.

The Permittee shall analyze the technologies, based on literature review, vendor contracts, and past experience to determine the testing requirements.

The Permittee shall develop a testing plan identifying the type(s) and goal(s) of the study(s), the level of effort needed, and the procedures to be used for data management and interpretation.

Upon completion of the testing, the Permittee shall evaluate the testing results to assess the technology or technologies with respect to the site-specific questions identified in the test plan.

The Permittee shall prepare a report summarizing the testing program and its results, both positive and negative.

VIII. TASK VII: REPORTS

A. Progress Reports

The Permittee shall provide signed progress reports as required by Module Condition II.B.7.(a).

B. Draft and Final Reports

The Permittee shall prepare a RCRA Facility Investigation ("RFI") Report as required by Module Condition II.E.6. The RFI Report shall present all information gathered under the approved RFI Work Plan.

PART 373 APPENDIX II-C

SCOPE OF WORK FOR A CORRECTIVE MEASURES STUDY

U.S. Department of Energy
Knolls Atomic Power Laboratory
NY6890008992

Niskayuna, New York
Schenectady County

I. PURPOSE

The purpose of the Corrective Measures Study (CMS) is to develop and evaluate the corrective action alternative or alternatives and to recommend the corrective measure or measures to be taken. This Appendix serves as guidance for developing a CMS and much of its content may not be applicable, especially when developing a focused CMS addressing a presumptive remedy. Permittee should consult with Department representatives before beginning the CMS process regarding which items need to be addressed during the study. The Permittee will furnish the personnel, materials, and services necessary to prepare the corrective measure study, except as otherwise specified.

II. SCOPE

The Corrective Measures Study consists of four tasks:

Task I: Identification and Development of the Corrective Measure Alternative or Alternatives

- A. Description of Current Situation
- B. Establishment of Corrective Action Objectives
- C. Screening of Corrective Measures Technologies
- D. Identification of the Corrective Measure Alternative or Alternatives

Task II: Evaluation of the Corrective Measure Alternative or Alternatives

- A. Technical/Environmental/Human Health/Institutional
- B. Cost Estimate

Task III: Justification and Recommendation of the Corrective Measure or Measures

- A. Technical
- B. Human Health
- C. Environmental

Task IV: Reports

- A. Progress
- B. Final

III. TASK I: IDENTIFICATION AND DEVELOPMENT OF THE CORRECTIVE ACTION ALTERNATIVE OR ALTERNATIVES

Based on the results of the RCRA Facility Investigation and consideration of the identified Preliminary Corrective Measure Technologies (Task II of Appendix II-B), the Permittee shall identify, screen, and develop the alternative or alternatives for removal, containment, treatment and/or other remediation of the contamination based on the objectives established for the corrective action.

A. Description of Current Situation

The Permittee shall submit an update to the information describing the current situation at the facility and the known nature and extent of the contamination as documented by the RCRA Facility Investigation Report. The Permittee shall provide an update to information presented in Task I of the RFI to the Commissioner regarding previous response activities and any interim measures which have or are being implemented at the facility. The Permittee shall also make a facility-specific statement of the purpose for the response, based on the results of the RCRA Facility Investigation ("RFI"). The statement of purpose should identify the actual or potential exposure pathways that should be addressed by corrective measures.

B. Establishment of Corrective Action Objectives

The Permittee, in conjunction with the Department, shall establish site specific objectives for the corrective action. These objectives shall be based on public health and environmental criteria, information gathered during the RFI, EPA and New York State guidance, and the requirements of any applicable federal and state statutes. At a minimum, all corrective actions concerning groundwater releases from regulated units must be consistent with, and as stringent as, those required under 6 NYCRR 373-2.6.

C. Screening of Corrective Measure Technologies

The Permittee shall review the results of the RFI and reassess the technologies specified in Task II and identify additional technologies which are applicable at the facility. The Permittee shall screen the preliminary corrective measure technologies identified in Task II of the RFI and any supplemental technologies to eliminate those that may prove infeasible to implement, that rely on technologies unlikely to perform satisfactorily or reliably, or that do not achieve the corrective measure objective within a reasonable time period. This screening process focuses on eliminating those technologies which have severe limitations for a given set of waste

and site-specific conditions. The screening step may also eliminate technologies based on inherent technology limitations. Site, waste, and technology characteristics which are used to screen inapplicable technologies are described in more detail below:

1. Site Characteristics

Site data should be reviewed to identify conditions that may limit or promote the use of certain technologies. Technologies whose use is clearly precluded by site characteristics should be eliminated from further consideration;

2. Waste Characteristics

Identification of waste characteristics that limit the effectiveness or feasibility of technologies is an important part of the screening process. Technologies clearly limited by these waste characteristics should be eliminated from consideration. Waste characteristics particularly affect the feasibility of in-situ methods, direct treatment methods, and land disposal (on/off-site); and

3. Technology Limitations

During the screening process, the level of technology development, performance record, and inherent construction, operation, and maintenance problems should be identified for each technology considered. Technologies that are unreliable, perform poorly, or are not fully demonstrated may be eliminated in the screening process. For example, certain treatment methods have been developed to a point where they can be implemented in the field without extensive technology transfer or development.

- D. Identification of the Corrective Measure Alternative or Alternatives

The Permittee shall develop the corrective measure alternative or alternatives based on the corrective action objectives and analysis of the Preliminary Corrective Measure Technologies, as presented in Task II of the RFI and as supplemented following the preparation of the RFI Final Report. The Permittee shall rely on engineering practice to determine which of the previously identified technologies appear most suitable. Technologies can be combined to form the overall corrective action alternative or alternatives. The alternative or alternatives developed should represent a workable number of option(s) that each appears to adequately address all problems and corrective action objectives. Each alternative may consist of an individual technology or a combination of technologies. The Permittee shall document the reasons for excluding technologies, identified in Task II, as supplemented in the development of the alternative or alternatives.

IV. TASK II: EVALUATION OF THE CORRECTIVE MEASURE ALTERNATIVE OR ALTERNATIVES

The Permittee shall describe each corrective measure alternative that passes through the Initial Screening in Task I of Appendix II-C and evaluate each corrective measure alternative and its components. The evaluation shall be based on technical, environmental, human health and institutional concerns. The Permittee shall also develop cost estimates of each corrective measure.

A. Technical/Environmental/Human Health/Institutional

The Permittee shall provide a description of each corrective measure alternative which includes, but is not limited to the following: preliminary process flow sheets; preliminary sizing and type of construction for buildings and structures; and rough quantities of utilities required. The Permittee shall evaluate each alternative in the four following areas:

1. Technical

The Permittee shall evaluate each corrective measure alternative based on performance, reliability, implementability and safety.

- (a) The Permittee shall evaluate performance based on the effectiveness and useful life of the corrective measure:
 - (i) Effectiveness shall be evaluated in terms of the ability to perform intended functions, such as containment, diversion, removal, destruction, or treatment. The effectiveness of each corrective measure shall be determined either through design specifications or by performance evaluation. Any specific waste or site characteristics which could potentially impede effectiveness shall be considered. The evaluation should also consider the effectiveness of combinations of technologies; and
 - (ii) Useful life is defined as the length of time the level of effectiveness can be maintained. Most corrective measure technologies, with the exception of destruction, deteriorate with time. Often, deterioration can be slowed through proper system operation and maintenance, but the technology eventually may require replacement. Each corrective measure shall be evaluated in terms of the projected service lives of its component technologies. Resource availability in the future life of the technology, as well as appropriateness of the technologies, must be considered in estimating the useful life of the project.

- (b) The Permittee shall provide information on the reliability of each corrective measure including their operation and maintenance requirements and their demonstrated reliability:
 - (i) Operation and maintenance requirements include the frequency and complexity of necessary operation and maintenance. Technologies requiring frequent or complex operation and maintenance activities should be regarded as less reliable than technologies requiring little or straight forward operation and maintenance. The availability of labor and materials to meet these requirements shall also be considered; and
 - (ii) Demonstrated and expected reliability is a way of measuring the risk and effect of failure. The Permittee should evaluate whether the technologies have been used effectively under analogous conditions; whether the combination of technologies have been used together effectively; whether failure of any one technology has an immediate impact on receptors; and whether the corrective measure has the flexibility to deal with uncontrollable changes.
- (c) The Permittee shall describe the implementability of each corrective measure including the relative ease of installation (constructability) and the time required to achieve a given level of response:
 - (i) Constructability is determined by conditions both internal and external to the facility conditions and includes such items as location of underground utilities, depth of water table, heterogeneity of subsurface materials, and location of the facility (i.e., remote location vs. a congested urban area). The Permittee shall evaluate what measures can be taken to facilitate construction under these conditions. External factors which affect implementation include the need for special permits or agreements, equipment availability, and the location of suitable off-site treatment or disposal facilities; and
 - (ii) Time has two components that shall be addressed: (1) the time it takes to implement a corrective measure; and (2) the time it takes to actually see beneficial results. Beneficial results are defined as the reduction of contaminants to some acceptable, pre-established level.

- (d) The Permittee shall evaluate each corrective measure alternative with regard to safety. This evaluation shall include threats to the safety of nearby communities and environments as well as those to workers during implementation. Among the factors to consider are fire, explosion, and exposure to hazardous substances.

2. Environmental

The Permittee shall perform an Environmental Assessment for each alternative. The Environmental Assessment shall focus on the facility conditions and pathways of contamination actually addressed by each alternative. The Environmental Assessment for each alternative will include, at a minimum, an evaluation of: the short and long term beneficial and adverse effects of the response alternative; any adverse effects on environmentally sensitive areas; and an analysis of measures to mitigate adverse effects.

3. Human Health

The Permittee shall assess each alternative in terms of the extent to which it mitigates short- and long-term potential exposure to any residual contamination and protects human health both during and after implementation of the corrective measure. The assessment will describe the levels and characterizations of contaminants on-site, potential exposure routes, and potentially affected populations. Each alternative will be evaluated to determine the level of exposure to contaminants and the reduction over time. For management of mitigation measures, the relative reduction of impact will be determined by comparing residual levels of each alternative with existing criteria, standards, or guidelines.

4. Institutional

The Permittee shall assess relevant institutional needs for each alternative. Specifically, the effects of Federal, State, and local environmental and public health standards, regulations, guidance, advisories, ordinances, or community relations on the design, operation, and timing of each alternative.

B. Cost Estimate

The Permittee shall develop an estimate of the cost of each corrective measure alternative (and for each phase or segment of the alternative). The cost estimate shall include capital, operation and maintenance costs.

- 1. Capital costs consist of direct (construction) and indirect (non-construction and overhead) costs.

- (a) Direct capital costs include:

- (i) Construction costs: Costs of materials, labor (including fringe benefits and worker's compensation), and equipment required to install the corrective measure;
 - (ii) Equipment costs: Costs of treatment, containment, disposal and/or service equipment necessary to implement the action; these materials remain until the corrective action is complete;
 - (iii) Land and site-development costs: Expenses associated with purchase of land and development of existing property; and
 - (iv) Buildings and services costs: Costs of process and non-process buildings, utility connections, purchased services, and disposal costs.
- (b) Indirect capital costs include:
 - (i) Engineering expenses: Costs of administration, design, construction supervision, drafting, and testing of corrective measure alternatives;
 - (ii) Legal fees and license or permit costs: Administrative and technical costs necessary to obtain licenses and permits for installation and operation;
 - (iii) Startup and shakedown costs: Costs incurred during corrective measure startup; and
 - (iv) Contingency allowances: Funds to cover costs resulting from unforeseen circumstances, such as adverse weather conditions, strikes, and inadequate facility characterization.
- 2. Operation and maintenance costs are post-construction costs necessary to ensure continued effectiveness of a corrective measure. The Permittee shall consider the following operation and maintenance cost components;
 - (a) Operating labor costs: Wages, salaries, training, overhead, and fringe benefits associated with the labor needed for post-construction operations;
 - (b) Maintenance materials and labor costs: Costs for labor, parts, and other resources required for routine maintenance of facilities and equipment;

- (c) Auxiliary materials and energy: Costs of such items as chemicals and electricity for treatment plant operations, water and sewer service, and fuel;
- (d) Purchased services: Sampling costs, laboratory fees, and professional fees for which the need can be predicted;
- (e) Disposal and treatment costs: Costs of transporting, treating, and disposing of waste materials, such as treatment plant residues generated during operations;
- (f) Administrative costs: Costs associated with administration of corrective measure operation and maintenance not included under other categories;
- (g) Insurance, taxes, and licensing costs: Costs of such items as liability and sudden accidental insurance; real estate taxes on purchased land or rights-of-way; licensing fees for certain technologies; and permit renewal and reporting costs;
- (h) Maintenance reserve and contingency funds: Annual payments into escrow funds to cover (1) costs of anticipated replacement or rebuilding of equipment and (2) any large unanticipated operation and maintenance costs; and
- (i) Other costs: Items that do not fit any of the above categories.

V. TASK III: JUSTIFICATION AND RECOMMENDATION OF THE CORRECTIVE MEASURE OR MEASURES

The Permittee shall justify and recommend a corrective measure alternative using technical, human health, and environmental criteria. This recommendation shall include summary tables, which allow the alternative or alternatives to be understood easily. Tradeoffs among health risks, environmental effects, and other pertinent factors shall be highlighted. The Commissioner will select the corrective measure alternative or alternatives to be implemented based on the results of Tasks II and III of Appendix II-C. At a minimum, the following criteria will be used to justify the final corrective measure or measures.

A. Technical

- 1. Performance - corrective measure or measures which are most effective at performing their intended functions and maintaining the performance over extended periods of time will be given preference;

2. Reliability - corrective measure or measures which do not require frequent or complex operation and maintenance activities and that have proven effective under waste and facility conditions similar to those anticipated will be given preference;
3. Implementability - corrective measure or measures which can be constructed and operated to reduce levels of contamination to attain or exceed applicable standards in the shortest period of time will be preferred; and
4. Safety - corrective measure or measures which pose the least threat to the safety of nearby residents and environments as well as workers during implementation will be preferred.

B. Human Health

The corrective measure or measures must comply with existing EPA and/or State criteria, standards, or guidelines for the protection of human health. Corrective measures which provide the minimum level of exposure to contaminants and the maximum reduction in exposure with time are preferred.

C. Environmental

The corrective measure or measures posing the least adverse impact (or greatest improvement) over the shortest period of time on the environment will be favored.

VI. TASK IV: REPORTS

A. Progress Reports

The Permittee shall provide the Commissioner with signed progress reports as required by Condition B.7.(a) of Module II of this Permit.

B. Corrective Measures Study ("CMS") Final Report

The Permittee shall prepare a CMS Final Report as required by Condition E.10. of Module II of this Permit. The CMS Final Report shall include all information gathered under the approved CMS Work Plan. The CMS Final Report shall at a minimum include:

1. A description of the facility;
 - (a) Site topographic map and preliminary layouts.
2. A summary of the corrective measure or measures;

- (a) Description of the corrective measure or measures and rationale for selection;
 - (b) Performance expectations;
 - (c) Preliminary design criteria and rationale;
 - (d) General operation and maintenance requirements; and
 - (e) Long-term monitoring requirements.
- 3. A summary of the RCRA Facility Investigation and impact on the selected corrective measure or measures;
 - (a) Field studies (groundwater, surface-water, soil, air); and
 - (b) Laboratory studies (bench scale, pilot scale).
- 4. Design and Implementation Precautions;
 - (a) Special technical problems;
 - (b) Additional engineering data required;
 - (c) Permits and regulatory requirements;
 - (d) Access, easements, right-of-way;
 - (e) Health and safety requirements; and
 - (f) Community relations activities.
- 5. Cost Estimates and Schedules;
 - (a) Capital cost estimate;
 - (b) Operation and maintenance cost estimate; and
 - (c) Project schedule (design, construction, operation).

PART 373 APPENDIX II-D

INDUSTRIAL SEWER ASSESSMENT WORK PLAN OUTLINE

U.S. Department of Energy
Knolls Atomic Power Laboratory
NY6890008992

Niskayuna, New York
Schenectady County

I. INITIAL EVALUATION

It is the intent of this Permit to require an evaluation of the potential for, or actual releases from those below and above ground sections of an industrial sewer that previously or currently handled hazardous waste or liquids containing hazardous constituents. The term "industrial sewer" shall be used to designate these sections of a facility's industrial sewer system.

This first step in the evaluation is to determine the status of the industrial sewer system at the facility. To provide this information, the Permittee shall submit, within thirty (30) calendar days from Permit issuance, a schedule for the preparation of a document titled, "Current Industrial Sewer Condition Report," which will be part of the RCRA Facility Assessment-Sampling Visit Work Plan mentioned in Condition E.2.(b) of this Permit Module, and which will include the following information:

1. Physical characterizations of the industrial sewer:
 - a. Age;
 - b. Diameter and construction materials of pipe and manholes;
 - c. Previous repairs: date of repair, method of repair, cause of integrity breach, cleanup of contaminated environmental media;
 - d. Location of industrial sewer including laterals indicated on a site plan of the facility; and
 - e. Elevation of industrial sewer relative to the groundwater table.
2. Wastewater conveyed by the industrial sewer:
 - a. Hazardous constituents or hazardous waste transported by the system;
 - b. Concentration of constituents in wastewater; and

- c. Current volume handled by the system.
- 3. Results of previous integrity evaluations of the industrial sewer (if any):
 - a. Reason for evaluation;
 - b. Date of evaluation; and
 - c. Results for evaluation.
- 4. Plans to upgrade the industrial sewer system (if any):
 - a. Proposed type of upgrading and relocating industrial sewers above ground, slip-lining, installation of double walled pipe with leak detection, segregating waste streams, etc; and
 - b. Time frame for proposed work.

Based upon the available information, the Department will evaluate the industrial sewer system in terms of its potential to release waste, and if so, the potential impact on human health and the environment. Based on this initial evaluation, if a threat to human health and the environment exists, it is likely that integrity testing of the industrial sewer and/or soil sampling will be required.

The Department will take into account the facility's plans to upgrade the industrial sewer system when making the decision to require an integrity test. If the proposed upgrade is acceptable, and completed within an acceptable time frame, integrity testing may not be necessary. However, when the industrial sewers are decommissioned, testing and/or soil sampling may be necessary to evaluate environmental media contaminated by past releases.

II. INDUSTRIAL SEWER ASSESSMENT

If the Department makes a determination that integrity testing of the industrial sewer is necessary, a Sampling Visit (SV) Work Plan shall be submitted by the facility which addresses the methods, procedures, and schedules for assessing industrial sewer leaks would include an in-line TV survey and a method of integrity testing.

The remaining portions of the industrial sewer system, excluding the manholes, must undergo the integrity testing described below. If an industrial sewer pipe is above ground and can be visually inspected for leaks, then that industrial sewer pipe is exempt from this integrity testing requirement.

If the Permittee can demonstrate that an industrial sewer pipe is continuously below the groundwater table throughout the year, then that industrial sewer pipe may be exempt

from this integrity testing if infiltrating contaminated groundwater does not violate effluent limits at the point of discharge. However, this does not preclude the Permittee from testing or repairing industrial sewer pipes that are below the groundwater table. To demonstrate that an industrial sewer pipe is continuously below the groundwater table, the Permittee must submit a plot plan drawing of the facility with contour lines of the lowest seasonal overburden groundwater elevations and invert elevations and diameters of the industrial sewer pipes. A perched zone of groundwater may be included only if it occurs all year. If it cannot be shown that existing wells are adequate to determine groundwater elevations along an industrial sewer pipe, the Department may require piezometers to be installed to verify groundwater elevations.

In the event of a drought or other unusual conditions that may change groundwater levels, or upon notification by the Department, the Permittee shall monitor the groundwater elevations on a monthly basis along the untested industrial sewer pipes. The Permittee shall submit these monitoring results, including the measured piezometer or well groundwater elevations and the adjacent industrial sewer invert elevations, within fourteen (14) calendar days after the monitoring event. If the groundwater elevations remain below an industrial sewer pipe for two sampling events, then the Permittee shall perform an industrial sewer system integrity test in a time frame acceptable to the Department.

The industrial sewer assessment would address the following procedures:

1. Cleaning the industrial sewer system component (i.e., pipe, sump, etc.);
2. Conducting a TV survey of the industrial sewer pipe to confirm the location of all laterals, to observe the pipe's condition, and to locate cracks in the pipe;
3. Proposed integrity testing method to be performed on the industrial sewer system;
4. Repairing or removing from use any part of the industrial sewer system that fails a integrity test; and
5. Integrity testing of all repaired components.

The integrity test method must be approved by the Department. Upon receipt of the test results, the Department will determine those components of the industrial sewer system requiring repairs for continued use.

The Permittee shall show the locations of all repairs made prior to testing, and after testing, the locations of all leaks on a map in the RFA-Sampling Visit Report. The Department may require an RFI investigation of the extent of any releases from portions of the industrial sewer system that have been repaired or that have leaked, as per Module II, Condition E.5.(b). This would most likely include soil sampling.

III. INACTIVE OR ABANDONED INDUSTRIAL SEWER

The inactive or previously abandoned portions of the industrial sewer system shall be investigated by soil sampling.

1. Sampling Locations and Depths

Soil borings shall be taken along the abandoned industrial sewer, or if the industrial sewer has been removed, its former location. Locations may be modified based on field conditions with the Department's approval. A grab sample shall be collected below the invert elevation of the industrial sewer pipe from each boring.

2. Sampling and Analytical Methods

The sample will be analyzed for hazardous constituents specific to the industrial sewer lines under assessment.

IV. MANHOLES

Prior to integrity testing, a visual inspection of the manhole shall be conducted to determine the general condition of the manhole. Necessary repairs shall be completed prior to integrity testing.

The manhole integrity testing would normally consist of the following procedures:

1. Plug all pipe outlets discharging into the manhole. Also plug the manhole outlet;
2. Fill the manhole with water to a height two feet above the crown of the highest inlet pipe;
3. Measure the water lost over a one-hour period; and
4. Report the leak rate in gallons per day (gpd).

PART 373 APPENDIX II-E

PRELIMINARY REVIEW - VISUAL SITE INSPECTION REPORT

US Department of Energy
Knolls Atomic Power Laboratory
NY6890008992

Niskayuna, New York
Schenectady County

Knolls Atomic Power Laboratory
Niskayuna, New York

EPA I.D.# NY6890008992

RCRA Facility Assessment
Preliminary Review - Visual Site Inspection Report

New York State Department of Environmental Conservation

Original: August 6, 1997
Final Version: July 20, 1998

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Knolls Atomic Power Laboratory
EPA I.D. # NY6890008992

1.0 Introduction

This report is part of a multi-stage process of identifying potential releases of hazardous waste/hazardous constituents from Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) at RCRA-regulated facilities pursuant to the Hazardous and Solid Waste Amendments of 1984 (HSWA). It has been developed from both a desk-top review of New York State Department of Environmental Conservation (NYSDEC) files on the Knolls Atomic Power Laboratory (hereafter referred to as KAPL) in the Town of Niskayuna, Schenectady County, New York, and by the performance of a Visual Site Inspection (VSI) by DEC personnel on September 27, 1995 (Phase I), on April 30, 1997 through May 2, 1997 (Phase II), and on January 15, 1998 (Phase III). The report has been prepared according to USEPA's "RCRA Facility Assessment Guidance" dated October 1986 and generally follows the outline given for a Preliminary Review Report.

1.1 Objectives

The purpose of this report is to consolidate data on file concerning past and present waste storage/disposal activities at KAPL, to determine areas that require further investigation and possibly future corrective action measures, based upon this file data and also upon observations made during the above-mentioned VSI. Listed below are the specific objectives this preliminary review report has set out to accomplish:

- 1.) Identify and describe SWMUs and AOCs and evaluate any evidence of possible release(s).
- 2.) Group SWMUs and AOCs which have similar locations, wastes, and environmental settings.
- 3.) Identify potential exposure pathways and receptors.
- 4.) To determine where further work, in the form of a Sampling Visit (SV) or a RCRA Facility Investigation (RFI), will be required.
- 5.) Identify any releases where immediate action is necessary to avoid major environmental damage or human health risk.

2.0 Background

KAPL is largely self-supporting and consists of administrative offices, warehouses, machine shops, a boiler house for centralized heating, oil storage facilities, waste storage facilities, a sewage pumping station, a river pumping station for cooling water, and chemistry, physics, and metallurgical laboratories. Non-hazardous solid wastes are disposed of through local permitted facilities. Since October 1995, when the site's sewage treatment plant was taken out of service, sanitary wastes have been sent to the Town of Niskayuna sanitary sewer system.

Laboratory operations at KAPL began in 1949. The original mission of KAPL was to develop a chemical process for the separation of radionuclides from irradiated nuclear fuel and to develop a central electric power station nuclear reactor plant based on sodium coolant technology. The chemical process work, designated the Separation Process Research Unit (SPRU), was under the direction of the Atomic Energy Commission's nuclear weapons program. The SPRU research project was completed in 1953. The work was done on a laboratory scale; SPRU was never a production plant. Test quantities of fuel were dissolved in acids and treated with various chemicals to separate the radionuclides. The process included extraction, packaging, and shipment of the final products and resultant wastes. What remains today of the SPRU operations are some of the system components and buildings. Since the completion of SPRU research in 1953, KAPL has been dedicated to Naval nuclear propulsion research and development. Work continues today on further advances in Naval nuclear propulsion technology.

2.1 Current Process and Waste Description

Chemicals are not manufactured at KAPL, but are used incidental to site operations. These chemicals are transported by vendors to treatment, storage/disposal facilities for final disposition. These vendors operate under permits issued by State and Federal agencies. Radioactive wastes are shipped to government-owned disposal sites.

Ongoing work involving the development of improved materials and components for Naval nuclear propulsion plants is conducted in various different types of facilities at KAPL. The chemical laboratories consist of several individual labs for mass spectrometry, corrosion testing, chemical analysis, radiochemistry, and other related functions. Most of the chemical laboratory work involves non-radioactive materials. Metallurgical laboratories are operated to provide services related to the development, fabrication, testing, and inspection of materials for use in Naval reactors. Similar to the other labs, most of the work is on non-radioactive materials. The Radioactive Materials Laboratory (RML) consists of shielded rooms and support facilities for the physical, chemical, and metallurgical testing of highly radioactive material specimens. The Nuclear Physics facility was used to determine nuclear physics and design aspects of various fuel configurations. The facility was permanently shut down in January 1995 and is being disassembled.

During the past five years, the total quantity of chemically hazardous wastes shipped off-site has averaged about 40 tons per year. Of the 40 tons, about 30% consists of oil, solvents, cleaning solutions, debris, analytical waste, unused or expired products and reagents, and out-of-service equipment. Another 65% consists of Polychlorinated Biphenyl (PCB) oils, capacitors, transformers, and PCB-contaminated debris. The remaining 5% consists of photographic solutions from microfilming, computer operations, testing, and general photography. Occasional lead metal waste and lead-acid batteries are shipped for reclamation. Other hazardous waste recycling efforts include waste oil, nickel-cadmium batteries, fluorescent light ballasts, silver photographic solutions, liquid mercury, and mercury compounds. Radioactive materials managed at the site consist of irradiated test specimens, special nuclear materials, and components with small amounts of radioactivity on their surfaces.

2.2 Environmental Setting

KAPL is located in a larger metropolitan area in the Town of Niskayuna, Schenectady County, New York on the south bank of the Mohawk River, approximately two miles east of the City of Schenectady and ten miles northwest of the City of Albany. The geographic coordinates are 42° 49' 20" N. latitude and 73° 52' 06" W. longitude. The site consists of approximately 170 acres of land, extending 4200 feet along the river. Adjacent to KAPL's western border is the General Electric Corporate Research and Development Center, and to the east is the Town of Niskayuna municipal landfill. To the south is a residential area and to the north is the Mohawk River.

The site facilities occupy about 60 acres of the property, with the balance of the site consisting of woods and fields. Surface water from the undeveloped sections of the site drains to the Mohawk River by way of three (3) unnamed streams (referred to by KAPL as the East Boundary stream, the Mid-line stream, and the West Boundary stream). A fourth stream, the West Landfill stream, intermittently skirts the west side of the Closed Landfill (SWMU-001). The Mohawk River is the primary receiving water and is classified as a Class A stream. It supplies water for domestic, recreational, and industrial purposes for the surrounding community. The nearest downstream user of the Mohawk River, as a potable water supply, is the Latham Water District, approximately five miles from KAPL.

The site is located within the Mohawk Valley subdivision of the Hudson-Mohawk Lowland physiographic province of New York State. The valley is an east-west lowland drained by the Mohawk River and other associated tributaries, situated between the Adirondacks to the north and the Appalachian Uplands to the south. The area is underlain by Upper Middle Ordovician bedrock consisting of the Schenectady Formation and the Canajoharie Shale. The Schenectady Formation consists of graywacke, sandstone, siltstone, and shale. The overburden material consists of lacustrine deposits, glacial tills, and kame and esker deposits. Previous studies at KAPL have shown that the bedrock is overlain by a thick, continuous layer of compact grey till overlain by a thinner brown till. The till ranges in thickness up to 70 feet and thins toward the river. It generally consists of non-stratified material of varying grain size and very low permeability. Kame/esker sands and gravels or lacustrine deposits are found above the till.

Mean annual temperature in the general Albany area, based on meteorological records maintained since 1795, is approximately 48° F. January is the coldest month, with a mean temperature of 24°, and July the warmest, with a mean of 72°. The mean annual precipitation in the area is 37 inches. It is fairly evenly distributed throughout the year, with the heaviest precipitation occurring during June, July, and August. The mean annual snowfall for the area, included in the foregoing annual precipitation figures, is 50 inches, with almost all of it falling during the months of November to April, inclusive.

2.3 Current Facility Status

KAPL has been listed as a Class 2a in the NYS Registry of Inactive Hazardous Waste Disposal Sites, meaning that the site has a temporary classification which is assigned to sites that have inadequate and/or insufficient data for inclusion in any of the other classifications in the Registry.

3.0 SWMU/AOC Locations

The locations of KAPL's past and present SWMU's have been determined from information contained in KAPL's June 1992 Report on Solid Waste Management Units (Reference #8), supplemental packages (November 1996 and January 1998) submitted by KAPL to cover mixed waste and other SWMUs (References #9, #13, and #14), and KAPL's Revised Part B/373 Permit Application Package (Reference #12). The information in these references was verified during the Visual Site Inspections (VSI). A map indicating the locations of the SWMUs/AOCs is attached to this report.

3.1 SWMU/AOC Identification

A total of 77 SWMUs and 3 AOCs have been identified at the site. Of the SWMUs, twenty-four (24) are either present or former container storage areas, eight (8) are former land disposal units, twenty-five (25) are either present or former storage/treatment tanks, two (2) are former incinerators, five (5) are former or presently used sewer systems, and thirteen (13) do not fit into any of the previous categories. Of the AOCs, one (1) is an area of contaminated groundwater, one (1) is a grouping of former electrical transformer storage areas, and one (1) is a former soil disposal area. A description of each SWMU and AOC identified thus far, including wastes present (if known) and constituents which have appeared in previous sampling, is given at the end of this Visual Site Inspection Report.

3.2 SWMU/AOC Categories

It will be the intent of further investigation to group SWMUs/AOCs into five (5) basic categories, based on the status of releases from them and the ongoing corrective measures activities related to them. These categories are as follows:

- 1.) Likely/Adequate - The SWMU or AOC has been identified as having a release which has impacted the environment; however, the current corrective action program which has been implemented has been determined to be adequate in the control and remediation of the release;
- 2.) Likely/Inadequate - The SWMU or AOC has been identified as having a release which has impacted the environment and currently has either no corrective action program or an inadequate one;
- 3.) Likely/Enhancement - The SWMU or AOC has been identified as having a release which has

impacted the environment, and enhancements to the current corrective action program may be necessary to aid in the remediation of the release;

- 4.) Undetermined/Investigation - It cannot be determined, from the information available, whether or not the SWMU or AOC has released or is releasing hazardous constituents to the environment and, therefore, additional investigative activities may be necessary to make this determination; and
- 5.) Determined/Complete - It has been determined, from the information available, that the SWMU or AOC has not released nor is currently releasing hazardous constituents to the environment and, therefore, no further measures are needed to be taken for this SWMU or AOC at this time.

4.0 Grouping SWMUs/AOCs

Due to the large size of the KAPL site, many of the SWMUs/AOCs listed can be identified as having discrete boundaries, and thus grouping (other than in the case of SWMU-009 and AOC-002) has not been necessary. However, waste management units within the same containment area or tanks which are part of the same treatment system have occasionally been classified under the same SWMU heading. For such SWMUs, it appears that any further investigation, where prescribed, would necessarily be inclusive of all of the individual units within the SWMU, and thus placing the individual units under the same SWMU heading has been done for the sake of practicality. In addition, although all of the land disposal SWMUs (SWMUs- 001 through -008) have been identified individually, distinct boundaries to each SWMU have not always been identified and, thus, further investigations of these SWMUs may take place in the form of an overall study.

5.0 Exposure Pathways

The four (4) exposure pathways for this site are soil, groundwater, surface water, and sediment. Some potential receptors in the area are: 1.) Mohawk River users (via recreation and drinking water); 2.) Terrestrial and aquatic biota; 4.) On and off-site employees/residents in the area.

5.1 Surface Water

Current effluent discharges to the Mohawk River are regulated under a NYS SPDES permit. The Permit specifies the required quarterly sampling locations, parameters, and minimum sampling frequencies. KAPL's monitoring program comprises sampling both upriver and down river of the KAPL outfall, sampling of the West Boundary and Mid-line streams near the point of entry to the Mohawk River, and the East Boundary stream upstream and downstream of the Closed Landfill (SWMU-001). The West Landfill stream is also monitored when possible. The NYS surface water quality standard for iron has been occasionally exceeded in both the Mohawk River and East Boundary stream upstream and downstream sample locations, and in the West Landfill stream. The

State standard for manganese has also been exceeded in several East Boundary stream upstream samples and in the West Landfill stream. However, as the SPDES Permit does not monitor extensively for hazardous constituents, the potential for release of 6 NYCRR Subpart 373-2 Appendix 33 parameters remains largely uncharacterized.

5.2 Groundwater

KAPL's groundwater monitoring network consists of 56 wells. Five wells at the Closed Landfill (SWMI-001) are subject to routine radiological and chemical monitoring under the 6 NYCRR Part 360 program. The chemical monitoring includes quarterly monitoring for leachate indicators and annual baseline sampling for volatile organics and additional metals. Historically, phenols and low levels of dichlorodifluoromethane have been detected in downgradient and/or in-fill wells. However, 1996 results do not indicate a contravention of groundwater standards for either constituent.

One well within the vicinity of the Pyrophoric Area (SWMU-005) has demonstrated periodic levels of Volatile Organic Compounds (tetrachloroethene, trichloroethene, t-1,2-dichloroethene) detected above groundwater standards. The well is situated in an area where laboratory chemicals are believed to have been buried years ago. VOC migration is believed to be limited since results from a well located further downgradient are less than the minimum detection limit.

Hillside Area wells B-5 and B-15 (AOC-001) have typically shown elevated levels of VOCs (acetone, carbon tetrachloride, chloroform, 1,1-dichloroethene, t-1,2-dichloroethene, hexane, methylene chloride, tetrachloroethene, tetrahydrofuran, trichloroethene, vinyl chloride). The origin of these VOCs is attributed to historical solvent storage and dispensing operations. No VOCs were detected in monitoring wells downgradient of B-5 and B-15 in 1996 sampling. An investigation at the D3/D4 Yard upgradient of the wells was performed in 1994, in order to assess the potential migration mechanism from an area of known solvent storage. The investigation revealed that the VOCs were mostly restricted to porous backfill associated with building foundations and utility lines, and not migration through low-permeability indigenous soils. An Interim Corrective Measure at the D3/D4 Yard, which involved the excavation and removal of contaminated backfill material, was commenced in 1996 and completed in early 1997. The effect of this removal action on the Hillside well contaminant levels remains to be seen.

5.3 Sediment

In 1993, sediment sampling was conducted at various locations at the East Boundary stream, Mid-line stream, and West Boundary stream. All of the sediment sampling locations were analyzed for Target Analyte List (TAL) inorganics and Target Compound List (TCL) organics, excluding TCL volatile organics. Detectable inorganic concentrations were found in all sediments, but no appreciable difference between upstream and downstream concentrations are clear, with the exception of manganese at the Mid-line stream. Semi-volatile contaminant levels (primarily Polynuclear Aromatic Hydrocarbons, or PAHs) appeared to occur most in the vicinity of asphalt-paved areas and diminish downstream. There were no detectable PCB concentrations at any of the

sampling locations. Low levels of pesticide organics (benzene hexachloride, heptachlor, aldrin, DDE, endosulfan, and endrin) were found in both upstream and downstream sample locations.

5.4 Soil

Localized soil contamination, which can be traced to specific sources, has been discovered for the following SWMUs/AOCs:

- 1) High Yard Area (SWMU-023) - Contamination at the high voltage yard and former dielectric fluid filter press have resulted in a contaminated area of approximately 150 square feet. Previous sampling has revealed PCB concentrations of up to 3,850 ppm.
- 2) J7 Scrap and Salvage (SWMU-024) - Elevated levels of various metals (cadmium, chromium, lead, mercury, nickel, and zinc) have been detected in surface soil grab samples taken at this unit in 1994. The unit historically functioned as an accumulation point for mercury-containing/contaminated scrap, mercury switches, and waste oil.
- 2) Former PCB-Containing Transformers (AOC-002) - Transformers previously located in various areas had leaked over an unknown period of time, resulting in PCB soil contamination at some areas. Remediation of these areas during the mid-1990s resulted in maximum soil concentrations of <25 mg/kg.
- 3) D3/D4 Yard (part of AOC-001) - VOC soil contamination discovered at this former drum storage area was remediated to Interim Corrective Measure cleanup levels in 1996-1997. Contaminants found during the remediation include chloroform, c-1,2-dichloroethene, t-1,2-dichloroethene, methylene chloride, acetone, n-hexane, 1,1,1-trichloroethane, trichloroethene, tetrachloroethene, and toluene.

6.0 Conclusions

After review of the on-file documentation concerning the KAPL facility, it is apparent that some localized releases of contaminants from certain SWMUs/AOCs have been identified to date, resulting in contamination of on-site soils and groundwater; however, a complete assessment of the site and all possible impacted media has not been made. It is also apparent that certain remedial activities have been undertaken by the facility in the past, but it is unclear in some cases how extensive these measures have been in either mitigating the migration of contaminants from the site or fulfilling the final cleanup goals of corrective action, which need to consider all effects upon human and non-human receptors.

7.0 Recommendations For Future Work

To date, what is known about this site is that certain SWMUs/AOCs have released hazardous constituents to soil and groundwater, and evidence for release from other SWMUs/AOCs is insufficient. Therefore, to fully evaluate the releases from the site and their effects, both Sampling Visits and RCRA Facility Investigations are prescribed for the site. The attached SWMU/AOC data sheets describe the requirements of each individual SWMU/AOC in more detail. The following are category assignments for each SWMU/AOC, as per the descriptions given in Section 3.2 of this report:

- 1.) SWMU-001 - Category 1
- 2.) SWMU-002 - Category 4
- 3.) SWMU-003 - Category 3
- 4.) SWMU-004 - Category 4
- 5.) SWMU-005 - Category 2 (groundwater)
- 6.) SWMU-006 - Category 4
- 7.) SWMU-007 - Category 4
- 8.) SWMU-008 - Category 5
- 9.) SWMU-009 - Category 5
- 10.) SWMU-010 - Category 5
- 11.) SWMU-011 - Category 5
- 12.) SWMU-012 - Category 5
- 13.) SWMU-013 - Category 5
- 14.) SWMU-014 - Category 5
- 15.) SWMU-015 - Category 5
- 16.) SWMU-016 - Category 5
- 17.) SWMU-017 - Category 5
- 18.) SWMU-018 - Category 5
- 19.) SWMU-019 - Category 5
- 20.) SWMU-020 - Category 5
- 21.) SWMU-021 - Category 5
- 22.) SWMU-022 - Category 5
- 23.) SWMU-023 - Category 2
- 24.) SWMU-024 - Category 2
- 25.) SWMU-025 - Category 4
- 26.) SWMU-026 - Category 5
- 27.) SWMU-027 - Category 4
- 28.) SWMU-028 - Category 5
- 29.) SWMU-029 - Category 5
- 30.) SWMU-030 - Category 4
- 31.) SWMU-031 - Category 4
- 32.) SWMU-032 - Category 4
- 33.) SWMU-033 - Category 4

- 34.) SWMU-034 - Category 5
- 35.) SWMU-035 - Category 4
- 36.) SWMU-036 - Category 4
- 37.) SWMU-037 - Category 4
- 38.) SWMU-038 - Category 4
- 39.) SWMU-039 - Category 5
- 40.) SWMU-040 - Category 4
- 41.) SWMU-041 - Category 4
- 42.) SWMU-042 - Category 5
- 43.) SWMU-043 - Category 4
- 44.) SWMU-044 - Category 5
- 45.) SWMU-045 - Category 4
- 46.) SWMU-046 - Category 4
- 47.) SWMU-047 - Category 4
- 48.) SWMU-048 - Category 5
- 49.) SWMU-049 - Category 4
- 50.) SWMU-050 - Category 5
- 51.) SWMU-051 - Category 4
- 52.) SWMU-052 - Category 5
- 53.) SWMU-053 - Category 4
- 54.) SWMU-054 - Category 4
- 55.) SWMU-055 - Category 4
- 56.) SWMU-056 - Category 4
- 57.) SWMU-057 - Category 4
- 58.) SWMU-058 - Category 5
- 59.) SWMU-059 - Category 5
- 60.) SWMU-060 - Category 5
- 61.) SWMU-061 - Category 5
- 62.) SWMU-062 - Category 5
- 63.) SWMU-063 - Category 5
- 64.) SWMU-064 - Category 5
- 65.) SWMU-065 - Category 5
- 66.) SWMU-066 - Category 5
- 67.) SWMU-067 - Category 5
- 68.) SWMU-068 - Category 5
- 69.) SWMU-069 - Category 5
- 70.) SWMU-070 - Category 5
- 71.) SWMU-071 - Category 5
- 72.) SWMU-072 - Category 5
- 73.) SWMU-073 - Category 5
- 74.) SWMU-074 - Category 5
- 75.) SWMU-075 - Category 5
- 76.) SWMU-076 - Category 5

- 77.) SWMU-077 - Category 5
- 70.) AOC-001 - Category 2
- 71.) AOC-002 - Category 3 and 4
- 72.) AOC-003 - Category 4

8.0 Imminent Risks

Based upon the April 1988 Preliminary Assessment (Reference #2) and other available data, no imminent danger to human health or the environment has been identified; however, implementation of corrective action programs is required to attempt to control certain risks to health or the environment. The goal of these programs is to seek complete characterizations of, and final solutions for, the problems they deal with. In addition, the ongoing routine monitoring programs undertaken by KAPL are designed to alert the NYSDEC of any ongoing health or environmental risks.

SWMU-001

Closed Landfill (LF-1)

Unit Description:

This 3.7 acre, unlined sanitary/construction debris landfill is located outside and east of the site's upper level security area. The unit included a burn cage, a three-sided burn pad, a 1000-gallon steel in-ground waste oil tank, and several waste burial areas. Prior to Solid Waste Management Facility permitting in September 1978, chemical wastes were buried, burned, or poured onto the ground; waste oils were collected within the in-ground tank prior to off-site disposal, and combustible waste was burned in the burn cage. Subsequent to the 1978 SWMF permitting, these operations ceased; the burn cage and oil tank were removed, and landfill operations commenced. The landfill was closed during 1992 and 1993 in accordance with NYCRR Part 360 Solid Waste Management Facility closure requirements. A clay cap, installed during closure, covers the unit. Monitoring wells NTH-1A, NTH-2A, NTH-5A, W-11, and W-12 are tested annually for baseline scan parameters and quarterly for routine scan parameters.

Status:

Inactive

Approximate Period of Operation:

Early 1950's to June 1992

Types of Waste:

Non-hazardous waste included cafeteria wastes, scrap paper, cardboard, wood, plastic, glass, sawdust, metal, cans, construction and demolition debris, soil, and small amounts of sand filter bed rakings from the on-site sewage treatment plant. Chemical wastes included various laboratory reagents, paint and paint products, solvents, and floor strippers and waxes. Waste oils included vacuum pump, air compressor, and motor oils.

Constituents:

Hazardous constituents of an unspecified nature from early operations suspected.

Method of Containment:

6 NYCRR Part 360 cap

Media of Concern:

Soil, groundwater, surface water and sediment (East Boundary stream)

Site Investigation Plan
with Sampling and Next
Step(s) Toward Corrective
Action:

No action. Monitoring of point-of-compliance wells in recent years indicates no contravention of NYS standards for hazardous constituents.

SWMU-002

Former Landfill (LF-2)

Unit Description:

This land disposal area pre-dates KAPL operations and was used by the previous land owner for disposal of scrap metal and household waste. It was subsequently used by KAPL for the disposal of scrap metal, construction and demolition debris, and industrial waste. It was operated concurrently with LF-1, spanning the years 1948 to 1974. The area covered approximately one to two acres, but its exact boundaries cannot be determined.

Status:

Inactive

Approximate Period of Operation:

1948 to 1974

Types of Waste:

Construction and demolition debris, household wastes, old appliances, and possibly zirconium and waste oil. May have received chemicals and industrial wastes of an unspecified nature and quantity.

Constituents:

Unknown

Method of Containment:

None

Media of Concern:

Soil, groundwater, surface water and sediment (East Boundary stream)

Site Investigation Plan with Sampling and Next Step(s) Toward Corrective Action:

The Permittee will supplement existing geophysical/soil gas surveys with invasive methods (e.g. test pits, trenching, and/or soil borings, as necessary), to determine the areal and vertical extent of waste deposition. All such investigatory work will serve as the basis for a Sampling Visit (SV) to determine whether contaminant releases to the soils within the boundaries of the unit have occurred. The Permittee will also sample East Boundary stream sediments for Appendix 33 volatile organics, to supplement analyses conducted during the 1993 Expanded Site Investigation.

The Permittee will supplement the existing monitoring well system with additional data collection points designed to measure groundwater quality at this unit. Groundwater data collection methods will be subject to NYSDEC approval.

Analysis will be conducted for 6 NYCRR Subpart 373-2, Appendix 33 parameters (except as specified above), unless data exists to justify development of a SWMU-specific parameter list. Establishment of such a list will be subject to NYSDEC approval.

SWMU-003

Mercury Disposal Area (FLD-1)

Unit Description:

This unit was a small, unlined earthen pit east of the main plant area, measuring approximately two feet wide by five feet long by four feet deep. A small quantity of liquid mercury was discovered by employees' inspections in the late 1970's. The mercury came from disposal of old batteries, for which there was visual evidence. Soil borings showed visible droplets of mercury. A fifty pound mercury release was conservatively estimated. The pit was excavated in the early 1990s and the contaminated soil and battery carcasses were disposed of off-site.

Status:

Inactive

Approximate Period of Operation:

Unknown

Types of Waste:

Batteries, scrap metal, containers, and elemental mercury

Constituents:

Mercury

Method of Containment:

None

Media of Concern:

Soil, groundwater

Site Investigation Plan with Sampling and Next Step(s) Toward Corrective Action:

The Permittee will conduct a Sampling Visit (SV) to confirm the removal of buried materials and cleanup of mercury from the soils. A portion of the analyses shall be for 6 NYCRR Subpart 373-2, Appendix 33 parameters, (so as to confirm absence of contaminants other than mercury), unless data exists to justify development of a SWMU-specific parameter list. Establishment of such a list will be subject to NYSDEC approval.

SWMU-004

North Field (FLD-2)

Unit Description:

This unlined unit consists of an approximately 40,000 square foot area in a field east of the main plant area, north of the Former Landfill and the Pyrophoric Area. A comb-like pattern of apparent trenches and depressions devoid of vegetation are present at this unit. Employee interviews and physical evidence indicate that chemicals of an unspecified nature may have been placed in this location. Apparently, containers of waste were placed in previously prepared trenches. Once a trench was full, a new trench would be excavated. The excavated soil from the new trench was used as cover material for the former. Items visible at the surface include broken containers, wood, glass shards, bottles, and a protruding drum.

Status:

Inactive

Approximate Period of Operation:

Early 1960s to mid-1970s

Types of Waste:

Laboratory chemicals

Constituents:

Unknown

Method of Containment:

None

Media of Concern:

Soil, groundwater, surface water and sediment (Midline Stream)

Site Investigation Plan with Sampling and Next Step(s) Toward Corrective Action:

The Permittee will supplement existing geophysical/soil gas surveys with invasive methods (e.g. test pits, trenching, and/or soil borings, as necessary), to determine the areal and vertical extent of waste deposition. All such investigatory work will serve as the basis for a Sampling Visit (SV) to determine whether contaminant releases to the soils within the boundaries of the unit have occurred. The Permittee will also sample Midline Stream sediments for Appendix 33 volatile organics, to supplement analyses conducted during the 1993 Expanded Site Investigation.

The Permittee will supplement the existing monitoring well system with additional data collection points designed to measure groundwater quality at this unit. Groundwater data collection methods will be subject to NYSDEC approval.

Analysis will be conducted for 6 NYCRR Subpart 373-2, Appendix 33 parameters (except as specified above), unless data exists to justify development of a SWMU-specific parameter list. Establishment of such a list will be subject to NYSDEC approval.

SWMU-005

Pyrophoric Area (FLD-3)

Unit Description:

This unit consists of a four foot square, 1/4 inch thick steel plate former burn pad near Building Q6, and a field northeast of Q6 which covers approximately 23,000 square feet. Between the early 1950s and late 1970s, zirconium chips and powder were open-burned and/or buried. The burning took place with the aide of a fire accelerant (kerosene or methanol) on the steel plate. Approximately 7100 pounds of scrap zirconium were buried or burned at this unit. Because of zirconium's reactive nature, untreated zirconium chips and powder were immersed in oil and buried in approximately thirty one- gallon and five-gallon containers in the vicinity of Building Q6. Several of the containers were exhumed in the late 1980s. Subsurface geophysical investigations in 1988 confirmed the presence of buried metallic objects. Apparent burn residues are present on the nearby field.

Status:

Inactive

Approximate Period of Operation:

Early 1950s to late 1970s

Types of Waste:

Zirconium alloy lathe turnings, shavings, and chips

Constituents:

Zirconium, chromium, tin, nickel, and copper. Tetrachloroethene and trichloroethene have been detected in nearby monitoring well W-3.

Method of Containment:

None

Media of Concern:

Soil, groundwater, surface water and sediment (Midline Stream)

Site Investigation Plan with Sampling and Next Step(s) Toward Corrective Action:

The Permittee will supplement existing geophysical/soil gas surveys with invasive methods (e.g. test pits, trenching, and/or soil borings, as necessary), to determine the areal and vertical extent of waste deposition. All such investigatory work, plus visual observation of surface burn residues, will serve as the basis for a Sampling Visit (SV) to determine whether contaminant releases to the soils within

the boundaries of the unit have occurred. The Permittee will also sample Midline Stream sediments for Appendix 33 volatile organics, to supplement analyses conducted during the 1993 Expanded Site Investigation.

The Permittee will perform a RCRA Facility Investigation (RFI) to determine the source, nature, and extent of groundwater contamination discovered at monitoring well W-3. Groundwater data collection methods will be subject to NYSDEC approval.

Analysis will be conducted for 6 NYCRR Subpart 373-2, Appendix 33 parameters (except as specified above), unless data exists to justify the development of a SWMU-specific parameter list. Establishment of such a list will be subject to NYSDEC approval.

SWMU-006

West Field (FLD-4)

Unit Description:

This SWMU consists of an unlined land disposal area in a field northwest of the Former Landfill and west of the Pyrophoric Area. Approximate dimensions of the area are 40 feet long by three to four feet wide by three feet deep. Evidence was found of waste disposal activity, i.e. the trench, disturbed soil, empty broken bottles and containers, and buried metal debris. A small exploratory excavation confirmed their presence below ground. Employee interviews indicated that chemical wastes (of an unspecified nature) were buried for about one year more than 30 years ago. Subsurface geophysical investigations in 1988 confirmed the presence of buried metallic objects.

Status:

Inactive

Approximate Period of Operation:

About one year in the late 1950's or early 1960's

Types of Waste:

Laboratory chemicals

Constituents:

Unknown

Method of Containment:

None

Media of Concern:

Soil, groundwater, surface water and sediment (Midline Stream)

Site Investigation Plan with Sampling and Next Step(s) Toward Corrective Action:

The Permittee will supplement existing geophysical/soil gas surveys with invasive methods (e.g. test pits, trenching, and/or soil borings, as necessary), to determine the areal and vertical extent of waste deposition. All such investigatory work will serve as the basis for a Sampling Visit (SV) to determine whether contaminant releases to the soils within the boundaries of the unit have occurred. The Permittee will also sample Midline Stream sediments for Appendix 33 volatile organics, to supplement analyses conducted during the 1993 Expanded Site Investigation.

The Permittee will supplement the existing monitoring well system

with additional data collection points designed to measure groundwater quality at this unit. Groundwater data collection methods will be subject to NYSDEC approval.

Analysis will be conducted for 6 NYCRR Subpart 373-2, Appendix 33 parameters (except as specified above), unless data exists to justify the development of a SWMU-specific parameter list. Establishment of such a list will be subject to NYSDEC approval.

SWMU-007

Construction and Demolition Debris Area No. 1 (FLD-5)

Unit Description:

This SWMU is a remotely located open area north of the North Field (SWMU-004) and extending to a point roughly 200 feet from the Mohawk River. Unusually large broken asphalt slabs, pieces of reinforced concrete, and vitrified clay pipe are scattered within a circular land depression partially bounded by a low earthen berm. The observed land area covers approximately 20,000 square feet. The source of the waste material is presently unknown.

Status:

Inactive

Approximate Period of
Operation:

Unknown

Types of Waste:

Construction and demolition debris

Constituents:

Unknown if hazardous

Method of Containment:

None

Media of Concern:

Soil, groundwater

Site Investigation Plan
with Sampling and Next
Step(s) Toward Corrective
Action:

The Permittee will supplement existing geophysical/soil gas surveys with invasive methods (e.g. test pits, trenching, and/or soil borings, as necessary), to determine the areal and vertical extent of waste deposition. All such investigatory work will serve as the basis for a Sampling Visit (SV) to determine whether contaminant releases to the soils within the boundaries of the unit have occurred. Results of the soil sampling program may be used to determine if other environmental media of concern require investigation. Analysis will be for 6 NYCRR Subpart 373-2, Appendix 33 parameters, unless data exists to justify the development of a SWMU-specific parameter list. Establishment of such a list will be subject to NYSDEC approval.

SWMU-008

Construction and Demolition Debris Area No. 2

Unit Description:

This unit consists of an open area located outside and southeast of the Site's upper level security area, under the upper level overflow parking lot. Construction and demolition debris was deposited on the surface within this area as fill for the parking lot.

Status:

Inactive

Approximate Period of Operation:

Prior to mid-1970s

Types of Waste:

Construction and demolition debris

Constituents:

Records indicate no hazardous constituents.

Method of Containment:

None

Media of Concern:

Soil, groundwater, surface water and sediment (Midline Stream)

Site Investigation Plan
with Sampling and Next
Step(s) Toward Corrective
Action:

No action. No evidence of release of hazardous constituents.

SWMU-009

Scrap Metal Management Areas

Unit Description:

Scrap metal is accumulated at five primary areas. Two Scrap Metal Management Areas are located at the north end of the upper level security area, east of Building M1 (#1) and east of the raw metal stock storage area (#2). The remaining three areas are located at the lower level security area, adjacent to the former rail bed (#3), southeast of Building J7 (#4), and adjacent to Building L6 (#5). Operation involves staging of scrap metal on pallets or in drums, hoppers, and roll-offs. All the areas are paved with asphalt.

Status:

Active

Approximate Period of Operation:

#1-- around 1992 to present
#2-- around 1977 to present
#3-- around 1982 to present
#4-- around 1987 to present
#5-- around 1992 to present

Types of Waste:

Scrap metal (i.e. pipes, lathe turnings, office and other equipment, instrumentation, empty drums to be recycled, etc.)

Constituents:

No hazardous constituents known

Method of Containment:

Open storage on asphalt

Media of Concern:

Soil, groundwater, surface water and sediment at Area #4

Site Investigation Plan with Sampling and Next Step(s) Toward Corrective Action:

No action. No evidence of release of hazardous constituents.

SWMU-010

Current Hazardous Waste Storage Facility, Building Q1 (CS-1)

Unit Description:

This is the site's interim status hazardous waste storage facility, which has a permitted container storage capacity of 6,600 gallons (120 55-gallon drums). It is located at the northeast end of the upper level security area and consists of the south end of Building Q1, a building extension, and an earthen-bermed area, the last of which is used to store non-RCRA waste. Building Q1 resides on a bermed concrete slab and is a sheet-metal sided, steel-framed structure. The extension is a covered, three-sided structure which extends off the east side of Building Q1. The extension floor is concrete and is also bermed.

Status:

Active

Approximate Period of Operation:

1984 to present

Types of Waste:

Containerized hazardous wastes from various on-site sources:
D001-3, D005-9, D011
F001, F002, F005
B002, B003

Constituents:

Halogenated and non-halogenated solvents, photographic and silver/mercuric nitrate solutions, used oil, PCB ballasts, and miscellaneous laboratory reagents are stored at this unit prior to off-site disposal transport.

Method of Containment:

Indoors or bermed on concrete

Media of Concern:

Soil, groundwater

Site Investigation Plan
with Sampling and Next
Step(s) Toward Corrective
Action:

No action. No evidence of release to environmental media.

<u>SWMU-011</u>	Building Q3 Temporary Hazardous Waste Storage Facility (CS-2)
<u>Unit Description:</u>	This area was used as a staging area for 10 to 15 waste drums for less than two weeks in 1981, during the transition to occupancy of Building Q1 (SWMU-010). It occupied an area of approximately 224 square feet in the enclosed, roofed, steel-framed Building Q3, which resides on a concrete slab.
<u>Status:</u>	Inactive
<u>Approximate Period of Operation:</u>	<2 weeks in 1981
<u>Types of Waste:</u>	Similar to SWMU-010
<u>Constituents:</u>	Similar to SWMU-010
<u>Method of Containment:</u>	Indoors
<u>Media of Concern:</u>	Soil, groundwater
<u>Site Investigation Plan with Sampling and Next Step(s) Toward Corrective Action:</u>	No action. No evidence of release to environmental media.

SWMU-012

Former Container Storage Area, Building Z7 (CS-3)

Unit Description:

This unit was formerly the hazardous waste storage facility for KAPL. It consisted of a 400 square foot area of the North Garage section of an enclosed building, Building Z7. Building Z7 is covered, corrugated metal-sided steel-framed structure which resides on a concrete slab. The unit had a container storage capacity of 1650 gallons (30 drums). In 1984, the area was thoroughly cleared and closed in accordance with Subpart G of 40 CFR Part 265. The closure plan and associated chemical analyses are part of the operating record of the site's current hazardous waste storage facility, Building Q1.

Status:

Inactive

Approximate Period of Operation:

1961-1984

Types of Waste:

Same types of waste stored in CS-1 (SWMU-010).

Constituents:

Waste chemicals included chlorinated and non-chlorinated solvents, PCB's, and zirconium

Method of Containment:

Indoors

Media of Concern:

Soil, groundwater

Site Investigation Plan with Sampling and Next Step(s) Toward Corrective Action:

No action. No evidence of release to environmental media.

SWMU-013

Building K4 Boiler Blowdown Storage Tank (ST-1)

Unit Description:

This unit is a 1000-gallon, in-ground, vented concrete tank lined with carbon steel, located adjacent to and south of the Boiler House (Building K4). Historically, boiler blowdown in the tank was discharged to the storm water drain system. However, since 1980, blowdown had been transferred from the tank to an elementary neutralization tank (WT-1, SWMU-014) inside Building K4. Tank ST-1 is inspected annually and has a float alarm.

Status:

Active

Approximate Period of Operation:

1950 to present

Types of Waste:

Unneutralized boiler blowdown (average pH is 10.5 SU)

Constituents:

Phosphate, sulfite, and caustic boiler treatments, morpholine, sulfonated styrene/maleic anhydride copolymer

Method of Containment:

Primary

Media of Concern:

Soil, groundwater

Site Investigation Plan with Sampling and Next Step(s) Toward Corrective Action:

No action. No evidence of release of hazardous constituents.

SWMU-014

Building K4 Wastewater Neutralization Tank (WT-1)

Unit Description:

This 1000-gallon above-ground stainless steel tank is located inside the boilerhouse (Building K4) and was used for neutralization of both boiler blowdown and acidic/caustic streams from regeneration of ion exchange resins. The neutralized wastewater was then released to the site's stormwater drain system and ultimately discharged from a SPDES permitted outfall.

Status:

Inactive

Approximate Period of Operation:

1980 to September 1997

Types of Waste:

Boiler blowdown (pH 10.5) and make-up water treatment system regeneration wastewater (D002, pH 2.0)

Constituents:

Iron

Method of Containment:

Indoors, sealed concrete floor

Media of Concern:

Soil, groundwater

Site Investigation Plan with Sampling and Next Step(s) Toward Corrective Action:

No action. No evidence of release at the unit. Discharged to SPDES-regulated outfall (Mohawk River).

SWMU-015

Former C2/E1 Yard Wastewater Treatment Tank Site
(WT-2)

Unit Description:

This unit was a flow-through in-ground concrete tank that functioned as an oil-water separator in the event of a significant release of oil into the wastewater discharge system. It also received non-contact cooling water from various heat exchangers and furnaces located in Buildings A3, D1, D2, D3, and D4, as well as dilute chemical wastewater from chemistry and metallography laboratories located in A3. Blowdown water from the E1 cooling tower and water from various roof drains in E1/G1 were also discharged to the tank. The tank was constructed of 9-inch thick concrete, had a working capacity of 2000 gallons and was approximately 28 feet long by 8 feet wide by 8 feet deep.

Prior to 1952, tank effluent was discharged to the sanitary sewer system until a modification redirected the tank effluent to the storm water system. The tank was noticed to be intact and in good condition during its removal during the summer of 1996.

Status:

Inactive

Approximate Period of
Operation:

1950 to May 1996

Types of Waste:

Industrial wastewaters and spent acid solutions from laboratory, pickling, and machine shop operations, non-contact cooling waters, cooling tower blowdown, possibly trace amounts of solvents and reagent-grade chemicals.

Constituents:

Arsenic, barium, cadmium, chromium, lead, mercury, silver, zinc, lubricating oil, bis-diethylhexyl phthalate, and PCB's (constituents discovered in tank sludge)

Method of Containment:

Primary

Media of Concern:

Soil, groundwater

Site Investigation Plan
with Sampling and Next
Step(s) Toward Corrective
Action:

No action. Tank integrity inspection conducted in November 1994 indicated no evidence of release to surrounding soils. Former side-gradient well B-4 and down-gradient wells B-13, KH-18, and KH-19 have shown no contaminant impact from the tank.

SWMU-016

E1/G1 Wastewater Treatment Tanks (WT-3)

Unit Description:

This unit, which is located in the Building E1 basement, consists of a skid-mounted treatment system and two polyethylene, above-floor wastewater accumulation tanks: one 700 gallons, the other 1100 gallons. Treatment system capabilities include filtration, neutralization, ion exchange, and carbon polishing. Building E1 and G1 chemistry laboratory wastewater is collected within the 700-gallon tank, while Air Conditioning System condensate and leakage is collected within the 1100-gallon tank. Accumulated wastewater is batch-treated, if required, via the treatment system prior to release. Wastewater was discharged to the Yard Neutralization Tank (SWMU-015) until September 1995, when laboratory wastewater was re-routed to the Sanitary Drain System. During May 1996, AC condensate and leakage was re-routed directly to the storm water drain system. Since the late 1960's, a 1000-gallon carbon steel tank was used, until replacement with the present system in November 1993.

Status:

Active

Approximate Period of Operation:

Late 1960s to present

Types of Waste:

AC condensate and leakage, laboratory wastewater (pH 8.0 to 9.0 SU)

Constituents:

Iron, lead, cadmium, zinc, copper, barium, chromium, manganese

Method of Containment:

Indoors

Media of Concern:

Soil, groundwater

Site Investigation Plan with Sampling and Next Step(s) Toward Corrective Action:

No action. No evidence of release. Discharges to regulated SPDES outfall (Mohawk River).

<u>SWMU-017</u>	Building L3 Holding Tanks, Experimental Engineering (WT-4 & WT-5)
<u>Unit Description:</u>	This unit consists of two 1200-gallon above-floor polypropylene tanks located within a concrete pit in Building L3. The tanks are used for the collection and neutralization of test facility wastewater streams from a wet bench laboratory. Wastewater was batch-discharged to the storm drain system until February 1995, when it was re-routed to the sanitary drain system.
<u>Status:</u>	Active
<u>Approximate Period of Operation:</u>	1992 to present (Wastewater has been managed in tanks at this location since the early 1960's. Tank replacements occurred in 1990 and again in 1992 with the present tanks.)
<u>Types of Waste:</u>	Dilute laboratory wastewaters (pH ranges from 10.0 to 10.3 SU)
<u>Constituents:</u>	Phosphates, nitrates, sulfates, ammonia; morpholine, hydrazine, and formaldehyde additives; zinc, iron, copper, and chromium
<u>Method of Containment:</u>	Secondary
<u>Media of Concern:</u>	Soil, groundwater
<u>Site Investigation Plan with Sampling and Next Step(s) Toward Corrective Action:</u>	No action. No evidence of release to environmental media. Discharges to Town of Niskayuna POTW.

<u>SWMU-018</u>	Building L6 Equalization Tank, Experimental Engineering (WT-7)
<u>Unit Description:</u>	This 300-gallon above-ground stainless steel tank which is used to accumulate test facility wastewater from the experimental engineering area in Building L6. Wastewater is discharged to the adjacent WT-6 holding tank (SWMU-019).
<u>Status:</u>	Active
<u>Approximate Period of Operation:</u>	1988 to present
<u>Types of Waste:</u>	Wastewaters similar to those generated in Buildings L2 and L3 (pH generally ranges from 10.0 to 10.3 SU)
<u>Constituents:</u>	Traces of iron, lead, chromium, and zinc
<u>Method of Containment:</u>	Indoors, secondary (stainless steel containment berm)
<u>Media of Concern:</u>	Soil, groundwater
<u>Site Investigation Plan with Sampling and Next Step(s) Toward Corrective Action:</u>	No action. No evidence of release to environmental media.

SWMU-019

Building L6 Holding Tank, Experimental Engineering (WT-6)

Unit Description:

This unit is a 500-gallon above-ground stainless steel tank used for the neutralization of test facility wastewater streams from the experimental engineering area in Building L6. It receives wastewater that has been accumulated in WT-7 (SWMU-018), and discharges the wastewater to the sanitary drain system. Prior to re-routing of the discharge in February 1995, tank contents were discharged to the storm water drain system, and the tank's purpose was to ensure compliance with the SPDES permit limit for pH of wastewater at the outfall. Wastewater is currently neutralized, if required, prior to discharge.

Status:

Active

Approximate Period of Operation:

1988 to present

Types of Waste:

Wastewaters similar to those generated in Buildings L2 and L3 (pH generally ranges from 10.0 to 10.3 SU)

Constituents:

Traces of iron, lead, chromium, and zinc

Method of Containment:

Indoors

Media of Concern:

Soil, groundwater

Site Investigation Plan with Sampling and Next Step(s) Toward Corrective Action:

No action. No evidence of release to environmental media. Discharges to Town of Niskayuna POTW.

SWMU-020

Building D3 Neutralization Tank, Pickling Facility (WT-8)

Unit Description:

This unit is an open-top, above-ground polyethylene tank with an approximate capacity of 50 gallons and a working volume of 35 gallons. It is currently used to neutralize slightly caustic laboratory grade detergent wash and rinse waters, which are subsequently discharged to the industrial drain system. Prior to 1992, the tank was used to neutralize spent pickling solutions from the metallurgical facility, to comply with the SPDES permit limits for pH of wastewater at the outfall.

Status:

Active

Approximate Period of Operation:

1980 to present

Types of Waste:

Spent pickling solutions (formerly)

Constituents:

Copper, iron, zinc, barium, chromium, lead, silver

Method of Containment:

Indoors, secondary (steel berm)

Media of Concern:

Soil, groundwater

Site Investigation Plan with Sampling and Next Step(s) Toward Corrective Action:

No action. No evidence of release. Discharges to regulated SPDES outfall (Mohawk River).

SWMU-021

Building K3 Former Oil/Water Separator Site (ST-2)

Unit Description:

This unit was a closed, vented, 275-gallon above-ground carbon steel tank in a concrete revetment outside of K3. It was used to separate and store water-contaminated fuel oil from the bottom of the adjacent 185,000 gallon fuel oil storage tank and also used to store waste oils and solvents prior to fuel oil blending and burning in the Site boilers. It contained less than a gallon of sludge at the time of its removal and disposal in 1990. The sludge was analyzed for TCLP constituents and found to be hazardous for lead, benzene, trichloroethylene, and tetrachloroethylene.

Status:

Inactive

Approximate Period of Operation:

1950's/60's to 1990

Types of Waste:

Waste oil from cleaned boiler tips, kerosene, No.2 fuel oil, solvents

Constituents:

Lead, benzene, trichloroethylene, and tetrachloroethylene

Method of Containment:

Secondary (revetment)

Media of Concern:

Soil, groundwater

Site Investigation Plan with Sampling and Next Step(s) Toward Corrective Action:

No action. No evidence of release to environmental media.

SWMU-022

Former J3 Incinerator Site

Unit Description:

This former unit consisted of a firebrick-lined brick incinerator which was housed within a covered, nine by 17 foot, corrugated metal-sided, steel-framed structure. A covered, 12-foot square, corrugated cement asbestos-sided, wood-framed structure was added later. A 40-gallon per hour fuel oil burner provided the source of combustion. The incinerator was mostly used to burn classified/confidential papers. Combustion products were dispersed through a 44-foot high, eight-inch diameter metal stack.

Status:

Inactive

Approximate Period of Operation:

Built with original site construction (1950). Ceased being used in late 1950s, and dismantled in 1980.

Types of Waste:

Non-hazardous, combustible solid waste (e.g. scrap paper, cardboard, and plastics)

Constituents:

No hazardous constituents known

Method of Containment:

Unknown

Media of Concern:

Soil, groundwater, surface water and sediment (via potential for runoff to Mohawk River)

Site Investigation Plan with Sampling and Next Step(s) Toward Corrective Action:

No action. No evidence exists that this unit incinerated hazardous waste or hazardous constituents.

SWMU-023

High Yard Area (HYA-1)

Unit Description:

This unit consists of a high voltage yard and a former dielectric fluid filter press operation housed in Building Z4. PCB contamination of soils resulted from past leaks/spills of dielectric fluid arising from material handling practices. Long-term employees recall that PCB-containing dielectric fluid was used in five circuit breakers and three transformer load ratio controllers until 1985, when the fluid was replaced with 10C oil. The three transformers contained low levels of PCBs (130-160 ppm) until 1990, when they were retrofilled. The 500-gallon tank and filter press in Z4 were used to remove water and PCBs from the dielectric fluid.

Contamination is estimated to encompass approximately 150 square feet of soil area. At 14 locations, surface (4" depth) and subsurface (1' depth) samples were taken and analyzed for PCBs. PCB concentrations range up to 3,850 ppm.

An electrical system upgrade is currently under way.

Status:

Active

Approximate Period of
Operation:

1950 to present
filter press-- early 1950's to late 1970's

Types of Waste:

PCB-contaminated dielectric fluid

Constituents:

PCB's

Method of Containment:

None

Media of Concern:

Soil, groundwater

Site Investigation Plan
with Sampling and Next
Step(s) Toward Corrective
Action:

The Permittee shall conduct a RCRA Facility Investigation (RFI), incorporating those elements necessary to determine areal and vertical extent and concentration of PCB contamination.

SWMU-024

J7 Scrap & Salvage

Unit Description:

This unit consists of a covered, corrugated metal-sided steel-framed structure which currently houses a paper pulverizer and circuit board shredder. Historically, mercury containing/ contaminated scrap, mercury switches, and waste oil were accumulated at this unit. Elevated levels of various metals (listed below) were detected in surface soil grab samples taken in 1994, possibly due to perimeter storage of wastes.

Status:

Inactive

Approximate Period of
Operation:

1970s to 1980s (paper pulverizer)
1991 to 1994 (circuit board shredder)

Types of Waste:

Mercury containing/contaminated scrap, waste oil, circuit boards, paper

Constituents:

Cadmium, chromium, lead (645 ppm), mercury, nickel, and zinc

Method of Containment:

None (some outdoor storage suspected)

Media of Concern:

Soil, groundwater, surface water and sediment (via potential runoff to Mohawk River)

Site Investigation Plan
with Sampling and Next
Step(s) Toward Corrective
Action:

The Permittee will conduct a RCRA Facility Investigation (RFI), incorporating those elements necessary to define both areal and vertical extent and concentration of contamination. In the case that all potential contaminants cannot be sufficiently defined, some preliminary analyses shall be conducted for 6 NYCRR 373-2 Appendix 33 parameters. A SWMU-specific parameter list may be developed for subsequent sampling, subject to NYSDEC approval.

SWMU-025

Former L3 Sodium Treatment Area

Unit Description:

At this unit, waste sodium was reacted with water or methanol to render it non-reactive. A trapezoidal metal chamber with viewing windows and concrete flooring is all that currently remains of the unit. The surrounding area is presently paved. A 1956 soil pH measurement of 9.4 indicates treatment residues were released to the environment. Treatment residues may have contained heavy metals.

Status:

Inactive

Approximate Period of Operation:

1950s to early 1960s

Types of Waste:

Reactive sodium metal potentially contaminated with heavy metals

Constituents:

Possible heavy metals, other constituents unknown

Method of Containment:

Unknown. Present unit may have originally been part of a larger structure.

Media of Concern:

Soil, groundwater, surface water and sediment (via potential for runoff to Mohawk River)

Site Investigation Plan
with Sampling and Next
Step(s) Toward Corrective
Action:

The Permittee will conduct a Sampling Visit (SV) consisting of unbiased soil sampling (e.g. grid pattern and/or at regular intervals) designed to detect potential contaminant release from the unit. More focused sampling may be required in areas of obvious disposal or release. Results of the soil sampling program may be used to determine if other environmental media of concern require investigation.

Analysis will be for 6 NYCRR Subpart 373-2, Appendix 33 parameters, unless data exists to justify development of a SWMU-specific parameter list. Establishment of such a list will be subject to NYSDEC approval.

SWMU-026

G2 Wastewater Concentrator

Unit Description:

This unit consisted of two 50-gallon wastewater accumulation tanks (one polyethylene, the other stainless steel), a steam- and electric-heated stainless steel 55-gallon drum (which serves as the wastewater concentrator), two overflow collection tanks (one stainless steel, the other polyethylene), and several secondary containment structures, all of which were located on the upper level of the G2 Building. The unit was used to concentrate non-hazardous wastewater generated from corrosion coolant test facilities. Approximately 5,000 to 10,000 gallons of primary and secondary test coolants and laboratory wastewater were concentrated annually. Approximately 100 gallons of sludge were generated per year from this operation.

Status:

Inactive

Approximate Period of Operation:

Mid-1970s to 1997

Types of Waste:

Non-hazardous primary and secondary test coolants (primarily ammoniated water), laboratory wastewater, and hazardous sludge (D008)

Constituents:

Phosphates, sodium, sulfates, nitrates, hydrazine, morpholine, chromium, and lead

Method of Containment:

Indoors. Sealed floor drains on lower level with overflow alarms.

Media of Concern:

Soil, groundwater

Site Investigation Plan
with Sampling and Next
Step(s) Toward Corrective
Action:

No action. No evidence of release to environmental media.

SWMU-027

K4 Pit

Unit Description:

This unit is located in the Boiler House and consists of a concrete pit measuring 7.5 feet wide by 16 feet long by 8.5 feet deep. The pit floor is constructed of eight to 12 inch thick keyed concrete. An oil/water separator consisting of two 55-gallon drums (one fitted with absorbent filters, the other serving as an overflow) had been housed within the pit since approximately 1988. Subsequent to fuel oil/natural gas conversion, the oil/water separator ceased operation and was removed during the summer of 1995. Besides steam condensate, small volumes of steam condensate analytical waste were discharged to the pit via a laboratory sink. Currently, only steam condensate and groundwater seepage accumulates within the pit. The pit contents are pumped to the Boiler Blowdown Storage Tank.

Status:

Active

Approximate Period of Operation:

Late 1940s to present

Types of Waste:

Steam condensate and analytical waste containing hazardous constituents

Constituents:

Barium sulfate, others unknown

Method of Containment:

Groundwater seepage indicates containment is impaired.

Media of Concern:

Soil, groundwater

Site Investigation Plan with Sampling and Next Step(s) Toward Corrective Action:

The Permittee will conduct a Sampling Visit (SV) of the soils surrounding the unit, to determine if a contaminant release has occurred. As part of the SV Work Plan, the Permittee will evaluate if an examination of the unit's integrity (including associated piping) will aid the design of the sampling program. The Work Plan will include a justification for analytical parameters selected and supporting data, and be subject to NYSDEC review. Results of the soil sampling program may be used to determine if other media of concern require investigation.

SWMU-028

Site Boilers

Unit Description:

This unit consists of the Site's four Babcock and Wilcox steam boilers housed within Building K4. The cumulative boiler design capacity is approximately 100,000 pounds of steam per hour. The boilers burned No. 6 fuel oil from 1950 until 1994. On occasion, waste oils and solvents were mixed with the No. 6 fuel oil and burned. Blending of fuel oil with solvents ceased in the late 1970s and blending of waste oils ceased during the mid-1980s. The boilers were converted to natural gas with No. 2 fuel oil as a backup during 1995.

Status:

Active

Approximate Period of Operation:

Operated since site's inception (1950) to present

Types of Waste:

Waste oils and solvents

Constituents:

Possibly lead, benzene, trichloroethylene, tetrachloroethylene. Other constituents undetermined.

Method of Containment:

Inside Boiler House

Media of Concern:

N/A

Site Investigation Plan
with Sampling and Next
Step(s) Toward Corrective
Action:

No action. The units are operated in accordance with NYSDEC issued air pollutant emissions permits.

SWMU-029

Former K3 Fuel Oil Tank Site

Unit Description:

This unit is the former location of an 185,000-gallon aboveground fuel oil storage tank. The tank was fabricated of plate steel, and was fitted with a concrete secondary containment structure which still stands. The tank was used to store No. 6 fuel oil for the boilers. Spent solvents and used oil stored in an adjacent 275-gallon tank (SWMU-021) were blended with the No. 6 fuel oil in the 185,000-gallon storage tank. Spent solvent and used oil blending ceased in the late 1970s and mid-1980s, respectively.

Status:

Inactive

Approximate Period of
Operation:

Late 1940s to 1996

Types of Waste:

Spent solvents and used oil

Constituents:

(See constituents listed for SWMU-021)

Method of Containment:

Secondary (revetment)

Media of Concern:

Soil, groundwater, surface water and sediment (via potential for runoff to Mohawk River)

Site Investigation Plan
with Sampling and Next
Step(s) Toward Corrective
Action:

No action. No evidence of release to environmental media, as no spills or releases to the environment have been reported or observed by the facility.

Unit Description:

Building H2 was constructed to house liquid waste processing equipment for waste generated by the Separation Process Research Unit (SPRU) and SPRU-support facilities. The building resides on a 2-3 foot thick concrete foundation slab and is constructed of concrete walls over 2 feet thick. The building consists of approximately 27,900 square feet of floor space on three main floors, with nearly 70% of this space being located below grade. The majority of liquid processing equipment is fabricated of stainless steel and resides on the two lower levels.

During the early 1950s, chemical wastes were processed in Building H2. The waste was transferred via stainless steel drain lines to one of five stainless steel neutralizers. The neutralizer bottoms were transferred to the Tank Farm for storage, the organic distillate was collected and containerized, and excess water was processed with other wastewaters prior to discharge.

SPRU and SPRU-support facility wastewaters were accumulated in one of three stainless steel 10,000-gallon storage tanks. Accumulated wastewater was transferred to one of two evaporators where it was concentrated 400-fold. Distillate from the evaporators was collected in a receiver tank from where it was ultimately discharged to the Mohawk River via the K5 Retention Basin and/or storm water drain system. Evaporator bottoms were either dried in one of two drum driers and containerized in 55-gallon drums or were directly containerized. The containerized waste ("slurry waste") was staged adjacent to Building H2 prior to being placed in storage at the Slurry Drum Storage Area, the K6 Storage Pad, or the Railroad Staging Area.

From 1950 until 1964, the evaporative wastewater processing technique was employed. Subsequent to 1964, wastewater was processed via filtration and ion exchange prior to discharge. Discharge of treated wastewater ceased in 1977 when a water reuse system was installed.

In addition to liquid waste processing, solid wastes have been compacted in Building H2 since 1972.

Radioactivity detected in adjacent soil and footing drains indicate a potential release from this unit.

<u>Status:</u>	Active
<u>Approximate Period of Operation:</u>	Late 1940s to present
<u>Types of Waste:</u>	Corrosive chemical waste and heavy metal-bearing wastewater
<u>Constituents:</u>	Heavy metals, methyl isobutyl ketone and/or organic diluents
<u>Method of Containment:</u>	Radioactivity discovered in adjacent soils indicates impaired containment.
<u>Media of Concern:</u>	Soil, groundwater
<u>Site Investigation Plan with Sampling and Next Step(s) Toward Corrective Action:</u>	<p>The Permittee will conduct a Sampling Visit (SV) of soils in the vicinity of the unit to determine if contaminant releases have occurred. An examination of potential or likely release points, as well as a review of the location of previously detected radioactivity in soils, will be used in designing the sampling program. Results of the program may be used to determine if other environmental media of concern require investigation.</p> <p>Analysis will be for 6 NYCRR Subpart 373-2, Appendix 33 parameters, unless data exists to justify development of a SWMU-specific parameter list. Establishment of such a list will be subject to NYSDEC approval.</p>

SWMU-031

H2 Tank Farm

Unit Description:

This unit consists of one 5,000-gallon and six 10,000-gallon stainless steel storage tanks located in seven underground concrete vaults. The vaults are arranged in a north-south row on the east side of the H2 Processing Facility. The floors and walls of these vaults are constructed of concrete ranging from two to eight feet thick. Processed separations material and waste was accumulated within the various tanks from 1950 until 1954. Materials and waste remained in storage until the mid-1960s when it was removed, processed via evaporation, and transported off-site for disposal. Subsequent to SPRU operations, several tanks were used to accumulate and store liquid waste from materials and chemistry laboratories. During 1978, all tanks were drained and taken out of service. Tank heels remain in place. Radioactivity detected in footing drains indicates a potential release from this unit.

Status:

Inactive

Approximate Period of
Operation:

1950 to 1978

Types of Waste:

Corrosive liquid waste

Constituents:

Methyl isobutyl ketone, organic diluents, and/or heavy metals (arsenic, cadmium, chromium, lead, selenium, silver, mercury)

Method of Containment:

Secondary

Media of Concern:

Soil, groundwater

Site Investigation Plan
with Sampling and Next
Step(s) Toward Corrective
Action:

The Permittee will conduct a Sampling Visit (SV) of soils in the vicinity of the unit to determine if contaminant releases have occurred. An examination of potential or likely release points, as well as a review of the location of previously detected radioactivity in soils, shall be used in designing the sampling program. Results of the program may be used to determine if other environmental media of concern require investigation.

Analysis will be for 6 NYCRR Subpart 373-2, Appendix 33 parameters, unless data exists to justify development of a SWMU-specific parameter list. Establishment of such a list will be subject to NYSDEC approval.

SWMU-032

Former Temporary Waste Storage Facilities

Unit Description:

Three small, temporary wooden buildings were located west of Building L7 and north of Building L3. The buildings were designated as Lt-1, -2, and -3. A concrete slab measuring approximately 20 feet wide by 65 feet long by 2 feet deep fitted with 164 six-inch diameter by ten inch deep pit wells was located in Lt-1. The pits were used to store radioactive waste specimens. Magnetite block was used to cover the pit well openings. From 1950 until 1954 equipment and debris as well as solid and liquid waste were staged at and in the vicinity of the three buildings. The buildings were dismantled and removed during October 1954, and the concrete slab with residual waste was covered with three feet of fill and paved over. The slab and waste remained buried until September 1980, at which time the slab and waste were excavated and removed. Radioactivity detected in soils indicates a potential release from this unit.

Status:

Inactive

Approximate Period of
Operation:

1950 to 1954

Types of Waste:

Equipment, debris, solid and liquid waste in drums and boxes

Constituents:

Unknown

Method of Containment:

Unknown. Radioactivity detected in soils indicates impaired containment.

Media of Concern:

Soil, groundwater, surface water and sediment (via potential for runoff to Mohawk River)

Site Investigation Plan
with Sampling and Next
Step(s) Toward Corrective
Action:

The Permittee will conduct a Sampling Visit (SV) consisting of unbiased soil sampling (e.g. grid pattern and/or at regular intervals) designed to detect potential contaminant release from the unit. More focused sampling may be required in areas of obvious disposal or release. Results of the soil sampling program may be used to determine if other environmental media of concern require

investigation.

Analysis will be for 6 NYCRR Subpart 373-2, Appendix 33 parameters, unless data exists to justify development of a SWMU-specific parameter list. Establishment of such a list will be subject to NYSDEC approval.

SWMU-033

Former Pilot Incinerator/Storage Facility

Unit Description:

This unit initially consisted of an incinerator housed within a three-sided, corrugated transite-sided, steel-framed structure, which was located northeast of Building H2. The unit was subsequently modified into an enclosed 24-foot square waste storage building. The incinerator was operated for an approximate one-year period in the early 1950s. Subsequently, the unit was modified and used to stage solid waste until 1963 and equipment until 1970. It was also used to stage both “slurry waste” and wastewater with low levels of radioactivity from SPRU operations. The unit was dismantled in 1978. Radioactivity detected in soil indicates a potential release from this unit.

Status:

Inactive

Approximate Period of Operation:

1951/1952 (storage until 1970)

Types of Waste:

Combustible solid waste (primarily air filters from the SPRU), “slurry waste” (evaporated bottoms from the Building H2 waste treatment facility)

Constituents:

Methyl isobutyl ketone, heavy metals

Method of Containment:

Unknown. Radioactivity in soils indicates impaired or no containment.

Media of Concern:

Soil, groundwater, surface water and sediment (via potential for runoff to Mohawk River)

Site Investigation Plan
with Sampling and Next
Step(s) Toward Corrective
Action:

The Permittee will conduct a Sampling Visit (SV) consisting of unbiased soil sampling (e.g. grid pattern and/or at regular intervals) designed to detect potential contaminant release from the unit. More focused sampling may be required in areas of obvious disposal or release. Results of the soil sampling program may be used to determine if other environmental media of concern require investigation.

Analysis will be for 6 NYCRR Subpart 373-2, Appendix 33 parameters, unless data exists to justify development of a SWMU-specific parameter list. Establishment of such a list will be subject to NYSDEC approval.

SWMU-034

L7 Waste Processing Facility

Unit Description:

A waste processing facility was located in Building L7, which is an enclosed concrete block structure. A hydraulic press was located at this unit, as was a laboratory-scale pilot incinerator for approximately three months sometime in the 1960s to 1970s. The press was used to compact radioactive compressible materials into bales, which were then stored in wooden boxes at the K7 Storage Pad (SWMU-037). The building is now used as a staging area in support of the surrounding test facilities.

Status:

Inactive

Approximate Period of Operation:

Mid-1950s to early 1970s

Types of Waste:

Compressible solid waste (e.g. paper, cardboard, filters, personal protective equipment, wipes)

Constituents:

No hazardous constituents reported or observed by the facility.

Method of Containment:

Indoor operations.

Media of Concern:

Soil, groundwater, surface water and sediment (via potential for runoff to Mohawk River)

Site Investigation Plan with Sampling and Next Step(s) Toward Corrective Action:

No action. No evidence of release of hazardous constituents.

SWMU-035

Former Slurry Drum Storage Area

Unit Description:

This unit consisted of an approximate 900 square foot, earthen-bermed area located outside and east of the site's upper level security area. During the early 1950s, slurry waste generated from wastewater processing activities in Building H2 was staged at this unit prior to off-site disposal transport. The earthen berm was bulldozed and graded in the mid-1950s. Clean-up efforts were initiated in the early 1960s and again in the late 1970s. Approximately 1,000 cubic yards of soil have been removed. No visible evidence of the unit exists today. Radioactivity detected in soils indicates a potential release from this unit.

Status:

Inactive

Approximate Period of Operation:

Mid-1950s

Types of Waste:

"Slurry waste" from Building H2 operations, filters and equipment (See description for SWMU-030)

Constituents:

Heavy metals, other constituents unknown

Method of Containment:

None

Media of Concern:

Soil, groundwater

Site Investigation Plan with Sampling and Next Step(s) Toward Corrective Action:

The Permittee will conduct a Sampling Visit (SV) consisting of unbiased soil sampling (e.g. grid pattern and/or at regular intervals) designed to detect potential contaminant release from the unit. More focused sampling may be required in areas of obvious disposal or release. Results of the soil sampling program may be used to determine if other environmental media of concern require investigation.

Analysis will be for 6 NYCRR Subpart 373-2, Appendix 33 parameters, unless data exists to justify development of a SWMU-specific parameter list. Establishment of such a list will be subject to NYSDEC approval.

SWMU-036

Former K6 Storage Pad

Unit Description:

This unit is a 23 foot wide by 48 foot long concrete-shielded concrete storage pad which was used to store containerized solid waste potentially containing hazardous constituents. With the exception of the pad's southern wall, the shielding walls measure eight feet high and are over two and one half feet thick. The southern wall is an eight inch thick retaining wall. An earthen embankment abuts this wall. In 1987, a roof was installed over the unit, the above-grade structural components were cleaned up, the unit's floor was removed, and soil adjacent to the unit was excavated and placed within the unit. Radioactivity detected in soils indicates a potential release from this unit.

Status:

Inactive

Approximate Period of Operation:

Late 1950s to 1968

Types of Waste:

"Slurry waste" from Building H2 operations, filters, and equipment (See description for SWMU-030)

Constituents:

Heavy metals, other constituents unknown

Method of Containment:

Radioactivity in soil indicates impaired containment.

Media of Concern:

Soil, groundwater

Site Investigation Plan
with Sampling and Next
Step(s) Toward Corrective
Action:

The Permittee will conduct a Sampling Visit (SV) consisting of unbiased soil sampling (e.g. grid pattern and/or at regular intervals) designed to detect potential contaminant release from the unit. More focused sampling may be required in areas of obvious disposal or release. Results of the soil sampling program may be used to determine if other environmental media of concern require investigation.

Analysis will be for 6 NYCRR Subpart 373-2, Appendix 33 parameters, unless data exists to justify development of a SWMU-specific parameter list. Establishment of such a list will be subject to NYSDEC approval.

SWMU-037

Former K7 Storage Pad

Unit Description:

This former unit was located west of the K6 Storage Pad, and consisted of a fenced concrete pad. It was used to stage solid waste prior to off-site disposal shipment. Wastes were generally containerized in four-foot-square wooden boxes. Radioactivity detected in adjacent soils indicates a potential release at this unit.

Status:

Inactive

Approximate Period of Operation:

1960s

Types of Waste:

Solid waste (e.g. compacted paper, cardboard, and personal protective equipment from Building K7). Hazardous waste or hazardous constituents may have been managed at or in close proximity to this unit.

Constituents:

Unknown

Method of Containment:

Radioactivity in soils indicates impaired containment.

Media of Concern:

Soil, groundwater

Site Investigation Plan with Sampling and Next Step(s) Toward Corrective Action:

The Permittee will conduct a Sampling Visit (SV) consisting of unbiased soil sampling (e.g. grid pattern and/or at regular intervals) designed to detect potential contaminant release from the unit. More focused sampling may be required in areas of obvious disposal or release. Results of the soil sampling program may be used to determine if other environmental media of concern require investigation.

Analysis will be for 6 NYCRR Subpart 373-2, Appendix 33 parameters, unless data exists to justify development of a SWMU-specific parameter list. Establishment of such a list will be subject to NYSDEC approval.

SWMU-038

Railroad Staging Area

Unit Description:

This unit consists of the land area located adjacent to and south of the Site's former rail bed. Four foot square wooden boxes and 55-gallon drums of solid waste, including "slurry waste" from Building H2 operations, were staged at this unit prior to off-site disposal transport. Radioactivity detected in soils indicates a potential release from this unit.

Status:

Inactive

Approximate Period of Operation:

Early 1950s to late 1960s

Types of Waste:

"Slurry waste" from Building H2 operations, filters and equipment (See description for SWMU-030)

Constituents:

Heavy metals, other constituents unknown

Method of Containment:

Radioactivity in soils indicates impaired containment.

Media of Concern:

Soil, groundwater

Site Investigation Plan with Sampling and Next Step(s) Toward Corrective Action:

The Permittee will conduct a Sampling Visit (SV) consisting of unbiased soil sampling (e.g. grid pattern and/or at regular intervals) designed to detect contaminant release from the unit. More focused sampling may be required in areas of obvious disposal or release. Results of the soil sampling program may be used to determine if other environmental media of concern require investigation.

Analysis will be for 6 NYCRR Subpart 373-2, Appendix 33 parameters, unless data exists to justify development of a SWMU-specific parameter list. Establishment of such a list will be subject to NYSDEC approval.

SWMU-039

K4 Laundry Wastewater Pit

Unit Description:

This in-ground concrete pit is approximately 13 feet deep and is located on the south side of Building K4. It was formerly used to accumulate laundry wastewater. Wastewater was transferred to Building H2 for processing, the K5 Retention Basin, or the J4 Filter Bed. The pit was cleaned in the 1980s. Wall samples indicate trace levels of radioactivity.

Status:

Inactive

Approximate Period of
Operation:

1950 to 1959

Types of Waste:

Laundry wastewater

Constituents:

Citric and oxalic acids, EDTA (a chelating agent),
and/or phosphates

Method of Containment:

Primary

Media of Concern:

Soil, groundwater

Site Investigation Plan
with Sampling and Next
Step(s) Toward Corrective
Action:

No action. Records indicate that this unit did not process hazardous waste or hazardous constituents.

SWMU-040

K5 Retention Basin

Unit Description:

This unit is an in-ground, open-top concrete basin measuring approximately 22 feet wide by 43 feet long by 11 feet deep, and is constructed of one-foot thick concrete walls. The unit is equally divided into two 30,000-gallon holding basins. Non-hazardous wastewater from processing in Building H2 (and potentially containing hazardous constituents), and laundry wastewater was accumulated in the basin prior to storm water drain discharge. A roof was installed over the basin subsequent to its operational life. Radioactivity detected in adjacent soil indicates a potential release from this unit.

Status:

Inactive

Approximate Period of Operation:

1950 to late 1960s

Types of Waste:

Non-hazardous wastewater potentially containing hazardous constituents, laundry wastewater

Constituents:

Potential heavy metals, other constituents
undetermined

Method of Containment:

Radioactivity in soils indicates impaired containment.

Media of Concern:

Soil, groundwater

Site Investigation Plan
with Sampling and Next
Step(s) Toward Corrective
Action:

The Permittee will conduct a Sampling Visit (SV) consisting of unbiased soil sampling (e.g. grid pattern and/or at regular intervals) designed to detect potential contaminant release from the unit. More focused sampling may be required in areas of obvious disposal or release. Results of the soil sampling program may be used to determine if other environmental media of concern require investigation.

Analysis will be for 6 NYCRR Subpart 373-2, Appendix 33 parameters, unless data exists to justify development of a SWMU-specific parameter. Establishment of such a list will be subject to NYSDEC approval

SWMU-041

J4 Filter Bed

Unit Description:

This unit measures 30 feet wide by 40 feet long by 5 feet deep, with walls and floor constructed of eight inch concrete. The floor and walls were sealed; however, there were no water stops. Three filter media were used in the unit: filtering sand, torpedo sand, and gravel. Three four-inch laterals dispensed wastewater over this unit and three four-inch drain tile runners collected and conveyed wastewater to the Site's storm water drain system. The bed was initially used to filter laundry wastewater. Subsequent to the cessation of laundry operations in Building K4, the bed was used for interim storage of soil from the Slurry Drum Storage Area and an area between the K6 and K7 Storage Pads. The filter bed was used for interim storage from 1960 until 1967, at which time the majority of the soil was removed, new filter media was added, and the unit resumed its wastewater filtration operation. A headwall was added in the late 1970s/early 1980s. During the mid-1980s, the remaining soil and all filter media was removed and replaced with new filter media. Radioactivity detected in adjacent soils indicates a potential release from this unit.

Status:

Inactive

Approximate Period of Operation:

Early 1950s to 1959/1960

Types of Waste:

Laundry wastewater, soil, and sanitary wastewater

Constituents:

Possible heavy metals, other constituents unknown

Method of Containment:

Radioactivity in soils indicates impaired containment.

Media of Concern:

Soil, groundwater

Site Investigation Plan with Sampling and Next Step(s) Toward Corrective Action:

The Permittee will conduct a Sampling Visit (SV) consisting of unbiased soil sampling (e.g. grid pattern and/or at regular intervals) designed to detect potential contaminant release from the unit. More focused sampling may be required in areas of obvious disposal or

release. Results of the soil sampling program may be used to determine if other environmental media of concern require investigation.

Analysis will be for 6 NYCRR Subpart 373-2, Appendix 33 parameters, unless data exists to justify development of a SWMU-specific parameter list. Establishment of such a list will be subject to NYSDEC approval.

SWMU-042

RML Mixed Waste Storage Pits

Unit Description:

This mixed waste storage unit, located in the Building E4 extension, consists of four in-floor concrete storage pits. Each pit measures five feet square. Pit walls and floors are a minimum of 12 inches thick poured concrete. A half-inch steel plate covers each pit when materials and/or waste are not being added or removed. The unit's permitted capacity is 3,520 gallons. The unit is permitted for storage of various characteristic and listed mixed wastes. No liquid wastes are stored.

Status:

Active

Approximate Period of
Operation:

1996 (storage) to present

Types of Waste:

D001-D011, D018, D019, D022, D028, D029, D035, D036,
D039, D040, D042
F001-F005, F007, F009
P005, P010- P013, P015, P021, P022, P028- P030, P042, P056,
P063, P064, P068, P074, P076, P078, P081, P098, P104-P106, P113,
P114, P119, P120, P121
U002, U009, U012, U019, U031, U043-U045, U052, U056, U057,
U069, U070, U075-U080, U107-U109, U112, U117, U121, U122,
U133-U135, U140, U144, U151, U154, U159, U161, U165, U188,
U196, U204, U205, U208, U209- U211, U213, U216, U217, U219,
U220, U225-U228, U239, U381, U404
B001-B007

Constituents:

Various heavy metals, solvents, acute wastes, off-specification waste, and PCBs

Method of Containment:

Secondary

Media of Concern:

Soil, groundwater

Site Investigation Plan
with Sampling and Next
Step(s) Toward Corrective
Action:

No action. No evidence of release to environmental media.

SWMU-043

Former RML Chemical Waste Pit

Unit Description:

This former unit, located adjacent to and west of Building E2, consisted of an in-ground concrete vault with copper water stops, in which resided a concrete-shielded 55-gallon drum. A two-inch diameter stainless steel drain line encased in two feet of concrete ran from Cell No. 7 (Chemistry Cell) to this unit. The unit was used to collect small quantities of dissolution waste generated by the Chemistry Cell. Approximately 55 gallons of dissolution waste was generated every one to two years. When full, the concrete-shielded drum would be removed and a new drum would be placed in service. Use of the unit ceased in 1968 upon the discovery of leaks. The unit was cleaned in 1971. Two drums of soil were excavated from an area adjacent to, and northeast of this unit in 1981. The pit, drain line, and additional soil was removed in 1986. Radioactivity detected in adjacent soils indicates a potential release from this unit.

Status:

Inactive

Approximate Period of
Operation:

1957 to 1968

Types of Waste:

Corrosive liquid waste

Constituents:

Possible heavy metals

Method of Containment:

Radioactivity in soils indicated possible impaired containment.

Media of Concern:

Soil, groundwater

Site Investigation Plan
with Sampling and Next
Step(s) Toward Corrective
Action:

The Permittee will conduct a Sampling Visit (SV) of the soils surrounding the unit, to determine if a contaminant release has occurred. As part of the SV Work Plan, the Permittee will evaluate if an examination of the unit's integrity (including associated piping) will aid the design of the sampling program. Results of the soil sampling program may be used to determine if other environmental media of concern require investigation. Analysis will be for 6 NYCRR Subpart 373-2, Appendix 33

parameters, unless data exists to justify development of a SWMU-specific parameter list. Establishment of such a list will be subject to NYSDEC approval.

SWMU-044

RML Cobalt Pit

Unit Description:

This unit, located at RML, Building E4, is an 8.5 foot square by 15 foot deep concrete pit with water stops. The pit is covered with a 5/16-inch stainless steel plate. The unit was initially constructed and used for underwater material loading and unloading. The pit was drained subsequent to its initial use. During the late 1980s, eight stainless steel drums containing solid waste were staged in the unit for an approximate one-year time frame. The drums have since been removed and shipped off-site. The pit is currently empty, with the exception of standing water in the corner sump.

Status:

Inactive

Approximate Period of Operation:

Late 1950s to pre-1970. Drum storage in late 1980s (one year)

Types of Waste:

Solid zirconium, rags, metallic test specimens, sample material possibly containing hazardous constituents

Constituents:

Zirconium, possible heavy metals, other constituents unknown

Method of Containment:

Secondary

Media of Concern:

Soil, groundwater

Site Investigation Plan with Sampling and Next Step(s) Toward Corrective Action:

No action. No evidence of release to environmental media.

SWMU-045

RML In-Floor Storage

Unit Description:

This metallic test specimen and sample material storage unit, located in Building E4, Room 115, consists of an approximate six-foot diameter, six-foot deep concrete pit which is lined with steel and in which resides a five-tiered “lazy Susan” type device. The unit was used to store solid test specimens and sample material. Approximately 800 metallic test specimens and samples may remain in storage. Each specimen and sample is containerized in a two and one-half inch diameter, seven inch long aluminum can. The aluminum can is in turn contained within a liner can within the “lazy Susan.”

Status:

Active

Approximate Period of Operation:

Early 1950s to late 1970s. Storage continues to present day.

Types of Waste:

Metallic test specimens and sample material which may contain hazardous constituents

Constituents:

Various heavy metals, other constituents unknown

Method of Containment:

Tertiary

Media of Concern:

Soil, groundwater

Site Investigation Plan with Sampling and Next Step(s) Toward Corrective Action:

SWMU-045 is currently inaccessible for study. The Permittee will follow the procedures outlined in Condition E.2.(d) of this Permit Module.

SWMU-046

RML Building E2 Cask Storage Pit

Unit Description:

This recessed, eight-inch thick concrete floor pit is located in Room 108A of Building E2. The pit measures approximately ten feet long by six feet wide by seven feet deep, and has a 3/4-inch waterproof finish. When operational, a 1/4-inch stainless steel plate covered the unit. Currently, three lead shipping casks, possibly containing waste test specimens or sample material, are stored in the pit. The pit is filled with sand and capped with concrete.

Status:

Active

Approximate Period of
Operation:

1950's/early 1960's to present

Types of Waste:

Solid metallic test specimens and sample material which may contain hazardous constituents

Constituents:

Various heavy metals, other constituents unknown

Method of Containment:

Secondary

Media of Concern:

Soil, groundwater

Site Investigation Plan
with Sampling and Next
Step(s) Toward Corrective
Action:

SWMU-046 is currently inaccessible for study. The Permittee will follow the procedures outlined in Condition E.2.(d) of this Permit Module.

SWMU-047

RML Cask Storage Facility

Unit Description:

This unit consisted of three cask storage structures located adjacent to and north of Building E4. They were designated the Cask Storage Shed, Cask Storage Building, and Cask Storage Pit. The Cask Storage Shed, constructed in the mid-1950s, was an enclosed and covered structure measuring 20 feet wide by 38 feet long, with 2-foot thick concrete walls. The Cask Storage Building was located adjacent to and north of the Cask Storage Shed. It measured approximately 12 foot square and was also constructed of 2-foot thick concrete walls. The Cask Storage Pit was located adjacent to and east of the cask storage shed. The shed structure was extended over the pit. The pit measured 20 feet wide by nine feet long by four feet deep. The pit was retro-fitted with lead shielding in the early 1960s. During the mid-1980s, the cask storage shed, building, and pit were dismantled. A new cask storage pit, with similar dimensions, was constructed at the former cask storage pit location. The new cask storage pit is currently active and is used to store metallic test specimens and sample material prior to off-site shipping. Radioactivity was detected in the soils during the pit's renovation.

Status:

Active (pit portion only)

Approximate Period of Operation:

Mid-1950s to mid-1980s (Pit continues to be used).

Types of Waste:

Metallic test specimens and sample material which may contain hazardous constituents

Constituents:

Various heavy metals, other constituents unknown

Method of Containment:

Radioactivity in soils indicates possible impaired containment.

Media of Concern:

Soil, groundwater

Site Investigation Plan
with Sampling and Next
Step(s) Toward Corrective
Action:

The Permittee will conduct a Sampling Visit (SV) of the soils at the unit, to determine if any contaminant releases have occurred. Results of the soil sampling program may be used to determine if other environmental media of concern require investigation.

Analysis will be for 6 NYCRR Subpart 373-2, Appendix 33 parameters, unless data exists to justify development of a SWMU-specific parameter list. Establishment of such a list will be subject to NYSDEC approval.

SWMU-048

Building E1 Cask Storage Pit

Unit Description:

This recessed concrete floor pit, located in the southeast corner of Building E1, measures approximately eight feet long by five feet wide by six feet deep and was lined with two stainless-steel floor pans that served as revetments. The pit interior, including the concrete floor beneath the stainless-steel pans, is coated with an epoxy sealant. When operational, a 1/4-inch stainless steel plate covered the unit. The pit was filled with sand and capped with 15 inches of steel-reinforced concrete subsequent to operation. Seven casks were stored in the pit; two of the casks were contained in wooden boxes. The largest cask measured thirteen inches (outside diameter) by twenty inches tall. Six casks were constructed of lead encased in carbon steel, and the remaining cask was entirely of lead. Of the seven casks, five were empty, one contained an empty stainless steel canister (2.5 inch outside diameter and seven inches long), and one contained a polyethylene bottle (approximately 100 milliliters) which contained a corrosive liquid (pH ~ 1.0). The cap, sand, and casks were removed from December 1997 through February 1998. Upon exhumation, the pit and casks were found to be intact and in good condition. The casks were standing in an upright position. There were no visible cracks, chemical stains or residues within the pit, no odors were detected, and there were no signs of groundwater in-seepage.

Status:

Inactive

Approximate Period of Operation:

1950s/early 1960s to early 1998

Types of Waste:

Lead casks, and sample material which may contain hazardous constituents

Constituents:

Constituents undergoing analysis

Method of Containment:

Secondary revetment (stainless-steel floor pans within concrete pit)

Media of Concern:

Soil, groundwater

Site Investigation Plan with Sampling and Next Step(s) Toward Corrective Action:

No action, pending receipt by NYSDEC of a unit closeout report

describing actions taken at the unit and analytical results. The report shall be submitted to NYSDEC within sixty (60) days of the effective date of this permit.

SWMU-049

Former M4 Test Specimen Storage

Unit Description:

This former storage unit, located at the site of current Building M9, consisted of an in-ground concrete slab measuring approximately ten feet wide by 45 feet long by ten to 14 feet thick. Two hundred and fifty carbon steel pipes were recessed in the slab. The pipes measured four and eight inches in diameter and eight and 12 feet in length. Each pipe was fitted with a one or four foot long, concrete-filled steel pipe cap. A one foot high by one foot wide concrete curb lined the perimeter of the slab. Aluminum sheet metal covers protected the slab from the elements. Precipitation penetrating the unit's aluminum covers was diverted to the east end of the slab, where a 55-gallon drum housed within a four-foot deep concrete pit was located. The concrete pit had eight-inch thick walls.

The unit was used to store solid metallic test specimens and sample material prior to off-site shipment. Specimens and sample materials were containerized in aluminum cans prior to being placed in storage. The unit was dismantled and removed in 1982. During dismantling, radioactivity was detected in adjacent soils and was remediated.

Status:

Inactive

Approximate Period of Operation:

1953 to 1965 (removed in 1982)

Types of Waste:

Metallic test specimens and sample material which may contain hazardous constituents

Constituents:

Heavy metals, other constituents unknown

Method of Containment:

Massive concrete; however, radioactivity in surrounding soils may indicate release.

Media of Concern:

Soil, groundwater

Site Investigation Plan
with Sampling and Next
Step(s) Toward Corrective
Action:

The Permittee will conduct a Sampling Visit (SV) of the soils in the vicinity of the former unit, to determine if a contaminant release has occurred. A review of the location of previously detected radioactivity in the soils will be used in designing the sampling program. Results of the program may be used to determine if other environmental media of concern require investigation.

Analysis will be for 6 NYCRR Subpart 373-2, Appendix 33 parameters, unless data exists to justify development of a SWMU-specific parameter list. Establishment of such a list will be subject to NYSDEC approval.

SWMU-050

H2MA Mixed Waste Storage Unit

Unit Description:

This interim status, mixed waste storage unit, located adjacent to and south of Building H2, is a small modular building equipped with leak detection, control, and countermeasure devices. It receives wastes from the entire facility. The unit's permitted mixed waste capacity is 1,320 gallons. Containers of mixed waste are stored in this unit prior to off-site disposal transport.

Status:

Inactive (new location)

Approximate Period of Operation:

1990 to present

Types of Waste:

D001-D011, D018, D019, D022, D028, D029, D035, D036, D039, D040, D042
F001-F005, F007, F009
P005, P010- P013, P015, P021, P022, P028, P029, P030, P042, P056, P063, P064, P068, P074, P076, P078, P081, P098, P104- P106, P113, P114, P119, P120, P121
U002, U009, U012, U019, U031, U043-U045, U052, U056, U057, U069, U070, U077-U080, U107-U109, U112, U117, U121, U122, U133-U135, U140, U144, U151, U154, U159, U161, U165, U188, U196, U204, U205, U208-U211, U213, U216, U217, U219, U220, U225-U228, U239, U381, U404
B001-B007

Constituents:

Hazardous debris, elemental lead and mercury, spent solvents and oils, characteristic and listed wastes, and miscellaneous laboratory reagents

Method of Containment:

Containers enclosed within a modular structure and placed on an elevated floor grate.

Media of Concern:

N/A

Site Investigation Plan with Sampling and Next Step(s) Toward Corrective Action:

No action. No evidence of release. This unit was relocated to the truck bay of Building E11, where it will be closed in accordance with a NYSDEC-approved closure plan.

SWMU-051

Former Q4 Drum Pit

Unit Description:

This former unit consisted of a recessed floor pit and approximately four 55-gallon drums. The pit measured six foot square by four feet deep and its walls and floor were constructed of eight-inch thick concrete. It was used to collect process waste from Building Q4 fabrication operations. The unit, originally sand-filled and concrete-capped, was dismantled and removed in the early 1980s. Surveys of the pit walls and floor prior to dismantling indicated that historic spills had occurred within the unit.

Status:

Inactive

Approximate Period of
Operation:

1950s (dismantled in 1982/83)

Types of Waste:

Unknown

Constituents:

RCRA characteristics unknown

Method of Containment:

Secondary

Media of Concern:

Soil, groundwater

Site Investigation Plan
with Sampling and Next
Step(s) Toward Corrective
Action:

SWMU-051 is currently inaccessible for study. The Permittee will follow the procedures outlined in Condition E.2.(d) of this Permit Module.

SWMU-052

M10 Storage Facility

Unit Description:

This completely enclosed and covered storage unit is a sheet-metal-sided, steel-framed structure with a bermed concrete floor. The unit measures approximately 30 foot square and 20 feet high. The unit received RCRA interim waste storage status in August 1996, and its permitted storage capacity is 36,800 gallons. Containers of mixed waste are staged at this unit prior to off-site disposition (i.e. disposal or recycling).

Status:

Active

Approximate Period of
Operation:

1992 to present

Types of Waste:

D001-D011, D018, D019, D022, D028, D029, D035, D036, D039, D040, D042
F001-F005, F007, F009
P005, P010-P013, P015, P021, P022, P028-P030, P042, P056, P063, P064, P068, P074, P076, P078, P081, P098, P104-P106, P113, P114, P119-P121
U002, U009, U012, U019, U031, U043-U045, U052, U056, U057, U069, U070, U075-U080, U107-U109, U112, U117, U121, U122, U133-U135, U140, U144, U151, U154, U159, U161, U165, U188, U196, U204, U205, U208-U211, U213, U216, U217, U219, U220, U225-U228, U239, U381, U404
B001-B007

Constituents:

Includes construction and demolition debris coated with PCB-containing paint, elemental lead and cadmium, characteristically hazardous debris, PCB-contaminated oil which is characteristically hazardous for lead and chromium, and acetone-laden rags.

Method of Containment:

Indoor storage

Media of Concern:

N/A

Site Investigation Plan
with Sampling and Next
Step(s) Toward Corrective
Action:

No action. This unit will be closed in accordance with a NYSDEC-approved closure plan.

SWMU-053

Industrial Drain System

Unit Description:

This unit consists of those drain lines which conveyed chemical waste from the Radioactive Materials Laboratory (RML) and Buildings D3 and G2 to Building H2 for processing. The drain lines are fabricated of two-inch diameter, welded, stainless steel piping. With the exception of drains located in Building E4 Extension, all industrial drains are housed in basement pipe tunnels. The pipe tunnel walls, floors, and ceilings are constructed of concrete over six inches thick. A waterproof sealant was applied to the pipe tunnel walls and floors during construction.

Industrial drains extending from Building G2 to H2 conveyed waste from separations operations during the early 1950s. Subsequent to their use they were flushed with dilute nitric acid, drained, and capped and/or valved off. The D3/G1 industrial drain line, a stretch of underground pipe which extended from Building D3 to G1, was used from the mid-1950s until the mid-1970s to convey metallurgical waste from Building D3 to Building H2 for processing. This line was excavated and removed during 1978. A radiological survey of the excavated drain line was performed, and no releases were detected.

Status:

Inactive (except for portion which serves manipulator decontamination facility hot room)

Approximate Period of Operation:

Approximately 1950 to 1953 (except for D3/G1 line and line which serves manipulator decontamination facility hot room)

Types of Waste:

Corrosive wastewaters

Constituents:

Heavy metals, methyl isobutyl ketone, and/or organic diluents

Method of Containment:

Secondary except for E4 drains

Media of Concern:

Soil, groundwater

Site Investigation Plan
with Sampling and Next
Step(s) Toward Corrective
Action:

For any portions of the system which are in contact with the ground and not housed within basement pipe tunnels, the Permittee will perform a phased evaluation pursuant to Appendix III-F of this Module. Any analyses will be for 6 NYCRR Subpart 373-2, Appendix 33 constituents, unless data exists to justify development of a SWMU-specific parameter list. Establishment of such a list will be subject to NYSDEC approval. The evaluation will be part of the overall Sampling Visit Work Plan required in Module III, Condition E.2.(b).

SWMU-054

Wastewater Drain Systems

Unit Description:

This unit encompasses all drain lines, associated sumps, trenches, tanks, and lift/transfer stations used to convey wastewater from facilities internal to building structures. Examples include Buildings L2/L3/L6, E1/G1, and D3/C1 drain systems, as well as the site's wastewater reuse system. Drain lines are generally constructed of welded stainless steel, carbon steel, or HDPE and are predominantly located within buildings. Some exterior drains are fabricated of vitrified clay.

Status:

Active

Approximate Period of Operation:

1950 to present

Types of Waste:

Waste chemicals and dilute industrial and laboratory wastewater

Constituents:

Potential heavy metals, including elemental mercury which was removed during drain line maintenance operations

Method of Containment:

Primary

Media of Concern:

Soil, groundwater

Site Investigation Plan with Sampling and Next Step(s) Toward Corrective Action:

The Permittee will perform a phased evaluation of in-ground portions of the system, pursuant to Appendix III-F of this Module. The evaluation will be part of the Work Plan required in Module III, Condition E.2.(b). Any analyses will be conducted for 6 NYCRR Subpart 373-2, Appendix 33 parameters, unless data exists to justify development of a SWMU-specific parameter list. Establishment of such a list will be subject to NYSDEC approval.

SWMU-055

Laundry Drain System

Unit Description:

This unit consisted of drain lines which conveyed laundry wastewater from Building K4 to the K5 Retention Basin or to Building H2 for processing. It consisted of two lines extending 300 feet from Building K4 to a hillside valve pit; two lines extending 500 feet from the hillside valve pit to Building H2; and one line extending 75 feet from the valve pit to the K5 Retention Basin. Drain lines were constructed of three-inch diameter carbon steel piping and were located underground.

During the 1950s, laundry wastewater was conveyed from Building K4 to the K5 Retention Basin or to Building H2. During the early 1960s, subsequent to the 1959 laundry relocation to Building G2, wastewater was conveyed from Building H2 to the K5 Retention Basin.

Status:

Inactive

Approximate Period of Operation:

1950s to 1969 (lines removed during the late 1980s except for the K5/hillside valve pit line)

Types of Waste:

Laundry wastewater, wastewater from Building H2 processing

Constituents:

Citric and oxalic acids, EDTA, and/or phosphates, non-hazardous wastewater (potentially containing hazardous constituents) from Building H2

Method of Containment:

Primary

Media of Concern:

Soil, groundwater

Site Investigation Plan with Sampling and Next Step(s) Toward Corrective Action:

For the system's existing 75-foot stretch between hillside valve pit and K5 Retention Basin, the Permittee will perform an evaluation pursuant to Section's I, II, and IV of Appendix III-F of this Module. For the removed 500 foot stretch between the hillside valve pit and Building H2, the Permittee will submit a Work Plan for a soil boring

program as per Section III of Appendix III-F. Analysis shall be for 6 NYCRR Subpart 373-2 Appendix 33 constituents, unless data exists to justify development of a SWMU-specific parameter list. Establishment of such a list will be subject to NYSDEC approval. The evaluation will be part of the overall Sampling Visit Work Plan required in Module III, Condition E.2.(b).

SWMU-056

Storm Water Drain System

Unit Description:

This unit consists of those drain lines which conveyed wastewater from the former C2/E1 Yard Wastewater Treatment Tank (SWMU-015) and Building H2 to Outfall 001, as well as the line which discharged Q4 wastewater to an area west of the Midline Stream. This unit includes all associated sumps and transfer and lift stations. The storm water mains are constructed of 24" diameter concrete piping. Discharges from Building H2 and Yard Wastewater Treatment Tank storm water drain tie-ins are fabricated of eight-inch diameter carbon steel piping. The H2 tie-in was capped in the mid-to late 1970s.

Status:

Active

Approximate Period of Operation:

1950 to present

Types of Waste:

Dilute industrial and laboratory wastewater. Acidic and caustic solutions were reportedly bled into a manhole catch basin north of Building K4's west end.

Constituents:

Trace levels of heavy metals, other constituents undetermined

Method of Containment:

Primary

Media of Concern:

Soil, groundwater, surface water and sediment (SPDES outfall to Mohawk River)

Site Investigation Plan with Sampling and Next Step(s) Toward Corrective Action:

The Permittee will perform a phased evaluation, pursuant to Appendix III-F of this Module, for both active and inactive in-ground portions of this system. The evaluation will be part of the Work Plan required in Module III, Condition E.2.(b).

Included in the evaluation will be an assessment of the potential for off-site impact of pre-SPDES discharges. Residual sediments at system manholes/catch basins will be characterized and sampled, as

appropriate. Evaluation of conditions at system outfall locations may be required, based on the Appendix III-F evaluation.

Analyses will be conducted for 6 NYCRR Subpart 373-2, Appendix 33 parameters, unless data exists to justify development of a SWMU-specific parameter list. Establishment of such a list will be subject to NYSDEC approval.

SWMU-057

Pipe Tunnels

Unit Description:

This unit consists of tunnels located in and connecting the basements of Building G2 and H2. The tunnels are over five feet wide and eight feet high. They were constructed to house industrial and wastewater drain lines from operations in Buildings G2, G1, and E1. Wastewater was allegedly accumulated within these tunnels on occasion. Tunnel walls, floors, and ceilings are constructed of concrete over six inches thick. A waterproof sealant was applied to the unit's walls and floor during construction. Copper water stops were also installed at all construction joints. During a 1989 inspection, groundwater intrusion was observed at an expansion joint located at the north end of Building G2. High water marks and stains were also observed on tunnel walls and floors. Radioactivity detected in the Building H2 footing drains indicates a potential release.

Status:

Inactive

Approximate Period of Operation:

1950 to 1953

Types of Waste:

Wastewater potentially containing heavy metals

Constituents:

Specific constituents undetermined

Method of Containment:

Primary

Media of Concern:

Soil, groundwater

Site Investigation Plan with Sampling and Next Step(s) Toward Corrective Action:

The Permittee will conduct a Sampling Visit (SV) of the soils in the vicinity of the unit to determine if contaminant releases have occurred. An examination of potential or likely release points, as well as a review of the location of previously detected radioactivity in soils, will be used in designing the sampling program. Results of the program may be used to determine if other environmental media of concern require investigation.

Analysis will be for 6 NYCRR Subpart 373-2, Appendix 33 parameters, unless data exists to justify development of a SWMU-specific parameter list. Establishment of such a list will be subject to NYSDEC approval.

SWMU-058

SPRU Tank 527

Unit Description:

This stainless steel, cylindrical tank measures three feet in diameter and four feet high. It has a 200 gallon capacity and is located in Cell 3 of the former Separations Process Research Unit (SPRU) in Building G2. Cell 3 is constructed of five foot thick concrete walls and has a two foot thick concrete floor and a five foot thick concrete ceiling. The cell is lined with a stainless steel floor pan. A plastic containment coating was applied to the cell walls during construction. The tank formerly accumulated aqueous waste generated from the SPRU operations. When a significant quantity of waste was accumulated, it was transferred to Building H2 for processing. Immediately subsequent to SPRU operations, the tank was drained, flushed with a dilute nitric acid solution, and rinsed with water.

Status:

Inactive

Approximate Period of
Operation:

1950 to 1953

Types of Waste:

Corrosive liquid waste

Constituents:

Heavy metals, other constituents undetermined

Method of Containment:

Secondary

Media of Concern:

Soil, groundwater

Site Investigation Plan
with Sampling and Next
Step(s) Toward Corrective
Action:

No action. No evidence of release to environmental media, due to containment structures.

SWMU-059

SPRU Tank 531

Unit Description:

This stainless steel, cylindrical tank measures four feet in diameter and five feet high. It has a 500 gallon capacity and is located in the East Bay of Cell 5 in the SPRU. Cell 5 is constructed of two to five foot thick concrete walls and has a two foot thick concrete floor and ceiling. The cell is lined with a stainless steel floor pan. A plastic containment coating was applied to the cell walls during construction. The tank formerly accumulated spent organic solvent generated from the SPRU operations. When a significant amount of spent solvent was accumulated, it was transferred to SPRU Tank 316 for reclamation. Immediately subsequent to SPRU operations, the tank was drained, flushed with a dilute nitric acid solution, and rinsed with water.

Status:

Inactive

Approximate Period of
Operation:

1950 to 1953

Types of Waste:

Spent organic solvents mixed with tributyl phosphate

Constituents:

Methyl isobutyl ketone, others undetermined

Method of Containment:

Secondary

Media of Concern:

Soil, groundwater

Site Investigation Plan
with Sampling and Next
Step(s) Toward Corrective
Action:

No action. No evidence of release to environmental media, due to containment structures.

SWMU-060

SPRU Tank 532

Unit Description:

This stainless steel, cylindrical tank measures four feet in diameter and four feet high. It has a 400 gallon capacity and is located in the East Bay of Cell 5 in the SPRU. Cell 5 is constructed of two to five foot thick concrete walls and has a two foot thick concrete floor and ceiling. The cell is lined with a stainless steel floor pan. A plastic containment coating was applied to the cell walls during construction. Formerly, this tank accumulated aqueous waste generated from SPRU operations. When a significant quantity of waste was accumulated, it was transferred to Building H2 for processing. Immediately subsequent to SPRU operations, the tank was drained, flushed with a dilute nitric acid solution, and rinsed with water.

Status:

Inactive

Approximate Period of Operation:

1950 to 1953

Types of Waste:

Corrosive liquid waste

Constituents:

Heavy metals, other constituents undetermined

Method of Containment:

Secondary

Media of Concern:

Soil, groundwater

Site Investigation Plan with Sampling and Next Step(s) Toward Corrective Action:

No action. No evidence of release to environmental media, due to containment structures.

SWMU-061

SPRU Tank 534

Unit Description:

This stainless steel, cylindrical tank measures four and one-half feet in diameter and six feet high. It has a 750 gallon capacity and is located in the East Bay of Cell 5 in the SPRU. Cell 5 is constructed of two to five foot thick concrete walls and has a two foot thick concrete floor and ceiling. The cell is lined with a stainless steel floor pan. A plastic containment coating was applied to the cell walls during construction. Formerly, the tank accumulated spent organic solvent generated from SPRU operations. When a significant amount of spent solvent was accumulated, it was transferred to SPRU Tank 316 for reclamation. Immediately subsequent to SPRU operations, the tank was drained, flushed with a dilute nitric acid solution, and rinsed with water.

Status:

Inactive

Approximate Period of
Operation:

1950 to 1953

Types of Waste:

Spent organic solvent mixed with tributyl phosphate

Constituents:

Methyl isobutyl ketone. Other constituents undetermined.

Method of Containment:

Secondary

Media of Concern:

Soil, groundwater

Site Investigation Plan
with Sampling and Next
Step(s) Toward Corrective
Action:

No action. No evidence of release to environmental media, due to containment structures.

SWMU-062

SPRU Tank 551

Unit Description:

This stainless steel, cylindrical tank measures two feet in diameter and three and one-half feet high. It has a 75 gallon capacity and is located in the East Bay of Cell 5 in the SPRU. Cell 5 is constructed of two to five foot thick concrete walls and has a two foot thick concrete floor and ceiling. The cell is lined with a stainless steel floor plan. A plastic containment coating was applied to the cell walls during construction. Formerly, the tank accumulated aqueous waste generated from SPRU operations. When a significant quantity of waste was accumulated, it was transferred to Building H2 for processing. Immediately subsequent to SPRU operations, the tank was drained, flushed with a dilute nitric acid solution, and rinsed with water.

Status:

Inactive

Approximate Period of
Operation:

1950 to 1953

Types of Waste:

Corrosive liquid waste

Constituents:

Heavy metals, other constituents undetermined

Method of Containment:

Secondary

Media of Concern:

Soil, groundwater

Site Investigation Plan
with Sampling and Next
Step(s) Toward Corrective
Action:

No action. No evidence of release to environmental media, due to containment structures.

SWMU-063

SPRU Tank 536

Unit Description:

This stainless steel, cylindrical tank measures two and one-half feet in diameter and three feet high. It has a 100 gallon capacity and is located in the East Bay of Cell 5 in the SPRU. Cell 5 is constructed of two to five foot thick concrete walls and has a two foot thick concrete floor and ceiling. The cell is lined with a stainless steel floor pan. A plastic containment coating was applied to the cell walls during construction. Formerly, the tank accumulated spent organic solvent generated from SPRU operations. When a significant amount of spent solvent was accumulated, it was transferred to SPRU Tank 316 for reclamation. Immediately subsequent to SPRU operations, the tank was drained, flushed with a dilute nitric acid solution, and rinsed with water.

Status:

Inactive

Approximate Period of
Operation:

1950 to 1953

Types of Waste:

Spent organic solvent mixed with tributyl phosphate

Constituents:

Methyl isobutyl ketone. Other constituents undetermined.

Method of Containment:

Secondary

Media of Concern:

Soil, groundwater

Site Investigation Plan
with Sampling and Next
Step(s) Toward Corrective
Action:

No action. No evidence of release to environmental media, due to containment structures.

SWMU-064

SPRU Tank 316

Unit Description:

This stainless steel, cylindrical tank measures five feet in diameter and seven feet high. It has a 1,000 gallon capacity and is located at the south end of Cell 5 in the SPRU. Cell 5 is constructed of two to five foot thick concrete walls and has a two foot thick concrete floor and ceiling. The cell is lined with a stainless steel floor pan. A plastic containment coating was applied to the cell walls during construction. Formerly, spent solvent was transferred to this tank, where the solvent underwent a three step wash cycle. The solvent was first washed with water, then a caustic solution, and last with nitric acid. It would then be reused as a process ingredient.

Status:

Inactive

Approximate Period of
Operation:

Early 1950s

Types of Waste:

Spent organic diluent mixed with tributyl phosphate

Constituents:

Methyl isobutyl ketone, other constituents
undetermined

Method of Containment:

Secondary

Media of Concern:

Soil, groundwater

Site Investigation Plan
with Sampling and Next
Step(s) Toward Corrective
Action:

No action. No evidence of release to environmental media, due to containment structures.

SWMU-065

FCPE Discharge Tank

Unit Description:

The Full Core Physics Experiment (FCPE) Discharge Tank is located at the lower level of F Building (partly below grade), adjacent to a similar concrete “charge” tank. The two tanks have a common wall. Each tank measures approximately eight feet wide by 15 feet long by 13 feet deep and is constructed of 12-inch thick concrete. The bottom ten feet of the tanks are lined with stainless steel. Access to each tank is provided by a manhole. The tanks are equipped with liquid level indicators.

The tanks, designated the charge and discharge tanks, were constructed in the mid-1960s. The charge tank was used to store coolant (deionized water with traces of hydrazine) prior to use, and the discharge tank was used to store coolant subsequent to its use. Coolant was recycled via deionization columns and reused. The tanks were drained and taken out of service in August 1995. Less than one inch of residue remains within the tanks.

Status:

Inactive

Approximate Period of Operation:

Mid-1960s to 1995

Types of Waste:

Non-hazardous primary coolant

Constituents:

Hydrazine

Method of Containment:

Primary

Media of Concern:

Soil, groundwater

Site Investigation Plan
with Sampling and Next
Step(s) Toward Corrective
Action:

No action. No evidence of release to environmental media.

SWMU-066

Nuclear Material Storage Vault

Unit Description:

This area, located within the F Building Complex, consists of a concrete fuel storage vault which measures approximately 14 feet wide by 32 feet long. Its walls are constructed of two to six foot-thick concrete, and its floor is an eight-inch concrete slab. The unit was initially used to house a zero-power neutron reactor during the 1950s to the 1980s. From this time until the 1990's, the unit was used for fuel cell storage. When fuel storage operations ceased, the vault was used for a brief period of time during 1994 and 1995 to store construction and demolition debris.

Status:

Active

Approximate Period of Operation:

1994-1995 (waste storage)

Types of Waste:

C & D debris

Constituents:

No hazardous constituents known

Method of Containment:

Primary

Media of Concern:

Soil, groundwater

Site Investigation Plan with Sampling and Next Step(s) Toward Corrective Action:

No action. No evidence of release of hazardous constituents.

SWMU-067

E11 Waste Processing Facility

Unit Description:

Building E11 was constructed in 1997 to house waste processing equipment. The structure consists of a reinforced concrete foundation with a combination of reinforced concrete and steel framed prefabricated walls. A reinforced concrete floor slab resides within the structure. The slab slopes toward the center of the building. The slab and concrete walls are coated with an epoxy sealant. Within the structure, wastewater will be processed for reuse, liquid wastes will be solidified, solid waste will be segregated and packaged, compressible waste will be compacted and containerized, and containerized waste will be staged for off-site disposition.

The wastewater system is situated within an epoxy coated bermed section of the building and consists of four 6,250 gallon steel, above ground tanks (two tanks for treated wastewater and two for untreated), several roughing filters, carbon filters, ion exchange columns, polishing filters, and ultraviolet treatment systems.

Status:

Active

Approximate Period of Operation:

Operations to commence late 1997.

Types of Waste:

Dilute laboratory wastewaters and compressible and non-compressible solid wastes

Constituents:

Trace levels of heavy metals and organics

Method of Containment:

Indoor operation

Media of Concern:

Soil, groundwater

Site Investigation Plan with Sampling and Next Step(s) Toward Corrective Action:

Newly constructed unit. No action.

SWMU-068

E11 Mixed Waste Modular Additions

Unit Description:

These modular, prefabricated mixed waste storage units will be located within the Building E11 truck bay. Each unit is self-contained and is equipped with leak detection, control, and countermeasure devices. The modular units are designated E11MA-S and E11MA-L. E11MA-S was previously located adjacent to Building H2 and was referred to as H2MA (SWMU-050). E11MA-L is a new unit. The total permitted mixed waste storage capacity between the two modular units is 1,320 gallons.

Status:

Active

Approximate Period of Operation:

Operations commenced late 1997.

Types of Waste:

D001-D011, D018, D019, D022, D028, D029, D035, D036, D039, D040, D042
F001-F005, F007, F009
P005, P010-P013, P015, P021, P022, P028, P029, P030, P042, P056, P063, P064, P068, P074, P076, P078, P081, P098, P104-P106, P113, P114, P119, P120, P121
U002, U009, U012, U019, U031, U043-U045, U052, U056, U057, U069, U070, U077-U088, U107-U109, U112, U117, U121, U122, U133-U135, U140, U144, U151, U154, U159, U161, U165, U188, U196, U204, U205, U208-U211, U213, U216, U217, U219, U220, U225-U228, U239, U381, U404
B001-B007

Constituents:

Hazardous debris, elemental lead and mercury, spent solvents and oils, characteristic and listed wastes, and miscellaneous laboratory chemicals

Method of Containment:

Indoor operation

Media of Concern:

Soil, groundwater

Site Investigation Plan
with Sampling and Next
Step(s) Toward Corrective
Action:

No action. Modular units will be closed in accordance with a NYSDEC approved closure plan which will be issued with the facility's 6 NYCRR Part 373 Permit.

SWMU-069

K4 Holding Tank

Unit Description:

This 11,500 gallon, above-ground, insulated stainless steel tank is located outside of the north side of the boiler house in a covered, concrete secondary containment unit. The tank measures 11'6" in diameter by 16'4" long.

Neutralized boiler blowdown and dealkalizer regeneration wastewater is accumulated within this unit prior to being released to the site's storm water drain system.

Status:

Active

Approximate Period of Operation:

Operations commenced in September 1997

Types of Waste:

Neutralized boiler blowdown (pH ~8.0) and wastewater treatment system regeneration wastewater (pH ~8.0)

Constituents:

Iron

Method of Containment:

Secondary

Media of Concern:

Soil, groundwater

Site Investigation Plan with Sampling and Next Step(s) Toward Corrective Action:

No action. Newly constructed unit. Discharges to a SPDES-regulated outfall.

SWMU-070

Q1 ≤90 Day Waste Accumulation Area

Unit Description:

This ≤ 90 day waste accumulation area, located between Buildings Q1 and M2, consists of a box trailer measuring 8 foot wide by 46 foot long. Containers of waste, ranging from 1 to 55 gallons in size, as well as PCB articles, are stored within the unit prior to off-site disposition. An 8 inch steel curb serves as a secondary containment structure within the trailer. The unit is a TSCA and contingent hazardous waste storage area.

Status:

Active

Approximate Period of
Operation:

July 1996 through the present

Types of Waste:

Solid and liquid hazardous and PCB wastes

Constituents:

Similar to SWMU-010

Method of Containment:

Secondary

Media of Concern:

Soil, groundwater

Site Investigation Plan
with Sampling and Next
Step(s) Toward Corrective
Action:

No action. No evidence of release to environmental media.

SWMU-071

L9 \leq 90 Day Waste Accumulation Area

Unit Description:

This \leq 90 day waste accumulation area, located east of Building L9, consists of a small modular building, measuring 8 foot wide by 20 foot long. A portion of the modular building is used for waste storage. The building is completely enclosed and has an integrated secondary containment structure. The unit is used as a contingent waste storage area for containers of hazardous waste, prior to off-site disposition and/or relocation to Building Q1 (SWMU-010). Waste containers may range from 1 to 55 gallons in size.

Status:

Active

Approximate Period of Operation:

September 1997 through the present

Types of Waste:

Solid and liquid hazardous waste

Constituents:

Similar to SWMU-010

Method of Containment:

Secondary

Media of Concern:

Soil, groundwater, surface water, sediment (via potential runoff to Mohawk River)

Site Investigation Plan with Sampling and Next Step(s) Toward Corrective Action:

No action. No evidence of release to environmental media.

SWMU-072

F4 \leq 90 Day Waste Accumulation Area

Unit Description:

This \leq 90 day waste accumulation area, located within Building F4, consists of an approximately 1600 square foot floor area where containerized wastes are stored. The floor area is equipped with a welded stainless steel secondary containment structure. Containers generally range from 1 to 55 gallons in size; however, some larger box containers may be used. Recyclable materials are prepared for off-site recycling in the vicinity of the area. Preparation includes disassembly, segregation, and/or paint stripping. Wastes generated from preparation activities are containerized and stored in this area prior to off-site disposition and/or relocation to H2MA (SWMU-050) or the E11 Mixed Waste Modular Additions (SWMU-068).

Status:

Active

Approximate Period of Operation:

July 1996 through the present

Types of Waste:

Solid and liquid hazardous and PCB wastes

Constituents:

Predominantly PCB wastes; however, hazardous waste may be stored on occasion.

Method of Containment:

Indoors

Media of Concern:

Soil, groundwater

Site Investigation Plan with Sampling and Next Step(s) Toward Corrective Action:

No action. No evidence of release to environmental media.

SWMU-073

H2 \leq 90 Day Waste Accumulation Area

Unit Description:

This \leq 90 day waste accumulation area, located on the 332-foot level within Building H2, consists of an approximately 25 square foot floor area where containerized wastes are stored prior to off-site disposition and/or relocation to H2MA (SWMU-050) or the E11 Mixed Waste Modular Additions (SWMU-068). Waste containers range from 1 to 55 gallons in size and are generally stored on or within a secondary containment structure.

Status:

Active

Approximate Period of Operation:

November 1996 through the present

Types of Waste:

Solid and liquid hazardous waste

Constituents:

Similar to SWMU-050

Method of Containment:

Indoors

Media of Concern:

Soil, groundwater

Site Investigation Plan with Sampling and Next Step(s) Toward Corrective Action:

No action. No evidence of release to environmental media.

SWMU-074

PTR Hold Tank

Unit Description:

This 4,000-gallon, above-ground, stainless steel-lined, carbon steel tank is located within the Building E5 basement equipment room, adjacent to the Pressurized Test Reactor (PTR) cell. The horizontal tank measures 8 foot in diameter and 14 foot long. The tank is equipped with a liquid level indicator (sight glass).

The inactive tank is hard piped to the PTR test facility. It stored coolant (deionized water with trace quantities of hydrazine added) during test facility operation. Coolant, pumped from the tank to the test facility, would return to the tank and be reprocessed. Reprocessing consisted of running the spent coolant through a series of mixed bed ion exchange columns. The PTR test facility operated from the late 1950s until the mid-1970s. Subsequent to test facility operation, the tank continued to store coolant in lieu of disposal until the early 1990s, when the coolant was transferred to Building H2 (SWMU-030) for processing and discharge.

Status:

Inactive

Approximate Period of Operation:

Late 1950s until early 1990s

Types of Waste:

Non-hazardous primary coolant (deionized water) with trace quantities of hydrazine added. Hydrazine converts to ammonia when added to water.

Constituents:

Hydrazine

Method of Containment:

Indoors on concrete floor

Media of Concern:

Soil, groundwater

Site Investigation Plan with Sampling and Next Step(s) Toward Corrective Action:

No action. No evidence of release to environmental media.

SWMU-075

Former CWA Hold Tank

Unit Description:

This former 5,000-gallon, above-ground, stainless steel tank was located within the Building E5 Cold Water Assembly (CWA) cell. The horizontal tank measured 8 foot in diameter and 15 foot long.

The former tank was hard piped to the CWA test facility and stored coolant (deionized water, no hydrazine) during test facility operation. Coolant, pumped from the tank to the test facility, would return to the tank and be reprocessed. Reprocessing consisted of running the spent coolant through a series of mixed bed ion exchange columns. The CWA test facility operated from the early 1960s until the early 1980s. Subsequent to test facility operation, the tank contents were transferred to Building H2 (SWMU-030) for processing and discharge. During the early 1980s, the tank was disassembled, sectioned, and transferred off-site for appropriate disposal.

Status:

Inactive

Approximate Period of Operation:

Early 1960s until early 1980s

Types of Waste:

Non-hazardous primary coolant (deionized water)

Constituents:

No hazardous constituents known.

Method of Containment:

Indoors on concrete floor

Media of Concern:

Soil, groundwater

Site Investigation Plan with Sampling and Next Step(s) Toward Corrective Action:

No action. No evidence of release to environmental media.

SWMU-076

Former CWTA Hold Tank

Unit Description:

This former 5,800-gallon, above-ground, stainless steel tank was located within the Building E7 Cold Water Test Assembly (CWTA) cell. The horizontal tank measured 8 foot in diameter and 17 foot long.

The former tank was hard piped to the CWTA test facility and stored coolant (deionized water, no hydrazine) during test facility operation. Coolant, pumped from the tank to the test facility, would return to the tank and be reprocessed. Reprocessing consisted of running the spent coolant through a series of mixed bed ion exchange columns. The CWTA test facility operated from the early 1960s until the early 1970s. Subsequent to test facility operation in the early 1970s, the tank contents were transferred to the PTR Hold Tank (SWMU-074). During the early to mid-1970s, the tank was disassembled, sectioned, and transferred off-site for appropriate disposal.

Status:

Inactive

Approximate Period of Operation:

Early 1960s until early 1970s

Types of Waste:

Non-hazardous primary coolant (deionized water)

Constituents:

No hazardous constituents known.

Method of Containment:

Indoors on concrete floor

Media of Concern:

Soil, groundwater

Site Investigation Plan with Sampling and Next Step(s) Toward Corrective Action:

No action. No evidence of release to environmental media.

SWMU-077

Former ATR Hold Tanks

Unit Description:

These two identical above-ground, stainless steel tanks were located within the Building F3 Advanced Test Reactor (ATR) cell and had a combined capacity of 750 gallons. The vertical tanks measured 3.5 foot in diameter and 6 foot high.

The former tanks were hard piped to the ATR test facility and stored coolant (deionized water with trace quantities of hydrazine) during ATR test facility operation. Coolant, pumped from the tank to the test facility, would return to the tank and be reprocessed. Reprocessing consisted of running the spent coolant through a series of mixed bed ion exchange columns. The ATR test facility operated from the mid-1950s until the early 1970s. Subsequent to test facility operation, the tanks' contents were transferred to Building H2 for processing and disposal (i.e. discharge). The test facility, including hold tanks, was disassembled and shipped to another Department of Energy facility for use.

Status:

Inactive

Approximate Period of Operation:

Mid-1950s until early 1970s

Types of Waste:

Non-hazardous primary coolant (deionized water) with trace quantities of hydrazine added. Hydrazine converts to ammonia when added to water.

Constituents:

Hydrazine

Method of Containment:

Indoors on concrete floor

Media of Concern:

Soil, groundwater

Site Investigation Plan with Sampling and Next Step(s) Toward Corrective Action:

No action. No evidence of release to environmental media.

AOC-001

Hillside Area

Unit Description:

This AOC consists of the hillside land area located west of Buildings D3, D4, G1, G2, and H2. Incidental chemical product spills have resulted in the contamination of groundwater and soil in this area. In particular, an adjacent area, the D3/D4 Yard, served as a storage location for drums containing various volatile organic compounds (VOCs) used at the facility in the early part of its history. An Interim Corrective Measure (ICM) was performed at the Yard from 9/96 to 2/97, which involved excavation of the VOC-contaminated soils. Wells B-5 and B-15 have demonstrated consistent VOC contamination (t-1,2-dichloroethene, trichloroethene, chloroform, carbon tetrachloride, 1,1-dichloroethene, vinyl chloride) in annual sampling.

Status:

N/A

Approximate Period of Operation:

N/A

Types of Waste:

N/A

Constituents:

Acetone, carbon tetrachloride, chloroform, 1,1-dichloroethene, t-1,2-dichloroethene, hexane, methylene chloride, tetrachloroethylene, tetrahydrofuran, trichloroethene, and vinyl chloride

Method of Containment:

N/A

Media of Concern:

Soil, groundwater

Site Investigation Plan with Sampling and Next Step(s) Toward Corrective Action:

The Permittee will conduct a RCRA Facility Investigation (RFI) as per Appendix III-B of this Module, to define areal and vertical extent and concentration of contamination for environmental media of concern. Initial analysis will be conducted for 6 NYCRR 373-2 Appendix 33 parameters, unless data exists to justify development of an AOC-specific parameter list. Establishment of such a list will be subject to NYSDEC approval.

For the D3/D4 Yard, the Permittee shall submit to the Commissioner, for approval, a Report which evaluates previous Interim Corrective Measures, in terms of the final remedial goals specified in Module Condition A.2, sixth paragraph, and others as provided by the Commissioner, no later than one-hundred and eighty (180) calendar days prior to the date when the Yard becomes accessible for investigation. Accessibility to the Yard shall be considered achievable when the impediment to further investigation (e.g. building, utilities) is demolished, abandoned, or is altered in a manner that would allow access to the Yard. The Commissioner may, at any point prior to that time, require additional investigations and/or monitoring should it become apparent that residual contamination may impact human health and the environment. As a result of the Evaluation Report, the Commissioner may require performance of a Corrective Measures Study (CMS), as per Module Condition E.9 and according to the schedules therein, and/or a Risk Assessment as per current NYSDEC protocol.

Unit Description:

This area of concern consists of seven similar sub-areas where PCB-containing dielectric fluid releases, or suspected releases, occurred from transformers. All PCB-containing transformers were voluntarily replaced with "dry," non-PCB-containing transformers during the mid-1990s. In some areas, the associated switch gear was neither removed nor replaced due to operational concerns. [Note: Switch gear contains no dielectric fluids]. The individual sub-areas are discussed in detail below.

Area A: This area consists of the soil beneath the Building L3 transformer room. Transformers and switch gear were housed in this room since the early 1950s. Leaks of PCB-containing dielectric fluid from the transformers penetrated the concrete floor and contaminated the underlying soil. During 1994 and 1995, the transformers, associated switch gear, and concrete floor were removed and the underlying soil was remediated. Confirmation soil sample results show the maximum remaining PCB soil concentration is 23 mg/kg.

Area B: This area consists of the soil beneath Load Center (transformer) 1 East (LC-1E) and its associated switch gear, located in the Building G1 basement. LC-1E has been housed in the Building G1 basement since the early 1950s. Leaks of PCB-containing dielectric fluid penetrated the concrete floor and contaminated the underlying soil. Swipe samples of the floor showed PCB concentrations up to 316,000 ug/100 cm². During 1997, LC-1E was replaced, the contaminated floor was removed, and the underlying soil was remediated. Nine confirmation samples were collected subsequent to the remediation. Confirmation soil sample results show the maximum remaining PCB soil concentration is 0.8 mg/kg. Floor staining beneath the switch gear was visible during transformer removal and may indicate additional PCB-contaminated soil under the switch gear.

Area C: This area consists of the soil beneath Load Center (transformer) 1 West (LC-1W), located in the Building G1 basement. LC-1W has been housed in the Building G1 basement since the early 1950s and uses the same switch gear identified above in Area B. Leaks of PCB-containing dielectric fluid contaminated the underlying floor. Swipe samples of the floor showed PCB concentrations up to 940 ug/100 cm². During 1997, LC-1W was replaced and the floor was decontaminated (double washed and rinsed). Swipe samples

subsequent to floor decontamination showed PCB concentrations up to 160 ug/100 cm². The floor area was subsequently sealed with two coats of paint.

Area D: This area consists of the soil beneath Load Center (transformer) 2 (LC-2) and its associated switch gear, located in Building K4 - the Boiler House. LC-2 has been housed in the Boiler House since the early 1950s. Leaks of PCB-containing dielectric fluid penetrated the concrete floor and contaminated the underlying soil. Swipe samples of the floor showed PCB concentrations up to 370,000 ug/100 cm². During 1996 and 1997, LC-2 was replaced and the floor was removed. Nine confirmation samples were collected from the underlying soil. Confirmation soil sample results show the maximum PCB soil concentration is 4.0 mg/kg. Floor staining beneath the switch gear was visible during transformer removal and may indicate additional PCB-contaminated soil under the switch gear.

Area E: This area consists of the soil beneath Load Center (transformer) 8 (LC-8) and its associated switch gear, located in the Building G1 basement. LC-8 has been housed in the Building G1 basement since the early 1950s. Leaks of PCB-containing dielectric fluid penetrated the concrete floor and contaminated the underlying soil. Swipe samples of the floor showed PCB concentrations up to 1,500 ug/100 cm². During 1996 and 1997, LC-8 was replaced and the floor was removed. Seven confirmation samples were collected from the underlying soil. Confirmation soil sample results show the maximum PCB soil concentration is 23 mg/kg. PCB contamination under adjacent undisturbed switch gear is not anticipated because no floor stains were visible during transformer removal.

Area F: This area consists of the soil beneath Load Center (transformer) 22 (LC-22) and its associated switch gear, located in the Building L4 Pump House. LC-22 has been housed in the Pump House since the early 1950s. Leaks of PCB-containing dielectric fluid penetrated the concrete floor and contaminated the underlying soil. Swipe samples of the floor showed PCB concentrations up to 136,000 ug/100 cm². During 1996, LC-22 was replaced and the underlying floor was removed. Two confirmation samples were collected from the underlying soil. Confirmation soil sample results show the PCB soil concentration is <0.3 mg/kg. PCB contamination under adjacent undisturbed switch gear is not anticipated because no floor stains were visible during transformer removal.

Area G: This area consists of the soil beneath Load Center (transformer) 27 (LC-27) and its associated switch gear, located in the Building A1 basement. LC-27 has been housed in the Building A1 basement since the early 1950s. Leaks of PCB-containing dielectric fluid contaminated the underlying floor. Swipe samples of the floor showed PCB concentrations up to 51,000 ug/100 cm²; however, floor tile removal revealed a sealed (painted) concrete floor. During 1997 and 1998, the transformer and the associated switch gear were replaced and the underlying concrete floor was decontaminated (double washed and rinsed). Swipe samples subsequent to floor decontamination showed PCB concentrations up to 120 ug/ 100 cm². Additional decontamination activities are currently on-going.

Status: N/A

Approximate Period of Operation: 1950s to 1997

Types of Waste: Dielectric fluid leaks from load centers and transformers

Constituents: PCBs

Method of Containment: N/A

Media of Concern: Soil, groundwater

Site Investigation Plan with Sampling and Next Step(s) Toward Corrective Action: Areas included in AOC-002 are currently inaccessible. The Permittee will follow the procedures outlined in Conditions E.2.(d) and E.5.(c) of this Permit Module.

AOC-003

Lower Level Parking Lot

Unit Description:

This AOC consists of the fill material located below and adjacent to a 250-foot square lower level parking lot. Fill material obtained from former waste management areas was used to expand the lot during August, 1962. The fill was obtained from an area between Storage Pads K6 and K7 as well as the Railroad Staging Area (SWMU-038). Radioactivity has been detected in the fill material, indicating a historic release.

Status:

N/A

Approximate Period of Operation:

1962

Types of Waste:

Fill material possibly containing “slurry waste” from Building H2 operations (See description for SWMU-030)

Constituents:

Heavy metals, other constituents unknown

Method of Containment:

None

Media of Concern:

Soil, groundwater, surface water and sediment (via potential for runoff to Mohawk River, West Boundary Stream)

Site Investigation Plan with Sampling and Next Step(s) Toward Corrective Action:

The Permittee will conduct a Sampling Visit (SV) consisting of unbiased soil sampling (e.g. grid pattern and/or at regular intervals) designed to detect potential contaminant release from the unit. More focused sampling may be required in areas of obvious disposal or release. Results of the soil sampling program may be used to determine if other environmental media of concern require investigation.

Analysis will be for 6 NYCRR Subpart 373-2, Appendix 33 parameters, unless data exists to justify development of a SWMU-specific parameter list. Establishment of such a list will be subject to NYSDEC approval.

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

DIVISION OF MATERIALS MANAGEMENT

PART 373 PERMIT MODULE III - STORAGE IN CONTAINERS

U.S. Department of Energy
Knolls Atomic Power Laboratory
NY6890008992

Niskayuna, New York
Schenectady County

- A. AUTHORIZED STORAGE AREAS, WASTE TYPES AND STORAGE VOLUME. The Permittee may operate the following container storage areas at the facility and store the following wastes in containers in these areas up to the volumes listed, subject to the terms of the Permit.

UNIT	WASTE TYPE	TYPICAL CONTAINER VOLUME ⁽¹⁾	TOTAL VOLUME CAPACITY OF WASTE MANAGEMENT UNIT
Building Q1 ⁽²⁾	Refer to Attachment C, Tables 1, 2, & 3	< 1 to 202 gallons ⁽²⁾	6,600 gallons
E11 Truck Bay Modular Addition ⁽⁴⁾	Refer to Attachment C, Tables 1, 2, & 3	< 1 to 95 gallons ⁽⁵⁾	1,320 gallons
E11 Waste Processing Facility	Refer to Attachment C, Tables 1, 2, & 3	< 1 to 718 gallons ⁽⁶⁾	7,180 gallons
E4-Extension Floor Vaults (numbered 2, 3, 5, & 6)	Refer to Attachment C, Tables 1, 2, & 3	< 1 to 95 gallons ⁽⁵⁾	2,600 gallons

Notes:

- (1) Larger containers than those listed below may also be placed in the units, provided that the requirements of 6 NYCRR Part 373-2.9(f)(iii) are met.
- (2) The Building Q1 permitted unit consists of both Q1-south (1,650 gallons) and the Q1-extension (4,950 gallons).
- (3) Typical container volumes for wastes in this unit range from <1 gallon to 202-gallon containers (which are 3 ft. x 3 ft. x 3 ft. boxes).
- (4) The permitted unit consists of a prefabricated modular structure (E11 MA-L) and has an authorized capacity of 1,320 gallons. The structure is located on the southwest side of the Building E11 truck bay.
- (5) Typical container volumes for wastes in this unit may range from <1 gallon to 95-gallon overpack/salvage drums.
- (6) Typical container volumes for wastes managed in these units may range from <1 gallon to 718-gallon (4 ft. x 4 ft. x 6 ft.) metal boxes.

The total container storage capacity for hazardous and mixed waste is 17,700 gallons. The hazardous and mixed waste storage locations include Building Q1, E11 Truck Bay Modular Addition, E11 Waste Processing Facility, and E4-Extension.

The Permittee must comply with 6 NYCRR 373-2.9 as cited below and with the portions of the Permit Application incorporated by reference into this Permit. The Permittee is authorized to store only the hazardous wastes/mixed wastes identified in Attachment C of the Approved Part 373 Permit Application, which are generated at the Permittee's facility.

- B. CONDITION OF CONTAINERS - 6 NYCRR 373-2.9(b). If a container holding hazardous/mixed waste is not in good condition (e.g., severe rusting, apparent structural defects, deterioration of liner) or if it begins to leak, the Permittee shall transfer the hazardous/mixed waste from such container to a container that is in good condition or otherwise manage the waste in compliance with the conditions of this Permit. Each such occurrence shall be recorded in the inspection log and maintained as part of the operating record required by Module I, Condition D.5.(c) and Subpart 373-2.5(c). If any leaking container threatens human health or the environment, the Permittee must immediately report the situation as specified in Module I, Condition G, (i.e., Oral Reports).
- C. COMPATIBILITY OF WASTE WITH CONTAINERS - 6 NYCRR 373-2.9(c). The Permittee must use a container made of or lined with materials that will not react with, and is otherwise compatible with, the hazardous/mixed waste to be stored, so that the ability of the container to contain the waste is not impaired and in accordance with the Permit Application.
- D. MANAGEMENT OF CONTAINERS - 6 NYCRR 373-2.9(d).
1. A container holding hazardous/mixed waste must always be closed during storage, except when it is necessary to add or remove waste.

2. A container holding hazardous/mixed waste must not be opened, handled, or stored in a manner which may rupture the container or cause it to leak.
3. Containers holding hazardous/mixed waste must be marked with the words "Hazardous Waste" and with other words identifying their contents, as well as the hazards of the contents. Such containers must be stored in a clearly designated area separate from nonhazardous wastes and other materials. All material stored in an area designated for Hazardous Waste will be subject to all the terms and conditions of this permit. These terms and conditions include all the applicable container management attributes found in the permit (e.g., storage volume, condition of containers, compatibility of waste with containers, management of containers, special requirements for incompatible waste, inspections).

- E. INSPECTIONS - 6 NYCRR 373-2.9(e). The Permittee must inspect areas where containers are stored, looking for leaking containers and for deterioration of containers and/or the containment system caused by corrosion or other factors at least weekly, and comply with the Inspection Plan in the Permit Application which may require a more frequent inspection schedule. Loading and unloading areas must be inspected daily when in use (373-2.2(g)(2)(iv)). The Permittee must maintain adequate aisle space in accordance with Attachment F of the Approved Part 373 Permit Application, to allow the unobstructed movement of personnel, fire protection equipment, spill control equipment and decontamination equipment to any area of the facility in an emergency as required by 6 NYCRR 373-2.3(f), and to provide access for inspections as required by 6 NYCRR 373-2.9(e).
- F. CONTAINMENT - 6 NYCRR 373-2.9(f). The Permittee shall construct and maintain the containment systems in accordance with the requirements of 6 NYCRR 373-2.9(f), as specified in Attachment D of the Permit Application.

In addition to the inspections required by Condition E. of this Module, the Permittee shall have all container secondary containment systems inspected triennially by an independent, qualified, professional engineer registered in New York State, or alternatively, by an independent, qualified inspector working under a registered New York State professional engineer in accordance with 6 NYCRR 373-1.4(a)(5). After inspection, the engineer/inspector shall prepare a detailed report which specifies the nature and content of the inspection, observations made, details of any defects found, and any repairs made. The report must be submitted to the Department on or before the month and day of permit issuance every third year, unless the Department approves an extension of no greater than 30 days.

- G. SPECIAL REQUIREMENTS FOR IGNITABLE OR REACTIVE WASTE - 6 NYCRR 373-2.9(g). The Permittee shall not locate containers holding ignitable or reactive waste within fifteen (15) meters (50 feet) of the facility's property line.

- H. SPECIAL REQUIREMENTS FOR INCOMPATIBLE WASTE - 6 NYCRR 373-2.9(h).

1. The Permittee shall not place incompatible wastes or incompatible wastes and materials in the same container.
 2. The Permittee shall not place hazardous/mixed waste in an unwashed container that previously held an incompatible waste or material.
 3. A container holding a hazardous/mixed waste that is incompatible with any waste or other material stored nearby in other containers, piles, open tanks, or surface impoundments must be separated from those other materials or protected from them by means of a dike, berm, wall, or other device.
- I. CLOSURE - 6 NYCRR 373-2.9(i). At closure, all hazardous/mixed waste and hazardous/mixed waste residues must be removed from the containment system. Remaining containers, liners, bases, and soil containing or contaminated with hazardous/mixed waste or hazardous/mixed waste residues must be decontaminated or removed. The Permittee must comply with the Closure Plan incorporated into this Permit pursuant to Module I.
- J. AIREMISSION STANDARDS - 6 NYCRR 373-2.9(j). The owner or operator shall manage all hazardous/mixed waste placed in a container in accordance with the applicable requirements of sections 373-2.27, 373-2.28 and 373-2.29 of this Subpart, with special attention to paragraphs: (a); (c); (d) and (g) through (k) of 373-2.29 of this Subpart.

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

DIVISION OF MATERIALS MANAGEMENT

PART 373 PERMIT MODULE XIII – SCHEDULED
DATES/SCHEDULE DATE REQUIREMENTS

U.S. Department of Energy
Knolls Atomic Power Laboratory
NY6890008992

Niskayuna, New York
Schenectady County

A. COMPLIANCE SCHEDULE

The Permittee must complete the following activities within the scheduled timeframes indicated in the following table in accordance with 6 NYCRR 373-1.6(d):

Item No.	Item	Requirement	Compliance Date ¹
1.	Not Applicable		

Footnotes:

1. The Permittee must comply with the reporting requirements of 6 NYCRR 373-1.6(d)(1)(iii) for each interim date and the final compliance date.

B. SCHEDULE OF DELIVERABLES

The Permittee must complete the activities indicated in the following table within the scheduled timeframes from the effective date of the Permit:

Item No.	Item	Requirement	Due Date ¹
1.	SWMU/AOC Map	Submit a map showing the location of all SWMUs and AOCs on the site	Within 60 days of the effective date of this Permit
2.	Establish an electronic Information Repository	Permittee has requested a transition to an electronic Information Repository to meet the requirements of Module I Condition C.9.a)(3).	Within 6 months of the effective date of this Permit.

Footnotes:

1. Deliverable Date changes may be made with written approval from the Department.

C. ROUTINE REPORTING

The Permittee must submit the following routine reports to the Department by the indicated due date in accordance with the requirements of this Permit (Note: the table below is intended to serve as a guide for certain routine reporting required by this Permit. However, the Permittee is still obligated to comply with all applicable regulations cited in this Permit and all conditions and requirements contained in the Modules, Attachments and documents incorporated by reference into this Permit, regardless of whether they are or are not listed in the table below.):

Item No.	Item	Frequency	Due Date ¹	Requirement
1.	Hazardous Waste Manifest Reporting	On-going	10 days of receipt	6 NYCRR 373-2.5(b)(1)(i)
2.	Unmanifested Waste Report	On-going	Within 10 days of waste receipt	6 NYCRR 373-2.5(b)(2) and (3), and 373-2.5(f)
3.	Annual Report	Annually	March 1	6 NYCRR 373-2.5(e)
4.	Hazardous Waste Reduction Plan Update	Annually	July 1	ECL 27-0908 and Module I, Condition I.
5.	SWMU/AOC Current Conditions Report	Every 5 years or when requested	Within 5 years after date of permit issuance or within 30 days of request	Module II, Condition B.10.
6.	Site Treatment Plan Update	Annually, if changes occur	June 30	Module I, Condition E.
7.	Containers Secondary Containment Assessment Report	Every 3 years	On the month and day of permit issuance every third year	Module III, Condition F.
8.	Groundwater Monitoring Reports <ul style="list-style-type: none"> Hillside (D3/D6) and G1-D4 Alleyway 	Annually, or as per approved GWMPs	March 31 for the previous calendar year	Module II, Condition E.17.
9.	Miscellaneous \leq 90 Day Area (SWMU-079) Update	Annually or when requested	July 30	Module II, Condition A.3.(c)

Item No.	Item	Frequency	Due Date ¹	Requirement
10.	Annual Indoor Air Monitoring Reports <ul style="list-style-type: none"> Hillside and Q3 Yard 	Annually	June 30	<ul style="list-style-type: none"> Q3 Yard Supplemental RFI SVIE Report Hillside Area RFI Indoor Air Quality Assessment Data Summary

Footnotes:

1. Reporting Date changes may be made with written approval from the Department.

KNOLLS ATOMIC POWER LABORATORY

KNOLLS LABORATORY

Attachment A

EPA I.D. NUMBER NY 6890008992

**6 NYCRR PART 373 PERMIT
NUMBER**

4-4224-00024/00001


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United States Environmental Protection Agency RCRA SUBTITLE C SITE IDENTIFICATION FORM	
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1. Reason for Submittal (Select only one.)

<input type="checkbox"/>	Obtaining or updating an EPA ID number for on-going regulated activities (Items 10-17 below) that will continue for a period of time.
<input type="checkbox"/>	Submitting as a component of the Hazardous Waste Report for _____ (Reporting Year)
<input type="checkbox"/>	Site was a TSD facility, a reverse distributor, and/or generator of $\geq 1,000$ kg of non-acute hazardous waste, > 1 kg of acute hazardous waste, or > 100 kg of acute hazardous waste spill cleanup in one or more months of the reporting year (or State equivalent LQG regulations)
<input type="checkbox"/>	Notifying that regulated activity is no longer occurring at this Site
<input type="checkbox"/>	Obtaining or updating an EPA ID number for conducting Electronic Manifest Broker activities
<input checked="" type="checkbox"/>	Submitting a new or revised Part A (permit) Form

2. Site EPA ID Number

N	Y	6	8	9	0	0	0	8	9	9	2
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3. Site Name

USDOE Knolls Atomic Power Laboratory - Knolls Laboratory

4. Site Location Address

Street Address 2401 River Road		
City, Town, or Village Niskayuna		County Schenectady
State NY	Country United States	Zip Code 12309
Latitude 42°49'16.8"N	Longitude 73°52'5.3"W	<input type="checkbox"/> Use Lat/Long as Primary Address

5. Site Mailing Address

☐ Same as Location Street Address

Street Address PO Box 1069		
City, Town, or Village Schenectady		
State NY	Country United States	Zip Code 12301-1069

6. Site Land Type

<input type="checkbox"/> Private	<input type="checkbox"/> County	<input type="checkbox"/> District	<input checked="" type="checkbox"/> Federal	<input type="checkbox"/> Tribal	<input type="checkbox"/> Municipal	<input type="checkbox"/> State	<input type="checkbox"/> Other
----------------------------------	---------------------------------	-----------------------------------	---	---------------------------------	------------------------------------	--------------------------------	--------------------------------

7. North American Industry Classification System (NAICS) Code(s) for the Site (at least 5-digit codes)

A. (Primary) 541715	C.
B.	D.

EPA ID Number

N	Y	6	8	9	0	0	0	8	9	9	2
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OMB# 2050-0024; Expires 04/30/2024

8. Site Contact Information

☐ Same as Location Address

First Name	David	MI	A	Last Name	Delwiche
Title	Program Manager, Environment Safety and Health				
Street Address	PO Box 1069				
City, Town, or Village	Schenectady				
State	NY	Country	United States	Zip Code	12301-1069
Email	david.delwiche@nrp.doe.gov				
Phone	518-395-6366	Ext	N/A	Fax	518-395-7314

9. Legal Owner and Operator of the Site

A. Name of Site's Legal Owner

☐ Same as Location Address

Full Name	USDOE as administered by NRLFO		Date Became Owner (mm/dd/yyyy)	05/10/1949
Owner Type	<input type="checkbox"/> Private <input type="checkbox"/> County <input type="checkbox"/> District <input checked="" type="checkbox"/> Federal <input type="checkbox"/> Tribal <input type="checkbox"/> Municipal <input type="checkbox"/> State <input type="checkbox"/> Other			
Street Address	PO Box 1069			
City, Town, or Village	Schenectady			
State	NY	Country	United States	Zip Code 12301-1069
Email	david.delwiche@nrp.doe.gov			
Phone	518-395-6366	Ext	N/A	Fax 518-395-7314
Comments	NRLFO = Naval Reactors Laboratory Field Office			

B. Name of Site's Legal Operator

☐ Same as Location Address

Full Name	Fluor Marine Propulsion, LLC (FMP)		Date Became Operator (mm/dd/yyyy)	10/01/2018
Operator Type	<input checked="" type="checkbox"/> Private <input type="checkbox"/> County <input type="checkbox"/> District <input type="checkbox"/> Federal <input type="checkbox"/> Tribal <input type="checkbox"/> Municipal <input type="checkbox"/> State <input type="checkbox"/> Other			
Street Address	PO Box 1072			
City, Town, or Village	Schenectady			
State	NY	Country	United States	Zip Code 12301-1072
Email	michael.johnson2@unnpp.gov			
Phone	518-395-4864	Ext	N/A	Fax 518-395-4832
Comments				

EPA ID Number

N	Y	6	8	9	0	0	0	8	9	9	2
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10. Type of Regulated Waste Activity (at your site)

Mark "Yes" or "No" for all current activities (as of the date submitting the form); complete any additional boxes as instructed.

A. Hazardous Waste Activities

<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	1. Generator of Hazardous Waste—If "Yes", mark only one of the following—a, b, c	
<input checked="" type="checkbox"/>	a. LQG	-Generates, in any calendar month, 1,000 kg/mo (2,200 lb/mo) or more of non-acute hazardous waste (includes quantities imported by importer site); or - Generates, in any calendar month, or accumulates at any time, more than 1 kg/mo (2.2 lb/mo) of acute hazardous waste; or - Generates, in any calendar month or accumulates at any time, more than 100 kg/mo (220 lb/mo) of acute hazardous spill cleanup material.
<input type="checkbox"/>	b. SQG	100 to 1,000 kg/mo (220-2,200 lb/mo) of non-acute hazardous waste and no more than 1 kg (2.2 lb) of acute hazardous waste and no more than 100 kg (220 lb) of any acute hazardous spill cleanup material.
<input type="checkbox"/>	c. VSQG	Less than or equal to 100 kg/mo (220 lb/mo) of non-acute hazardous waste.
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	2. Short-Term Generator (generates from a short-term or one-time event and not from on-going processes). If "Yes", provide an explanation in the Comments section. <i>Note: If "Yes", you MUST indicate that you are a Generator of Hazardous Waste in Item 10.A.1 above.</i>	
<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	3. Treater, Storer or Disposer of Hazardous Waste—Note: Part B of a hazardous waste permit is required for these activities.	
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	4. Receives Hazardous Waste from Off-site	
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	5 Recycler of Hazardous Waste	
<input type="checkbox"/>	a. Recycler who stores prior to recycling	
<input type="checkbox"/>	b. Recycler who does not store prior to recycling	
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	6. Exempt Boiler and/or Industrial Furnace—If "Yes", mark all that apply.	
<input type="checkbox"/>	a. Small Quantity On-site Burner Exemption	
<input type="checkbox"/>	b. Smelting, Melting, and Refining Furnace Exemption	

B. Waste Codes for Federally Regulated Hazardous Wastes. Please list the waste codes of the Federal hazardous wastes handled at your site. List them in the order they are presented in the regulations (e.g. D001, D003, F007, U112). Use an additional page if more spaces are needed.

D001	D002	D003	D004	D005	D006	D007
D008	D009	D010	D011	D018	D019	D022
D026	D028	D029	D035	D036	D038	D039
D040	D042	D043	F001	F002	F003	F004
F005	F007	F009	F009	P010	F011	P012

C. Waste Codes for State Regulated (non-Federal) Hazardous Wastes. Please list the waste codes of the State hazardous wastes handled at your site. List them in the order they are presented in the regulations. Use an additional page if more spaces are needed.

B001	B002	B003	B004	B005	B006	B007

Attachment 1 - Continuation of Item 10B
RCRA SUBTITLE C SITE IDENTIFICATION FORM

Description of Hazardous Wastes – Waste Codes for Federally Regulated Hazardous Wastes.

P013	P015	P021	P022	P028	P029	P030
P042	P056	P063	P064	P068	P074	P075
P076	P078	P081	P098	P104	P105	P106
P113	P114	P119	P120	P121	P123	P205
U001	U002	U003	U009	U012	U019	U028
U031	U041	U043	U044	U045	U052	U056
U057	U068	U069	U070	U072	U075	U076
U077	U078	U079	U080	U092	U107	U108
U109	U112	U117	U121	U122	U133	U134
U135	U140	U144	U145	U151	U154	U159
U161	U162	U165	U188	U194	U196	U201
U204	U205	U208	U209	U210	U211	U213
U216	U217	U219	U220	U225	U226	U227
U228	U239	U359	U404			

EPA ID Number

N Y 6 8 9 0 0 0 8 9 9 2

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11. Additional Regulated Waste Activities (NOTE: Refer to your State regulations to determine if a separate permit is required.)

A. Other Waste Activities

<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	1. Transporter of Hazardous Waste—If “Yes”, mark all that apply.
<input type="checkbox"/>	a. Transporter
<input type="checkbox"/>	b. Transfer Facility (at your site)
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	2. Underground Injection Control
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	3. United States Importer of Hazardous Waste
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	4. Recognized Trader—If “Yes”, mark all that apply.
<input type="checkbox"/>	a. Importer
<input type="checkbox"/>	b. Exporter
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	5. Importer/Exporter of Spent Lead-Acid Batteries (SLABs) under 40 CFR 266 Subpart G—If “Yes”, mark all that apply.
<input type="checkbox"/>	a. Importer
<input type="checkbox"/>	b. Exporter

B. Universal Waste Activities

<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	1. Large Quantity Handler of Universal Waste (you accumulate 5,000 kg or more) - If “Yes” mark all that apply. Note: Refer to your State regulations to determine what is regulated.
<input type="checkbox"/>	a. Batteries
<input type="checkbox"/>	b. Pesticides
<input type="checkbox"/>	c. Mercury containing equipment
<input type="checkbox"/>	d. Lamps
<input type="checkbox"/>	e. Aerosol Cans
<input type="checkbox"/>	f. Other (specify) _____
<input type="checkbox"/>	g. Other (specify) _____
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	2. Destination Facility for Universal Waste Note: A hazardous waste permit may be required for this activity.

C. Used Oil Activities

<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	1. Used Oil Transporter—If “Yes”, mark all that apply.
<input type="checkbox"/>	a. Transporter
<input type="checkbox"/>	b. Transfer Facility (at your site)
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	2. Used Oil Processor and/or Re-refiner—If “Yes”, mark all that apply.
<input type="checkbox"/>	a. Processor
<input type="checkbox"/>	b. Re-refiner
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	3. Off-Specification Used Oil Burner
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	4. Used Oil Fuel Marketer—If “Yes”, mark all that apply.
<input type="checkbox"/>	a. Marketer Who Directs Shipment of Off-Specification Used Oil to Off-Specification Used Oil Burner
<input type="checkbox"/>	b. Marketer Who First Claims the Used Oil Meets the Specifications

EPA ID Number

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D. Pharmaceutical Activities

<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	1. Operating under 40 CFR Part 266, Subpart P for the management of hazardous waste pharmaceuticals—if “Yes”, mark only one. Note: See the item-by-item instructions for definitions of healthcare facility and reverse distributor.
	<input type="checkbox"/> a. Healthcare Facility
	<input type="checkbox"/> b. Reverse Distributor
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	2. Withdrawing from operating under 40 CFR Part 266, Subpart P for the management of hazardous waste pharmaceuticals. Note: You may only withdraw if you are a healthcare facility that is a VSQG for all of your hazardous waste, including hazardous waste pharmaceuticals.

12. Eligible Academic Entities with Laboratories—Notification for opting into or withdrawing from managing laboratory hazardous wastes pursuant to 40 CFR Part 262, Subpart K.

<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	A. Opting into or currently operating under 40 CFR Part 262, Subpart K for the management of hazardous wastes in laboratories— If “Yes”, mark all that apply. Note: See the item-by-item instructions for definitions of types of eligible academic entities.
	<input type="checkbox"/> 1. College or University
	<input type="checkbox"/> 2. Teaching Hospital that is owned by or has a formal written affiliation with a college or university
	<input type="checkbox"/> 3. Non-profit Institute that is owned by or has a formal written affiliation with a college or university
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	B. Withdrawing from 40 CFR Part 262, Subpart K for the management of hazardous wastes in laboratories.

13. Episodic Generation

<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	Are you an SQG or VSQG generating hazardous waste from a planned or unplanned episodic event, lasting no more than 60 days, that moves you to a higher generator category. If “Yes”, you must fill out the Addendum for Episodic Generator.
--	---

14. LQG Consolidation of VSQG Hazardous Waste

<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	Are you an LQG notifying of consolidating VSQG Hazardous Waste Under the Control of the Same Person pursuant to 40 CFR 262.17(f)? If “Yes”, you must fill out the Addendum for LQG Consolidation of VSQG hazardous waste.
--	---

15. Notification of LQG Site Closure for a Central Accumulation Area (CAA) (optional) OR Entire Facility (required)

<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	LQG Site Closure of a Central Accumulation Area (CAA) or Entire Facility.
	A. <input type="checkbox"/> Central Accumulation Area (CAA) or <input type="checkbox"/> Entire Facility
	B. Expected closure date: _____ mm/dd/yyyy
	C. Requesting new closure date: _____ mm/dd/yyyy
	D. Date closed : _____ mm/dd/yyyy
	<input type="checkbox"/> 1. In compliance with the closure performance standards 40 CFR 262.17(a)(8)
	<input type="checkbox"/> 2. Not in compliance with the closure performance standards 40 CFR 262.17(a)(8)

EPA ID Number

N Y 6 8 9 0 0 0 8 9 9 2

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16. Notification of Hazardous Secondary Material (HSM) Activity

<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	Are you notifying under 40 CFR 260.42 that you will begin managing, are managing, or will stop managing hazardous secondary material under 40 CFR 260.30, 40 CFR 261.4(a)(23), (24), (25), or (27)? If "Yes", you must fill out the Addendum to the Site Identification Form for Managing Hazardous Secondary Material.
--	---

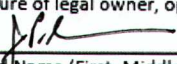
17. Electronic Manifest Broker

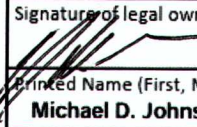
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	Are you notifying as a person, as defined in 40 CFR 260.10, electing to use the EPA electronic manifest system to obtain, complete, and transmit an electronic manifest under a contractual relationship with a hazardous waste generator?
--	--

18. Comments (include item number for each comment)

Items 3 and 9a., Full Name USDOE - United States Department of Energy. Item 10.B - See Attachment 1 - Continuation of Item 10.B (Page A-6).

19. Certification I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations. **Note: For the RCRA Hazardous Waste Part A permit Application, all owners and operators must sign (see 40 CFR 270.10(b) and 270.11).**

Signature of legal owner, operator or authorized representative 	Date (mm/dd/yyyy) 05/06/2024
Printed Name (First, Middle Initial Last) Jay P. Showman	Title Manager, NRLFO
Email jay.showman@unnpp.gov	

Signature of legal owner, operator or authorized representative 	Date (mm/dd/yyyy) 04/23/2024
Printed Name (First, Middle Initial Last) Michael D. Johnson	Title Site Director, Knolls Laboratory
Email michael.johnson2@unnpp.gov	

EPA ID Number

N	Y	6	8	9	0	0	0	8	9	9	2
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OMB# 2050-0024; Expires 04/30/2024

United States Environmental Protection Agency
HAZARDOUS WASTE PERMIT PART A FORM



1. Facility Permit Contact

First Name	David	MI	A	Last Name	Delwiche
Title	Program Manager, Environment Safety and Health				
Email	david.delwiche@nrl.doe.gov				
Phone	518-395-6366	Ext	N/A	Fax	518-395-7314

2. Facility Permit Contact Mailing Address

Street Address	PO Box 1069	
City, Town, or Village	Schenectady	
State	NY	Country United States
Zip Code	12301-1069	

3. Facility Existence Date (mm/dd/yyyy)

11/19/1980

4. Other Environmental Permits

A. Permit Type	B. Permit Number													C. Description
N	N	Y	0	0	0	5	8	5	1					SPDES - NYSDEC
N	G	P	-	0	-	2	4	-	0	0	1			SPDES - MS4 - NYSDEC
E	K	A	P	L	-	2	0	1	2	-	0	0	3	NESHAPS - EPA
E	C	-	O	C	2	0	1	8	0	0	1	3	4	Real Estate Permit - NYS Canal Corp.
														See Section 11. comments for additional
														permits.

5. Nature of Business

The Knolls Atomic Power Laboratory (Knolls Laboratory) is operated under contract with the United States Department of Energy as administered by Naval Reactors Laboratory Field Office (NRLFO). The principal function of the Knolls Laboratory is the research and development of Naval Nuclear Propulsion Systems.

EPA ID Number

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6. Process Codes and Design Capacities

Line Number		A. Process Code			B. Process Design Capacity		C. Process Total Number of Units	D. Unit Name
					(1) Amount	(2) Unit of Measure		
0	1	S	0	1	6,600	G	002	Q1 Complex
0	2	S	0	1	1,320	G	001	E11 Truck Bay Mod Add.
0	3	S	0	1	2,600	G	004	E4 Extension Floor Vaults
0	4	S	0	1	7,180	G	001	Building E11 WPF

7. Description of Hazardous Wastes (Enter codes for Items 7.A, 7.C and 7.D(1))

Line No.	A. EPA Hazardous Waste No.			B. Estimated Annual Qty of Waste	C. Unit of Measure	D. Processes									
						(1) Process Codes					(2) Process Description (if code is not entered in 7.D1))				
	S	e	e	Comments	Below										

8. Map

Attach to this application a topographical map, or other equivalent map, of the area extending to at least one mile beyond property boundaries. The map must show the outline of the facility, the location of each of its existing intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all spring, rivers, and other surface water bodies in this map area. See instructions for precise requirements.

9. Facility Drawing

All existing facilities must include a scale drawing of the facility. See instructions for more detail.

10. Photographs

All existing facilities must include photographs (aerial or ground-level) that clearly delineate all existing structures; existing storage, treatment, and disposal areas; and sites of future storage, treatment, or disposal areas. See instructions for more detail.

11. Comments

Item 4. Other Environmental Permits- E-4-4224-00024/00039 - Air State Facility - NYSDEC, E-4-4224-00024/00052 - Water Withdrawal Non-public - NYSDEC, SPDES-Construction Activity-NYSDEC GP-0-20-001, NYSCC Canal Work Permit C-WK-202200051. Item 7. Description of Hazardous Wastes - see attached sheets A-12 to A-29. Item 8. Map - see attached sheet page A-30. Item 9. Facility Drawings - see attached sheet page A-31. Item 10. Photographs - see attached pages A-32 to A-37.

7. Description of Hazardous Wastes (Continued)							
Line Number	A. EPA Hazardous Waste No. (enter code)	B. Estimated Annual Quantity of Waste	C. Unit of Measure (Enter Code)	D. Processes			
				(1) Process Codes (Enter Code)		(2) Process Description (If a code is not entered in D(1))	
1	D001*	5000	P	S01			
2	D002*	5000	P	S01			
3	D003*	600	P	S01			
4	D004*	100	P	S01			
5	D005*	600	P	S01			
6	D006*	1500	P	S01			
7	D007*	5500	P	S01			
8	D008*	6500	P	S01			
9	D009*	1000	P	S01			
10	D010*	100	P	S01			
11	D011*	4000	P	S01			
12	D018*	2500	P	S01			
13	D019	10	P	S01			
14	D022	30	P	S01			
15	D026	50	P	S01			
16	D028*	30	P	S01			
17	D029*	30	P	S01			
18	D035*	400	P	S01			
19	D036*	100	P	S01			
20	D038	5	P	S01			
21	D039*	5500	P	S01			
22	D040*	2000	P	S01			
23	D042	30	P	S01			
24	D043	1	P	S01			
--	--	--	--	--			
25	F001*	100	P	S01			
26	F002*	1000	P	S01			
27	F003*	1000	P	S01			
28	F004*	10	P	S01			
29	F005*	1000	P	S01			
30	F007	30	P	S01			
31	F009	30	P	S01			
--	--	--	--	--			
32	P005	30	P	S01			
33	P010	10	P	S01			

7. Description of Hazardous Wastes (Continued)							
Line Number	A. EPA Hazardous Waste No. (enter code)	B. Estimated Annual Quantity of Waste	C. Unit of Measure (Enter Code)	D. Processes			
				(1) Process Codes (Enter Code)		(2) Process Description (If a code is not entered in D(1))	
34	P011	1	P	S01			
35	P012	5	P	S01			
36	P013	1	P	S01			
37	P015*	5	P	S01			
38	P021	1	P	S01			
39	P022	1	P	S01			
40	P028	10	P	S01			
41	P029	1	P	S01			
42	P030	20	P	S01			
43	P042	5	P	S01			
44	P056	1	P	S01			
45	P063	1	P	S01			
46	P064	1	P	S01			
47	P068	1	P	S01			
48	P074	1	P	S01			
49	P075	2	P	S01			
50	P076	1	P	S01			
51	P078	1	P	S01			
52	P081	1	P	S01			
53	P098	10	P	S01			
54	P104	1	P	S01			
55	P105	10	P	S01			
56	P106	10	P	S01			
57	P113	1	P	S01			
58	P114	1	P	S01			
59	P119*	10	P	S01			
60	P120	1	P	S01			
61	P121	1	P	S01			
62	P123	1	P	S01			
63	P205	1	P	S01			
--	--	--	--	--			
64	U001	1	P	S01			
65	U002*	150	P	S01			
66	U003	10	P	S01			

7. Description of Hazardous Wastes (Continued)							
Line Number	A. EPA Hazardous Waste No. (enter code)	B. Estimated Annual Quantity of Waste	C. Unit of Measure (Enter Code)	D. Processes			
				(1) Process Codes (Enter Code)			(2) Process Description (If a code is not entered in D(1))
67	U009	1	P	S01			
68	U012	10	P	S01			
69	U019	10	P	S01			
70	U028	10	P	S01			
71	U031	30	P	S01			
72	U041	50	P	S01			
73	U043	1	P	S01			
74	U044*	1	P	S01			
75	U045	1	P	S01			
76	U052	1	P	S01			
77	U056	10	P	S01			
78	U057	10	P	S01			
79	U068	7	P	S01			
80	U069	1	P	S01			
81	U070	10	P	S01			
82	U072	12	P	S01			
83	U075	50	P	S01			
84	U076	20	P	S01			
85	U077	20	P	S01			
86	U078	1	P	S01			
87	U079	1	P	S01			
88	U080	10	P	S01			
89	U092	1	P	S01			
90	U107	10	P	S01			
91	U108	30	P	S01			
92	U109	1	P	S01			
93	U112*	1	P	S01			
94	U117	1	P	S01			
95	U121	1	P	S01			
96	U122	75	P	S01			
97	U133	40	P	S01			
98	U134*	70	P	S01			
99	U135	1	P	S01			
100	U140	20	P	S01			
101	U144	40	P	S01			

7. Description of Hazardous Wastes (Continued)							
Line Number	A. EPA Hazardous Waste No. (enter code)	B. Estimated Annual Quantity of Waste	C. Unit of Measure (Enter Code)	D. Processes			
				(1) Process Codes (Enter Code)		(2) Process Description (If a code is not entered in D(1))	
102	U145	1	P	S01			
103	U151*	250	P	S01			
104	U154	50	P	S01			
105	U159*	50	P	S01			
106	U161	1	P	S01			
107	U162	50	P	S01			
108	U165	10	P	S01			
109	U188	10	P	S01			
110	U194	5	P	S01			
111	U196	1	P	S01			
112	U201	1	P	S01			
113	U204	1	P	S01			
114	U205	1	P	S01			
115	U208	1	P	S01			
116	U209	1	P	S01			
117	U210*	150	P	S01			
118	U211	1	P	S01			
119	U213	10	P	S01			
120	U216	1	P	S01			
121	U217	1	P	S01			
122	U219	10	P	S01			
123	U220*	50	P	S01			
124	U225	1	P	S01			
125	U226*	200	P	S01			
126	U227	10	P	S01			
127	U228*	150	P	S01			
128	U239	20	P	S01			
129	U359	1	P	S01			
130	U404	10	P	S01			
--	--	--	--	--			
131	B001*	100	P	S01			
132	B002*	100	P	S01			
133	B003*	100	P	S01			
134	B004*	1000	P	S01			
135	B005*	1000	P	S01			

7. Description of Hazardous Wastes (Continued)							
Line Number	A. EPA Hazardous Waste No. (enter code)	B. Estimated Annual Quantity of Waste	C. Unit of Measure (Enter Code)	D. Processes			
				(1) Process Codes (Enter Code)		(2) Process Description (If a code is not entered in D(1))	
136	B006*	1000	P	S01			
137	B007*	10000	P	S01			
Routine Waste Combinations							
138	D001	250	P	S01			
	D002						Included with above
--	--	--	--	--			
139	D001	10	P	S01			
	D002						Included with above
	D003						Included with above
--	--	--	--	--			
140	D001	30	P	S01			
	D002						Included with above
	D007						Included with above
--	--	--	--	--			
141	D001	30	P	S01			
	D002						Included with above
	D009						Included with above
--	--	--	--	--			
142	D001	30	P	S01			
	D003						Included with above
--	--	--	--	--			
143	D001	20	P	S01			
	D005						Included with above
--	--	--	--	--			
144	D001	10	P	S01			
	D006						Included with above
--	--	--	--	--			
145	D001	100	P	S01			
	D007						Included with above
--	--	--	--	--			
146	D001	1000	P	S01			
	D007						Included with above
	D008						Included with above
--	--	--	--	--			

7. Description of Hazardous Wastes (Continued)							
Line Number	A. EPA Hazardous Waste No. (enter code)	B. Estimated Annual Quantity of Waste	C. Unit of Measure (Enter Code)	D. Processes			
				(1) Process Codes (Enter Code)			(2) Process Description (If a code is not entered in D(1))
147	D001	10	P	S01			
	D007						Included with above
	D008						Included with above
	D035						Included with above
--	--	--	--	--			
148	D001	100	P	S01			
	D008						Included with above
--	--	--	--	-			
149	D001	1000	P	S01			
	D008						Included with above
	D035						Included with above
--	--	--	--	--			
150	D001	10	P	S01			
	D009						Included with above
--	--	--	--	--			
151	D001	20	P	S01			
	D011						Included with above
--	--	--	--	--			
152	D001	100	P	S01			
	D018						Included with above
--	--	--	--	--			
153	D001	5	P	S01			
	D019						Included with above
--	--	--	--	--			
154	D001	10	P	S01			
	D022						Included with above
--	--	--	--	--			
155	D001	500	P	S01			
	D035						Included with above
--	--	--	--	--			
156	D001	100	P	S01			
	D039						Included with above
--	--	--	--	--			
157	D001	5	P	S01			
	D040						Included with above

7. Description of Hazardous Wastes (Continued)							
Line Number	A. EPA Hazardous Waste No. (enter code)	B. Estimated Annual Quantity of Waste	C. Unit of Measure (Enter Code)	D. Processes			
				(1) Process Codes (Enter Code)		(2) Process Description (If a code is not entered in D(1))	
--	--	--	--	--			
158	D002	30	P	S01			
	D003						Included with above
--	--	--	--	--			
159	D002	5	P	S01			
	D004						Included with above
	D007						Included with above
--	--	--	--	--			
160	D002	100	P	S01			
	D004						Included with above
	D007						Included with above
	D008						Included with above
--	--	--	--	--			
161	D002	5	P	S01			
	D005						Included with above
--	--	--	--	--			
162	D002	100	P	S01			
	D005						Included with above
	D007						Included with above
	D008						Included with above
--	--	--	--	--			
163	D002*	50	P	S01			
	D005						Included with above
	D008						Included with above
--	--	--	--	--			
164	D002	5	P	S01			
	D005						Included with above
	D011						Included with above
--	--	--	--	--			
165	D002	1500	P	S01			
	D006						Included with above
--	--	--	--	--			
166	D002	100	P	S01			
	D006						Included with above
	D007						Included with above

7. Description of Hazardous Wastes (Continued)							
Line Number	A. EPA Hazardous Waste No. (enter code)	B. Estimated Annual Quantity of Waste	C. Unit of Measure (Enter Code)	D. Processes			
				(1) Process Codes (Enter Code)			(2) Process Description (If a code is not entered in D(1))
167	D002	5	P	S01			
	D006						Included with above
	D007						Included with above
	D008						Included with above
--	--	--	--	--			
168	D002	100	P	S01			
	D006						Included with above
	D007						Included with above
	D008						Included with above
	D010						Included with above
--	--	--	--	--			
169	D002	5	P	S01			
	D006						Included with above
	D008						Included with above
--	--	--	--	--			
170	D002*	5000	P	S01			
	D007						Included with above
--	--	--	--	--			
171	D002*	100	P	S01			
	D007						Included with above
	D008						Included with above
--	--	--	--	--			
172	D002	100	P	S01			
	D007						Included with above
	D010						Included with above
--	--	--	--	--			
173	D002	5	P	S01			
	D007						Included with above
	D011						Included with above
--	--	--	--	--			
174	D002*	100	P	S01			
	D008						Included with above
--	--	--	--	--			
175	D002*	500	P	S01			
	D008						Included with above
	D009						Included with above

7. Description of Hazardous Wastes (Continued)							
Line Number	A. EPA Hazardous Waste No. (enter code)	B. Estimated Annual Quantity of Waste	C. Unit of Measure (Enter Code)	D. Processes			
				(1) Process Codes (Enter Code)		(2) Process Description (If a code is not entered in D(1))	
--	--	--	--	--			
176	D002	50	P	S01			
	D008						Included with above
	D010						Included with above
--	--	--	--	--			
177	D002	50	P	S01			
	D008						Included with above
	D011						Included with above
--	--	--	--	--			
178	D002*	30	P	S01			
	D009						Included with above
--	--	--	--	--			
179	D002	10	P	S01			
	D010						Included with above
--	--	--	--	--			
180	D002*	50	P	S01			
	D011						Included with above
--	--	--	--	--			
181	D002	2000	P	S01			
	D022						Included with above
	D039						Included with above
--	--	--	--	--			
182	D003	30	P	S01			
	D011						Included with above
--	--	--	--	--			
183	D004*	10	P	S01			
	D008						Included with above
	D018						Included with above
--	--	--	--	--			
184	D004	10	P	S01			
	D010						Included with above
--	--	--	--	--			
185	D005*	30	P	S01			
	D007						Included with above
--	--	--	--	--			

7. Description of Hazardous Wastes (Continued)							
Line Number	A. EPA Hazardous Waste No. (enter code)	B. Estimated Annual Quantity of Waste	C. Unit of Measure (Enter Code)	D. Processes			
				(1) Process Codes (Enter Code)		(2) Process Description (If a code is not entered in D(1))	
186	D006*	10	P	S01			
	D007						Included with above
--	--	--	--	--			
187	D006	500	P	S01			
	D007						Included with above
	D011						Included with above
--	--	--	--	--			
188	D006*	1500	P	S01			
	D008						Included with above
--	--	--	--	--			
189	D006*	10	P	S01			
	D008						Included with above
	D009						Included with above
	D018						Included with above
--	--	--	--	--			
190	D006*	1500	P	S01			
	D008						Included with above
	D018						Included with above
--	--	--	--	--			
191	D006	10	P	S01			
	D009						Included with above
--	--	--	--	--			
192	D006	500	P	S01			
	D011						Included with above
--	--	--	--	--			
193	D006*	1500	P	S01			
	D018						Included with above
--	--	--	--	--			
194	D007	100	P	S01			
	D008						Included with above
--	--	--	--	--			
195	D007	100	P	S01			
	D008						Included with above
	D009						Included with above
--	--	--	--	--			
196	D007*	350	P	S01			

7. Description of Hazardous Wastes (Continued)							
Line Number	A. EPA Hazardous Waste No. (enter code)	B. Estimated Annual Quantity of Waste	C. Unit of Measure (Enter Code)	D. Processes			
				(1) Process Codes (Enter Code)		(2) Process Description (If a code is not entered in D(1))	
	D008						Included with above
	D011						Included with above
--	--	--	--	--			
197	D007	100	P	S01			
	D009						Included with above
--	--	--	--	--			
198	D007	100	P	S01			
	D010						Included with above
--	--	--	--	--			
199	D007	4000	P	S01			
	D011						Included with above
--	--	--	--	--			
200	D008*	100	P	S01			
	D009						Included with above
--	--	--	--	--			
201	D008*	150	P	S01			
	D011						Included with above
--	--	--	--	--			
202	D008*	1500	P	S01			
	D018						Included with above
--	--	--	--	--			
203	D008	30	P	S01			
	D022						Included with above
--	--	--	--	--			
204	D009*	10	P	S01			
	D011						Included with above
--	--	--	--	--			
205	D039	50	P	S01			
	D040						Included with above
--	--	--	--	--			
206	F001	10	P	S01			
	D006						Included with above
--	--	--	--	--			
207	F001	10	P	S01			
	D006						Included with above
	D008						Included with above

7. Description of Hazardous Wastes (Continued)							
Line Number	A. EPA Hazardous Waste No. (enter code)	B. Estimated Annual Quantity of Waste	C. Unit of Measure (Enter Code)	D. Processes			
				(1) Process Codes (Enter Code)		(2) Process Description (If a code is not entered in D(1))	
--	--	--	--	--			
208	F001	10	P	S01			
	D006						Included with above
	D018						Included with above
--	--	--	--	--			
209	F001	10	P	S01			
	D008						Included with above
--	--	--	--	--			
210	F001	10	P	S01			
	F003						Included with above
--	--	--	--	--			
211	F001	10	P	S01			
	F003						Included with above
	F005						Included with above
--	--	--	--	--			
212	F001	10	P	S01			
	F003						Included with above
	F005						Included with above
	D008						Included with above
	D018						Included with above
--	--	--	--	--			
213	F002	100	P	S01			
	D006						Included with above
	D008						Included with above
--	--	--	--	--			
214	F002	10	P	S01			
	D008						Included with above
--	--	--	--	--			
215	F002	100	P	S01			
	F003						Included with above
	F005						Included with above
--	--	--	--	--			
216	F003	100	P	S01			
	F005						Included with above
--	--	--	--	--			
217	F007	10	P	S01			

7. Description of Hazardous Wastes (Continued)							
Line Number	A. EPA Hazardous Waste No. (enter code)	B. Estimated Annual Quantity of Waste	C. Unit of Measure (Enter Code)	D. Processes			
				(1) Process Codes (Enter Code)		(2) Process Description (If a code is not entered in D(1))	
	D003						Included with above
--	--	--	--	--			
218	F007	10	P	S01			
	D003						Included with above
	D011						Included with above
--	--	--	--	--			
219	F009	10	P	S01			
	D002						Included with above
--	--	--	--	--			
220	F009	10	P	S01			
	D003						Included with above
	D011						Included with above
--	--	--	--	--			
221	B002*	250	P	S01			
	D006						Included with above
	--	--	--	--			
222	B002*	250	P	S01			
	D006						Included with above
	D008						Included with above
	--	--	--	--			
223	B002*	10	P	S01			Included with above
	D006						Included with above
	D008						Included with above
	D018						Included with above
--	--	--	--	--			
224	B002*	10	P	S01			
	D006						Included with above
	D018						Included with above
--	--	--	--	--			
225	B002	250	P	S01			
	D008						Included with above
--	--	--	--	--			
226	B002*	10	P	S01			
	D008						Included with above
	D018						Included with above
--	--	--	--	--			

7. Description of Hazardous Wastes (Continued)							
Line Number	A. EPA Hazardous Waste No. (enter code)	B. Estimated Annual Quantity of Waste	C. Unit of Measure (Enter Code)	D. Processes			
				(1) Process (2) Codes (Enter Code)			(2) Process Description (If a code is not entered in D(1))
227	B002*	10	P	S01			
	D018						Included with above
--	--	--	--	--			
228	B002	50	P	S01			
	F002						Included with above
--	--	--	--	--			
229	B003*	250	P	S01			
	D006						Included with above
--	--	--	--	--			
230	B003*	250	P	S01			
	D006						Included with above
	D008						Included with above
--	--	--	--	--			
231	B003*	10	P	S01			Included with above
	D006						Included with above
	D008						Included with above
	D018						Included with above
--	--	--	--	--			
232	B003*	10	P	S01			
	D006						Included with above
	D018						Included with above
--	--	--	--	--			
233	B003*	250	P	S01			
	D008						Included with above
--	--	--	--	--			
234	B003*	10	P	S01			
	D008						Included with above
	D018						Included with above
--	--	--	--	--			
235	B003*	10	P	S01			
	D018						Included with above
--	--	--	--	--			
236	B004*	50	P	S01			
	D006						Included with above
--	--	--	--	--			
237	B004*	10	P	S01			

7. Description of Hazardous Wastes (Continued)							
Line Number	A. EPA Hazardous Waste No. (enter code)	B. Estimated Annual Quantity of Waste	C. Unit of Measure (Enter Code)	D. Processes			
				(1) Process Codes (Enter Code)			(2) Process Description (If a code is not entered in D(1))
	D006						Included with above
	D007						Included with above
--	--	--	--	--			
238	B004*	10	P	S01			
	D006						Included with above
	D007						Included with above
	D008						Included with above
--	--	--	--	--			
239	B004*	10	P	S01			
	D006						Included with above
	D008						Included with above
--	--	--	--	--			
240	B004*	50	P	S01			
	D007						Included with above
--	--	--	--	--			
241	B004*	50	P	S01			
	D007						Included with above
	D008						Included with above
--	--	--	--	--			
242	B004*	50	P	S01			
	D008						Included with above
--	--	--	--	--			
243	B005	50	P	S01			
	D006						Included with above
--	--	--	--	--			
244	B005	50	P	S01			
	D007						Included with above
--	--	--	--	--			
245	B005	100	P	S01			
	D007						Included with above
	D008						Included with above
--	--	--	--	--			
246	B005*	50	P	S01			
	D008						Included with above
--	--	--	--	--			
247	B007*	50	P	S01			

7. Description of Hazardous Wastes (Continued)							
Line Number	A. EPA Hazardous Waste No. (enter code)	B. Estimated Annual Quantity of Waste	C. Unit of Measure (Enter Code)	D. Processes			
				(1) Process Codes (Enter Code)		(2) Process Description (If a code is not entered in D(1))	
	D001						Included with above
--	--	--	--	--			
248	B007*	50	P	S01			
	D001						Included with above
	D007						Included with above
--	--	--	--	--			
249	B007*	50	P	S01			
	D001						Included with above
	D007						Included with above
	D008						Included with above
--	--	--	--	--			
250	B007*	50	P	S01			
	D001						Included with above
	D008						Included with above
--	--	--	--	--			
251	B007*	50	P	S01			
	D002						Included with above
--	--	--	--	--			
252	B007*	50	P	S01			
	D005						Included with above
--	--	--	--	--			
253	B007*	100	P	S01			
	D005						Included with above
	D006						Included with above
--	--	--	--	--			
254	B007*	50	P	S01			
	D005						Included with above
	D006						Included with above
	D007						Included with above
--	--	--	--	--			
255	B007*	50	P	S01			
	D005						Included with above
	D006						Included with above
	D007						Included with above
	D008						Included with above

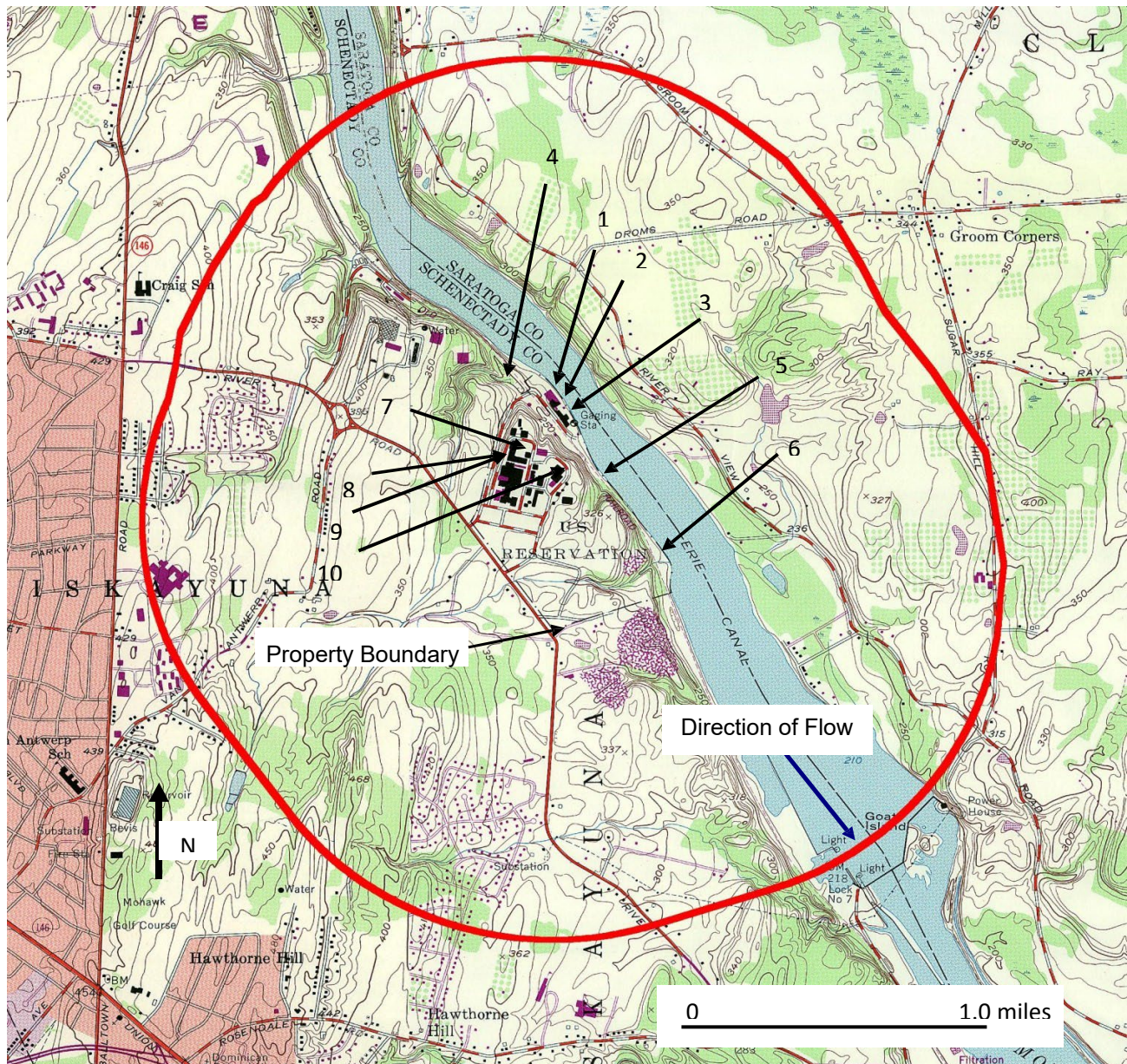
7. Description of Hazardous Wastes (Continued)							
Line Number	A. EPA Hazardous Waste No. (enter code)	B. Estimated Annual Quantity of Waste	C. Unit of Measure (Enter Code)	D. Processes			
				(1) Process Codes (Enter Code)		(2) Process Description (If a code is not entered in D(1))	
--	--	--	--	--			
256	B007*	50	P	S01			
	D005						Included with above
	D006						Included with above
	D008						Included with above
--	--	--	--	--			
257	B007*	100	P	S01			
	D005						Included with above
	D007						Included with above
--	--	--	--	--			
258	B007*	100	P	S01			
	D005						Included with above
	D007						Included with above
	D008						Included with above
--	--	--	--	--			
259	B007*	100	P	S01			
	D005						Included with above
	D008						Included with above
--	--	--	--	--			
260	B007*	50	P	S01			
	D006						Included with above
--	--	--	--	--			
261	B007*	50	P	S01			
	D006						Included with above
	D007						Included with above
	D008						Included with above
	D011						Included with above
--	--	--	--	--			
262	B007*	50	P	S01			
	D006						Included with above
	D007						Included with above
--	--	--	--	--			
263	B007*	50	P	S01			
	D006						Included with above
	D007						Included with above
	D008						Included with above
--	--	--	--	--			

7. Description of Hazardous Wastes (Continued)							
Line Number	A. EPA Hazardous Waste No. (enter code)	B. Estimated Annual Quantity of Waste	C. Unit of Measure (Enter Code)	D. Processes			
				(1) Process Codes (Enter Code)			(2) Process Description (If a code is not entered in D(1))
264	B007*	50	P	S01			
	D006						Included with above
	D008						Included with above
--	--	--	--	--			
265	B007*	50	P	S01			
	D006						Included with above
	D011						Included with above
--	--	--	--	--			
266	B007*	500	P	S01			
	D007						Included with above
--	--	--	--	--			
267	B007*	1000	P	S01			
	D007						Included with above
	D008						Included with above
--	--	--	--	--			
268	B007*	10000	P	S01			
	D008						Included with above
--	--	--	--	--			
269	B007*	30	P	S01			
	F003						Included with above
--	--	--	--	--			
270	B007	3000	P	S01			
	B002						Included with above
	D008						Included with above

*These codes are more likely than others to be generated as mixed waste.

8. Map (continued)

Knolls Atomic Power Laboratory - Knolls Laboratory



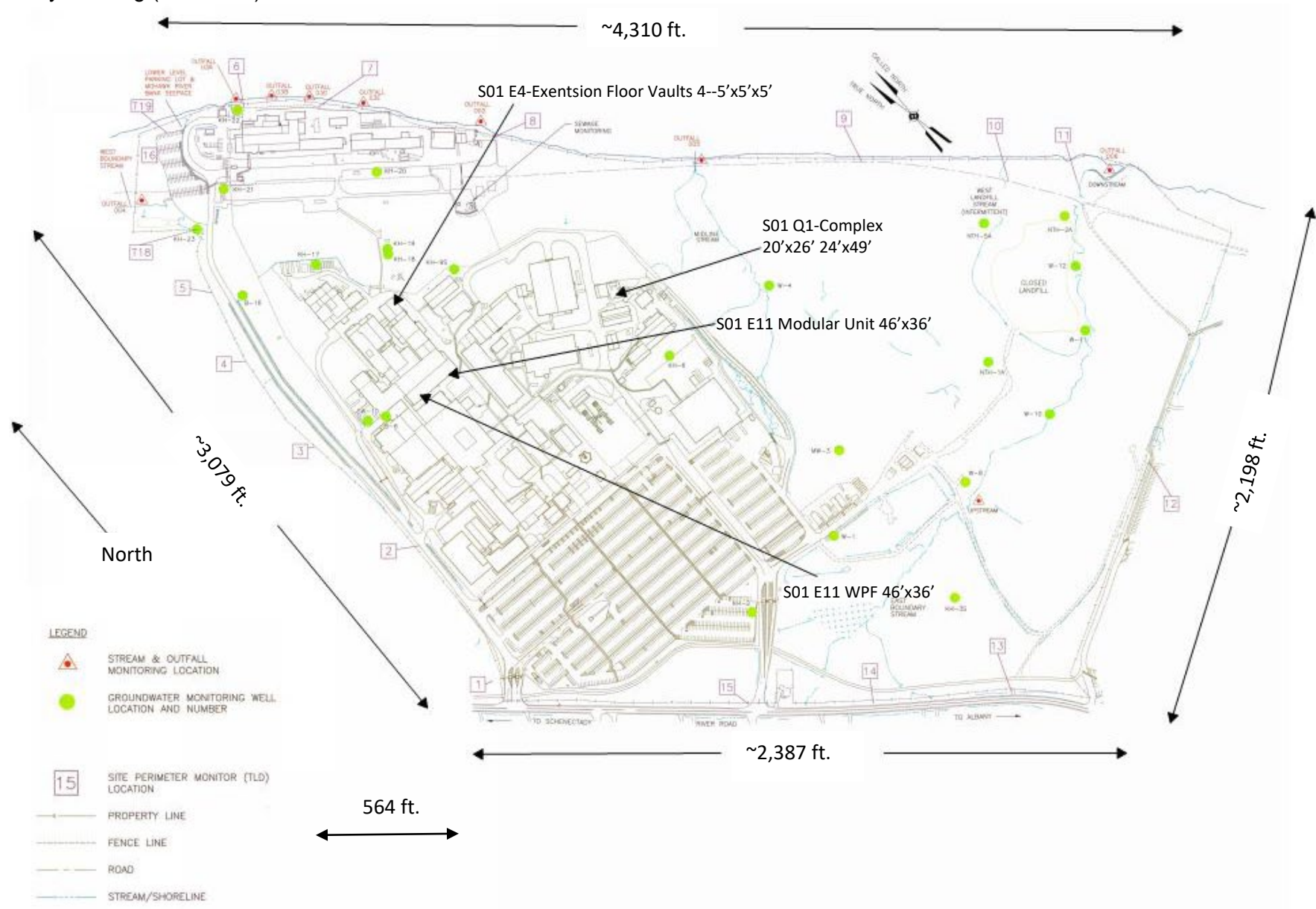
Knolls Atomic Power Laboratory – Knolls Laboratory

Niskayuna Quadrangle (1995)

42°49' 16.8" Latitude - 73°52' 5.3" Longitude

- | | |
|--|---|
| 1. SPDES Outfall 001 – River Water Intake | 2. SPDES Outfalls 03A, B, D, E |
| 3. SPDES Outfall 002 | 4. SPDES Outfall 004 – West Boundary Stream |
| 5. SPDES Outfall 005 – Midline Stream | 6. SPDES Outfall 006 – East Boundary Stream |
| 7. Waste Management Units – E4 Ext. Floor Vaults (S01) | 8. Waste Management Unit – E11 Modular Addition (S01) |
| 9. Waste Management Unit – E11 Waste Processing Facility (S01) | 10. Waste Management Unit – Q1 Complex (S01) |

9 . Facility Drawing (continued)



10. Photographs (continued)



10. Photographs (continued)



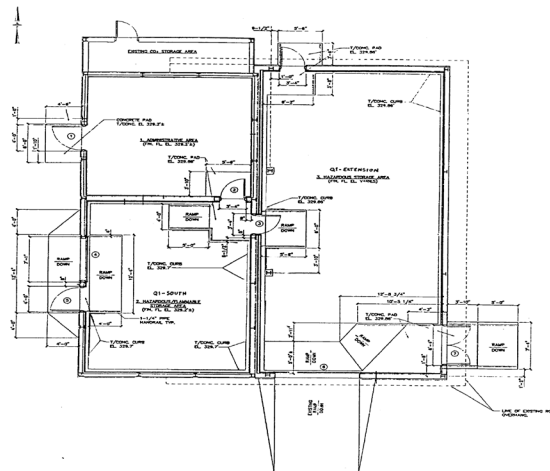
Unclassified

Process Code S01

Photograph Date 10/2021

Q1 Complex

Q1 – South – Front (West) and Side (South) Views / Q1-Extension – Side (South) View



Process Code - S01

10. Photographs (continued)



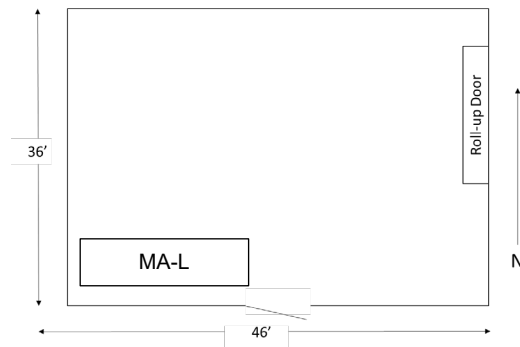
Q1 Complex

Q1 – Extension (South and East)

10. Photographs (continued)



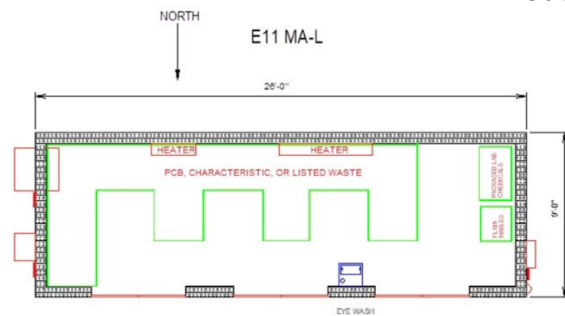
**E11 Truck Bay Containing Modular Addition
(Southwest view)
E11 MA-L**



10. Photographs (continued)



E11 Modular Addition MA-L

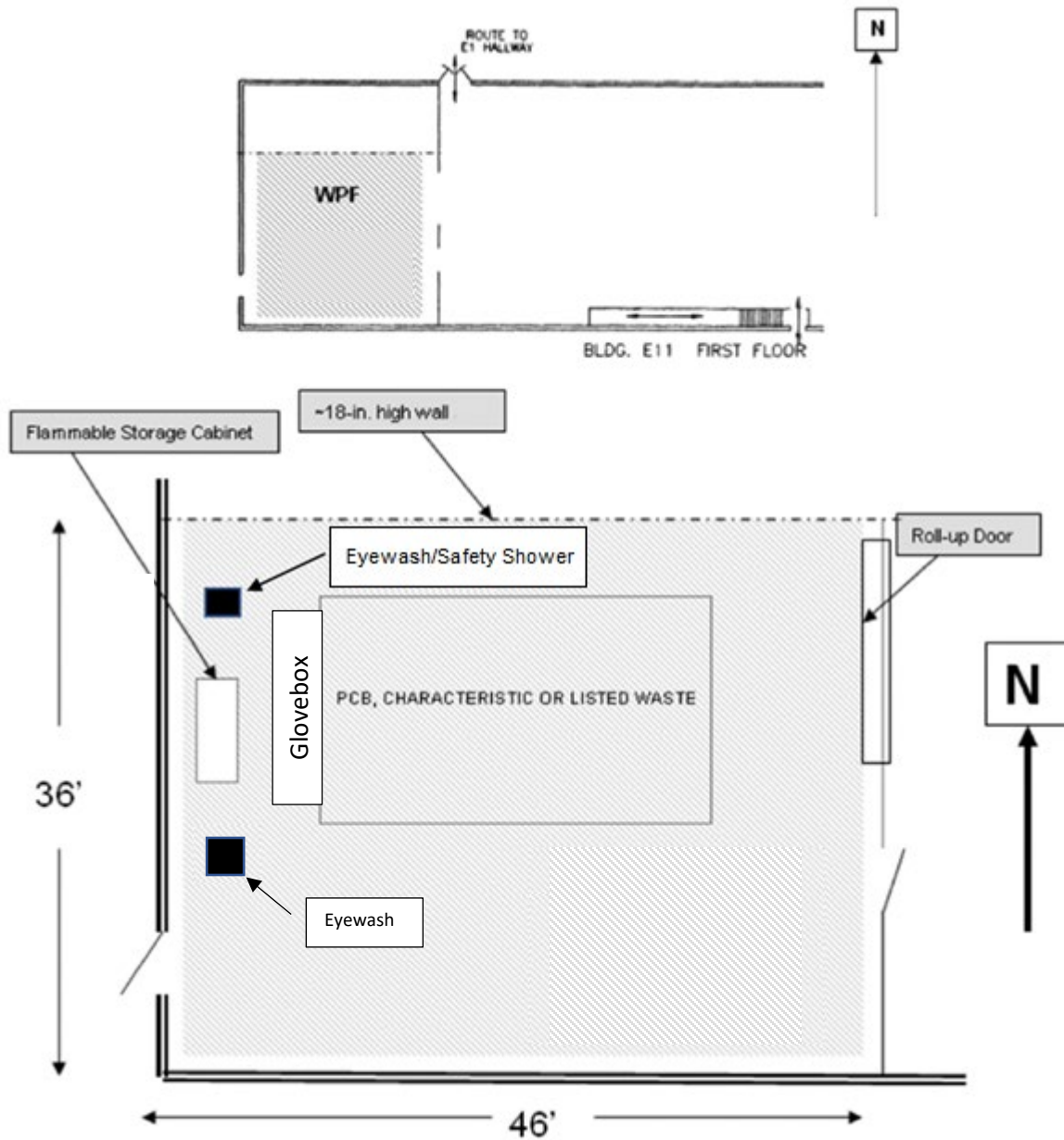


10. Photographs (continued)



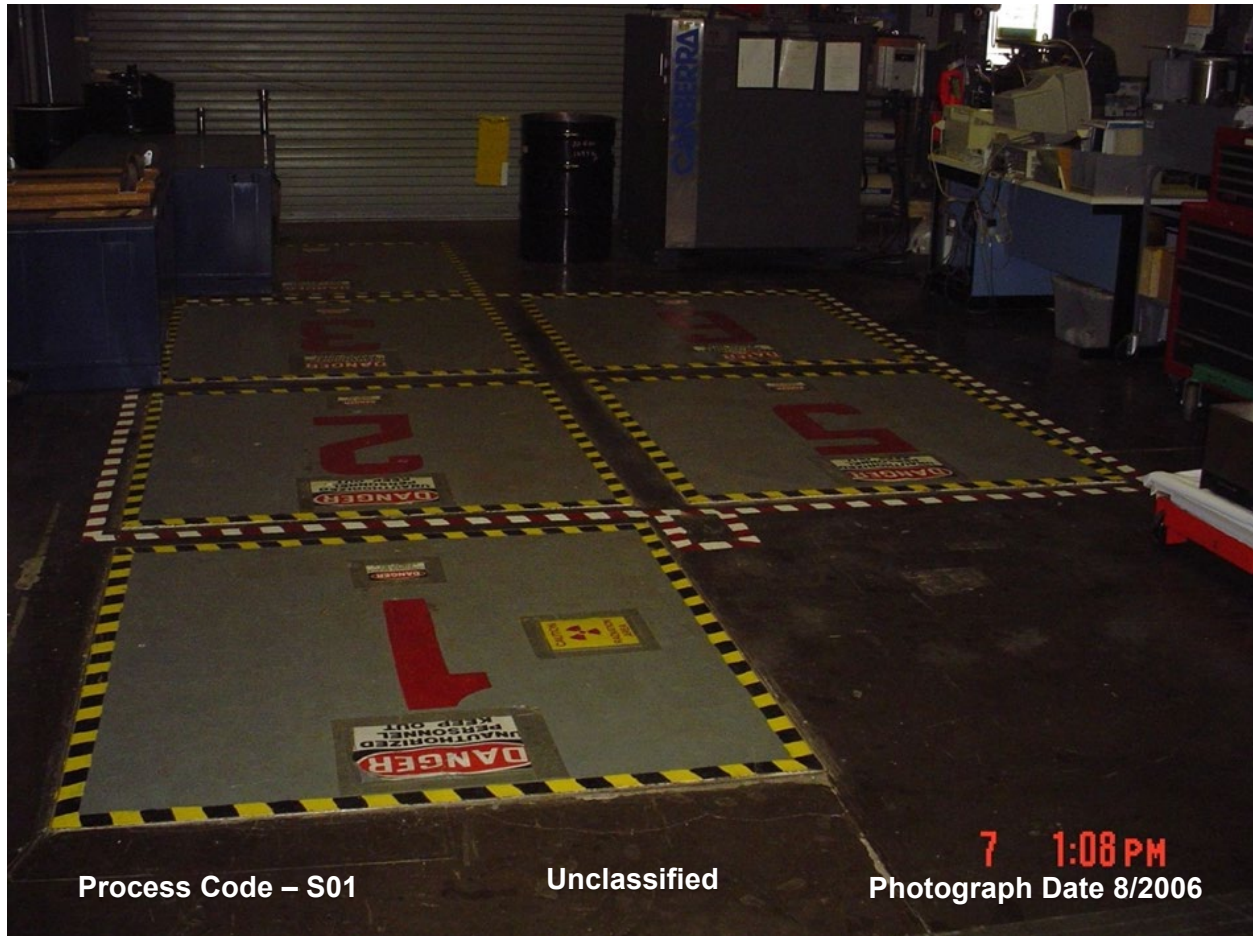
**Building E11 Waste
Processing Facility**
(Southwest corner facing
northeast)

10. Photographs (continued)



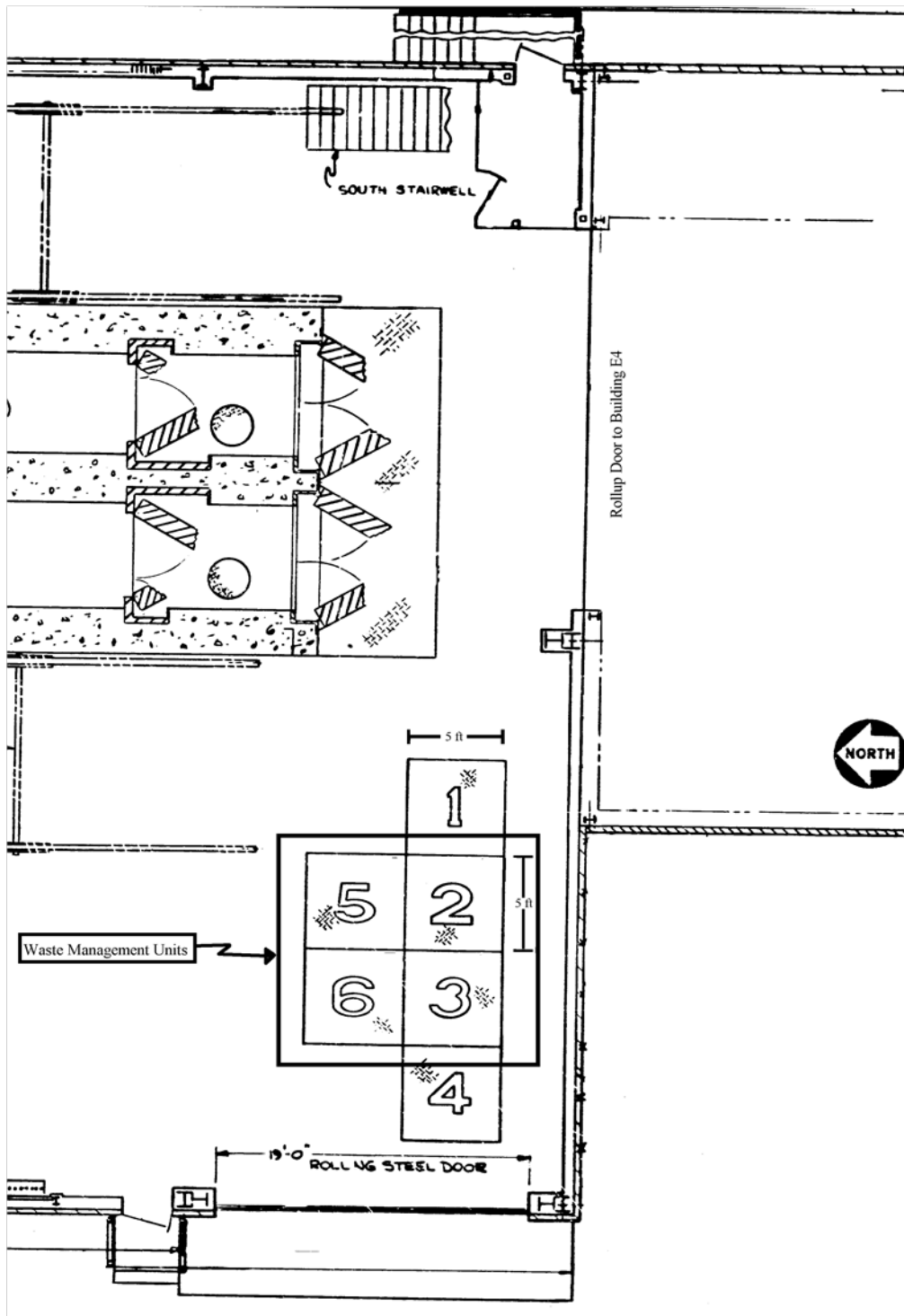
E11 Waste Processing Facility (S01)

10. Photographs (continued)



E4 Extension Vaults (2, 3, 5, and 6)

10. Photographs (continued)



E4 Extension Vaults (2, 3, 5, and 6)

KNOLLS ATOMIC POWER LABORATORY

KNOLLS LABORATORY

Attachment B Facility Description

EPA I.D. NUMBER NY 6890008992

**6 NYCRR PART 373 PERMIT
NUMBER
4-4224-00024/00001**

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INTRODUCTION

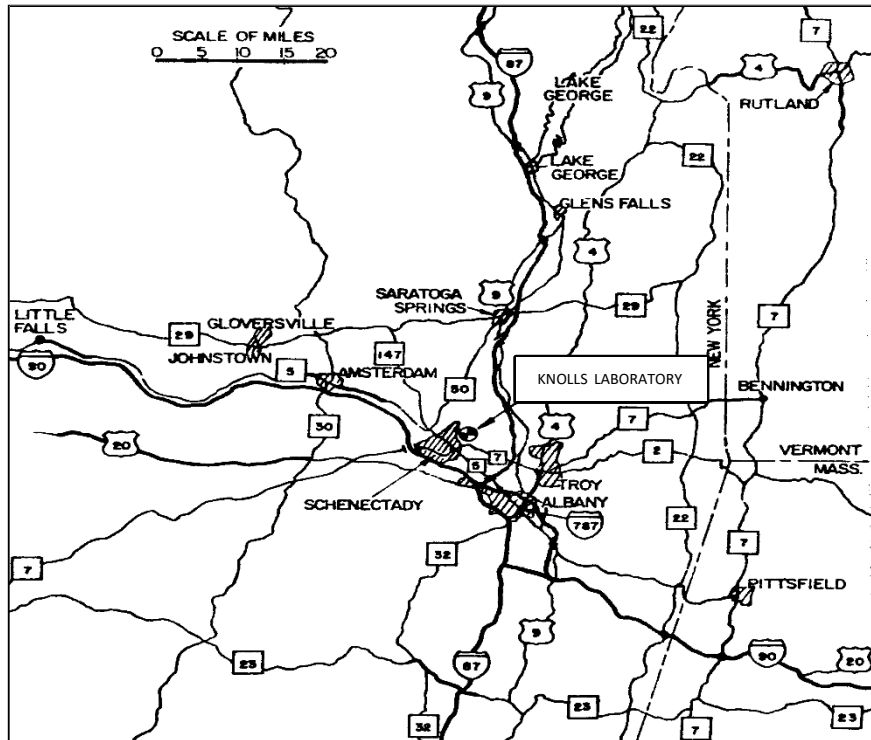
This attachment provides a general description of the Knolls Atomic Power Laboratory (KAPL) - Knolls Laboratory, located in Niskayuna, New York. It is presented in accordance with 6 NYCRR §§373-1.5(a)(2)(i), (x), (xi), (xix), and 373-2.2(j) [40 CFR §§270.14(b)(1), (10), (11), (19)].

GENERAL DESCRIPTION

The Knolls Laboratory is owned by the U. S. Department of Energy (USDOE) and operated for the Government under contract. The principal function of the Knolls Laboratory is research and development in the design and operation of naval nuclear propulsion plants. As a result of these operations, the Knolls Laboratory generates hazardous waste and mixed waste¹, which may have to be accumulated/stored on site for periods exceeding 90 days prior to disposition at a licensed off-site facility in accordance with all applicable environmental regulations.

A general location map for the Knolls Laboratory is provided as Figure 1. The Knolls Laboratory is located in the Town of Niskayuna, Schenectady County, New York, on the south bank of the Mohawk River. The Laboratory consists of 170 acres of land, extending approximately 4,310 feet along the river. Most of the Laboratory property is located on a bluff about 100 feet high with a steep slope dropping off to a low bench about 15 to 20 feet above the water surface of the river.

**FIGURE 1
GENERAL LOCATION MAP**



¹ The term, "Mixed waste" describes waste that contains both hazardous waste and radioactive material (source, special nuclear, or by-product material regulated by the Atomic Energy Act of 1954 [42 U.S.C. 2011 etseq.])

The Knolls Laboratory's operations are located in two principal areas. The larger area is at the top of the bluff on the northwesterly section of the property and is called the "upper level." The smaller area is located on the "lower level" bench adjacent to the river. The two areas occupy about 60 acres (35%) of the property. The balance of the Laboratory consists of woods and fields. The surrounding area is a mixture of open land, other research and development/light industry, parks, municipal facilities, and low-density suburban residential housing.

The Knolls Laboratory consists of laboratory buildings, offices, a warehouse, shops, cooling towers, a boiler house for centralized heating, and a river pumping station for non-contact cooling water. The Knolls Laboratory also consists of roads and parking lots paved with asphalt and concrete. Water for domestic use and fire protection is supplied by the City of Schenectady and Town of Niskayuna. Electrical power is furnished through transmission lines managed by National Grid.

Various types of both hazardous waste and mixed waste are produced at the Knolls Laboratory. The sources of these wastes are primarily from either byproducts from work in the research and development laboratories or resultant from demolition and refurbishment operations that occur throughout the Knolls Laboratory. Information regarding the types of wastes managed at the Knolls Laboratory can be found in Attachment C.

The hazardous and mixed wastes that are generated during normal operations are managed within four units at the Knolls Laboratory for periods exceeding 90-days. The waste management units and their design capacities are specified in Table 1. Their locations are shown on Figure 2, which can be found in a map pocket in the back of this attachment. The layout, structural attributes (i.e., walls, roof, floor) and operations that occur within each of the units are described within Attachment D.

TABLE 1
HAZARDOUS /MIXED WASTE MANAGEMENT UNITS

Waste Management Unit	Design Capacity (gallons)
Building Q1 complex (Q1-south and Q1-extension)	6,600
Building E11 truck bay modular addition: E11 MA-L ⁽¹⁾	1,320
Four floor vaults (#2, #3, #5 & #6) located in the Building E4-extension	2,600
Building E-11 Waste Processing Facility (E11 WPF)	7,180

Note for Table 1

(1) One prefabricated modular structure (E11 MA-L) is located on the southwest side of the Building E11 truck bay. The permitted unit, consisting of a prefabricated modular structure, has an authorized capacity of 1,320 gallons.

There is no disposal of hazardous or mixed waste at the Knolls Laboratory. The Knolls Laboratory only receives, stores, and processes all of the hazardous/mixed waste it manages under the terms of this permit for shipment to off-site, licensed/permitted treatment, storage and/or disposal facilities. The types of waste containers typically received at each of the units include chemical reagent bottles, cans, jugs, drums, and large volume boxes (e.g., 4 ft x 4 ft x 6 ft).

TOPOGRAPHIC MAP

The regulations outlined in 6 NYCRR §373-1.5(a)(2)(xix) [40 CFR §270.14(b)(19)] require that a topographic map be provided showing the facility and a distance of 1000 feet around it displayed along with a number of specific items. Figures 2 through 6 have been included to provide the applicable information. Table 2 presents a listing of the information required and indicates which of the corresponding figures provide the necessary items. Figures 2 through 4 can be found below, in addition to larger versions in the map pockets at the back of this Attachment.

The subsections that follow provide further explanations regarding the information requirements specified in 6 NYCRR §373-1.5(a)(2)(xix) and 40 CFR §270.14(b)(19).

- a. **Land Uses** -- Figure 4, Knolls Laboratory Surrounding Land Use Map shows that the area within 1000 feet of the Knolls Laboratory is a mixture of open land, parks, municipal facilities, research and development/light industry, and low density suburban residential housing.
- b. **Wind Rose** -- Figure 5 presents the wind rose for the Knolls Laboratory. The wind rose shown was prepared utilizing data obtained from monitoring equipment (mounted approximately 20 meters off the ground) on a meteorological tower located at the Laboratory. The wind rose represented is the composite data from 1989 through 2022.
- c. **Access Control** -- The developed portion of the Knolls Laboratory is surrounded by a fence to prevent accidental or unauthorized access to all active portions of the facility. Personnel and vehicle gates for routine entry on the Knolls Laboratory are controlled by security personnel.

Each hazardous/mixed waste management unit is equipped with the proper warning/identification signs to prevent unauthorized entry. Access control to each of the units is further controlled via locking of all vehicular and personnel entryways, when unoccupied.
- d. **Buildings** -- Figures 2 through 4 show the location of all existing buildings on the Laboratory property. Further details regarding the hazardous/mixed waste management units can be found in Attachments D and G.
- e. **Run-off Control Systems** -- Figure 2 illustrates the Laboratory's storm water drainage system. The main storm water system drains most of the Laboratory (including the locations around the E4-Extension and adjacent to Building E11) through outfalls into the Mohawk River. There are auxiliary storm water systems to drain the remaining portions of the Laboratory not covered by the main system. The auxiliary systems, specifically those around Building Q1, drain to hillsides that slope towards the Midline Stream, which eventually flows into the Mohawk River.

The design and construction of the hazardous/mixed waste management units themselves provide adequate runoff protection. Each unit consists of sufficient curbing or sloping to prevent any accumulated liquids from reaching the outside environment. There are no floor drains in any of these units.

- f. Injection and Withdrawal Wells** -- The Knolls Laboratory does not have any withdrawal or injection wells. There are no groundwater monitoring wells dedicated to the Knolls Laboratory's hazardous/mixed waste operations since such wells are not required for storage/treatment facilities. There are no drinking water wells. The site relies on municipal water sources.
- g. Loading Areas** -- The loading areas for wastes being transferred to or removed from the hazardous/mixed waste management units for off-site disposition are shown on Figures 2 through 4. Only trained personnel remove containerized and/or palletized waste from the respective waste management units and load the waste transport vehicles.
- h. Access and Internal Roads** -- All access and internal roads for the Laboratory are shown on Figures 2 through 4. The primary routes over which hazardous/mixed wastes are transported off-site from the respective waste management units are designated on Figure 2. Other (alternate) routes may be necessary when construction or other obstacles prevent use of primary routes.
- i. Storm, Sanitary and Process Sewage Systems** -- Wastewater from the Knolls Laboratory originates from several sources including cooling tower blowdown, boiler blowdown, site service water, site drainage, and Mohawk River water that is used for non-contact cooling. The storm drain system, which intercepts much of this water, is comprised of drainage piping, drain manways, and catch basins. A diagram of the Laboratory's storm sewer drainage system is provided on Figure 2. Most of the effluent from this gravity flow underground system is discharged to the Mohawk River. All discharges to the Mohawk River are monitored in accordance with the conditions of a State Pollutant Discharge Elimination System (SPDES) permit (refer to Attachment A for permit information).
- The sanitary sewer system directs domestic sewage and some minor amounts of process water to a single lift station, which then directs this flow to the Town of Niskayuna publicly owned treatment works via a forced main.
- j. Fire Control Facilities** -- The Laboratory is equipped with fire hydrants to supply water for fire fighting. Fire protection is provided by the Emergency Services & Systems (ESS) organization, which is trained and equipped to handle first response to on-site fires and emergencies associated with hazardous/mixed waste. Figures 2 through 4 reflect fire hydrants in vicinity of waste management units.
- In the event that off-site assistance is necessary, the Niskayuna Fire Department would be notified. The emergency response capabilities at the Knolls Laboratory are discussed in Attachment G.
- k. Flood Control/Drainage Barriers** -- As described in *Location Information* part b., the hazardous/mixed waste management units at the Knolls Laboratory are located above the 100-year floodplain and do not require any flood control barriers. As illustrated in Figure 2 storm drains are located in proximity to the hazardous/mixed waste management units to direct any storm water away from the waste management units.

LOCATION INFORMATION

- a. **Seismic Standard** -- The Knolls Laboratory is located in the town of Niskayuna, Schenectady County, New York. As such, this facility is not located in a seismically sensitive area listed in Appendix VI of 40 CFR Part 264. Since the Laboratory is not located in political jurisdictions listed in §264, Appendix VI, it is not required to demonstrate compliance with 40 CFR §264.18(a).
- b. **Floodplain Standards** -- According to the Flood Insurance Rate Map (FIRM), as prepared by the Federal Emergency Management Agency (FEMA), the Knolls Laboratory is not located within a 100-year floodplain (see Figure 6). Therefore, it is not required to demonstrate compliance with 6 NYCRR §373-2.2(j).

TRAFFIC INFORMATION

The gate through which hazardous/mixed waste transport vehicles normally enter the Knolls Laboratory and the routes over which they travel to and from each respective waste management units are shown in Figure 2. Normally, all vehicles arriving and exiting for waste shipments enter/exit the Laboratory via the main truck entrance on River Road as illustrated in Figure 2. Traffic control along the designated routes consists of signs depicting speed limits and clearance heights, where appropriate.

The roads over which waste transport vehicles drive are constructed of asphalt/concrete and have a load bearing capacity in accordance with the American Association of State Highway and Transportation Officials (AASHTO) Standard H20-44. They have been subjected to fully loaded trucks of the box tractor-trailer variety for several years and have exhibited no major deterioration. The average traffic volume, based on records over the past few years, is approximately 11 waste shipments per year.

TABLE 2
FIGURES CORRESPONDING TO THE TOPOGRAPHIC MAP GENERAL REQUIREMENTS

	<u>FIGURES</u>				
	2	3	4	5	6
Scale 1 inch ≤ 200 ft	X				
Contours sufficient to show surface water flow		X			
Extend 1,000 ft beyond property			X		X
Map scale	X	X	X		X
Map date	X	X	X		X
100-year floodplain area					X
Surface waters including intermittent waters	X	X	X		
Surrounding land use			X		
Wind rose				X	
Map orientation	X	X	X	X	X
Legal boundaries of the HWM facility site		X	X		
Location of access control	X				
Injection and withdrawal wells ¹					
Buildings	X	X	X		
Structures	X	X	X		
Sewers	X				
Location of exempt storage areas and solid waste storage areas	X	X	X		
Location of dry wells ²					
Loading and unloading areas	X	X	X		
Fire control facilities	X	X	X		
Flood control or drainage barriers ³					
Run-off control systems	X				
Location of waste management units	X	X	X		
Access and internal roads	X	X	X		

Notes for Table 2

- (1) The Knolls Laboratory does not have any withdrawal or injection wells.
(2) The Knolls Laboratory does not have any dry wells.
(3) The Knolls Laboratory does not have a need for any flood control or drainage barriers.

FIGURE 2

KNOLLS SITE PART B/373 PERMIT WASTE MANAGEMENT UNIT LOCATION PLAN



FIGURE 3

KNOLLS SITE PART B/373 PERMIT WASTE MANAGEMENT UNIT TOPOGRAPHIC PLAN

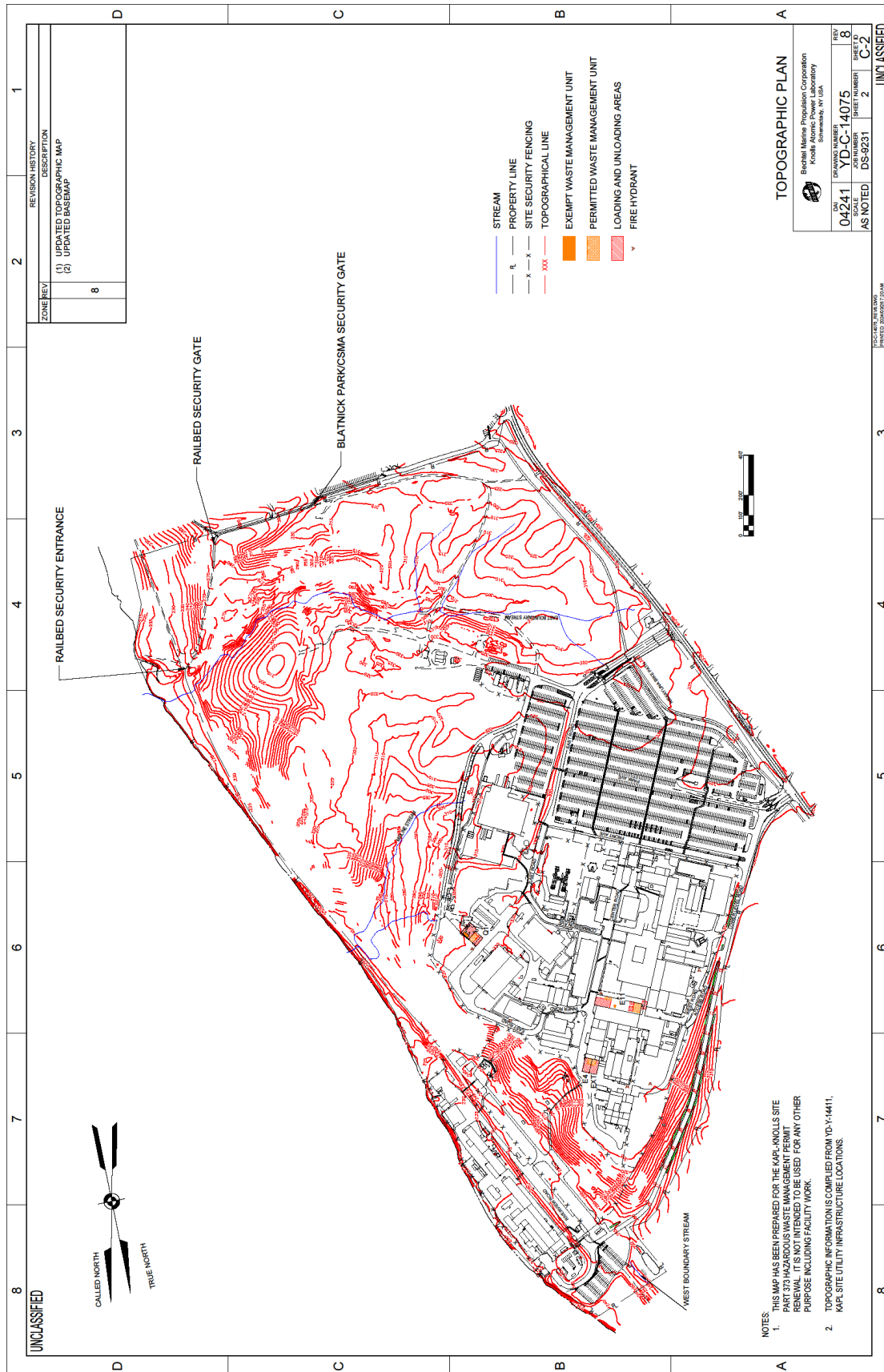
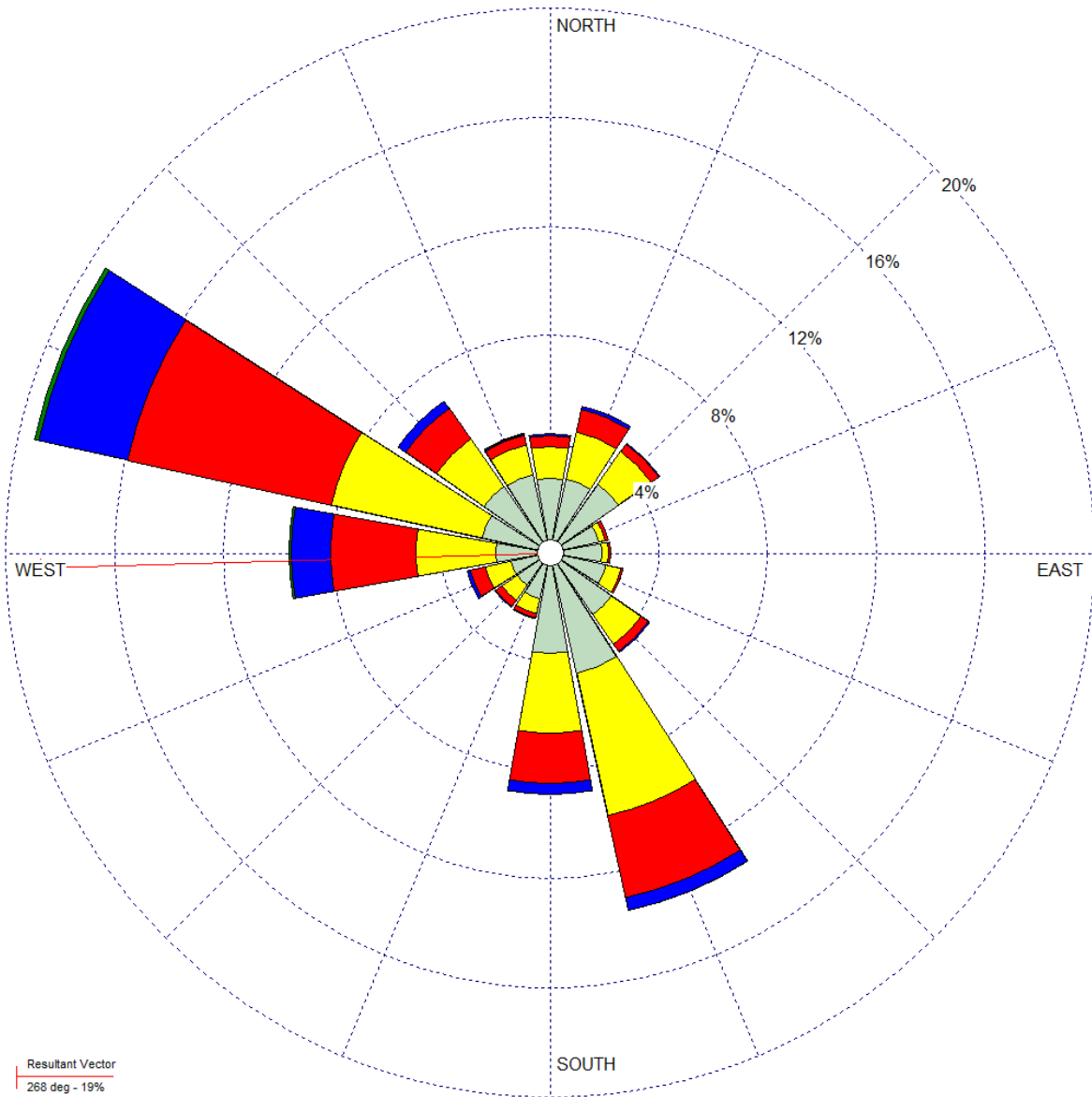


FIGURE 4

**KNOLLS SITE PART B/373 PERMIT WASTE MANAGEMENT UNIT
SURROUNDING LAND USE MAP**

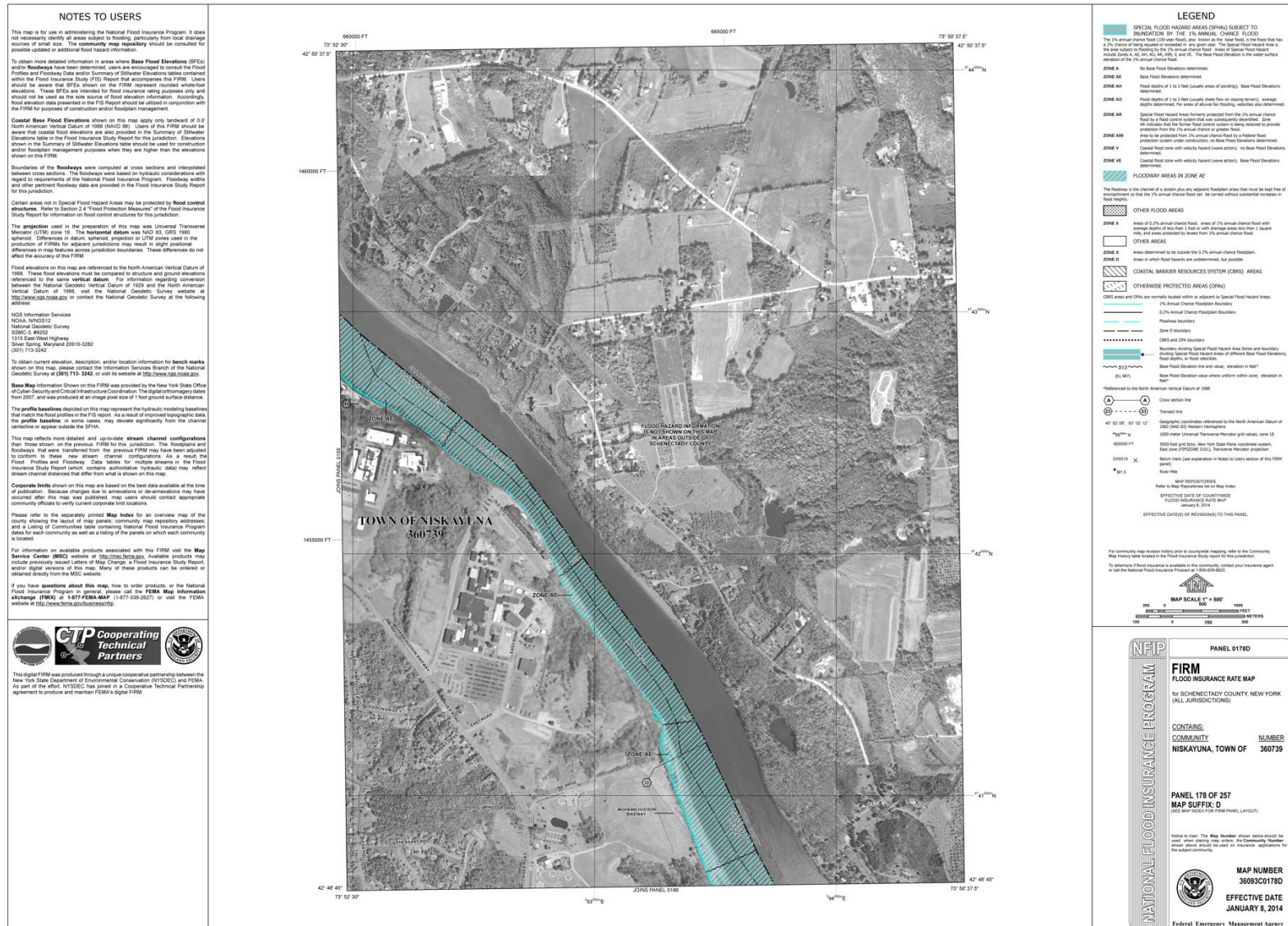


FIGURE 5
KNOLLS LABORATORY WIND ROSE
1989-2022



	Wind Speeds (m/s)	
	Greater than or equal to:	and less than:
	0.3	2.0
	2.0	3.5
	3.5	5.5
	5.5	8.5
	8.5	11.0
	11.0	

**FIGURE 6
FLOOD INSURANCE RATE MAP**



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KNOLLS ATOMIC POWER LABORATORY

KNOLLS LABORATORY

Attachment C Waste Characteristics

EPA I.D. NUMBER NY6890008992

**6 NYCRR PART 373 PERMIT
NUMBER
4-4224-00024/00001**

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INTRODUCTION

The information included herein is presented in accordance with the applicable requirements of 6 NYCRR §§371.3(a)(3), 373-1.5(a)(2), 373-2.2(e)(2), 373-2.5(c)(2), 376.1(g)(1) and 376.2(a) and (b) [40 CFR §§270.14(b)(2), 270.14(b)(3), 264.13 and 268.7(a)]. This attachment describes the chemical and physical nature of the hazardous and mixed wastes managed at the Knolls Laboratory. This attachment also contains the waste analysis plan for evaluating, sampling, and testing the waste to ensure that sufficient information is available for safe handling and to identify proper disposal means to protect human health and the environment.

CHEMICAL AND PHYSICAL CHARACTERISTICS

The Knolls Laboratory has historically generated various wastes which are hazardous wastes identified and listed in 6 NYCRR Part 371 [40 CFR Part 261]. Table 1 presents a listing of hazardous waste codes typically generated at the Knolls Laboratory. The Knolls Laboratory identifies/classifies its hazardous and mixed¹ wastes within a number of general waste categories. Table 2 provides a listing of the general waste categories and a brief description of the types of waste that are covered under each category.

Table 3 provides more detailed information on each of the general waste categories including the corresponding hazardous waste code numbers which typically² apply to each category, the processes generating the waste, sources of waste data, sampling methods, typical test parameters, major constituents (by %), management type and locations where permitted wastes are expected to be managed, compatibility groupings, typical treatment/disposal options, and estimated amount of each category expected to be handled per year.

A note appears on Table 3 that states that any waste code on this table may be generated in various combinations and stored on site for >90 days. Examples of typical waste code combinations per general waste category, which correspond to those waste codes listed in Table 1, are provided in Table 4.

The majority of hazardous and mixed wastes which are managed at the Knolls Laboratory are generated via laboratory operations, and facility renovation activities. The resultant waste streams are periodically evaluated by a cognizant Waste Chemical Coordinator³ (WCC) to determine if their compositions change due to process alterations or other factors. The remainder of the hazardous and mixed waste managed at the facility is comprised of waste generated during maintenance operations, remediation activities or from the discarding of unused excess, expired or off-specification laboratory reagents, products, or equipment.

-
- 1 The term, "*Mixed waste*" describes waste that contains both hazardous waste and radioactive material (source, special nuclear, or by-product material regulated by the Atomic Energy Act of 1954 [42 U.S.C. 2011 et seq.])
 - 2 That is, if a generated waste meets criteria that fits at least one general waste category in Table 2, but it has a waste code that is not assigned to that general waste category on Table 3, the generated waste is not precluded from being managed in a waste management unit covered under this permit unless --
 - The unassigned waste code is not listed on Table 1 (or in Attachment A); or
 - A general waste category does not exist in Table 2 that would adequately represent the generated waste.
 - 3 The term "*Waste Chemical Coordinator*" or "WCC" describes the KAPL employees responsible for coordinating the hazardous/mixed waste programs at the Knolls Laboratory. (See Attachment H for further information on this position.)

TABLE 1
HAZARDOUS WASTE GENERATED AT THE KNOLLS LABORATORY

HAZARDOUS WASTE NO. ¹	EPA WASTE CATEGORY ² (includes synonyms)
D001	A solid waste that exhibits the characteristics of ignitability. (I)
D002	A solid waste that exhibits the characteristic of corrosivity. (C)
D003	A solid waste that exhibits the characteristic of reactivity. (R)
D004, D005, D006, D007, D008, D009, D010, D011, D018, D019, D022, D026, D028, D029, D035, D036, D038, D039, D040, D042, D043	A solid waste that exhibits the characteristic of Toxicity. (T)
F001	The following spent halogenated solvents used in degreasing: tetrachloroethylene, trichloroethylene, methylene chloride, 1,1,1 - trichloroethane, carbon tetrachloride, and chlorinated fluorocarbons; all spent solvent mixtures/blends used in degreasing containing, before use, a total of ten percent or more (by volume) of one or more of the above halogenated solvents listed in F002, F004, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures. (T)
F002	The following spent halogenated solvents: tetrachloroethylene, methylene chloride, trichloroethylene, 1,1,1 - trichloroethane, chlorobenzene, 1,1,2 - trichloro - 1,2,2 - trifluoroethane, ortho-dichlorobenzene, trichlorofluoromethane, and 1,1, 2-trichloroethane; all spent solvent mixtures/blends containing, before use, a total of ten percent or more (by volume) of one or more of the above halogenated solvents or those listed in F001, F004, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures. (T)
F003	The following spent non-halogenated solvents: xylene, acetone, ethyl acetate, ethyl benzene, ethyl ether, methyl isobutyl ketone, n-butyl alcohol, cyclohexanone, and methanol; all spent solvent mixtures/blends containing, before use, only the above spent non-halogenated solvents; and all spent solvent mixtures/blends containing, before use, one or more of the above non-halogenated solvents, and a total of ten percent or more (by volume) of one or more of those solvents listed in F001, F002, F004, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures. (I)
F004	The following spent non-halogenated solvents: cresols and cresylic acid, and nitrobenzene; all spent solvent mixtures/blends containing, before use, a total of ten percent or more (by volume) of one or more of the above non-halogenated solvents or those solvents listed in F001, F002, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures. (T)

TABLE 1
HAZARDOUS WASTE GENERATED AT THE KNOLLS LABORATORY

HAZARDOUS WASTE NO. ¹	EPA WASTE CATEGORY ² (includes synonyms)
F005	The following spent non-halogenated solvents: toluene, methyl ethyl ketone, carbon disulfide, isobutanol, pyridine, benzene, 2-ethoxyethanol, and 2-nitropropane; all spent solvent mixtures/blends containing, before use, a total of ten percent or more (by volume) of one or more of the above non-halogenated solvents or those solvents listed in F001, F002, or F004; and still bottoms from the recovery of these spend solvents and spent solvent mixtures. (I,T)
F007	Spent cyanide plating bath solutions from electroplating operations. (R,T)
F009	Spent stripping and cleaning bath solutions from electroplating operations where cyanides are used in the process. (R,T)
P005	Allyl alcohol 2-Propen-1-ol
P010	Arsenic acid [H ₃ AsO ₄]
P011	Arsenic oxide [As ₂ O ₅] Arsenic pentoxide
P012	Arsenic oxide [As ₂ O ₃] Arsenic trioxide
P013	Barium cyanide
P015	Beryllium Powder
P021	Calcium cyanide Calcium cyanide [Ca(CN) ₂]
P022	Carbon disulfide
P028	Benzene, (chloromethyl) Benzylchloride
P029	Copper cyanide Copper cyanide Cu(CN)
P030	Cyanides (soluble cyanide salts), not otherwise specified
P042	1,2-Benzenediol, 4-[1-hydroxy-2-(methylamino)ethyl]-, (R) Epinephrine
P056	Fluorine
P063	Hydrocyanic acid Hydrogen cyanide

TABLE 1
HAZARDOUS WASTE GENERATED AT THE KNOLLS LABORATORY

HAZARDOUS WASTE NO. ¹	EPA WASTE CATEGORY ² (includes synonyms)
P064	Methane, isocyanato- / Methyl isocyanate
P068	Methyl hydrazine Hydrazine, methyl-
P074	Nickel cyanide [Ni(CN) ²]
P075	Nicotine, & salts Pyridine, 3-(1-methyl-2-pyrrolidinyl)-, (S)-, & salts
P076	Nitric oxide Nitrogen oxide NO
P078	Nitrogen dioxide Nitrogen oxide NO ₂
P081	Nitroglycerine (R) 1,2,3-Propanetriol, trinitrate (R)
P098	Potassium cyanide Potassium cyanide K(CN)
P104	Silver cyanide Silver cyanide Ag(CN)
P105	Sodium azide
P106	Sodium cyanide Sodium cyanide Na(CN)
P113	Thallic oxide Thallium oxide Tl ₂ O ₃
P114	Selenious acid, dithallium(1+) salt Thallium(I) selenite
P119	Ammonium vanadate Vanadic acid, Ammonium salt
P120	Vanadium pentoxide Vanadium oxide V ₂ O ₅
P121	Zinc cyanide Zinc cyanide Zn(CN) ₂
P123	Toxaphene
P205	Zinc, bis(dimethylcarbamodithioato-S,S')-,: Ziram

TABLE 1
HAZARDOUS WASTE GENERATED AT THE KNOLLS LABORATORY

HAZARDOUS WASTE NO. ¹	EPA WASTE CATEGORY ² (includes synonyms)
U001	Ethanal (I); Acetaldehyde
U002	Acetone (I) 2-Propanone (I)
U003	Acetonitrile (I,T)
U009	Acrylonitrile 2-Propenenitrile
U012	Aniline (I,T) Benzenamine (I,T)
U019	Benzene (I,T)
U028	Diethylhexyl phthalate 1,2-Benzenedicarboxylic acid, bis(2-ethylhexyl) ester
U031	1-Butanol (I) n-Butyl alcohol (I)
U041	Epichlorohydrin Oxirane, (chloromethyl)-2
U043	Ethene, chloro- Vinyl chloride
U044	Chloroform Methane, trichloro-
U045	Methane, chloro- (I,T) Methyl chloride (I,T)
U052	Cresol (Cresylic acid) Phenol, methyl-
U056	Benzene, hexahydro- (I) Cyclohexane (I)
U057	Cyclohexanone (I)
U068	Methane, dibromo-; Methylene bromide
U069	1,2-Benzenedicarboxylic acid, dibutyl ester Dibutyl phthalate

TABLE 1
HAZARDOUS WASTE GENERATED AT THE KNOLLS LABORATORY

HAZARDOUS WASTE NO. ¹	EPA WASTE CATEGORY ² (includes synonyms)
U070	Benzene, 1,2-dichloro- o-Dichlorobenzene
U072	Benzene, 1,4-dichloro- p-Dichlorobenzene
U075	Dichlorodifluoromethane Methane, dichlorodifluoro-
U076	Ethane, 1,1-dichloro- Ethylidene dichloride
U077	Ethane, 1,2-dichloro- Ethylene dichloride
U078	1,1-Dichloroethylene Ethene, 1,1-dichloro-
U079	1,2-Dichloroethylene Ethene, 1,2-dichloro-, (E)-
U080	Methane, dichloro- Methylene chloride
U092	Dimethylamine (I) Methanamine, N-methyl- (I)
U107	1,2-Benzenedicarboxylic acid, dioctyl ester Di-n-octyl phthalate
U108	1,4-Diethyleneoxide 1,4-Dioxane
U109	1,2-Diphenylhydrazine Hydrazine, 1,2-diphenyl-
U112	Ethyl acetate (I) Acetic acid, ethyl ester (I)
U117	Ethane, 1,1'-oxybis- (I) Ethyl ether (I)
U121	Methane, trichlorofluoro- Trichloromonofluoromethane
U122	Formaldehyde
U133	Hydrazine (R,T)

TABLE 1
HAZARDOUS WASTE GENERATED AT THE KNOLLS LABORATORY

HAZARDOUS WASTE NO. ¹	EPA WASTE CATEGORY ² (includes synonyms)
U134	Hydrofluoric acid (C,T) Hydrogen fluoride (C,T)
U135	Hydrogen sulfide Hydrogen sulfide H ₂ S
U140	Isobutyl alcohol (I,T) 1-Propanol, 2-methyl- (I,T)
U144	Lead acetate Acetic acid, lead(2+) salt
U145	Lead phosphate; Phosphoric acid, lead(2 +) salt (2:3)
U151	Mercury
U154	Methanol (I) Methyl alcohol (I)
U159	Methyl ethyl ketone (MEK) (I,T) 2-Butanone (I,T)
U161	Methyl isobutyl ketone (I) 4-Methyl-2-pentanone (I) Pentanol, 4-methyl-
U162	2-Propenoic acid, 2-methyl-, methyl ester (I,T) Methyl Methacrylate (I,T)
U165	Naphthalene
U188	Phenol
U194	n-Propylamine (I,T) 1-Propanamine (I,T)
U196	Pyridine
U201	Resorcinol 1,3-Benzenediol
U204	Selenious acid Selenium dioxide
U205	Selenium sulfide Selenium sulfide SeS ₂ (R,T)

TABLE 1
HAZARDOUS WASTE GENERATED AT THE KNOLLS LABORATORY

HAZARDOUS WASTE NO. ¹	EPA WASTE CATEGORY ² (includes synonyms)
U208	Ethane, 1,1,1,2-tetrachloro- 1,1,1,2-Tetrachloroethane
U209	Ethane, 1,1,2,2-tetrachloro- 1,1,2,2-Tetrachloroethane
U210	Tetrachloroethylene Ethene, tetrachloro-
U211	Carbon tetrachloride Methane, Tetrachloro -
U213	Furan, tetrahydro- (I) Tetrahydrofuran (I)
U216	Thallium(I) chloride Thallium chloride TICl
U217	Nitric acid, thallium(1+) salt Thallium(I) nitrate
U219	Thiourea
U220	Toluene Benzene, methyl-
U225	Bromoform Methane, tribromo-
U226	Ethane, 1,1,1-trichloro- Methyl chloroform
U227	1,1,2-Trichloroethane Ethane, 1,1,2-trichloro-
U228	Trichloroethylene Ethene, trichloro
U239	Benzene, dimethyl - (I,T) Xylene (I,T)
U359	Ethanol, 2-ethoxy-; Ethylene glycol monoethyl ether
U404	Triethylamine Ethanamine, N,N-diethyl-
B001 ³	PCB Oil (concentrated) from transformers, capacitors, etc.

TABLE 1
HAZARDOUS WASTE GENERATED AT THE KNOLLS LABORATORY

HAZARDOUS WASTE NO. ¹	EPA WASTE CATEGORY ² (includes synonyms)
B002 ³	Petroleum oil or other liquid containing 50 ppm or greater of PCBs, but less than 500 ppm PCBs. This includes oil from electrical equipment whose PCB concentration is unknown, except for circuit breakers, reclosers and cable.
B003 ³	Petroleum oil or other liquid containing 500 ppm or greater of PCBs.
B004 ³	PCB Articles containing 50 ppm or greater of PCBs, but less than 500 ppm PCBs, excluding small capacitors. This includes oil-filled electrical equipment whose PCB concentration is unknown, except for circuit breakers, reclosers, and cable.
B005 ³	PCB Articles, other than transformers, that contain 500 ppm or greater of PCBs, excluding small capacitors.
B006 ³	PCB Transformers. "PCB Transformers" means any transformer that contains 500 ppm PCB or greater.
B007 ³	Other PCB Wastes including contaminated soil, solids, sludges, clothing, rags and dredge material.

NOTES FOR TABLE 1

1. All waste codes on this table may be generated in various combinations and stored on site for greater than 90 days. Examples of typical combinations are shown within Attachment A - Part A Application and in Table 4 of this section.
2. The primary hazardous properties of the above listed chemicals have been indicated by the letter T (Toxicity), R (Reactivity), I (Ignitability) and C (Corrosivity). Absence of a letter indicates that the chemical is only listed for toxicity.
3. These are New York State hazardous waste numbers related to polychlorinated biphenyls (PCBs), based on regulations contained in 6 NYCRR §371.4(e).

TABLE 2
KNOLLS LABORATORY WASTE CATEGORIES

CATEGORY	DESCRIPTION
Oils	Lubricating/cutting, pump, engine and hydraulic oils from maintenance/repair of various equipment and machinery, and remediation activities.
PCB Contaminated Waste	Waste material with PCB concentrations ≥ 50 ppm, meeting the criteria specified in 6 NYCRR 371.4(e).
Debris, Equipment and Solids	Discarded organic (e.g., paper, plastic, cloth, rubber) and inorganic (e.g., glass, metal, ceramic) debris, equipment, and solids containing or contaminated with materials/residues, cleaning/decontamination solutions, surface coatings, inherent hazardous waste, or solidified media.
Sludges and Particulates	Organic and inorganic system residues, sludges, particulates and paint chips from maintenance and remedial operations
Aqueous Liquids and Slurries	Aqueous waste from laboratory, maintenance, decontamination and remedial operations
Soils	Waste soils from maintenance, decontamination and remediation activities.
Solvents	Waste solvents from laboratory operations, maintenance, decontamination and remediation activities.
Miscellaneous Lab Chemicals	Small, lab-pack type wastes consisting of discarded portions of unused commercial chemical products, off-specification species, container residues, spill residues and minute laboratory wastes.

CONTAINERIZED WASTE

The Knolls Laboratory manages its hazardous waste and mixed waste on site for periods exceeding 90 days in four waste management units. These units are: the Building Q1 complex, which includes Building Q1 south and the Building Q1 extension; one modular structure (E11 MA-L) in the Building E11 truck bay; the four floor vaults (numbered 2, 3, 5, and 6) located in the Building E4 extension; and the E11 Waste Processing Facility (E11 WPF). Information regarding each of these four units can be found in Attachments A, B, D, and G (Part A Permit Application, Facility Description, Process Description, and Contingency Plan, respectively).

All hazardous/mixed waste managed at the Knolls Laboratory is stored in containers (see Attachment D for discussion regarding container types and volumes). Prior to transferring hazardous or mixed waste to one of the four management units mentioned previously, each waste is evaluated to determine its proper identification and characterization. Waste evaluations can be performed using acceptable knowledge, laboratory analysis, or a combination of the two. Information regarding these evaluation parameters is discussed in *Waste Analysis Plan*, below.

WASTE ANALYSIS PLAN

A prerequisite step in proper management is the identification of hazardous wastes and mixed wastes in accordance with regulatory and permit requirements. The Knolls Laboratory evaluates solid wastes to determine if the wastes are hazardous in accordance with RCRA characteristics and listings set forth in 6 NYCRR §§371.3 and 371.4 [40 CFR Part 261, subparts C & D]. These evaluations are performed through the application of acceptable knowledge or testing.

Acceptable knowledge can be broadly defined to include:

- ‘Process knowledge’ whereby detailed information on the waste is obtained from existing published or documented sources such as Safety Data Sheets (SDS), information supplied with purchased materials, information on materials obtained from standard references such as the Condensed Chemical Dictionary (Van Nostrand/Reinhold), the Merck Index (Merck), Dangerous Properties of Industrial Materials (Sax), or equivalent sources, and analysis data or studies conducted by the Knolls Laboratory, or other Naval Nuclear Propulsion Program Sites (e.g. the Kesselring Site in West Milton, NY). Waste analysis data obtained from Knolls Laboratory generators that are received at the Knolls Laboratory’s waste management units.
- Waste analysis for mixed waste may be performed on surrogate samples. Surrogate materials must be selected or developed which are representative of the waste being generated. These surrogates will be prepared to be consistent with the physical make-up, chemical constituents and concentration of the parent waste without the radioactivity. Analysis of the surrogate will provide sufficient data to determine if the waste is acceptable for meeting permit requirements. A surrogate may be produced for current waste streams and for any waste which, is new or differs in chemical constituents, concentration, or physical composition.

The Knolls Laboratory also ensures permit compliance by conducting a full-scale or, under certain circumstances, an abbreviated-scale, sampling and analysis program for the wastes prior to managing the waste in the permitted units. Full-scale analysis (e.g., EPA’s SW-846 methods or equivalent) may be necessary when:

- A new process begins or changes are made to an existing process
- A new waste is generated at the facility for the first time
- An off-site TSDF requires appropriate laboratory information
- A WCC suspects that the wastes received from on-site were not adequately identified by the generator
- EPA/NYSDEC changes RCRA waste identification/classification or land disposal restriction rules
- The hazardous characteristics of the waste stream are variable

Table 3 provides a listing of the typical evaluation parameters per general waste category that a waste falling under that category would be subject to under the term “full-scale”. The evaluator may use acceptable knowledge to limit the individual constituents analyzed for under these typical evaluation parameters to only those actually expected to be in the waste stream.

Abbreviated-scale waste analysis, often referred to as “fingerprint analysis” is conducted generally for parameters (e.g., flash point, pH, halogen content) that will give information that can be used to help verify that the waste generated, or received, matches the expected characteristics for that waste. For example, fingerprint analysis can be used to indicate that the

waste received matches the description on the internal waste transfer form, and that it is the waste type that the facility has agreed to (and is permitted to) accept.

The Knolls Laboratory may use acceptable knowledge alone or in conjunction with sampling and laboratory analysis. Although the exclusive use of acceptable knowledge does not relieve the Knolls Laboratory of its responsibility to obtain accurate waste analysis data, there are situations where it may be appropriate to apply acceptable knowledge, including:

- Hazardous waste characteristics from specific processes are properly documented.
- The waste is discarded unused commercial chemical products, reagents or chemicals of known physical and chemical constituents. Several of these fit into the P-listed and U-listed categories (6 NYCRR §371.4(d) or 40 CFR §261.33).
- Physical nature of the waste does not lend itself to taking a laboratory sample. For example, to conduct waste analysis of surface contaminated construction debris, such as painted steel girders, piping, and other structural devices, it may be necessary to use a combination of laboratory analysis and process knowledge. The process knowledge could be applied to identifying the composition of base construction materials (e.g., steel). One could then collect surface samples (e.g., paint or surface wipe) and conduct laboratory analysis to determine the representative concentrations of any contaminants present. If the base materials are porous, such as gypsum, the contaminants could be determined by conducting analysis on the extracts obtained from a solvent wash.
- Health and safety risks to personnel would not justify sampling and analysis (e.g., minimizing exposure to radioactivity and handling of radioactive material, if mixed waste is involved).

The results of all waste analyses and waste determinations performed on wastes managed in the permitted units are maintained in the facility operating record in accordance with 6 NYCRR §373-2.5(c)(2)(iii) [40 CFR §264.73(b)(3)]. A written operating record is kept at the Knolls Laboratory in accordance with 6 NYCRR §373-2.5(c)(1) [40 CFR §264.73(a)]. Appendix 4 provides Waste Analysis Report Examples.

A. PARAMETERS AND RATIONALE

An accurate representation of a waste's physical and chemical properties is critical in determining viable waste management options. Table 5 provides:

- a listing of analysis parameters utilized at the Knolls Laboratory when waste testing is to be performed. These analysis parameters are selected to represent those characteristics necessary for safe and effective waste management.
- a rationale column corresponding to each analysis parameter category. Each rationale describes the basis for selection of the particular waste analysis parameter and how it will measure the necessary physical and chemical waste properties to afford effective waste management within regulatory, permit, process and design conditions.

B. TEST METHODS

The Knolls Laboratory requires that all laboratory test methods utilized be those approved by EPA and referenced in the latest edition of "Test Methods for Evaluating Solid Waste, Physical/ Chemical Methods" (EPA Office of Water and Waste Management, SW-846), other equivalent references and/or guidance documents, or equivalent methods approved by the NYSDEC. Examples of the methods applicable to Knolls Laboratory are presented in

Table 5⁴. Appropriate digestion and sample preparation methods approved by EPA in the latest edition of SW-846, are to be used for these parameters prior to analysis. In addition, as required by 6 NYCRR §370.1(f), all outside laboratories contracted by KAPL which perform analyses stipulated in this section, must maintain current New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP) certification for those waste parameters where certification exists.

C. SAMPLING METHODS

Appendix 1 contains information on the equipment and procedures recommended for use when sampling the various hazardous waste streams. Table 3 provides a listing of the preferred sample method(s) corresponding to each of the general waste categories. A notation allowing the use of any other approved sampling method is provided in the note section following the table.

D. FREQUENCY OF EVALUATION

All unlabeled or incompletely documented waste will be properly evaluated to meet the requirements of this waste analysis plan prior to acceptance at any permitted waste management unit. Since the majority of waste, which is generated at the Knolls Laboratory is from adequately identified and documented operations or processes, reevaluations are not required every time identical/recurring waste is to be delivered to a permitted waste management unit. Reevaluation of an incoming waste is required if there has been a change in raw materials or operational parameters, or discrepancies are discovered during periodic waste stream review.

The minimum frequency of evaluation for each waste within a general waste category is based upon the process generating the waste and its frequency of generation. Examples of the correlation between waste evaluations and generation frequencies are presented below:

Generation		Evaluation Frequency
Frequency	Process	
Waste is generated often.	The process generating the waste is always the same.	Full-scale evaluation performed when waste is first generated, but will have its process and previous results reviewed annually to determine if anything has changed.
Waste is generated repeatedly in multiple container quantities.	The process generating the waste is the same or wastes are combined from multiple sources with like processes.	Full-scale evaluation performed when waste(s) first generated. Evaluations using representative samples could entail use of individual samples from each container or a composite sample of a grouping of containers to determine the hazardous nature of the waste. The process(es) generating waste(s) and previous results are reviewed annually to determine if anything has changed.
Waste is generated infrequently * (e.g., once a year or longer).	The process generating the waste is atypical.	Full-scale evaluations performed on every container of waste generated.

* Includes wastes falling under the general Miscellaneous Lab Chemical category.

⁴ EPA continuously updates Publication SW-846 to add new or revise existing approved test methods. Therefore, the Knolls Laboratory will be allowed to utilize any new or revised methods approved by EPA that correspond with those test parameters specified in Table 5.

E. RESERVED

F. RESERVED

G. ADDITIONAL REQUIREMENTS FOR IGNITABLE, REACTIVE, OR INCOMPATIBLE WASTE

All waste is evaluated for ignitability and reactivity before storage in the permitted units. Employing acceptable knowledge to determine ignitability or reactivity potential is often used. If a waste is determined to be ignitable or reactive, specific handling and storage requirements are determined by a WCC. Waste handlers are trained to use special precautions when handling ignitable or reactive materials. Segregation methods for storage of reactive wastes and incompatible wastes are determined prior to acceptance of the waste at one of the Knolls Laboratory's waste management units. Table 3 provides a listing of compatibility grouping codes corresponding to each of the general waste categories managed at the Knolls Laboratory. The compatibility grouping codes are defined in Appendix 3. Additional requirements for ignitable and reactive waste are described in Attachment F - Procedures to Prevent Hazards.

H. QUALITY ASSURANCE/QUALITY CONTROL PLAN

Appendix 2 provides the Knolls Laboratory Quality Assurance/Quality Control plan in accordance with the requirements outlined in 6 NYCRR §373-1.6(a)(5) [40 CFR §270.30(e)].

I. RECORDING OF ANALYSIS RESULTS

The results of all analysis conducted to evaluate Knolls Laboratory hazardous and mixed waste streams as part of this permit will be maintained in the facility operating record until closure of the facility as required by 6 NYCRR §373-2.5(c)(2)(iii) [40 CFR §264.73(b)(3)].

J. TESTING FOR PERMITS

The Knolls Laboratory does not perform any testing as part of this permit to satisfy other permits (e.g., SPDES). When testing is performed to satisfy any off-site treatment and disposal methods (e.g., land burial restrictions), the results are maintained within the facility operating record.

K. ADDITIONAL INFORMATION

Evaluations performed on spill residues associated with the Knolls Laboratory hazardous and mixed waste management units will be maintained in the facility operating record.

L. REQUIREMENTS FOR COMPLIANCE WITH AIR EMISSIONS STANDARDS FOR TANKS, SURFACE IMPOUNDMENTS AND CONTAINERS

Specific waste management unit (including containers) exemptions are provided in 6 NYCRR § 373-2.29(a)(2) [40 CFR § 264.1080(b)]. At the Knolls Laboratory, the following hazardous/mixed wastes are exempted from testing, evaluation, recordkeeping, and air emissions control management:

- (1) Wastes managed in containers with capacities less than or equal to 0.1 m³ (100 liters or 26 gallons); or

- (2) Wastes managed in a waste management unit which is used solely for the management of radioactive mixed waste under the authority of the Atomic Energy Act and the Nuclear Waste Policy Act.

The 6 NYCRR § 373-2.29 [40 CFR Part 264, subpart CC] standards require an evaluation/determination of the volatile organic (VO) concentration of a hazardous/mixed waste only when the hazardous/mixed waste is to be placed in a waste management unit (e.g., container, tank, or surface impoundment subject to the rule), that does not use air emission controls in accordance with the requirements of the rule (e.g., containers using Level 1 controls).

Hazardous/mixed wastes that are not managed in an exempt unit or a unit that is compliant with the 6 NYCRR § 373-2.29 [40 CFR Part 264 subpart CC] standards, will be evaluated to determine whether the waste's average VO concentration is equal to or greater than 500 ppmw (parts per million by weight). The determination will be performed using acceptable knowledge or laboratory analysis as outlined in 6 NYCRR § 373-2.29(d) [40 CFR § 264.1083]. For each hazardous/mixed waste generated at the Knolls Laboratory, which is not exempted, the volatile organic (VO) concentration determination must be made at the point the waste is first identified as a hazardous waste per 6 NYCRR § 371 [40 CFR 261].

The WCC, or designee is responsible for determining the VO concentration, or verifying the determination made by the generator of the waste, by testing and/or application of knowledge, of hazardous/mixed wastes not exempted from regulation. Those hazardous/mixed wastes having VO concentrations greater than or equal to 500 ppmw, will be managed to control air emissions per the applicable portions of 6 NYCRR § 373-2.29 [40 CFR Part 264, subpart CC]. The methods used to control the VO emissions from nonexempt hazardous/mixed wastes in CSAs at the Knolls Laboratory are discussed in Attachment D.

TABLE 3
KNOLLS LABORATORY WASTE STREAM BREAKDOWN

General Waste Category (1)	EPA/NYSDEC Hazardous Waste Codes (2) (3)	Typical Process/Source Generating Waste	Source of Waste Data (4)	Sampling Methods (5)	Typical Evaluation Parameters (6) (7) (8)	Major Component (10) Percent		Storage		Compatibility Group (12)	Amount Handled Per Year (lbs)	Typical Disposal Path
								Type	Location (11)			
Oils	D001, D005, D006, D007, D008, D009, D010, D011, D018, D019, D022, D028, D029, D035, D036, D039, D040, F001, F002, F003, F004, F005	<ul style="list-style-type: none">General MaintenanceDiscontinued use of process equipment<ul style="list-style-type: none">RemediationDiscarded out-of-specification or unused products/materials	Process Knowledge Laboratory Analysis of Representative Sample Laboratory Analysis of Representative Surrogate Sample	Coliwasa Grab Sample Composite Whole Waste	TC-Metals Total Organic Halogens PCBs Flash Point	Hazardous Constituents Petroleum/Synthetic Hydrocarbons Water Other Inert/nonhazardous constituents	<1 80-99 0-10 0-10	S01	Q1 E11T/B E4-Ext. E11 WPF	C, D	1000 - 5000	Recycle/Reclaim Incinerate
PCB Contaminated Waste	D001, D002, D005, D006, D007, D008, D009, D010, D011, D018, D035, D036, D039, D040, F001, F002, F003, F005, B001, B002, B003, B004, B005, B006, B007	<ul style="list-style-type: none">General MaintenanceDiscontinued use of process equipment<ul style="list-style-type: none">RemediationFacility RenovationLaboratory Wastes	Process Knowledge Laboratory Analysis of Representative Sample Laboratory Analysis of Representative Surrogate Sample	Coliwasa Grab Sample Composite Surface Sample Whole Waste	TC-Metals PCBs	Hazardous Constituents Petroleum/Synthetic Hydrocarbons Water Other Inert/nonhazardous constituents	<1-99 <1-99 <1 1-99	S01	Q1 E11T/B E4-Ext. E11 WPF	C, E (13)	10000 - 100000	Incinerate Stabilize Landfill (14)
Debris, Equipment and Solids	D003, D005, D006, D007, D008, D009, D010, D011, D018, D019, D022, D026, D028, D029, D035, D036, D039, D040, F001, F002, F003, F004, F005, F007, F009, P015	<ul style="list-style-type: none">General MaintenanceDiscontinued use of process equipment<ul style="list-style-type: none">RemediationFacility RenovationDiscarded out-of-specification or unused products/material	Process Knowledge Laboratory Analysis of Representative Sample Laboratory Analysis of Representative Surrogate Sample	Grab Sample Composite	TC-Metals TC-Organics Free Liquids (9) PCBs	Hazardous Constituents Petroleum/Synthetic Hydrocarbons Water Other Inert/nonhazardous constituents	1-99 <1 <1 1-99	S01	Q1 E11T/B E4-Ext. E11 WPF	C, E (13)	5000-20000	Recycle/Reclaim Incinerate Retort Stabilize
Sludges and Particulates	D002, D005, D006, D007, D008, D009, D010, D011, D018, D019, D022, D026, D028, D029, D035, D036, D039, D040, F001, F002, F003, F005	<ul style="list-style-type: none">General MaintenanceDiscontinued use of process equipment<ul style="list-style-type: none">RemediationFacility Renovation	Process Knowledge Laboratory Analysis of Representative Sample Laboratory Analysis of Representative Surrogate Sample	Grab Sample Composite Whole Waste	TC-Metals TC-Organics pH Flash Point Free Liquids (9) PCBs	Hazardous Constituents Petroleum/Synthetic Hydrocarbons Water Other Inert/nonhazardous constituents	<1-99 1 0-1 1-99	S01	Q1 E11T/B E11 WPF E4-Ext.	A, B, C, E (13)	500-2500	Incinerate Retort Stabilize
Aqueous Liquids and Slurries	D001, D002, D003, D005, D006, D007, D008, D009, D010, D011, D018, D019, D022, D026, D028, D029, D035, D036, D039, D040, D042, F001, F002, F003, F004, F005, F007, F009	<ul style="list-style-type: none">General MaintenanceDiscontinued use of process equipment<ul style="list-style-type: none">RemediationFacility RenovationLaboratory Wastes	Process Knowledge Laboratory Analysis of Representative Sample Laboratory Analysis of Representative Surrogate Sample	Coliwasa Grab Sample Composite Whole Waste	TC-Metals TC-Organics pH Flash Point	Hazardous Constituents Petroleum/Synthetic Hydrocarbons Water Other Inert/nonhazardous constituents	<1-10 1 90-99 1-10	S01	Q1 E11T/B E4-Ext. E11 WPF	A, B, C, D, E (13)	1000-10000	Recycle/Reclaim Waste Water Treatment Incinerate Retort Stabilize
Soils	D005, D006, D007, D008, D009, D010, D011, D018, D019, D022, D028, D029, D035, D039, D040, D042, F001, F002, F003, F004, F005, U002, U151, U154, U210, U211, U220, U226, U227, U228	<ul style="list-style-type: none">RemediationFacility Renovation	Process Knowledge Laboratory Analysis of Representative Sample Laboratory Analysis of Representative Surrogate Sample	Grab Sample Composite	TC-Metals TC-Organics Free Liquids (9)	Hazardous Constituents Petroleum/Synthetic Hydrocarbons Water Other Inert/nonhazardous constituents	<1-10 1 1-10 90-99	S01	Q1 E11T/B E4-Ext. E11 WPF	C, E	1000-100000	Incinerate Stabilize
Solvents	D001, D005, D006, D007, D008, D009, D010, D011, D018, D019, D022, D028, D029, D035, D036, D039, D040, D042, F001, F002, F003, F004, F005	<ul style="list-style-type: none">General MaintenanceDiscontinued use of process equipment<ul style="list-style-type: none">RemediationFacility RenovationDiscarded out-of-specification or unused products/materialLaboratory Wastes	Process Knowledge Laboratory Analysis of Representative Sample Laboratory Analysis of Representative Surrogate Sample	Coliwasa Grab Sample Composite Whole Waste	TC-Metals TC-Organics Flash Point	Hazardous Constituents Petroleum/Synthetic Hydrocarbons Water Other Inert/nonhazardous constituents	11-99 1 1-10 1-99	S01	Q1 E11T/B E4-Ext. E11 WPF	C, D	1000-5000	Recycle/Reclaim Incinerate
Miscellaneous Lab Chemicals	Any/All Table 1 Constituents	<ul style="list-style-type: none">RemediationDiscarded out-of-specification or unused products/materialLaboratory Wastes	Process Knowledge Laboratory Analysis of Representative Sample Laboratory Analysis of Representative Surrogate Sample	Grab Sample Whole Waste	TC-Metals TC-Organics pH Flash Point	Hazardous Constituents Petroleum/Synthetic Hydrocarbons Water Other Inert/nonhazardous constituents	1-100 0-99 0-99 0-99	S01	Q1 E11T/B E4-Ext. E11 WPF	Any (13)	1000-5000	Recycle/Reclaim Waste Water Treatment Incinerate Retort Stabilize Landfill

NOTES FOR TABLE 3

- (1) Waste categories listed in this column are taken from Table 2
- (2) These general waste category code assignments are “typical”. That is, if a generated waste meets criteria that fits at least one general waste category in Table 2, but it has a waste code that is not assigned to that general waste category in this table, the generated waste is not precluded from being managed in a waste management unit covered under this permit unless --
 - The unassigned waste code is not listed on Table 1 (or in Attachment A); or
 - A general waste category does not exist in Table 2 that would adequately represent the generated waste.
- (3) All waste codes on this table may be generated in various combinations and stored on site for greater than 90 days. Examples of typical combinations are shown in ATTACHMENT A, Part A Application.
- (4) One or any combination.
- (5) See Appendix 1 for representative sampling method references.
- (6) These are the minimum parameters expected to be evaluated for each waste stream within a general waste category. Evaluations of a waste stream may entail acceptable knowledge (i.e., process knowledge, waste analysis data from other sources or surrogate samples) or laboratory analysis of a representative sample to provide the applicable parameter information consistent with this portion of the table. Where laboratory analysis is used, test parameters are selected based on knowledge of waste matrices and the waste generating process. See Table 5 for recommended methods and rationale for analysis (Other approved methods in EPA’s latest approved edition of Publication SW-846 may also be used).
- (7) Wastes that are determined to be hazardous wastes, as identified in 6 NYCRR 371.2 (40 CFR 261), may be subject to evaluation for volatile organic content to determine the applicability of management requirements under §373-2.29 (40 CFR 264.1083), as discussed in Waste Analysis Plan, subparagraph 1.
- (8) Requisite LDR characterization parameters may also be necessary as specified at 6 NYCRR §376.1(g)(1) [40 CFR §268.7(a)]
- (9) Free Liquids evaluation may be conducted through visual means.
- (10) Based on acceptable knowledge, laboratory analyses or a combination of the two.
- (11) Storage Locations: E11 T/B stands for the Building E11 truck bay which includes a prefabricated modular structure -- modular addition - large (E11 MA-L), E4-Ext stands for the E4-Extension Floor Vaults, and E11 WPF stands for Waste Processing Facility located in Building E11.
- (12) See Appendix 3 for explanation of the compatibility group(s).
- (13) Exceptions are not typical wastes (see Appendix 3); They are handled separately on site with extreme caution and under close supervision. Varies depending upon overall composition of waste stream.
- (14) Many PCB wastes (NYS hazardous per 6 NYCRR 371.4(e)) can still be landfilled without treatment per applicable portions of 40 CFR Part 761.

TABLE 4
EXAMPLES OF WASTE STREAM CODE COMBINATIONS ⁽¹⁾

General Waste Category	Hazardous/Mixed Waste Code Combinations ⁽²⁾
Oils	D006/D008 D006/D008/D018 D006/D018 D008/D018
PCB Contaminated Waste	B002/D006 B002/D006/D008 B002/D008 B003/D006 B003/D006/D008 B003/D008 B007/B002/D008 B007/D007/D008 B007/D008 B007/F003
Debris, Equipment, and Solids	D007/D009 D008/D009 D007/D008/D009
Sludges and Particulates	D001/D007/D008 D001/D007/D008/D035 D001/D008/D035 D007/D008/D011
Aqueous Liquids and Slurries	D001/D002 D001/D002/D003 D001/D002/D007 D001/D002/D009 D001/D003 D001/D005 D001/D006 D001/D007 D001/D008 D001/D009 D001/D011 D002/D005/D007/D008 D002/D006 D002/D006/D007 D002/D006/D007/D008/D010 D002/D007 D002/D007/D008 D002/D007/D010 D002/D008 D002/D009 D002/D011 D006/D011 D007/D011

TABLE 4
EXAMPLES OF WASTE STREAM CODE COMBINATIONS ⁽¹⁾

General Waste Category	Hazardous/Mixed Waste Code Combinations ⁽²⁾
Solvents	D001/D018 D001/D022 D001/D035 D001/D039 F001/D006 F001/D006/D008 F001/D006/D018 F001/D008 F001/F003/F005 F001/F003/F005/D008/D018 F002/D006/D008
Miscellaneous Lab Chemicals	Various

NOTES FOR TABLE 4

- (1) This table is not meant to provide a listing of all the possible permutations of waste code combinations, other combinations of waste codes appearing in Table 1 may be possible.
- (2) Justification for listing these combinations is based upon acceptable knowledge (i.e., process knowledge, analytical results, etc.).

TABLE 5
RECOMMENDED METHODS AND RATIONALE FOR ANALYSIS ⁽¹⁾

TEST PARAMETER	MEDIA TYPE ⁽²⁾	METHOD	REFERENCE	RATIONALE
pH	L, SI	Electrometric Measurement pH Paper Method	USEPA SW-846 Methods ⁽³⁾ : Electrometric 9040 pH Paper 9041	<ul style="list-style-type: none"> - Identify wastes that may compromise container structural integrity. - Identify wastes that may require pretreatment to ensure optimum effectiveness of treatment processes (e.g., stabilization).
Flash Point	L	Pensky-Martens Closed Cup Method / Setaflash Closed- Cup Method	USEPA SW-846 Methods: Pensky- Martin 1010 Setaflash 1020 ASTM ⁽⁴⁾ Standard D-93	<ul style="list-style-type: none"> - Identify appropriate storage conditions (e.g., out of direct sunlight, away from heat sources). - Determine applicable requirements to treat, deactivate or separately manage ignitable wastes to ensure compliance with applicable regulations.
Free Liquids	SI, So	Paint Filter	USEPA SW-846 Method 9095	<ul style="list-style-type: none"> - Identify presence/absence of free liquids to ensure compliance with applicable land disposal standards.

TABLE 5
RECOMMENDED METHODS AND RATIONALE FOR ANALYSIS ⁽¹⁾

TEST PARAMETER	MEDIA TYPE ⁽²⁾	METHOD	REFERENCE	RATIONALE
Metals	L, SI, So	Atomic Absorption Spectroscopy (AAS); Inductively Coupled Plasma (ICP)	USEPA SW-846 Methods: - ICP 6010B - Atomic Absorption 7000 - Arsenic 7061 - Barium - Cadmium - Chromium - Lead - Selenium 7741 - Silver	<ul style="list-style-type: none"> - Identify constituent(s) for compliance with regulatory limits and for safe handling of the waste. - Determine applicable requirements to treat, deactivate or separately manage characteristic wastes to ensure compliance with applicable regulations.
		Manual Cold Vapor Technique	USEPA SW-846 Methods: - Mercury 7470, 7471	

TABLE 5
RECOMMENDED METHODS AND RATIONALE FOR ANALYSIS ⁽¹⁾

TEST PARAMETER	MEDIA TYPE (2)	METHOD	REFERENCE	RATIONALE
Volatile Organics	L, SI, So	Gas Chromatography/ Mass Spectroscopy (GC/MS)	USEPA SW-846 Methods: - Volatiles 8260 - Semivolatiles 8270	<ul style="list-style-type: none"> - Identify constituent(s) for compliance with regulatory limits and for safe handling of the waste. - Determine applicable requirements to treat, deactivate or separately manage characteristic wastes to ensure compliance with applicable regulations
Halogenated / Non-Halogenated Volatile / Aromatic Organics	L, SI, So	Gas Chromatography	USEPA SW-846 Methods: - Halogenated 8021 - Nonhalogenated 8015 - Aromatic 8021	
Total Organic Halogens (TOx)	L, SI, So	Carbon adsorption w/ microcoulometric - titration detector / Neutron Activation	USEPA SW-846 Methods: - TOx 9020 - Neutron Activation 9022	
Polychlorinated Biphenyls (PCBs)	L, SI, So	Gas Chromatography	USEPA SW-846 Method 8082, 8082A	

NOTES FOR TABLE 5

- (1) Other methods referenced in 6 NYCRR 371, Appendix 19 and other equivalent references and/or guidance documents, or equivalent methods approved by the NYSDEC may be utilized as necessary.
- (2) L = Liquid, SI = Sludge, So = Solid
- (3) 'Test Methods for Evaluating Solid Waste, Physical/Chemical Methods', U.S. Environmental Protection Agency - Office of Solid Waste, Publication SW-846, latest edition approved by the USEPA. Other applicable SW-846 test methods approved by USEPA, other equivalent references and/or guidance documents, or equivalent methods approved by the NYSDEC may also be used.
- (4) American Society of Testing Materials, latest editions.

APPENDIX 1 REPRESENTATIVE SAMPLING METHODS

APPENDIX 1

REPRESENTATIVE SAMPLING METHODS

The methods and equipment used for sampling waste materials will vary with the form and consistency of the waste materials to be sampled. Samples collected using the sampling protocols listed below (or equivalent methods approved by the commissioner), for sampling waste with properties similar to the indicated materials, will be considered to be representative of the waste. These methods are referenced in 6 NYCRR 371, Appendix 19 and 40 CFR 261, Appendix I.

1. Extremely viscous liquid - ASTM Standard D140-70
2. Crushed or powdered material - ASTM Standard D346-75
3. Soil or rock-like material - ASTM Standard D-420-69
4. Soil-like material - ASTM Standard D1452-65
5. Fly Ash-like material - ASTM Standard D2234-76
6. Containerized liquid wastes - "COLIWASA" described in Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, EPA Publication SW-846, 3rd edition, or latest revision, U.S. Environmental Protection Agency, Office of Solid Waste, Washington, D.C. 20460

Where they are necessary, waste sampling will, as a minimum, be performed utilizing the guidance provided in 6 NYCRR 371 Appendix 19 [40 CFR Part 261 Appendix I], the latest approved methods in USEPA Publication SW-846, other equivalent references and/or guidance documents, or equivalent methods approved by the NYSDEC.

APPENDIX 2
QUALITY ASSURANCE/QUALITY CONTROL PLAN

APPENDIX 2

QUALITY ASSURANCE/QUALITY CONTROL PLAN

I. INTRODUCTION

The basic purpose of the Quality Assurance/Quality Control (QA/QC) program is to ensure that data generated in the implementation of the Laboratory's hazardous/mixed waste management program is technically sound, statistically valid, properly documented, and satisfactory for its intended use.

The following QA/QC plan is based on applicable guidance outlined in the QA/QC chapter of the latest USEPA approved edition of EPA Publication SW-846. This chapter of Publication SW-846 states that a proper QA/QC program should address the necessary level of precision and accuracy to reflect the intended use for the data.

The majority of the hazardous/mixed waste generated at the Knolls Laboratory comes from adequately identified sources and has properly documented characteristics. Where appropriate or where required, references to specific methodologies, procedures, or other Knolls Laboratory programs are included.

II. QUALITY ASSURANCE/QUALITY CONTROL ACTIVITIES

Each waste generated at the Knolls Laboratory is evaluated to determine its proper identification and characterization prior to its management within any of the four waste management units covered in this permit. Waste evaluations can be performed using acceptable knowledge (i.e., process knowledge, waste analysis data from other sources or surrogate samples), laboratory analysis, or a combination of the two. Where laboratory analysis is utilized, the KAPL-Knolls Laboratory maintains a QA/QC program in order to ensure the accuracy and reliability of the analyses performed on solid waste samples. Since KAPL personnel or KAPL's subcontractors perform all sampling and vendor labs perform the majority of the analyses, the KAPL QA/QC program is divided into internal and external controls.

A. Internal Controls

The internal controls section of the QA/QC plan can be broken into 5 parts -- 1) sample and analytical protocols; 2) sample containers; 3) sample accountability; 4) sample storage; and 5) audits.

1. Sample and Analytical Protocols

Where they are necessary, waste sampling and analysis must, as a minimum, be performed in accordance with 6 NYCRR 371 Appendix 19 [40 CFR Part 261 Appendix I], the latest approved methods in USEPA Publication SW-846, other equivalent references and/or guidance documents, or equivalent methods approved by the NYSDEC. Each analytical methodology provides guidance on sample collection, preservation and handling requirements. Appendix 1 lists the various methodologies and sampling protocols that may be used for representative sampling of waste streams generated at the Knolls Laboratory. The discussion regarding analysis frequency is provided in Waste Analysis Plan section under subparagraph d, "Frequency of Evaluation," however since most of the waste generated at the

Knolls Laboratory is from adequately identified and documented sources, repeat analysis is not required each time identical/recurring waste is delivered to a hazardous/mixed waste management unit. Duplicate samples are taken at a 5% frequency (or 1 out of every 20) to verify the reproducibility of laboratory results and sampling technique. If major discrepancies occur, further sampling and analysis will take place until satisfactory resolution of discrepancies is achieved.

2. Sample Containers

Sample containers for chemical wastes are vendor or KAPL supplied. All containers are new, appropriately cleaned using accepted practices (such as ASTM Standards or Standard Methods) and, if necessary, furnished with all materials required for sample preservation.

3. Sample Accountability

Appropriate chain-of-custody protocols are utilized for all samples destined for laboratory analysis in accordance with the applicable Sampling Plan section in the latest USEPA approved edition of EPA Publication SW-846. The protocols utilized for each sample include labels, seals, analysis request and chain of custody sheets. An example of a typical chain-of-custody form is included at the end of this appendix. Different forms may be used depending on the vendor laboratory being used; however, the required elements will be the same. Samples are typically transported to the vendor laboratory via the laboratory's courier or common carrier (ground/air transport).

4. Sample Storage

Sample container types, handling, preservation techniques, and hold times shall, where applicable, conform to guidelines cited in the latest USEPA approved edition of EPA Publication SW-846 and other appropriate references. If the sample is to be subjected to multiple analyses, storage conditions (e.g., refrigeration) shall address all requirements cited as needed to ensure valid results.

5. Audits

An organization within KAPL, knowledgeable of applicable regulatory requirements, but not involved in the daily hazardous/mixed waste operations, will periodically evaluate the Knolls Laboratory hazardous/mixed waste sampling and analysis program.

B. External Controls

The Knolls Laboratory External Controls section of the QA/QC plan encompasses the following responsibilities:

1. Vendor Certification

Vendors are required to maintain Certification by the New York State Department of Health Environmental Laboratory Accreditation Program (NYSDOH ELAP), as required by 6 NYCRR 370.1(f). This certification shall cover all parameters listed in

the contract for those waste parameters where certification exists. Copies of the current certification shall be maintained by the vendor and available to KAPL during the term of the contract.

2. Vendor QA/QC

Vendors are required to have a QA/QC program that incorporates all applicable requirements in the latest USEPA approved edition of EPA Publication SW-846 and all other QA/QC requirements of the New York State Department of Environmental Conservation and the New York State Department of Health. Vendors shall maintain their QA/QC programs current and have copies available for KAPL review during the term of the contract.

3. Vendor Subcontracting

Vendors shall not subcontract analysis without prior approval by KAPL.

4. Vendor Supplied Sample Containers

Vendors will supply containers, necessary preservatives and under no conditions exceed recommended holding periods as established by State and Federal regulatory guidelines.

5. Vendor Inspections

At any reasonable time during the contract period, a KAPL representative may visit the vendor laboratory to review data, procedures, equipment and analytical techniques.

CHAIN OF CUSTODY RECORD

[illegible]

APPENDIX 3
COMPATIBILITY GROUP CHART

APPENDIX 3 COMPATIBILITY GROUP CHART

Compatibility groups are identified in the following chart. Chemicals stored within a particular group are considered to be compatible with each other in the event of an incident which would cause commingling of the chemicals. This also facilitates appropriate packaging for shipping this material for off-site disposition. In cases where a chemical would fit into two (2) or more groups, it would be placed in the group most appropriate for the highest hazard concern (e.g., NaCl would normally be in group A, however, NaCl in acetone would be placed in group D).

COMPATIBILITY GROUP	GENERIC DESCRIPTION	SPECIFIC DESCRIPTION	EXAMPLES
A	Acids, Inorganics and Base Sensitive	Inorganic Acids	HCl, H ₂ SO ₄ , HNO ₃ , H ₂ PO ₄
		Inorganic Chemicals which do not liberate gas with acids	NaCl, K ₂ SO ₄
		Base Sensitive Compounds	Acetic Acid (CH ₃ COOH)
B	Bases and Acid Sensitive	Inorganic Bases	NaOH, NH ₄ OH
		Organic Bases w/flash point > 140°F	Triethanolamine
		Inorganic Chemicals which are acid sensitive	KCN, Na ₂ S
C	Organics and Organic Acids	Organic Chemicals	Oils, CCl ₄
		Organic Acids	Carboxylic, Acetic, Oxalic
D	Combustibles and Flammables	Organic Chemicals w/flash points ≥140°F but <200°F	Oils
		Organic Chemicals w/flash points <140°F	Acetone, Paints, Flammable Aerosols
E	Oxidizers and Heavy Metals	Inorganic Oxidizers	KNO ₃ , KMnO ₄ , (NH ₄)S ₂ O ₈
		Heavy Metal Compounds and Elements	CuSO ₄ , ZnCl ₂ , Hg, Pb, Cd
F	Poisons	Toxic Organic Compounds and Organic Poisons	Silvex, 2,4-D, Insecticides
U	Unstable Compounds	Unstable and Shock Sensitive Compounds	Picric Acid, Ammonium Nitrite
		Peroxide forming compounds that are not stabilized	Ethyl Ether, Isopropyl Ether, Dioxane, Styrene
W	Water Reactive	Water Reactive Compounds	Sodium Metal

APPENDIX 4 WASTE ANALYSIS REPORT EXAMPLES

This appendix is provided in accordance with 6 NYCRR 373-1.5(a)(2)(ii) [40 CFR 270.14(b)(2)]. The laboratory reports in this appendix are examples of waste analysis results corresponding to the generic waste streams outlined in Tables 2 and 3.

The following table provides a catalog of some recent laboratory report examples:

GENERIC WASTE CATEGORY	WASTE STREAM EXAMPLE	REPORT DATE	PAGES C.4-
Liquids	Maintenance Coolant & Machine Cutting Fluids	4/2/21 1/7/21	3,4
PCB Contaminated Waste	Paint Chips with PCBs	6/14/21 12/7/20 12/6/20 7/1/20	5,6,7,8
Oil	Used Oil	9/29/21 5/24/21 1/7/21	9,10,11
Sludges and Particulates	Metal grinding sludges	10/31/06 2/20/07	12,13
Aqueous Liquids and Slurries	Acid pickling & descale solution	10/15/20 10/25/18	14,15
Soils	Soil and cleanup material	8/24/05	16
Solvents	Polishing solution	10/18/05	17
Aqueous	Concrete Wastewater	1/7/21	18

Adirondack Environmental Services, Inc

Date: 06-Apr-21

CLIENT: Knolls Atomic Power Laboratory
Work Order: 210402042
Reference: Knolls Site / 118092
PO#: 140543

Client Sample ID: HWO#13763
Collection Date: 4/2/2021
Lab Sample ID: 210402042-001
Matrix: LIQUID

Release# : Line 1-KN-RME-21-009

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
TCLP MERCURY - SW1311/7470A						
(Prep: SW7470A - 4/5/2021)						Analyst: AVB
Mercury-TCLP	ND	0.002		mg/L	1	4/5/2021 11:56:11 AM
TCLP METALS - SW1311/6010C						
(Prep: SW1311 - 4/2/2021)						Analyst: WB
Arsenic-TCLP	0.213	0.050		mg/L	1	4/5/2021 4:19:42 PM
Barium-TCLP	0.468	0.100		mg/L	1	4/5/2021 4:19:42 PM
Cadmium-TCLP	0.124	0.050		mg/L	1	4/5/2021 4:19:42 PM
Chromium-TCLP	0.058	0.050		mg/L	1	4/5/2021 4:19:42 PM
Lead-TCLP	0.160	0.050		mg/L	1	4/5/2021 4:19:42 PM
Selenium-TCLP	0.143	0.050		mg/L	1	4/5/2021 4:19:42 PM
Silver-TCLP	ND	0.100		mg/L	1	4/5/2021 4:19:42 PM

Adirondack Environmental Services, Inc

Date: 15-Jan-21

CLIENT: Knolls Atomic Power Laboratory

Client Sample ID: 13636

Work Order: 210108047

Collection Date: 1/7/2021 1:40:00 PM

Reference: Knolls Site / 118092

Lab Sample ID: 210108047-001

PO#: 118092

Matrix: LIQUID

Release# : CCP-DUPRE-21-002

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
TCLP MERCURY - SW1311/7470A						
(Prep: SW7470A - 1/8/2021)						Analyst: AVB
Mercury-TCLP	ND	0.002		mg/L	1	1/8/2021 4:37:15 PM
TCLP METALS - SW1311/6010C						
(Prep: SW1311 - 1/8/2021)						Analyst: WB
Arsenic-TCLP	3.11	0.500		mg/L	10	1/13/2021 4:00:10 PM
Barium-TCLP	ND	1.00		mg/L	10	1/13/2021 4:00:10 PM
Cadmium-TCLP	ND	0.500		mg/L	10	1/13/2021 4:00:10 PM
Chromium-TCLP	ND	0.500		mg/L	10	1/13/2021 4:00:10 PM
Lead-TCLP	ND	0.500		mg/L	10	1/13/2021 4:00:10 PM
Selenium-TCLP	ND	0.500		mg/L	10	1/14/2021 3:48:45 PM
Silver-TCLP	ND	1.00		mg/L	10	1/13/2021 4:00:10 PM

Adirondack Environmental Services, Inc

Date: 23-Jun-21

CLIENT: Knolls Atomic Power Laboratory

Client Sample ID: HWO# 13848

Work Order: 210617046

Collection Date: 6/14/2021

Reference: Knolls Site / 118092

Lab Sample ID: 210617046-003

PO#: 140543

Matrix: SOLID

Release# : Line 1-KN-RME-21-026

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
POLYCHLORINATED BIPHENYLS - EPA 8062A						
(Prep: SW 3580A - 6/17/2021)						Analyst: KF
PCB, Total	1800	47		µg/g	50	6/22/2021 1:15:22 PM
Surr: Decachlorobiphenyl	150	51.3-143	S	%REC	50	6/22/2021 1:15:22 PM

Adirondack Environmental Services, Inc

Date: 22-Dec-20

CLIENT: Knolls Atomic Power Laboratory Client Sample ID: HWO# 13559
Work Order: 201210066 Collection Date: 12/7/2020
Reference: Knolls Site / 118092 Lab Sample ID: 201210066-001
PO#: 118092 Matrix: SOLID

Release# : CCP-DUPRE-20-062

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
POLYCHLORINATED BIPHENYLS - EPA 8082A						Analyst: KF
(Prep: SW 3580A - 12/10/2020)						
PCB, Total	570	10		µg/g	10	12/15/2020 10:20:20 PM
Surr: Decachlorobiphenyl	130	51.3-143		%REC	10	12/15/2020 10:20:20 PM
ICP METALS-EPA 6010C						Analyst: WB
(Prep: SW3050B - 12/11/2020)						
Cadmium	7.30	0.500		µg/g	1	12/15/2020 2:55:32 PM
Chromium	345	0.500		µg/g	1	12/15/2020 2:55:32 PM
Lead	1380	0.500		µg/g	1	12/15/2020 2:55:32 PM
Manganese	155	1.00		µg/g	1	12/15/2020 2:55:32 PM
Nickel	16.1	5.00		µg/g	1	12/15/2020 2:55:32 PM
TCLP MERCURY - SW1311/7470A						Analyst: AVB
(Prep: SW7470A - 12/11/2020)						
Mercury-TCLP	ND	0.002		mg/L	1	12/11/2020 2:23:33 PM
TCLP METALS - SW1311/6010C						Analyst: WB
(Prep: SW1311 - 12/10/2020)						
Arsenic-TCLP	ND	0.050		mg/L	1	12/11/2020 2:06:31 PM
Barium-TCLP	0.325	0.100		mg/L	1	12/11/2020 2:06:31 PM
Cadmium-TCLP	ND	0.050		mg/L	1	12/11/2020 2:06:31 PM
Chromium-TCLP	ND	0.050		mg/L	1	12/11/2020 2:06:31 PM
Lead-TCLP	ND	0.050		mg/L	1	12/11/2020 2:06:31 PM
Selenium-TCLP	ND	0.050		mg/L	1	12/11/2020 2:06:31 PM
Silver-TCLP	ND	0.100		mg/L	1	12/11/2020 2:06:31 PM

Adirondack Environmental Services, Inc

Date: 16-Dec-20

CLIENT: Knolls Atomic Power Laboratory **Client Sample ID:** HWO# 13555
Work Order: 201208039 **Collection Date:** 12/6/2020
Reference: Knolls Site / 7011090 **Lab Sample ID:** 201208039-005
PO#: 118092 **Matrix:** SOLID

Release# : C470L-20-12 / G.Karlewicz' CC

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
POLYCHLORINATED BIPHENYLS - EPA 8082A						Analyst: KF
(Prep: SW 3580A - 12/9/2020)						
PCB, Total	55	1.8		µg/g-dry	2	12/10/2020 8:28:22 PM
Surr: Decachlorobiphenyl	146	51.3-143	S	%REC	2	12/10/2020 8:28:22 PM
ICP METALS-EPA 6010C						Analyst: WB
(Prep: SW3050B - 12/9/2020)						
Cadmium	0.758	0.522		µg/g-dry	1	12/10/2020 4:53:19 PM
Chromium	54.9	0.522		µg/g-dry	1	12/10/2020 4:53:19 PM
Lead	1340	0.522		µg/g-dry	1	12/10/2020 4:53:19 PM
TCLP MERCURY - SW1311/7470A						Analyst: AVB
(Prep: SW7470A - 12/9/2020)						
Mercury-TCLP	ND	0.002		mg/L	1	12/9/2020 1:18:00 PM
TCLP METALS - SW1311/6010C						Analyst: WB
(Prep: SW1311 - 12/8/2020)						
Arsenic-TCLP	ND	0.050		mg/L	1	12/9/2020 3:11:41 PM
Barium-TCLP	ND	0.100		mg/L	1	12/9/2020 3:11:41 PM
Cadmium-TCLP	ND	0.050		mg/L	1	12/9/2020 3:11:41 PM
Chromium-TCLP	0.129	0.050		mg/L	1	12/9/2020 3:11:41 PM
Lead-TCLP	1.76	0.050		mg/L	1	12/9/2020 3:11:41 PM
Selenium-TCLP	ND	0.050		mg/L	1	12/9/2020 3:11:41 PM
Silver-TCLP	ND	0.100		mg/L	1	12/9/2020 3:11:41 PM
MOISTURE CONTENT-ASTM D2216 (NOT ELAP CERTIFIED)						Analyst: TSZ
Percent Moisture	4.2	0.1		wt%	1	12/15/2020

Adirondack Environmental Services, Inc

Date: 11-Aug-20

CLIENT: Knolls Atomic Power Laboratory Client Sample ID: HWO# 13414
Work Order: 200806076 Collection Date: 7/1/2020
Reference: Knolls Site / Lab Sample ID: 200806076-005
PO#: 118092 Matrix: SOLID

Release# : CCP-DUPRE-20-042

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
POLYCHLORINATED BIPHENYLS - EPA 8082A						
(Prep: SW 3580A - 8/7/2020)						Analyst: KF
PCB, Total	92	10		µg/g	10	8/10/2020 7:26:42 PM
Surr: Decachlorobiphenyl	130	51.3-143		%REC	10	8/10/2020 7:26:42 PM
ICP METALS-EPA 6010C						
(Prep: SW3050B - 8/6/2020)						Analyst: WB
Cadmium	18.1	0.500		µg/g	1	8/7/2020 3:05:13 PM
Chromium	3000	5.00		µg/g	10	8/7/2020 2:46:38 PM
Lead	25500	5.00		µg/g	10	8/7/2020 2:46:38 PM
Manganese	446	1.00		µg/g	1	8/7/2020 3:05:13 PM
Nickel	45.3	5.00		µg/g	1	8/7/2020 3:05:13 PM
TCLP MERCURY - SW1311/7470A						
(Prep: SW7470A - 8/7/2020)						Analyst: AVB
Mercury-TCLP	ND	0.002	H	mg/L	1	8/7/2020 12:26:36 PM
TCLP METALS - SW1311/6010C						
(Prep: SW1311 - 8/6/2020)						Analyst: WB
Arsenic-TCLP	ND	0.050		mg/L	1	8/7/2020 12:49:55 PM
Barium-TCLP	0.229	0.100		mg/L	1	8/7/2020 12:49:55 PM
Cadmium-TCLP	0.125	0.050		mg/L	1	8/7/2020 12:49:55 PM
Chromium-TCLP	0.054	0.050		mg/L	1	8/7/2020 12:49:55 PM
Lead-TCLP	12.7	0.050	X	mg/L	1	8/7/2020 12:49:55 PM
Selenium-TCLP	ND	0.050		mg/L	1	8/7/2020 12:49:55 PM
Silver-TCLP	ND	0.100		mg/L	1	8/7/2020 12:49:55 PM

Adirondack Environmental Services, Inc

Date: 06-Oct-21

CLIENT: Knolls Atomic Power Laboratory
Work Order: 210929114
Reference: Knolls Site / 118092
PO#: 140543

Client Sample ID: HWO #13988
Collection Date: 9/29/2021
Lab Sample ID: 210929114-002
Matrix: LIQUID

Release# : Line 1-KN-RME-21-044

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
ICP METALS-EPA 6010C						Analyst: WB
(Prep: SW3050B - 9/30/2021)						
Arsenic	ND	0.250		µg/g	1	9/30/2021 3:42:20 PM
Cadmium	ND	0.250		µg/g	1	9/30/2021 3:42:20 PM
Chromium	ND	0.250		µg/g	1	9/30/2021 3:42:20 PM
Lead	9.64	0.250		µg/g	1	9/30/2021 3:42:20 PM
FLASH POINT - SW 1010A						Analyst: BG
Flash Point	> 200	60		°F	1	10/6/2021
TOTAL HALOGENS - SW 9075						Analyst: CP
Total Halogens	ND	0.02	S	wt%	1	10/5/2021

Adirondack Environmental Services, Inc

Date: 01-Jun-21

CLIENT: Knolls Atomic Power Laboratory
Work Order: 210524054
Reference: Knolls Site / 118092
PO#: 140543

Client Sample ID: HWO# 13820
Collection Date: 5/24/2021
Lab Sample ID: 210524054-003
Matrix: LIQUID

KN-RME-21-020

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
ICP METALS-EPA 6010C Analyst: WB						
(Prep: SW3050B - 5/25/2021)						
Arsenic	ND	0.250		µg/g	1	5/26/2021 7:46:29 PM
Cadmium	ND	0.250		µg/g	1	5/26/2021 7:46:29 PM
Chromium	ND	0.250		µg/g	1	5/26/2021 7:46:29 PM
Lead	ND	0.250		µg/g	1	5/26/2021 7:46:29 PM
FLASH POINT - SW 1010A Analyst: JH						
Flash Point	> 200	60		°F	1	5/26/2021
TOTAL HALOGENS - SW 9075 Analyst: JH						
Total Halogens	0.02	0.02		wt%	1	5/27/2021

Adirondack Environmental Services, Inc

Date: 15-Jan-21

CLIENT: Knolls Atomic Power Laboratory
Work Order: 210108047
Reference: Knolls Site / 118092
PO#: 118092

Client Sample ID: 13638
Collection Date: 1/7/2021 1:30:00 PM
Lab Sample ID: 210108047-003
Matrix: LIQUID

Release# : CCP-DUPRE-21-002

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
ICP METALS-EPA 6010C Analyst: WB						
(Prep: SW3050B - 1/11/2021)						
Arsenic	ND	0.250		µg/g	1	1/12/2021 6:04:19 PM
Cadmium	ND	0.250		µg/g	1	1/12/2021 6:04:19 PM
Chromium	ND	0.250		µg/g	1	1/12/2021 6:04:19 PM
Lead	1.51	0.250		µg/g	1	1/12/2021 6:04:19 PM
FLASH POINT - SW 1010A Analyst: JW						
Flash Point	> 200	60		°F	1	1/15/2021
TOTAL HALOGENS - SW 9075 Analyst: JW						
Total Halogens	ND	0.02		wt%	1	1/11/2021

6NYCRR Part 373 Permit
Attachment C - WASTE CHARACTERISTICS

U.S. Department of Energy
Knolls Atomic Power Laboratory
Knolls Laboratory
EPA ID # NY 6890008992

Adirondack Environmental Services, Inc

CLIENT: Knolls Atomic Power Laboratory
Work Order: 061110029
Project: Q1 mod
PO#: KN6007716

Date: 16-Nov-06

Client Sample ID: HWO-8902 Debris
Collection Date: 10/31/2006
Lab Sample ID: 061110029-003
Matrix: SOLID

Analyses	Result	FQL	Qual	Units	DF	Date Analyzed
Analyst: KH						
TCLP MERCURY SW1311/7470A (Prep: SW7470A - 11/15/2006)						
Mercury-TCLP	< 0.020	0.020		mg/L	1	11/16/2006
Analyst: SM						
TCLP METALS - ICP SW1311/6010A (Prep: SW1311 - 11/14/2006)						
Arsenic-TCLP	< 0.05	0.05		mg/L	1	11/15/2006 5:16:00 PM
Barium-TCLP	0.45	0.10		mg/L	1	11/15/2006 5:16:00 PM
Cadmium-TCLP	0.13	0.05		mg/L	1	11/15/2006 5:16:00 PM
Chromium-TCLP	< 0.05	0.05		mg/L	1	11/15/2006 5:16:00 PM
Lead-TCLP	< 0.05	0.05		mg/L	1	11/15/2006 5:16:00 PM
Selenium-TCLP	< 0.05	0.05		mg/L	1	11/15/2006 5:16:00 PM
Silver-TCLP	< 0.10	0.10		mg/L	1	11/15/2006 5:16:00 PM

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
X - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
T - Tentatively Identified Compound-Estimated Conc.
E - Value above quantitation range

6NYCRR Part 373 Permit
Attachment C - WASTE CHARACTERISTICS

U.S. Department of Energy
Knolls Atomic Power Laboratory
Knolls Laboratory
EPA ID # NY 6890008992

Date: 14-Mar-07

Adirondack Environmental Services, Inc

CLIENT: Knolls Atomic Power Laboratory
Work Order: 070309001
Reference: Knolls Site / HWO#8945-8952
PO#: KN6008625

Client Sample ID: HWO#8945 Machining/Grinding
Collection Date: 2/20/2007
Lab Sample ID: 070309001-001
Matrix: SOLID

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
Analyst: KH						
TCLP MERCURY SW1311/7470A (Prep: SW7470A - 3/12/2007)						
Mercury-TCLP	< 0.020	0.020		mg/L	1	3/13/2007
Analyst: SM						
TCLP METALS - ICP SW1311/6010A (Prep: SW1311 - 3/12/2007)						
Arsenic-TCLP	< 0.01	0.05		mg/L	1	3/13/2007 9:33:00 AM
Barium-TCLP	0.11			mg/L	1	3/13/2007 9:33:00 AM
Cadmium-TCLP	0.41			mg/L	1	3/13/2007 9:33:00 AM
Chromium-TCLP	< 0.05	0.05		mg/L	1	3/13/2007 9:33:00 AM
Lead-TCLP	< 0.05	0.05		mg/L	1	3/13/2007 9:33:00 AM
Selenium-TCLP	< 0.05	0.05		mg/L	1	3/13/2007 9:33:00 AM
Silver-TCLP	< 0.10	0.10		mg/L	1	3/13/2007 9:33:00 AM

Qualifiers:

ND - Not Detected at the Reporting Limit	S - Spike Recovery outside accepted recovery limits
J - Analyte detected below quantitation limits	R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank	T - Tentatively Identified Compound-Estimated Conc.
X - Value exceeds Maximum Contaminant Level	E - Value above quantitation range

Adirondack Environmental Services, Inc

Date: 22-Oct-20

CLIENT: Knolls Atomic Power Laboratory
Work Order: 201015099
Reference: Knolls Site /
PO#: 118092

Client Sample ID: 13519
Collection Date: 10/15/2020
Lab Sample ID: 201015099-008
Matrix: LIQUID

Release#: CCP-DUPRE-20-052

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
TCLP MERCURY - SW1311/7470A						
(Prep: SW7470A - 10/16/2020)						Analyst: AVB
Mercury-TCLP	ND	0.002		mg/L	1	10/19/2020 12:14:21 PM
TCLP METALS - SW1311/6010C						
(Prep: SW1311 - 10/16/2020)						Analyst: WB
Arsenic-TCLP	0.090	0.050		mg/L	1	10/19/2020 4:28:32 PM
Barium-TCLP	0.433	0.100		mg/L	1	10/19/2020 4:28:32 PM
Cadmium-TCLP	ND	0.050		mg/L	1	10/19/2020 4:28:32 PM
Chromium-TCLP	3.60	0.050		mg/L	1	10/19/2020 4:28:32 PM
Lead-TCLP	0.797	0.050		mg/L	1	10/19/2020 4:28:32 PM
Selenium-TCLP	ND	0.050		mg/L	1	10/19/2020 4:28:32 PM
Silver-TCLP	8.20	1.00	X	mg/L	10	10/19/2020 4:40:08 PM
TOTAL ORGANIC CARBON - SM 5310C-2011						
						Analyst: NK
Total Organic Carbon	28.6	10.0		mg/L	10	10/19/2020 8:28:00 PM
TOTAL SUSPENDED SOLIDS - SM 2540D-2011						
(Prep: Gen Prep - 10/20/2020)						Analyst: NK
TSS (Residue, Non-Filterable)	294	4.0		mg/L	1	10/20/2020

Adirondack Environmental Services, Inc

Date: 31-Oct-18

CLIENT: Knolls Atomic Power Laboratory
Work Order: 181026007
Reference: 118092 /
PO#: 118092

Client Sample ID: HWO# 12332
Collection Date: 10/25/2018
Lab Sample ID: 181026007-001
Matrix: LIQUID

Release# : C310AE-18-045

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
TCLP MERCURY - SW1311/7470A						
(Prep: SW7470A - 10/26/2018)						Analyst: AVB
Mercury-TCLP	ND	0.002		mg/L	1	10/26/2018 2:41:49 PM
TCLP METALS - SW1311/6010C						
(Prep: SW1311 - 10/26/2018)						Analyst: WB
Arsenic-TCLP	ND	0.050		mg/L	1	10/26/2018 1:20:57 PM
Barium-TCLP	0.767	0.100		mg/L	1	10/26/2018 1:20:57 PM
Cadmium-TCLP	0.110	0.050		mg/L	1	10/26/2018 1:20:57 PM
Chromium-TCLP	117	5.00	X	mg/L	100	10/26/2018 1:29:09 PM
Lead-TCLP	1.87	0.050		mg/L	1	10/26/2018 1:20:57 PM
Selenium-TCLP	ND	0.050		mg/L	1	10/26/2018 1:20:57 PM
Silver-TCLP	16.4	1.00	X	mg/L	10	10/26/2018 1:25:02 PM
TOTAL ORGANIC CARBON - SM 5310C-2011						
						Analyst: NK
Total Organic Carbon	1290	100		mg/L	100	10/26/2018 2:57:00 PM

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Attachment C - WASTE CHARACTERISTICS

U.S. Department of Energy
Knolls Atomic Power Laboratory
Knolls Laboratory
EPA ID # NY 6890008992

Adirondack Environmental Services, Inc

Date: 24-Aug-05

CLIENT: Knolls Atomic Power Laboratory
Work Order: 050817028
Project: Knolls Site
PO#: KN 503950

Client Sample ID: HWO-8516
Collection Date: 8/11/2005
Lab Sample ID: 050817028-001
Matrix: SOLID

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
TCLP VOLATILES SW1311/8260(SW1311)						Analyst: ML
Benzene-TCLP	< 85	85		µg/L	17	8/23/2005 8:08:00 PM

Qualifiers:

ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

* - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

T - Tentitively Identified Compound-Estimated Conc.

E - Value above quantitation range

6NYCRR Part 373 Permit
Attachment C - WASTE CHARACTERISTICS

U.S. Department of Energy
Knolls Atomic Power Laboratory
Knolls Laboratory
EPA ID # NY 6890008992

Adirondack Environmental Services, Inc

Date: 18-Oct-05

CLIENT: Knolls Atomic Power Laboratory Client Sample ID: HWO-8568
Work Order: 051012004 Collection Date: 10/6/2005
Project: KAPL Lab Sample ID: 051012004-012
PO#: KN506616 Matrix: LIQUID

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
TCLP MERCURY SW1311/7470A(SW7470A)						
Mercury-TCLP	< 0.020	0.020		mg/L	1	Analyst: KH 10/17/2005
TCLP METALS - ICP SW1311/6010A(SW1311)						
Arsenic-TCLP	< 0.50	0.50		mg/L	10	Analyst: SM 10/18/2005 1:57:00 PM
Barium-TCLP	< 1.00	1.00		mg/L	10	10/18/2005 1:57:00 PM
Cadmium-TCLP	< 0.50	0.50		mg/L	10	10/18/2005 1:57:00 PM
Chromium-TCLP	1.85	0.50		mg/L	10	10/18/2005 1:57:00 PM
Lead-TCLP	< 0.50	0.50		mg/L	10	10/18/2005 1:57:00 PM
Selenium-TCLP	0.96	0.50		mg/L	10	10/18/2005 1:57:00 PM
Silver-TCLP	< 1.00	1.00		mg/L	10	10/18/2005 1:57:00 PM

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits
J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank T - Tentatively Identified Compound-Estimated Conc.
* - Value exceeds Maximum Contaminant Level E - Value above quantitation range

Adirondack Environmental Services, Inc

Date: 15-Jan-21

CLIENT: Knolls Atomic Power Laboratory

Client Sample ID: 13641

Work Order: 210108047

Collection Date: 1/7/2021 12:45:00 PM

Reference: Knolls Site / 118092

Lab Sample ID: 210108047-006

PO#: 118092

Matrix: LIQUID

Release# : CCP-DUPRE-21-002

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
PH - SM4500 H B - NOT CERTIFIABLE PARAMETER						Analyst: JH
pH	12.5	1.0	H	pH Units@17C	1	1/8/2021 3:20:00 PM

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KNOLLS ATOMIC POWER LABORATORY

KNOLLS LABORATORY

Attachment D Process Description

EPA I.D. NUMBER NY 6890008992

**6 NYCRR PART 373 PERMIT
NUMBER
4-4224-00024/00001**

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INTRODUCTION

The information included herein is presented in accordance with the requirements of 6 NYCRR §§373-1.5, 2.2, 2.9 and 2.29 [40 CFR §§270.15, 264.17, 264.171 through 264.177, and 264.1080 through 264.1091].

WASTE MANAGEMENT UNITS

The hazardous and mixed wastes that are generated during normal operations are managed within four units at the Knolls Laboratory for periods exceeding 90 days. The design capacities of the four waste management units are provided in Table 1, and their locations are shown in Figure 1. The layout, structural attributes (e.g., walls, roof, floor, etc.), and operations that occur within each of the units are described below.

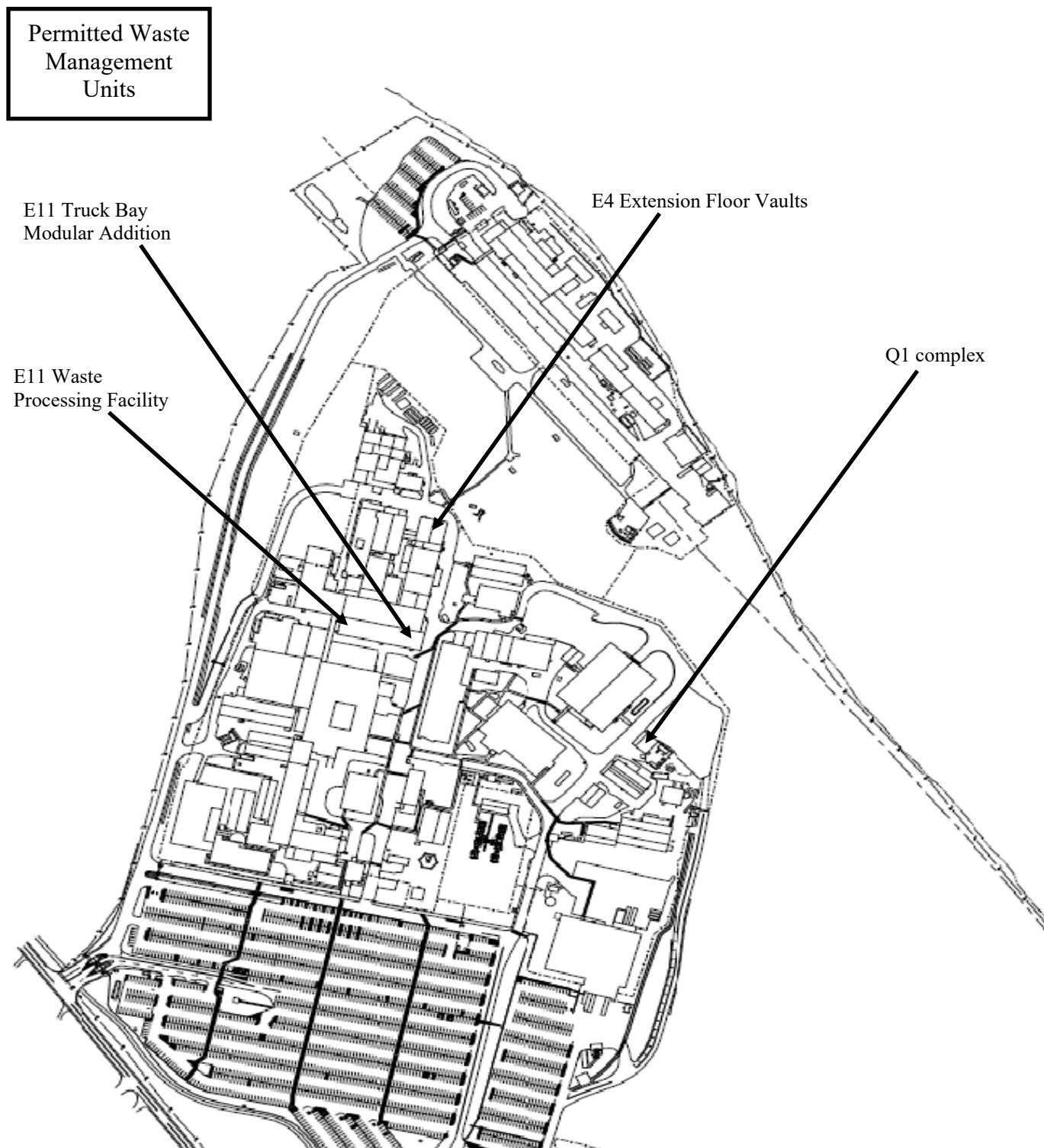
TABLE 1
KNOLLS LABORATORY HAZARDOUS/MIXED WASTE MANAGEMENT UNITS

Waste Management Unit	Typical Container Volumes (gallons) ¹	Authorized Capacity (gallons)
Building Q1 complex ²	<1 to 202 ³	6,600
E11 Truck Bay Modular Addition	<1 to 95 ⁴	1,320
Four floor vaults (numbered 2, 3, 5 & 6) located in the Building E4-Extension	<1 to 95 ⁴	2,600
Building E11 Waste Processing Facility (E11 WPF)	<1 to 718 ⁵	7,180

Notes for Table 1

1. Larger containers other than those listed below may also be placed in the units, although for containers with liquids the largest container would not exceed the containment capacity.
2. Building Q1 permitted unit consists of both Q1-south (1,650 gallons) and the Q1-extension (4,950 gallons).
3. 202-gallon containers are 3 ft x 3 ft x 3 ft cubic yard boxes.
4. 95-gallon containers are overpack/salvage drums.
5. 718-gallon containers are 4 ft x 4 ft x 6 ft metal boxes.

**FIGURE 1
KNOLLS LABORATORY MAP**



The hazardous and mixed wastes generated at various locations throughout the facility are typically transported to any of the four waste management units for >90-day storage at the Knolls Laboratory. These waste management units are described below.

A. Building Q1 Complex

The Building Q1 complex comprises two units; Q1-south and Q1-extension (see Figures 2 and 3).

1. Building Q1-south

A fully enclosed, steel framed, sheet metal and concrete block structure that occupies an internal area approximately 20 ft x 26 ft and has an authorized capacity of 1,650 gallons of waste. The unit has a secondary containment system made of reinforced concrete and is equipped with 6-inch high curbing. Its secondary containment volume is approximately 1,600 gallons (taking obstacles and access ramps into consideration) and the largest volume container normally in the unit is a 95-gallon overpack/salvage drum¹.

Access into Building Q1-south for both personnel and waste is gained via three (3) personnel access doors (one at the front (west) of the unit, one on the north wall leading into Q1-north, and one on the back (east) wall leading into the Q1-extension), as well as a large roll-up door at the front (west) side of the building. Separation between the Q1-south hazardous waste storage unit and the Q1-north portion of the building is achieved by means of a cinder block wall.

2. Building Q1-extension

Located on the eastern side of the complex, the extension is fully enclosed with concrete block walls both front and back (east and west, respectfully) and on the two sides and atop by steel framing and metal sheeting. Access to the extension for both personnel and waste can be achieved via the three personnel access doors (one at the front (west) of the unit leading into Q1-south, one on the north wall, and one on the back (east) wall), and a roll-up door on the south side.

The extension occupies an area approximately 24 ft x 49 ft and has an authorized capacity to manage 4,950 gallons of waste. The unit is also equipped with a secondary containment system made of reinforced concrete with 6-inch high curbing. Its secondary containment volume is approximately 4,200 gallons (if void of obstacles and considering the access ramps) and the largest volume container expected to be managed in the unit is a 202-gallon cubic yard box¹. The floor of the unit slopes on all sides toward its center.

The secondary containment for the Building Q1 complex is protected with a specialty coating for concrete. The epoxy coating system is resistant to a broad range of hazardous chemicals including organics (e.g., methylene chloride, ethylene dichloride, trichloroethylene, benzene, phenol, ketones, and alcohols), acids (e.g., hydrochloric, sulfuric, and

¹ Larger containers than those listed may also be placed in the units, although for containers with liquids the largest container would not exceed the containment capacity.

phosphoric), and caustics (e.g., ammonium hydroxide, sodium hydroxide, and potassium hydroxide). Control joints were injected to grade with a two-part polysulfide sealant.

B. Modular Addition within the Building E11 Truck Bay

The truck bay of Building E11 contains a prefabricated modular unit that is designated as E11 Modular Addition - Large (E11 MA-L). (Refer to Figure 1 for location).

The E11 MA-L is a prefabricated modular structure located on the southwest side of the Building E11 truck bay (Refer to Figure 4 for the floor plan). The unit's dimensions are approximately 26 ft x 9 ft and it has a manufacturer's design capacity of 2,640 gallons. The E11 MA-L is constructed of steel (supports, walls and roof) and is equipped with a 7½ inch deep containment reservoir (capable of retaining 867 gallons) which is coated with a chemically resistant epoxy. The secondary containment reservoir is equipped with a polypropylene liner and is overlaid by removable fiberglass grates on which the containers of waste are placed. Access to the unit is via three sets of large double doors along the front of the structure. Waste is loaded and unloaded through these doors.

This permitted unit consists of a prefabricated modular structure with an authorized capacity of 1,320 gallons. The largest volume container normally managed in this unit is a 95-gallon overpack/salvage drum. The ventilation system associated with this modular unit is installed for radiological purposes.

C. Four Floor Vaults in the Building E4-Extension

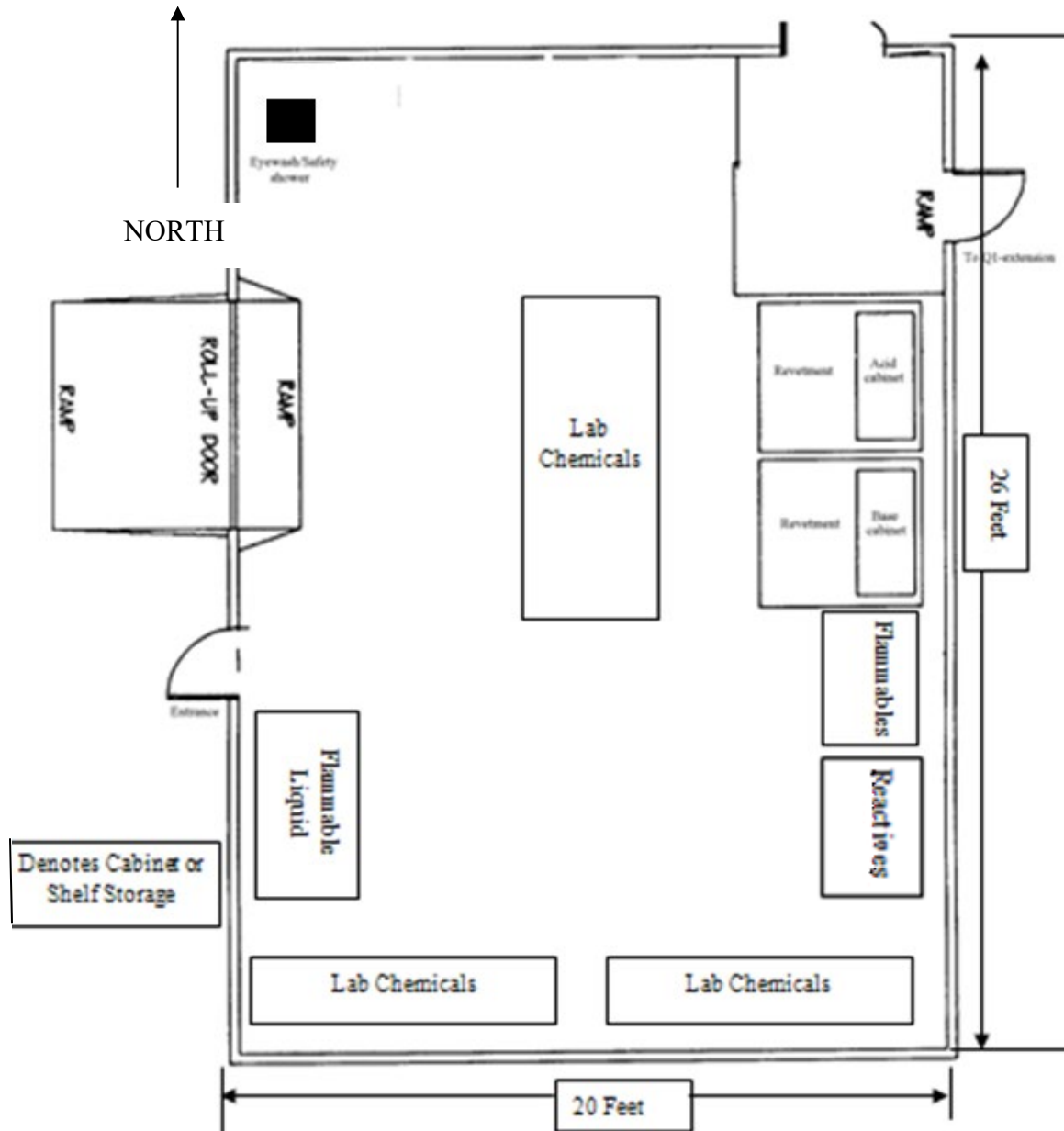
There are six floor vaults located within the Building E4-extension, four of which have been designated for the management of mixed waste only (vault numbers 2, 3, 5 and 6). The four units individually have dimensions of 5 ft x 5 ft x 5 ft and are constructed of reinforced concrete and fitted with stainless steel liners (see Figures 5 and 6). The stainless steel construction of these liners is compatible with all potential wastes anticipated to require storage in this unit. In the unlikely event that a specific waste is generated that is incompatible with the stainless steel secondary containment liner (e.g. strong mineral acid), then an appropriate step, (e.g. facilon liner, or overpack, etc.), would be taken to ensure compatible secondary containment storage of the waste before it is stored within the floor vaults. The vaults have a combined authorized capacity of approximately 2,600 gallons. Access to the vaults may only be gained through the thick steel covers, which are only removable using a crane or similar device. The vaults are kept closed (i.e., covers in place) unless adding waste, removing waste, or performing required inspections. The largest volume container normally managed in the unit is a 95-gallon overpack/salvage drum.

D. Building E11 Waste Processing Facility

This permitted unit is located in the Process Area Room located in the western end of building E11 (Refer to Figure 7). The permitted unit is approximately 36 feet wide by 46 feet long. The building is a steel framed structure constructed on a concrete slab. The floor is covered with a chemically resistant epoxy. The floor is sloped to the center of the room and the authorized capacity for this facility is 7,180 gallons. The facility has one vehicle access roll up door on the east wall and two personnel access doors, one on the east wall and one on the west wall. The largest volume container to be managed in this unit is an approximately 718-gallon, 4ft. x 4ft. x 6ft. metal box.

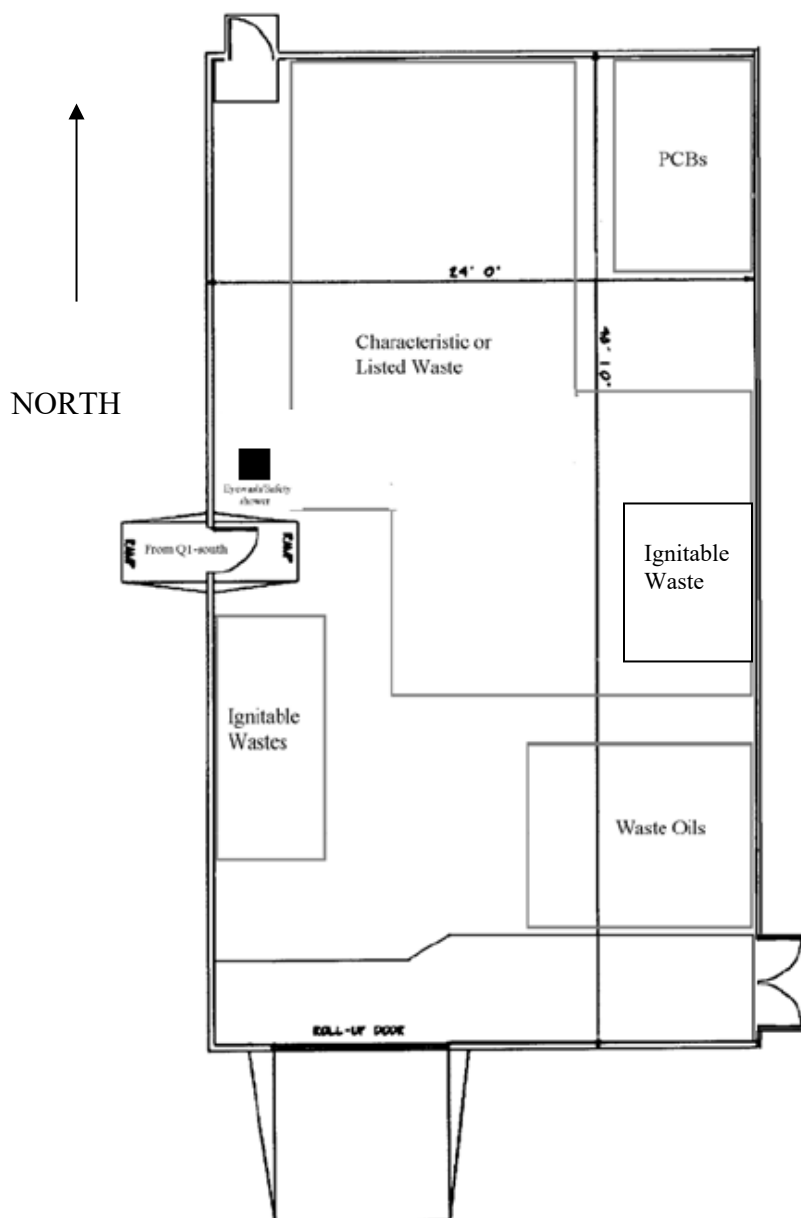
Containerized wastes stored in any of the waste management units include those containing free liquids and those without free liquids. Each of the waste management units is equipped to manage containerized waste liquid and non-liquid alike by ensuring adequate secondary containment for any type of spill or leak. All the units are fully enclosed and equipped with systems (roof drains or similar devices) to protect them from the weather (e.g., precipitation).

**FIGURE 2
BUILDING Q1 - SOUTH**



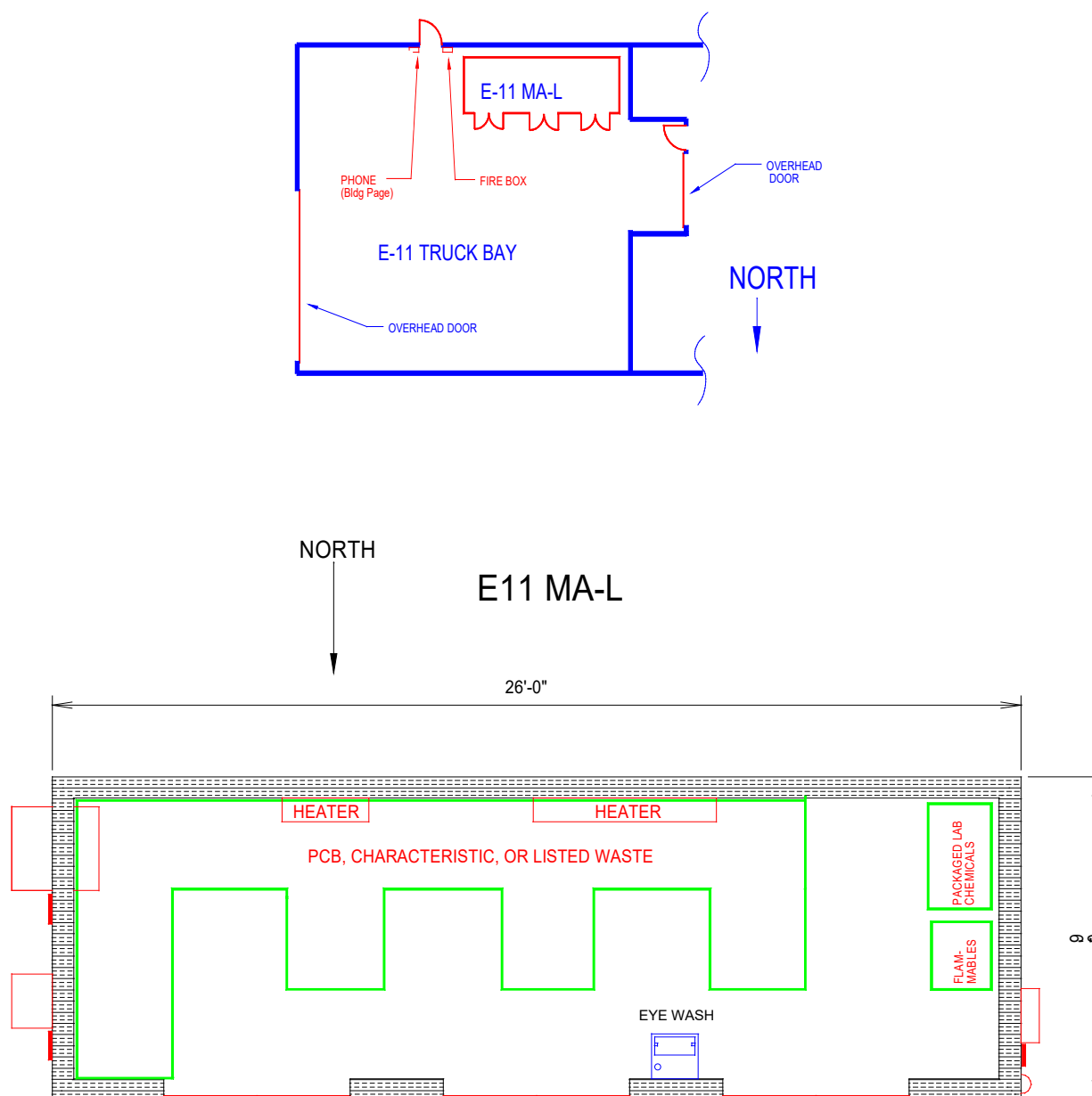
Notes: These are general locations planned for each category based upon segregation compatibility and inspection requirements. The areas may be enlarged, moved, or recategorized as needed to accommodate variations in individual waste stream generation rates. Acid and Base cabinets are located within concrete revetments which are effective at separation of potential spills from adjacent areas. In all cases, requirements for the proper management of containers will be met.

FIGURE 3
BUILDING Q1 - EXTENSION



Note: These are general locations planned for each category based upon segregation compatibility and inspection requirements. The areas may be enlarged, moved, or recategorized as needed to accommodate variations in individual waste stream generation rates. In all cases, requirements for the proper management of containers will be met.

FIGURE 4
MODULAR ADDITION WITHIN BUILDING E11 TRUCK BAY



Note: These are general locations planned for each category based upon segregation compatibility and inspection requirements. The areas may be enlarged, moved, or recategorized as needed to accommodate variations in individual waste stream generation rates. In all cases, requirements for the proper management of containers will be met.

FIGURE 5
E4-EXTENSION FLOOR VAULTS FLOOR PLAN

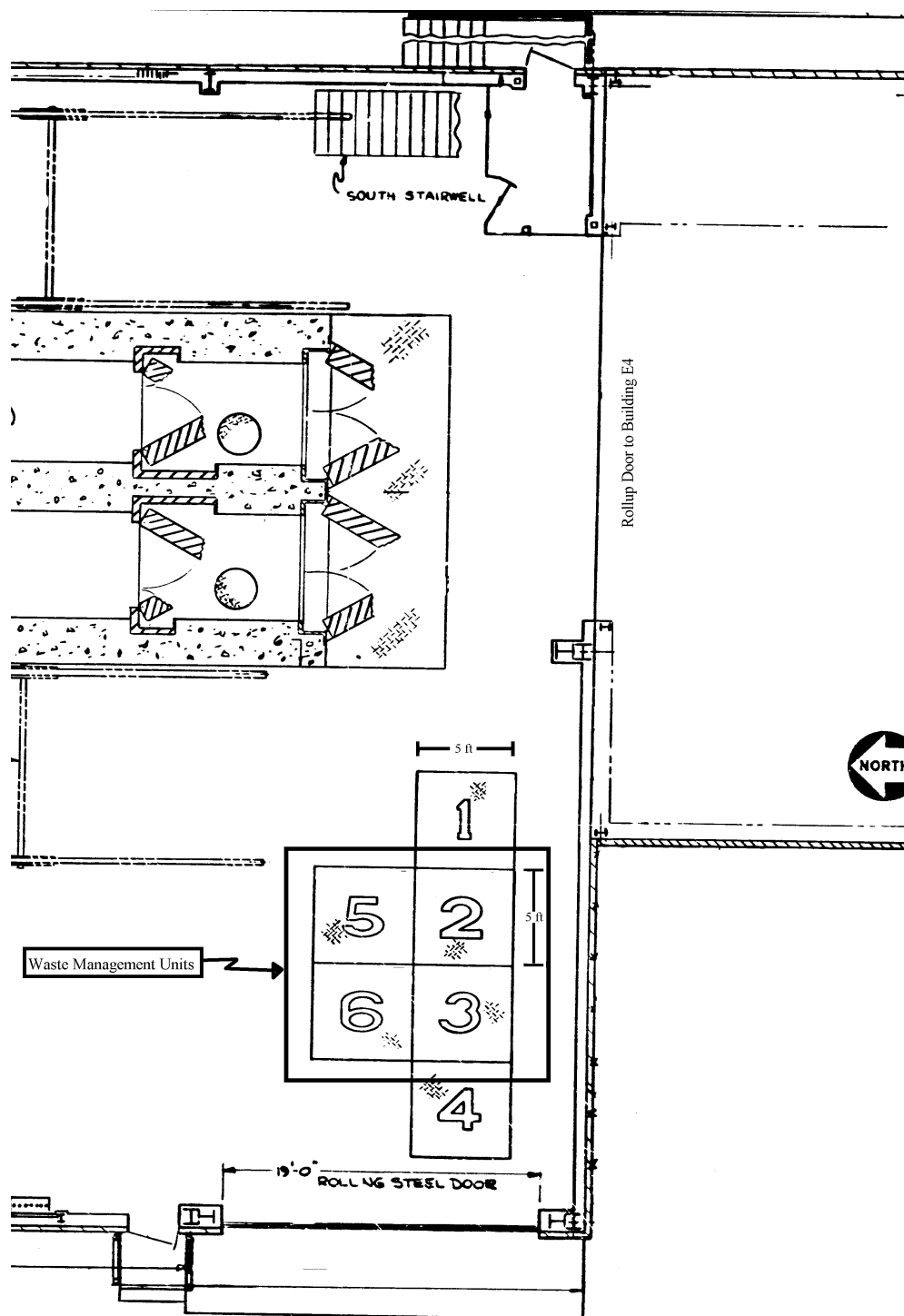
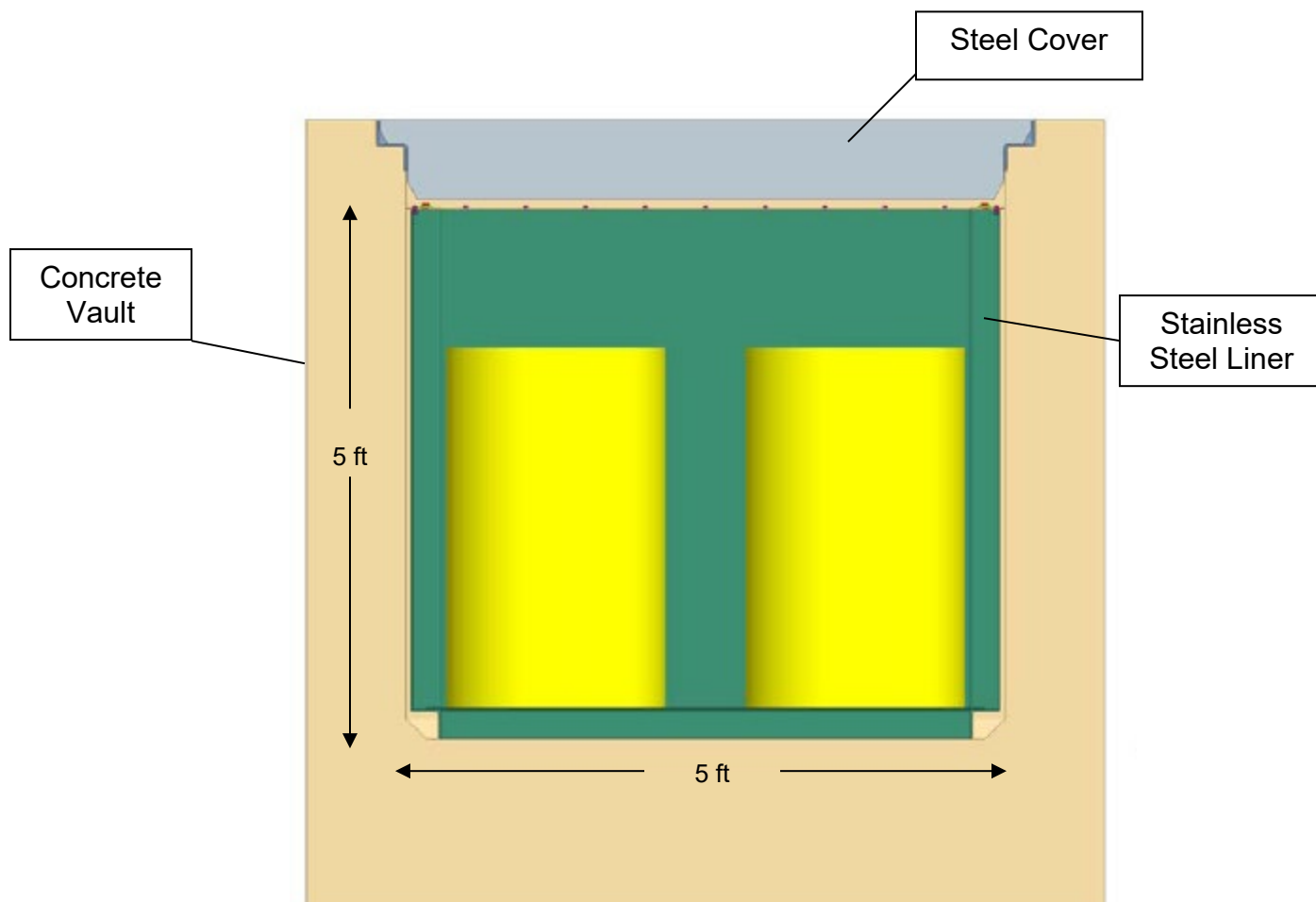
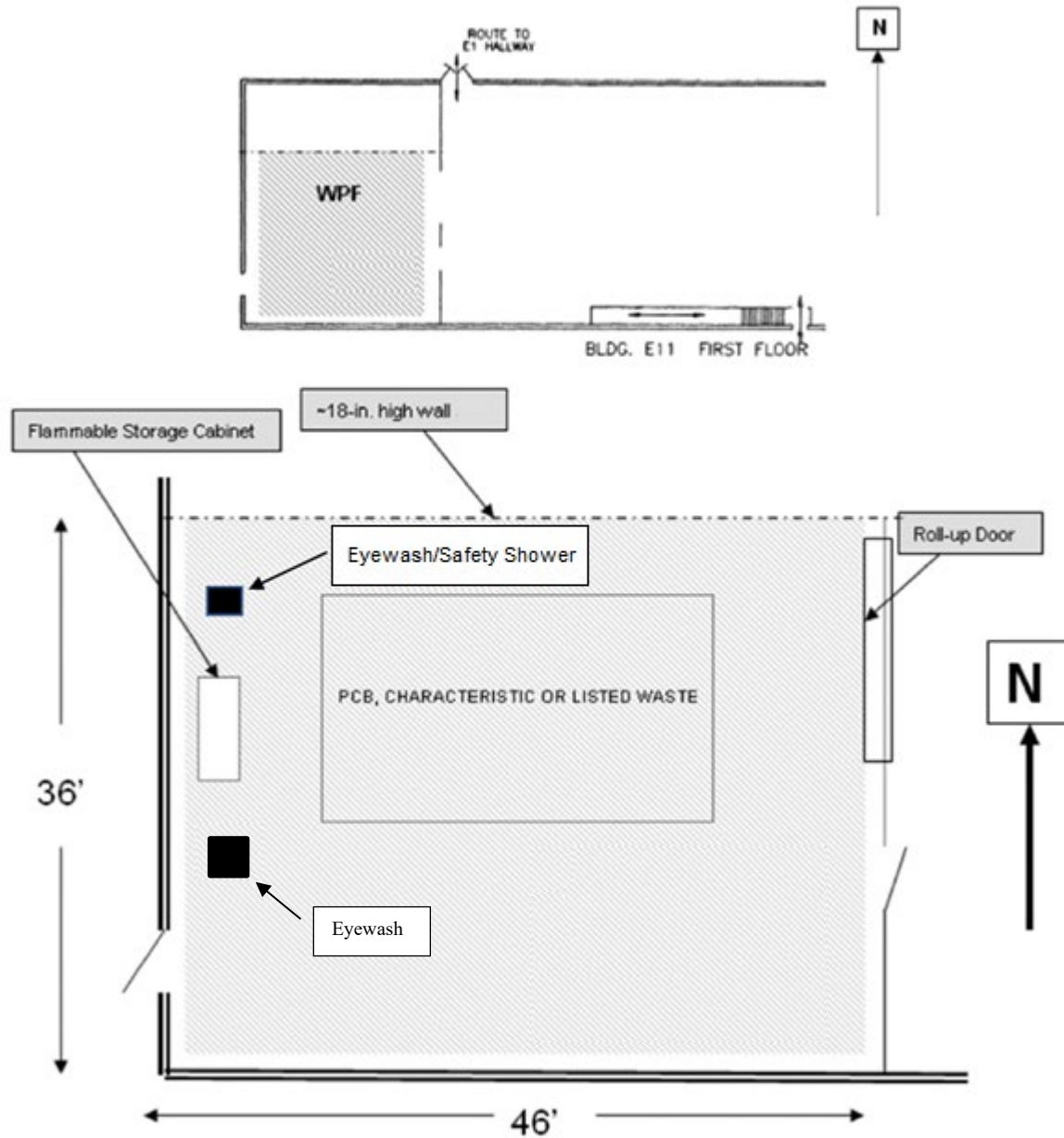


FIGURE 6
E4-EXTENSION FLOOR VAULT LINERS
(cross-section)



**FIGURE 7
E11-WASTE PROCESSING FACILITY**



Note: These are general locations planned for each category based upon segregation compatibility and inspection requirements. The areas may be enlarged, moved, or recategorized as needed to accommodate variations in individual waste stream generation rates. In all cases, requirements for the proper management of containers will be met.

DESCRIPTION OF SYSTEM

A. Drainage and Protection of Containers from Standing Liquids; Secondary Containment

Each of the permitted waste management units is equipped with a secondary containment system, which is sufficiently impervious to contain leaks, spills, and/or accumulated precipitation until the collected material can be removed. In addition, all of the permitted units are fully enclosed and equipped with systems (roof drains or similar devices) to protect them from the weather (e.g., precipitation).

All wastes containing free liquids will be managed in the permitted units such that they are protected from potential contact with accumulated liquids, in accordance with 6 NYCRR §373-2.9(f)(1) [40 CFR §264.175(b)]. Various methods will be used to accomplish this such as elevating them off the floor by means of pallets, shelving, etc.; use of self-containment devices (e.g., trays, self-contained pallets, collapsible containments, etc.); and/or other appropriate means to assure protection from standing liquids should a leak or spill occur.

In accordance with 6 NYCRR §373-2.9(f)(2) [40 CFR §264.175(c)], wastes that do not contain free liquids need not have a containment system or be elevated off the floor since the units are designed and operated to remove liquid resulting from precipitation (i.e., see discussion above related to the units being fully enclosed). If wastes containing free liquids are also managed in the unit at the same time, these non-free liquid wastes will be protected from potential contact with accumulated liquids (other than precipitation) by any of the following methods: the free liquid containing wastes may be separately contained in self-containment devices (e.g., trays, self-contained pallets, collapsible containments, etc.); all wastes will be elevated off the floor by means of pallets, shelving, etc.; and/or other appropriate means to assure protection from standing liquids, should a leak or spill occur.

B. Capacity of Containment System Relative to Waste Volume Stored

Each of the permitted waste management units covered in this attachment is equipped with a secondary containment system that has sufficient capacity to contain 10 percent of the volume of containers or the volume of the largest container, whichever is greater. Table 2 provides comparison of the existing secondary containment capacities with the regulatory requirements. However, if the storage area is storing containers holding only wastes that do not contain free liquids this capacity requirement does not apply.

The Knolls Laboratory permitted units may also be utilized to manage PCB waste. As such, the requirements for storage of regulated quantities of PCBs specified in 40 CFR §761.65 and 6 NYCRR §373 will be followed. Secondary containment capacities noted in Table 2 indicate that each unit will conform to the §761.65 requirements. However, according to 40 CFR §761.65(b)(1)(ii), storage facilities for PCB/radioactive waste are exempt from the curbing requirements.

TABLE 2
SECONDARY CONTAINMENT CAPACITIES

UNIT	Largest Container ¹	Authorized Capacity ²	Containment Capacity ³	10% Total Authorized Capacity
<u>Q1 Complex</u> Q1-South Q1-Extension	202 gallons	6,600 gallons	~ 1,600 gallons ~ 4,200 gallons	660 gallons
<u>E11 truck bay</u> E11 MA-L	95 gallons	1,320 gallons	~ 867 gallons	132 gallons
E4-Extension	95 gallons	2,600 gallons	~2,600 gallons ⁴	260 gallons
E11 WPF	718 gallons	7,180 gallons	~ 898 gallons	718 gallons

Notes for Table 2

1. Larger containers other than those listed below may also be placed in the units, although for containers with liquids the largest container would not exceed the containment capacity.
2. The Knolls Laboratory will control the PCB storage capacities in the units to comply with the containment requirements in 40CFR §761.65.
3. Secondary containment capacity requirements do not apply to storage areas that only store waste containers that do not contain free liquids. [6NYCRR §373-2.9(f)(2)]
4. The design of the stainless steel lined floor vaults are such that the liners themselves act much like curbing and therefore the authorized capacity equals the containment capacity.

C. Provisions for Preventing or Managing Run-On

Run-on prevention is provided mainly by the design/construction of the waste management units themselves. As discussed above, each of the units has a roof, four walls, and curbing that will prevent any outside liquids from reaching the containers being managed.

The closest storm water catch basins in proximity to the waste management units are designated on Figure 2 (located in the map pocket at the back of Attachment B). This figure also shows the catch basins along the primary transport routes for waste leaving the site. The main storm water system drains most of the Laboratory (including the locations around the E4-Extension and Building E11) through a series of piping into the Mohawk River. There are also auxiliary storm water systems to drain the remaining portions of the site not covered by the main system. The auxiliary systems, specifically around Building Q1, drain to hillsides that slope towards the Midline Stream which flows into the Mohawk River.

D. Analysis and Removal of Spill Overflow

If a spill or container leak is detected, the container will either be placed in an overpack drum or its contents transferred to a new container, and the released waste absorbed or appropriately cleaned up and placed in a suitable container. The area of the release will be decontaminated as necessary following spill cleanup.

Although catastrophic spills are not likely, since the largest free-liquids container volume is expected to be no more than 95 gallons, procedures are available to remove large quantities of liquids. Any major spill that cannot be removed with absorbent will be removed using a pump. The liquids will be transferred to suitable containers as soon as possible and the containers will be sealed and appropriately labeled.

E. Requirements for Ignitable or Reactive Wastes and Incompatible Wastes

The protocols to be followed when managing ignitable, reactive, or incompatible wastes are covered in Attachment F. No ignitable or reactive wastes are stored within 50 feet of the property boundary at Knolls Laboratory, in compliance with 6 NYCRR §373-2.9(g) [40 CFR §264.176]. The locations of the waste management units in relation to the site property line are illustrated in Attachment B, Figures 3 and 4.

CONTAINER MANAGEMENT PRACTICES

A. Description of Containers

Hazardous and mixed wastes managed within the Knolls Laboratory permitted units are routinely stored in readily available prefabricated containers (e.g., USDOT authorized containers) compatible with the waste as specified in 6 NYCRR §373-2.9(c), except for specific cases whereby a solid waste is too large for any prefabricated container. In this situation, the waste will be securely sealed within a compatible wrapping material that will preclude the release of any hazardous waste or hazardous waste constituent and therefore meet the definition of a RCRA container as specified in 6 NYCRR §370.2(b)(33) [40 §CFR 260.10].

Most hazardous and mixed wastes are stored in new 55-gallon steel drums, which conform to applicable USDOT requirements. Liquid wastes are normally stored in "close-top, bung type" steel drums that have non-removable lids. Wastes that contain no free liquids are stored in either "open-top" steel drums that have removable lids, metal boxes or in fiber boxes. "Open-top" drums are sealed by ensuring proper seating of the gasketed cover on the rim and securing the bolt ring mechanism until the lid is tightly in place.

Low volume laboratory wastes are also stored in the waste management units. These wastes are often stored in their original containers (i.e., small jars, cans or poly containers), which are placed in trays on shelves or racks until they are prepared for off-site disposition. Prior to off-site disposition, compatible laboratory wastes that are similar in characteristics are packaged together in USDOT approved containers (lab packs) in accordance with the designated treatment method. The containers contain sufficient absorbent medium to reduce the likeliness of container breakage, thus preventing the mixing of the wastes, and to meet USDOT and disposal facility requirements.

To maintain compliance with 6 NYCRR §373-2.29 (40 CFR §264.1080-1091), all regulated wastes (e.g., hazardous wastes having a volatile organic concentration ≥ 500 ppmw), when managed in containers with capacities greater than 26 gallons, will be placed in Level 1 containers (e.g., USDOT specification containers) in compliance with the container requirements in 6 NYCRR §373-2.29(g) (40 CFR §264.1086). These containers will be kept closed and only opened for sampling or addition of more waste.

B. Container Handling Practices

Preparation for transit to the storage area includes a visual inspection of the container and its contents by the cognizant generator. This inspection includes checks for proper sealing of the container, signs of leaks or corrosion, sealing of bungs and lids, and affirmation that the contents are labeled correctly. If the visual inspection reveals that a container may contain material other than the labeled contents, or if the cognizant generator has other reasons to suspect an inconsistency, a sample of the container's contents may be taken and analyzed. Prior to transport to the waste management units, the cognizant generators notify a Waste Chemical Coordinator (WCC) that a containerized waste is ready for transport. Notification consists of an internal waste identification and certification form, which provides the identification and characterization of the waste. Upon receipt, a WCC reviews and approves the form and the waste is scheduled for pickup.

Wastes are transported to the hazardous/mixed waste management units either by truck, forklift, barrel jack or, if small enough, by hand. If a truck is used, the waste is loaded on the truck either by hand, forklift, or other suitable equipment. Prior to transport, a final check is made to ensure that the container is properly sealed, and, if necessary, secured to the vehicle to prevent containers from moving or falling over in transit.

The wastes are loaded into and unloaded out of the permitted units through personnel or vehicle access doorways. Many of these access ways are equipped with sloped ramps to provide ease of entry into and out of the units. As noted in a previous discussion, access to the E4-extension floor vaults can only be gained through the removal of the heavy steel plate covers using an overhead crane or similar device. The wastes must then be lowered into or removed from each of the vaults using a lifting device.

Following arrival at the waste management unit, a WCC, cognizant supervisor, Waste Processor, or designee re-inspects the containers for signs of leakage or damage, which may have occurred in transit. If a container does not pass this inspection, it may be placed in an overpack or the contents may be transferred to another suitable container. If it passes inspection, a WCC, cognizant supervisor, or designee ensures that the waste is properly stored in a compatible location within the unit and the information used to track and control the waste is adequately recorded.

The compatibility of the waste material with other wastes stored in the unit is determined through the use of the internal waste identification and certification form or the container labels. Only compatible wastes are stored adjacent to each other within the waste management unit. Reactive wastes, ignitable wastes or wastes incompatible with one another are segregated by various methods that are in compliance with the provisions outlined in 6 NYCRR §373-2.9(h) [40 CFR §264.177]. Adequate aisle space is provided to allow waste management unit personnel to inspect any stored container and, in emergency situations, to allow for unobstructed access to any area within the unit to deploy fire protection, spill control, and decontamination equipment.

There may be occasions when containers with low exposure rates may be used to provide radiation shielding for containers with higher exposure rates (this is known by the term 'dense packing'). Dense packing may be used so long as there is a means of detecting, locating the source of, and responding to a release within 24 hours of detection to mitigate any significant release².

The maximum container stacking height ranges from one to three containers depending on the type of container and the design height of the waste management unit, but single-level storage is preferred and practiced whenever possible. Any placement or relocation of containers in the unit is supervised by a WCC, cognizant supervisor, or designee.

After they are properly situated, the containers are opened only to inspect the contents, extract samples, add to or repackage the waste within the existing container, or transfer the contents to another container. Compatibility regarding the latter actions is assured by verifying the containers' contents (e.g., through the internal waste identification and certification form or the container labels). During storage, the wastes are in the custody of a WCC or cognizant supervisor who retains accountability for their disposal.

To maintain compliance with 6 NYCRR §373-2.29, all regulated wastes (e.g. hazardous wastes having a volatile organic concentration ≥ 500 ppmw), when managed in containers greater than 26 gallons, will be placed in Level 1 containers (e.g. DOT specification containers) in compliance with the container requirements in 6 NYCRR §373-2.29 (g). These containers will be kept closed and only opened for sampling or addition of more waste.

Infrequently, mixed wastes may be moved from the waste management unit for non-intrusive activities that require the use of specialized equipment not present in the waste management unit, such as radiation counting equipment. In such cases, the movement and return of the mixed waste will be recorded in the operating record. Information to be recorded includes container identification, the date and time removed and returned, where it was moved, and the reason for the movement. Mixed wastes removed from the waste management unit for such purposes will be returned to the waste management unit within one shift of removal and are not opened at any time during this movement.

When the hazardous or mixed wastes are to be transported to, or removed from any waste management unit for off-site disposition, trained waste/material handlers, waste processors, or waste disposal vendor employees will remove the wastes from the unit, and a licensed hazardous waste hauler will transport the wastes from the Knolls Laboratory facility to a permitted TSDF.

C. Inspections

Inspections of the waste management units are performed and documented in accordance with the inspection protocols outlined in Attachment F. These inspections are performed to ensure that the containers are free from hazards due to corrosion, leaks, ruptures or spills, and that the structural integrity of the unit and secondary containment remains intact.

² This concept was developed from guidance published at 60 FR 40204 – 40211, dated 08/07/95. The dense packing provision is specifically discussed at 60 FR 40209, §III.

KNOLLS ATOMIC POWER LABORATORY

KNOLLS LABORATORY

Attachment E SWMU/AOC INFORMATION PACKAGE

EPA I.D. NUMBER NY 6890008992

**6 NYCRR PART 373 PERMIT
NUMBER**

4-4224-00024/00001

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**Knolls Atomic Power Laboratory – Knolls Laboratory
Niskayuna, New York
SWMU/AOC Information Package**

Table I. SWMU/AOC Summary

No Further Action	No Further Action		
SWMU-001, Closed Landfill SWMU-008, Construction and Demolition Debris Area No. 2 SWMU-009, Scrap Metal Management Areas SWMU-010, Current Hazardous Waste Storage Facility, Building Q1 SWMU-011, Building Q3 Temporary Hazardous Waste Storage Facility SWMU-012, Former Container Storage Area, Building Z7 SWMU-013, Building K4 Boiler Blowdown Storage Tank SWMU-014, Building K4 Wastewater Neutralization Tank SWMU-015, Former C2/E1 Yard Wastewater Treatment Tank Site SWMU-016, E1/G1 Wastewater Treatment Tanks SWMU-017, Building L3 Holding Tanks, Experimental Engineering SWMU-018, Building L6 Equalization Tank, Experimental Engineering SWMU-019, Building L6 Holding Tank, Experimental Engineering SWMU-020, Building D3 Neutralization Tank, Pickling Facility SWMU-021, Building K3 Former Oil/Water Separator Site SWMU-022, Former J3 Incinerator Site SWMU-023, High Yard Area SWMU-024, J7 Scrap and Salvage SWMU-026, G2 Wastewater Concentrator SWMU-028, Site Boilers SWMU-029, Former K3 Fuel Oil Tank Site SWMU-030, H2 Processing Facility*† [Transferred] SWMU-031, H2 Tank Farm*† [Transferred] SWMU-034, L7 Waste Processing Facility* SWMU-035, Former Slurry Drum Storage Area*† [Transferred] SWMU-036, Former K6 Storage Pad*† [Transferred] SWMU-037, Former K7 Storage Pad*† [Transferred] SWMU-038, Railroad Staging Area*† [Transferred] SWMU-039, K4 Laundry Wastewater Pit* SWMU-040, K5 Retention Basin*† [Transferred] SWMU-042, RML Mixed Waste Storage Pits* SWMU-044, RML Cobalt Pit* SWMU-048, Building E1 Cask Storage Pit* SWMU-049, Former M4 Test Specimen Storage* SWMU-050, H2MA Mixed Waste Storage Unit* SWMU-052, M10 Storage Facility* SWMU-057, Pipe Tunnels*† [Transferred] SWMU-058, SPRU Tank 527*† [Transferred] SWMU-059, SPRU Tank 531*† [Transferred] SWMU-060, SPRU Tank 532*† [Transferred] SWMU-061, SPRU Tank 534*† [Transferred] SWMU-062, SPRU Tank 551*† [Transferred] SWMU-063, SPRU Tank 536*† [Transferred] SWMU-064, SPRU Tank 316*† [Transferred] SWMU-065, FCPE Discharge Tank* SWMU-066, Nuclear Material Storage Vault* SWMU-067, E11 Waste Processing Facility* SWMU-068, E11 Mixed Waste Modular Additions* SWMU-069, K4 Holding Tank SWMU-070, Q1 ≤ 90 Day Waste Accumulation Area SWMU-071, L9 ≤ 90 Day Waste Accumulation Area SWMU-072, F4 ≤ 90 Day Waste Accumulation Area* SWMU-073, H2 ≤ 90 Day Waste Accumulation Area*	SWMU-074, PTR Hold Tank* SWMU-075, Former CWA Hold Tank* SWMU-076, Former CWTA Hold Tank* SWMU-077, Former ATR Hold Tanks* SWMU-078, Steam Condensate Return System; Discharge Areas SWMU-079, Miscellaneous ≤ 90 Day Waste Accumulation Areas* SWMU-080, Canberra Q2 Unit, Building E11* SWMU-081, SPRU Fractionation Tanks 1*† SWMU-082, SPRU Fractionation Tanks 2*† SWMU-083, K4 West Wastewater Tank SWMU-084, K4 Annex Wastewater Tank SWMU-085, SPRU Mixed Waste Storage Area*† SWMU-086, Conex Box SWMU*† SWMU-087, Building P9 Cooling Tower Blowdown Neutralization Tank AOC-002, Former PCB-Containing Transformer Area G AOC-003, Lower Level Parking Lot*† [Transferred] AOC-004, Z5 Sanitary Sewer/CSMA Soil Pile & Copper Release/CSMA Soil Pile AOC-006, Red Pines Area*† [Transferred] AOC-008, G2 Area of Concern*† AOC-009, T1 North		
	<table><tr><th>Further Action</th></tr><tr><td>SWMU-002, Former Landfill SWMU-003, Mercury Disposal Area SWMU-004, North Field SWMU-005, Pyrophoric Area SWMU-006, West Field SWMU-007, Construction and Demolition Debris Area No.1 SWMU-025, Former L3 Sodium Treatment Area SWMU-027, K4 Pit SWMU-032, Former Temporary Waste Storage Facilities* SWMU-033, Former Pilot Incinerator/Storage Facility* SWMU-041, J4 Filter Bed* SWMU-043, Former RML Chemical Waste Pit* SWMU-045, RML In-Floor Storage* SWMU-046, RML Building E2 Cask Storage Pit* SWMU-047, RML Cask Storage Facility* SWMU-051, Former Q4 Drum Pit* SWMU-053, Industrial Drain System* SWMU-054, Wastewater Drain Systems* SWMU-055, Laundry Drain System* SWMU-056, Storm Water Drain System* AOC-001, Hillside Area AOC-002, Former PCB-Containing Transformers Areas A, B, C, D, E, F, H AOC-005, Q3 Yard AOC-007, H1 Cooling Tower Area</td></tr></table>	Further Action	SWMU-002, Former Landfill SWMU-003, Mercury Disposal Area SWMU-004, North Field SWMU-005, Pyrophoric Area SWMU-006, West Field SWMU-007, Construction and Demolition Debris Area No.1 SWMU-025, Former L3 Sodium Treatment Area SWMU-027, K4 Pit SWMU-032, Former Temporary Waste Storage Facilities* SWMU-033, Former Pilot Incinerator/Storage Facility* SWMU-041, J4 Filter Bed* SWMU-043, Former RML Chemical Waste Pit* SWMU-045, RML In-Floor Storage* SWMU-046, RML Building E2 Cask Storage Pit* SWMU-047, RML Cask Storage Facility* SWMU-051, Former Q4 Drum Pit* SWMU-053, Industrial Drain System* SWMU-054, Wastewater Drain Systems* SWMU-055, Laundry Drain System* SWMU-056, Storm Water Drain System* AOC-001, Hillside Area AOC-002, Former PCB-Containing Transformers Areas A, B, C, D, E, F, H AOC-005, Q3 Yard AOC-007, H1 Cooling Tower Area
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* Asterisk denotes the unit managed RCRA solid waste potentially containing or mixed with RCRA-solid-waste-exempt special nuclear or byproduct material.

† All Corrective Action responsibilities for this Solid Waste Management Unit or Area of Concern are assigned to the U.S. Department of Energy – Environmental Management (DOE-EM), formerly known as DOE-Oakland Operations Office (EPA ID No. NYR000096859) as described in the SPRU Permit #4-4224-00024/00055 for the former Separations Process Research Unit (SPRU) operation.

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Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
Closed Landfill, SWMU-001 (Current Landfill, LF-1)	<p>Physical: This 3.7 acre, unlined landfill is located outside and east of the Site's upper level security area. The unit included a burn cage, three-sided burn pad, and 1,000 gallon, steel, in-ground, waste oil tank, as well as several waste burial areas. A clay cap, installed during 1992 and 1993, covers the unit. The cap is intact and in good condition.</p> <p>Operational: This unit was used from the early 1950s until June 1992. Prior to New York State Solid Waste Management Facility (SWMF) permitting, September 1978, chemical wastes were buried, burned, or poured on the ground at this unit, waste oils were accumulated within an in-ground tank prior to off-site disposition, and combustible waste was burned in a burn cage. Subsequent to the 1978 SWMF permitting, these operations ceased, the burn cage and oil tank were removed, and landfill operations commenced. The landfill was closed during 1992 and 1993 in accordance with NYCRR Part 360, Solid Waste Management Facility closure requirements.</p> <p>Waste Types/Characteristics: Non-hazardous waste included cafeteria waste, scrap paper, cardboard, wood, plastic, glass, and construction and demolition debris. Chemical waste included various laboratory reagents, paint and paint products, solvents, and floor strippers and waxes. Waste oils included vacuum pump, air compressor, and motor oils.</p> <p>Release Information: Perimeter groundwater monitoring wells show impacts associated with sanitary landfill leachate. The following constituents were detected in an in-fill groundwater monitoring well during the mid- to late 1980s: Arsenic (0.013 mg/l), Cadmium (0.002 mg/l), Lead (0.02 mg/l), Nickel (0.11 mg/l), Zinc (1.0 mg/l), Bis Diethyl Hexyl Phthalate (8 µg/l), Chloroethane (20 µg/l), 1,1-Dichloroethane (63 µg/l), 1,1-Dichloroethene (19 µg/l), t-1,2-Dichloroethene (110 µg/l), Heptachlor (0.0006 µg/l), Toluene (1.3 µg/l), 1,1,1-Trichloroethane (0.8 µg/l), Trichloroethene (2.2 µg/l), and Vinyl Chloride (80 µg/l).</p> <p>A crushed, but intact, partially full waste oil drum was found protruding from the units eastern slope, May 1984. The drum was removed and, subsequent to analysis, the contents were disposed as waste oil.</p> <p>Recommended Action: No action (Continue 6 NYCRR, Part 360 post-closure monitoring).</p>

Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
Former Landfill, SWMU-002 (Former Landfill, LF-2)	<p>Physical: This one to two acre, unlined landfill is located outside and east of the Site's upper level security area, southwest of the Closed Landfill and north of the East Boundary Stream.</p> <p>Operational: The unit pre-dates Knolls Laboratory operations and was used by the previous land owner for disposal of scrap metal and household waste. The Knolls Laboratory used the unit from the early 1950s until the mid-1970s for disposal of scrap metal, construction and demolition debris, and industrial waste.</p> <p>Waste Type/Characteristics: Scrap metal, construction and demolition debris, and industrial waste.</p> <p>Release Information: A partially full waste oil drum was found protruding from the unit's southern slope, May 1984. The drum was removed and, subsequent to analysis, the contents were disposed as waste oil.</p> <p>A 1988 geophysical survey confirmed burial of metallic debris.</p> <p>Recommended Action: Sampling Visit.</p> <p>Subsequent Action: Sampling Visit work completed in 2007. RCRA Facility Investigation (RFI) fieldwork was conducted in 2009 and 2010. RFI Report transmitted to the Department in October 2011. The Department approved the RFI Report in November 2016. Focused Corrective Measures Study (FCMS) transmitted to the Department in May 2018; approved in April 2019. The Department prepared a draft Statement of Basis proposing the FCMS as a final remedy for this SWMU and provided a 45-day public comment period from April 13, 2022 to May 30, 2022. The Department's Final Statement of Basis was issued on June 27, 2022. The schedule for implementation of the FCMS and preparation of the Corrective Measures Implementation Work Plan (CMI WP) shall be provided to the Department in accordance with the conditions established in the Major modification to the Part 373 Permit issued June 27, 2022. A schedule modification request for the preparation of the LDA CMI WP was transmitted to the Department on May 11, 2023 and approved on May 25, 2023. A modified schedule was transmitted to NYSDEC on September 14, 2023 and approved by the Department on October 31, 2023 to transmit the LDA CMI WP to NYSDEC by February 29, 2024.</p>

Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
Mercury Disposal Area, SWMU-003 (Red Pines Area, FLD-1)	<p>Physical: This unlined disposal area, located outside and east of the Site's upper level security area, consisted of a small earthen pit. The pit measured approximately two feet wide by five feet long by four feet deep.</p> <p>Operational: Dates of operation for this unit are unknown. The burial area was discovered in the late 1970s.</p> <p>Waste Type/Characteristics: Batteries, scrap metal, containers, and elemental mercury.</p> <p>Release Information: Soil borings showed visible droplets of mercury. A fifty pound mercury release was conservatively estimated. The waste and visibly contaminated soil was excavated and disposed off-site as chemical waste.</p> <p>Recommended Action: Sampling Visit.</p> <p>Subsequent Action: Sampling Visit work completed in 2007. RCRA Facility Investigation (RFI) fieldwork was conducted in 2009 and 2010. RFI Report transmitted to the Department in October 2011. The Department approved the RFI Report in November 2016. Focused Corrective Measures Study (FCMS) transmitted to the Department in May 2018; approved in April 2019. The Department prepared a draft Statement of Basis proposing the FCMS as a final remedy for this SWMU and provided a 45-day public comment period from April 13, 2022 to May 30, 2022. The Department's Final Statement of Basis was issued on June 27, 2022. The schedule for implementation of the FCMS and preparation of the Corrective Measures Implementation Work Plan (CMI WP) shall be provided to the Department in accordance with the conditions established in the Major modification to the Part 373 Permit issued June 27, 2022. A schedule modification request for the preparation of the LDA CMI WP was transmitted to the Department on May 11, 2023 and approved on May 25, 2023. A modified schedule was transmitted to NYSDEC on September 14, 2023 and approved by the Department on October 31, 2023 to transmit the LDA CMI WP to NYSDEC by February 29, 2024.</p>

Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
<p>North Field, SWMU-004 (North Field, FLD-2)</p>	<p>Physical: This unlined unit consists of a 40,000 square feet area located outside and east of the Site's upper level security area, north of the Former Landfill and the Pyrophoric Area. A comb-like pattern of apparent trenches and depressions devoid of vegetation are present at this unit.</p> <p>Operational: This unit was allegedly used from the early 1960s to the mid-1970s. Containers of waste were placed in previously prepared trenches. Once a trench was full, a new trench would be excavated. The excavated soil from the new trench was used as cover material for the former. Update: No evidence of prepared trenches or buried containers was discovered during the Sampling Visit work.</p> <p>Waste Type/Characteristics: Laboratory chemicals.</p> <p>Release Information: Employee interviews allege this area was used for chemical waste disposal.</p> <p>Recommended Action: Sampling Visit.</p> <p>Subsequent Action: Sampling Visit work completed in 2007. RCRA Facility Investigation (RFI) fieldwork was conducted in 2009 and 2010. RFI Report transmitted to the Department in October 2011. The Department approved the RFI Report in November 2016. Focused Corrective Measures Study (FCMS) transmitted to the Department in May 2018; approved in April 2019. The Department prepared a draft Statement of Basis proposing the FCMS as a final remedy for this SWMU and provided a 45-day public comment period from April 13, 2022 to May 30, 2022. The Department's Final Statement of Basis was issued on June 27, 2022. The schedule for implementation of the FCMS and preparation of the Corrective Measures Implementation Work Plan (CMI WP) shall be provided to the Department in accordance with the conditions established in the Major modification to the Part 373 Permit issued June 27, 2022. A schedule modification request for the preparation of the LDA CMI WP was transmitted to the Department on May 11, 2023 and approved on May 25, 2023. A modified schedule was transmitted to NYSDEC on September 14, 2023 and approved by the Department on October 31, 2023 to transmit the LDA CMI WP to NYSDEC by February 29, 2024.</p>

Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
Pyrophoric Area, SWMU-005 (Pyrophoric Area, FLD-3)	<p>Physical: This unit consisted of a four feet square, 1/4 inch thick, steel plate and the land area surrounding former Building Q6. The plate was generally located east of Building Q6. Building Q6 was located outside and east of the Site's upper level security area, north of the Former Landfill.</p> <p>Operational: This unit served as a scrap zirconium burn pad from the early 1950s to the late 1970s. Scrap zirconium was open burned with the aid of a fire accelerant (kerosene or methanol) on a steel plate located in the vicinity of Building Q6. Untreated scrap zirconium submersed in oil was also buried in the vicinity of Building Q6. Building Q6 was demolished in September of 2017.</p> <p>Waste Type/Characteristics: Approximately 7,100 pounds of reactive zirconium alloy lathe turnings, shavings, and chips were burned or buried at this unit. Zirconium alloys may have contained chromium (up to 0.1%), tin (up to 1.5%), nickel (up to 0.1%), and copper (up to 0.1%). Approximately thirty containers of oil-submersed, scrap zirconium are known to have been buried at this unit.</p> <p>Release Information: Apparent burn residues are present on a land area east of former Building Q6. Records indicate at least thirty containers of zirconium submerged in oil were buried in the vicinity of former Building Q6. Several of these containers were exhumed in the late 1980s. Isolated depressions with small cavities in which metal debris may be observed are located west of former Building Q6. High conductivity values and numerous magnetic anomalies were detected during a 1988 geophysical investigation at this unit.</p> <p>Recommended Action: Sampling Visit.</p> <p>Subsequent Action: Sampling Visit work completed in 2007. RCRA Facility Investigation (RFI) fieldwork was conducted in 2009 and 2010. RFI Report transmitted to the Department in October 2011. The Department approved the RFI Report in November 2016. Focused Corrective Measures Study (FCMS) transmitted to the Department in May 2018; approved in April 2019. The Department prepared a draft Statement of Basis proposing the FCMS as a final remedy for this SWMU and provided a 45-day public comment period from April 13, 2022 to May 30, 2022. The Department's Final Statement of Basis was issued on June 27, 2022. The schedule for implementation of the FCMS and preparation of the Corrective Measures Implementation Work Plan (CMI WP) shall be provided to the Department in accordance with the conditions established in the Major modification to the Part 373 Permit issued June 27, 2022. A schedule modification request for the preparation of the LDA CMI WP was transmitted to the Department on May 11, 2023 and approved on May 25, 2023. A modified schedule was transmitted to NYSDEC on September 14, 2023 and approved by the Department on October 31, 2023 to transmit the LDA CMI WP to NYSDEC by February 29, 2024.</p>

Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
West Field, SWMU-006 (West Field, FLD-4)	<p>Physical: This unlined land disposal area consists of an open field located outside and east of the Site's upper level security area, northwest of the Former Landfill and west of the Pyrophoric Area.</p> <p>Operational: This unit was used for an approximate one year time period in the late 1950s or early 1960s. Chemical wastes were buried in a 40 feet long, three to four feet wide, by three feet deep trench.</p> <p>Waste Type/Characteristics: Laboratory chemicals.</p> <p>Release Information: Tetrachloroethylene and trichloroethylene have been detected in a monitoring well located down gradient from this unit.</p> <p>High conductivity values and a large magnetic anomaly were detected during a 1988 geophysical investigation over this unit.</p> <p>A small exploratory excavation revealed evidence of the past waste management practice. Broken bottles and containers, as well as metal debris, were observed during the exploratory excavation.</p> <p>Recommended Action: Sampling Visit.</p> <p>Subsequent Action: Sampling Visit work completed in 2007. RCRA Facility Investigation (RFI) fieldwork was conducted in 2009 and 2010. RFI Report transmitted to the Department in October 2011. The Department approved the RFI Report in November 2016. Focused Corrective Measures Study (FCMS) transmitted to the Department in May 2018; approved in April 2019. The Department prepared a draft Statement of Basis proposing the FCMS as a final remedy for this SWMU and provided a 45-day public comment period from April 13, 2022 to May 30, 2022. The Department's Final Statement of Basis was issued on June 27, 2022. The schedule for implementation of the FCMS and preparation of the Corrective Measures Implementation Work Plan (CMI WP) shall be provided to the Department in accordance with the conditions established in the Major modification to the Part 373 Permit issued June 27, 2022. A schedule modification request for the preparation of the LDA CMI WP was transmitted to the Department on May 11, 2023 and approved on May 25, 2023. A modified schedule was transmitted to NYSDEC on September 14, 2023 and approved by the Department on October 31, 2023 to transmit the LDA CMI WP to NYSDEC by February 29, 2024.</p>

Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
Construction and Demolition (C&D) Debris Area No. 1, SWMU-007 (C&D Material Debris Area, FLD-5)	<p>Physical: This unit consists of a remotely located open area outside and east of the Site's upper level security area, north of the North Field. Construction and demolition debris is present on the land surface at this unit.</p> <p>Operational: Dates and methods of operation are unknown.</p> <p>Waste Type/Characteristics: Construction and demolition debris.</p> <p>Release Information: No spills or releases to the environment reported and or observed; however, based upon lack of operational information and the unit's remote location, a sampling visit was recommended.</p> <p>Recommended Action: Sampling Visit</p> <p>Subsequent Action: Sampling Visit work completed in 2007. RCRA Facility Investigation (RFI) fieldwork was conducted in 2009 and 2010. RFI Report transmitted to the Department in October 2011. The Department approved the RFI Report in November 2016. Focused Corrective Measures Study (FCMS) transmitted to the Department in May 2018; approved in April 2019. The Department prepared a draft Statement of Basis proposing the FCMS as a final remedy for this SWMU and provided a 45-day public comment period from April 13, 2022 to May 30, 2022. The Department's Final Statement of Basis was issued on June 27, 2022. The schedule for implementation of the FCMS and preparation of the Corrective Measures Implementation Work Plan (CMI WP) shall be provided to the Department in accordance with the conditions established in the Major modification to the Part 373 Permit issued June 27, 2022. A schedule modification request for the preparation of the LDA CMI WP was transmitted to the Department on May 11, 2023 and approved on May 25, 2023. A modified schedule was transmitted to NYSDEC on September 14, 2023 and approved by the Department on October 31, 2023 to transmit the LDA CMI WP to NYSDEC by February 29, 2024.</p>

Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
C&D Debris Area No. 2, SWMU-008	<p>Physical: This unit consists of an open area located outside and southeast of the Site's upper level security area, under the upper level overflow parking lot.</p> <p>Operational: Construction and demolition debris was deposited on the surface of the land area as fill for a parking lot prior to the mid-1970s.</p> <p>Waste Type/Characteristics: Construction and demolition debris.</p> <p>Release Information: No spills or releases to the environment reported or observed. Employee interviews indicate clean construction and demolition debris was used as fill for the upper level overflow parking lot. The 1993 EPA Region II CERCLA Expanded Site Inspection (ESI) indicates no historical releases. Based on the unit's highly visible location, ESI and Midline Stream sample results, no action is recommended.</p> <p>Recommended Action: No action.</p>

Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
Scrap Metal Management Areas, SWMU-009	<p>Physical: Scrap metal is or has been accumulated at six primary areas. Two Scrap Metal Management Areas were located at the north end of the upper level security area east of the former raw metal stock storage area and east of former Building M1 (currently Building T1). Two areas were located at the lower level security area adjacent to Building L6 and adjacent to the former rail bed. One area is located at the lower level southeast of Buildings J2 and J7. One area is located north of Building Q14. All Scrap Metal Management Areas are paved.</p> <p>Operational: Two units are currently active. Operation involves staging of scrap metal on pallets or in drums, hoppers, and roll-offs.</p> <p>Waste Type/Characteristics: Scrap Metal (i.e., pipes, lathe turnings, equipment, instrumentation, etc.).</p> <p>Release Information: No spills or releases to the environment reported or observed.</p> <p>Recommended Action: No action.</p>

Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
Current Hazardous Waste Storage Facility, Building Q1, SWMU-010 (Current Container Storage Area, Building Q-1, CS-1)	<p>Physical: This active unit, located at the northeast end of the upper level security area, consists of the south end of Building Q1, a building extension, and a paved and bermed area. Building Q1 resides on a bermed concrete slab and is a sheet metal-sided, steel-framed structure. The extension is a covered, three-sided structure which extends off the east side of Building Q1. The extension floor is concrete and is also bermed. The paved and bermed area is approximately 2,500 square feet and is located adjacent to and east of the extension.</p> <p>Operational: This currently active Hazardous Waste Management Facility has been in operation since 1984. The unit is permitted to store containerized hazardous waste up to one year. Hazardous waste may be stored within Building Q1 or the Q1 Extension. The combined permitted capacity is 6,600 gallons. Non-hazardous waste, such as asbestos and waste oil, are/were stored in the paved and bermed area.</p> <p>Waste Type/Characteristics: Containerized hazardous waste; such as, halogenated and non-halogenated solvents, photographic and silver/mercuric nitrate solutions, and miscellaneous laboratory reagents are stored at this unit prior to off-site disposal transport.</p> <p>Release Information: No spills or releases to the environment reported or observed.</p> <p>Recommended Action: No action. This unit will be closed in accordance with a Department-approved closure plan.</p>

Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
<p>Building Q3 Temporary Hazardous Waste Storage Facility, SWMU-011 (Former Container Storage Area, Building Q-3, CS-2)</p>	<p>Physical: This unit consisted of a 224 square feet area within Building Q3. Building Q3, located at the northeast end of the Site's upper level security area, was an enclosed, steel framed structure which resides on a concrete slab.</p> <p>Operational: Building Q3 was used for less than two weeks during 1981 to stage hazardous waste. The above-grade structure of Building Q3 was removed in 2023. The concrete slab remains.</p> <p>Waste Type/Characteristics: Ten to 15 drums of hazardous waste were staged at this unit for up to two weeks.</p> <p>Release Information: No spills or releases to the environment reported or observed.</p> <p>Recommended Action: No action.</p>

Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
<p>Former Container Storage Area, Building Z7, SWMU-012 (Former Container Storage Area, Building Z-7, CS-3)</p>	<p>Physical: This unit, centrally located at the upper level security area, consisted of a 400 square feet area of former Building Z7's north garage. Building Z7 was a covered, corrugated metal sided, steel framed structure which was built on a concrete slab.</p> <p>Operational: This unit was operated from 1961 until 1984. Waste chemicals were staged at this unit prior to off-site disposal transport. Building Z7 was removed in 2000 to make way for a new office building.</p> <p>Waste Type/Characteristics: Waste chemicals included chlorinated and non-chlorinated solvents, PCB's, and zirconium.</p> <p>Release Information: No spills or releases to the environment reported or observed.</p> <p>Recommended Action: No action.</p>

Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
<p>Building K4 Boiler Blowdown Storage Tank, SWMU-013 (Boiler Blowdown Holding Tank, ST-1)</p>	<p>Physical: This unit is a 1,000 gallon, in-ground, steel-lined, concrete tank located adjacent to and south of the Boiler House (Building K4). The interior of the tank had been lined with carbon steel up until the 1990s when the tank was relined with stainless steel. The Boiler House is located at the east end of the Site's lower level security area.</p> <p>Operational: This currently active unit has been in operation since 1950. Non-hazardous boiler blowdown is accumulated within this unit. Historically, boiler blowdown was discharged to the storm water drain system; however, starting in 1980, blowdown was transferred for neutralization to a stainless steel tank (SWMU-014) located in Building K4. In September 1997, blowdown was redirected to SWMU-069.</p> <p>Waste Type/Characteristics: Non-hazardous boiler blowdown (average pH is ~10.5 SU).</p> <p>Release Information: No spills or releases to the environment reported.</p> <p>Recommended Action: No action.</p>

Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
Building K4 Wastewater Neutralization Tank, SWMU-014 (Wastewater Treatment Tank, Neutralization, WT-1)	<p>Physical: This unit was a 1,000 gallon, above-ground, stainless steel tank, located inside Building K4. The tank was intact and in good condition.</p> <p>Operational: This unit operated from 1980 until September 1997 and has since been removed. Approximately 2,000 gallons of non-hazardous boiler blowdown (pH ~10.5 SU), and 1,500 gallons of corrosive (pH ~2.0 SU) make-up water treatment system regeneration wastewater was neutralized within this unit per day during peak winter months. The neutralized wastewater was released to the Site's stormwater drain system and ultimately discharges from a SPDES permitted outfall.</p> <p>Waste Type/Characteristic: Non-hazardous and corrosive wastewater.</p> <p>Release Information: No spills or releases to the environment reported or observed.</p> <p>Recommended Action: No action.</p>

Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
<p>Former C2/E1 Yard Wastewater Treatment Tank Site, SWMU-015 (Wastewater Treatment Tank, Yard Tank, WT-2)</p>	<p>Physical: This unit was an in-ground, flow-through, concrete tank, located at the upper level security area, between Buildings C2 and E1. The unit was constructed of nine inch thick concrete walls and measured 27 feet long, seven feet wide, and eight feet deep. The tank consisted of a six feet long inlet equalization chamber, two 2.5 feet wide by 17 feet long, parallel, neutralization chambers, and a one foot long outlet chamber. The neutralization chambers consisted of several limestone filled over/under baffles. The tanks design capacity is 50 gallons per minute with a 30 minute residence time. The tank was intact and in good condition prior to its discontinued use and removal during the summer of 1996.</p> <p>Operational: This unit operated from 1950 until May 1996. It served as an integral component of the Site's industrial drain system. From 1950 until 1952 industrial wastewaters were neutralized within this unit and discharged to the sanitary drain system. Subsequently, the limestone was removed and the industrial wastewater was redirected to the Site's storm water drain system.</p> <p>Waste Type/Characteristics: Industrial wastewaters from laboratory, pickling, and machine shop operations, non-contact cooling waters, and cooling tower blowdown. Although sludges generated within the tank were non-hazardous, trace levels of hazardous constituents were detected. The hazardous constituents detected were: arsenic, barium, cadmium, chromium, lead, mercury, silver, bis diethyl hexyl phthalate (DEHP), and PCBs.</p> <p>Release Information: No spills or releases to the environment reported or observed.</p> <p>Recommended Action: No action. (Pursuant to unit closure negotiations, the Department, in September 1995, concurred with KAPL's no action recommendation.)</p>

Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
<p>E1/G1 Wastewater Treatment Tank, SWMU-016 (Wastewater Treatment Tank, WT-3)</p>	<p>Physical: This unit, located in the Building E1 basement, consists of a skid-mounted treatment system and a 700 gallon polyethylene wastewater accumulation tank. The skid mounted treatment system capabilities include filtration, neutralization, ion exchange, and carbon polishing. The unit is intact and in good condition.</p> <p>Operational: A 1,000 gallon, carbon steel tank accumulated air conditioner (AC) condensate and laboratory wastewater since the late 1960s. The steel tank was replaced November 1993 with two polyethylene wastewater accumulation tanks and a skid-mounted treatment system. Building E1 and G1 chemistry laboratory wastewater is accumulated within the 700 gallon polyethylene tank. AC system condensate and leakage was accumulated within an 1,100 gallon polyethylene tank. The 1,100 gallon polyethylene tank was removed in 2021. Accumulated wastewater is batch treated, if required, via the skid-mounted treatment system prior to release. Wastewater was discharged to the Yard Neutralization Tank until September 1995, when laboratory wastewater was rerouted to the Sanitary Drain System. During May 1996 AC condensate and leakage wastewater was rerouted directly to the storm water drain system.</p> <p>Waste Type/Characteristics: Approximately 800 gallons of laboratory wastewater (pH generally 8.0 to 9.0 SU) is accumulated, batch treated if required, and discharged per month.</p> <p>Release Information: No spills or releases to the environment reported or observed.</p> <p>Recommended Action: No action.</p>

Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
<p>Building L3 Holding Tanks, Experimental Engineering, SWMU-017 (Wastewater Collection/Treatment Tanks WT-4 & 5)</p>	<p>Physical: This unit consists of two 1,200 gallon, above-ground, polypropylene tanks located within a concrete pit in Building L3. Building L3 is located at the west end of the Site's lower level security area. The tanks are intact and in good condition.</p> <p>Operational: Experimental Engineering primary and secondary test waters and wastewater from a wet bench laboratory have been managed within tanks since the early 1960s. Originally, two wastewater accumulation/treatment tanks (one 1,000 gallon, the other 275 gallon) were used to manage waste test waters and laboratory wastewater. These tanks were replaced with two 300 gallon tanks in 1990. The two 300 gallon tanks were replaced by two 1,200 gallon tanks in 1992. One tank remained inactive until November 1995. Approximately 600 gallons of waste test water and laboratory wastewater is accumulated per week. Wastewater was batch discharged to the storm water drain system until February 1995 when it was rerouted to the sanitary drain system.</p> <p>Waste Type/Characteristics: Wastewaters containing phosphates, nitrates, sulfates, and ammonia as well as morpholine, hydrazine, and formaldehyde additives. The pH of accumulated wastewater generally ranges from 10.0 to 10.3 SU.</p> <p>Release Information: No spills or releases to the environment reported or observed.</p> <p>Recommended Action: No action.</p>

Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
Building L6 Equalization Tank, Experimental Engineering, SWMU-018 (Wastewater Collection Tank, WT-7)	<p>Physical: This unit was a 300 gallon, above-ground, stainless steel tank, located inside Building L6. Building L6 is located at the lower level security area, between the Mohawk River and former rail bed. The tank was intact and in good condition.</p> <p>Operational: This unit began operation in 1988 and has since been removed. This unit was used to accumulate Experimental Engineering test facility wastewater which was similar to that generated in Buildings L2 and L3. Wastewater was discharged to an adjacent, 500 gallon, stainless steel, holding tank - the L6 Holding Tank.</p> <p>Waste Type/Characteristics: Approximately 500 gallons of non-hazardous wastewater was accumulated per week.</p> <p>Release Information: No spills or releases to the environment reported or observed.</p> <p>Recommended Action: No action.</p>

Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
<p>Building L6 Holding Tank, Experimental Engineering, SWMU-019 (Wastewater Collection Tank, WT-6)</p>	<p>Physical: This unit was a 500 gallon, above-ground, stainless steel tank, located inside Building L6. Building L6 is located at the lower level security area. The tank was intact and in good condition.</p> <p>Operational: This unit began operation in 1988 and has since been removed. This unit received accumulated test facility wastewater from an adjacent, 300 gallon, stainless steel, equalization tank - the L6 Equalization Tank - and discharged it to the sanitary drain system. Wastewater was neutralized, if required, prior to discharge.</p> <p>Waste Type/Characteristics: Wastewater was similar to that generated in Buildings L2 and L3. Wastewater pH generally ranged from 10.0 to 10.3 SU.</p> <p>Release Information: No spills or releases to the environment reported or observed.</p> <p>Recommended Action: No action.</p>

Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
<p>Building D3 Neutralization Tank, Pickling Facility, SWMU-020 (Wastewater Treatment Tank, Pickling Facility, WT-8)</p>	<p>Physical: This 50 gallon, above-ground, open-top, polyethylene tank was located at the Building D3 Pickling Facility. Building D3, a metallurgical facility, is centrally located at the west end of the Site's upper level security area. The tank was intact and in good condition.</p> <p>Operational: From 1980 until 1992 spent pickling solutions were neutralized in this unit prior to being discharged to the Site's industrial drain system. Up to 35 gallons of spent pickling solution was batch treated and discharged at any one time. Due to an alloy change, neutralization and discharge of spent pickling solutions ceased in 1992. Thereafter spent pickling solutions were and continue to be managed as hazardous waste. The neutralization tank was used to neutralize slightly caustic Alconox (laboratory grade detergent) wash and rinse waters which were subsequently discharged to the industrial drain system. This operation ceased in the late 1990s and has since been removed.</p> <p>Waste Type/Characteristics: Spent pickling solutions were corrosive and contained heavy metals. Sludges generated during the neutralization of spent pickling solutions contained heavy metals. Alconox wash and rinse waters were non-hazardous.</p> <p>Release Information: No spills or releases to the environment reported or observed.</p> <p>Recommended Action: No action.</p>

Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
Building K3 Former Oil/Water Separator Site, SWMU-021 (Oil-Water Holding Tank, ST-2)	<p>Physical: This former unit, a 275 gallon oil tank, was located within an 185,000 gallon fuel oil tank secondary containment structure at the lower level, north of the Boiler House. The tank was intact and in good condition prior to its 1990 removal.</p> <p>Operational: This unit was operational from the early 1950s until 1990. The tank served two functions. It was used to separate and store water contaminated fuel oil from the bottom of the adjacent 185,000 gallon fuel oil storage tank and it was used to store waste oils and solvents prior to fuel oil blending and burning in the Site boilers. Spent solvent and waste oil blending ceased prior to 1980 and the mid-1980s, respectively.</p> <p>Waste Type/Characteristics: Waste oil and solvents. A 1991 tank residue analysis showed hazardous levels of lead, benzene, trichloroethylene, and tetrachloroethylene.</p> <p>Release Information: No spills or releases to the environment reported or observed.</p> <p>Recommended Action: No action.</p>

Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
Former J3 Incinerator Site, SWMU-022	<p>Physical: This former unit was located at the east end of the Site's lower level security area. It consisted of a firebrick-lined, brick incinerator which was housed within a covered, 15 feet by 15 feet corrugated metal-sided, steel-framed structure. A covered, 12 feet by 12 feet corrugated cement asbestos-sided, wood-framed structure was added later. A 40 gallon per hour fuel oil burner provided the source of combustion. Combustion products were dispersed through a 44 feet high, eight-inch diameter, metal stack.</p> <p>Operational: The unit was built during the original Site construction and was dismantled in 1980.</p> <p>Waste Type/Characteristics: Non-hazardous, combustible, solid waste; such as, scrap paper, cardboard, and plastics.</p> <p>Release Information: No spills or releases to the environment reported.</p> <p>Recommended Action: No action.</p>

Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
High Yard Area, SWMU-023	<p>Physical: This unit was comprised of three oil-filled transformers and associated switchgear and load ratio controllers, five oil-filled circuit breakers, appurtenant overhead and subsurface structures, and a former dielectric fluid filter press operation housed in Building Z4. The High Yard Area was de-energized and all above grade structures were removed by 2014. All below grade structures were removed during the implementation of an Interim Corrective Measure (ICM) from 2014 to 2015. The area was remediated, backfilled, and restored with grass vegetative cover. This unit is centrally located at the upper level security area.</p> <p>Operational: The High Yard Area was fully operational from 1950 to the spring of 1998, at which time the High Yard Area was de-energized and power transmission was transferred to a new high yard immediately east of the High Yard Area. The filter press was operational from the early 1950's to the late 1970's. The filter press and associated 500-gallon above-ground holding tank were used to remove water and impurities from the dielectric fluid in the circuit breakers and load ratio controllers. The filter press, and the holding tank and associated piping, were disposed of offsite in the late 1970's. With the exception of Building Z4, the switchgear and associated conduits, and energized conduits, all aboveground equipment and supporting structures were removed and disposed off-site by 1998. The High Yard Area switchgear and associated conduits and conductors remained tied to a new replacement high yard until 2013. The switchgear, Building Z4, and the remaining subsurface conductors were removed by January 2014. With the exception of an energized electrical hand-hole in the northeast portion of the High Yard Area, all above grade and below grade electrical equipment and structures were removed prior to and during the ICM that occurred from 2014 to 2015.</p> <p>Waste Type/Characteristics: PCB-contaminated dielectric fluid, volatile organic compounds (VOCs) (e.g., benzene, tetrachloroethylene, trichloroethylene, xylene, trans-1,2-dichloroethylene), and semivolatile organic compounds (SVOCs) (e.g., 1,4-dichlorobenzene, 1,2,4-trichlorobenzene, benzo(a) pyrene, dibenzo(a,h) pyrene).</p> <p>Release Information: PCBs, VOCs, and SVOCs were detected in soil at concentrations greater than the Department's TAGM 4046 clean-up objectives. The maximum concentration for PCBs, VOCs (tetrachloroethylene), and SVOCs (1,2,4-trichlorobenzene) are 9,000; 290,000 and 210,000 parts per billion (ppb), respectively.</p> <p>VOCs (cis-1,2-dichloroethylene, trans-1,2-dichloroethylene, and tetrachloroethylene) were detected in groundwater monitoring well samples greater than the 6 NYCRR Part 703.5 5-ppb water quality standard. The maximum VOC (cis-1,2-dichloroethylene) concentration is 22 ppb. A single PCB result (0.22 ppb), as compared with the standard of 0.09 ppb, from a highly turbid water sample associated with PCB contaminated soils, is considered suspect.</p>

Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
High Yard Area, SWMU-023 (cont.)	<p>Recommended Action: ICM implementation is being deferred until the High Yard is completely decommissioned.</p> <p>Previous Action: The Department included this as a Further Action SWMU in Module III of the original Permit in July 1998. The RCRA Facility Investigation was completed in 2001. An ICM work plan was approved by the Department in 2004.</p> <p>Subsequent Action: High Yard Area decommissioning complete in January 2014. PCB remediation was conducted under the authority of TSCA; Self-Implementing PCB Remediation Waste Cleanup Notification approved by EPA Region 2 in June 2014. Revised ICM Work Plan approved by the Department in October 2014. First phase of remediation completed in December 2014. Remediation was completed in December 2015. The ICM Report was approved by the Department in December 2017. Post-remediation groundwater monitoring was implemented from 2017 to 2021. In September 2021, the Department approved discontinuation of groundwater monitoring based on results below groundwater standards.</p>

Table II. Knolls Laboratory SWMUs and AOCs

□ Name	Description & Recommended Action
J7 Scrap & Salvage, SWMU-024	<p>Physical: This unit consists of a covered, corrugated metal-sided, steel-framed structure, designated Building J7. Building J7 is located at the east end of the Site's lower level security area.</p> <p>Operational: The unit housed a paper pulverizer and circuit board shredder. The circuit board shredding operation ceased in 1994. Historically, mercury containing/contaminated scrap and waste oil were accumulated at this unit.</p> <p>Waste Type/Characteristics: Mercury containing/contaminated scrap, waste oil, circuit boards, and paper were accumulated at this unit.</p> <p>Release Information: Elevated levels (i.e., above background) of cadmium, chromium, lead, mercury, nickel, and zinc have been detected in surface soil grab samples.</p> <p>Recommended Action: Sampling Visit.</p> <p>Subsequent Action: RCRA Facility Investigation (RFI) and Interim Corrective Measures (ICM) completed. The Department approved the ICM in August 2003. The Department further stated that evaluation and reporting of the ICM as a final remedy will be performed in the future as part of the overall final Corrective Measures assessment for the Knolls Laboratory.</p>

Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
Former L3 Sodium Treatment Area, SWMU-025	<p>Physical: This unit was located adjacent to the northeast corner of Building L3, at the Site's lower level security area. The unit's physical characteristics (i.e., land area, open topped tank, catch basin, etc.), if any, are unknown. The area is currently paved.</p> <p>Operational: The unit was operated during the 1950s and possibly the early 1960s. Waste sodium was reacted with water or methanol to render it non-reactive.</p> <p>Waste Type/Characteristics: Reactive sodium metal potentially contaminated with heavy metals.</p> <p>Release Information: A 1956 soil pH measurement of 9.4 indicates treatment residues were released to the environment. Treatment residues may have contained heavy metals.</p> <p>Recommended Action: Sampling Visit.</p>

Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
G2 Wastewater Concentrator, SWMU-026	<p>Physical: This unit was located within the north end of Building G2. It consisted of two 50-gallon wastewater accumulation tanks (one polyethylene, the other stainless steel), a steam- and electric-heated stainless steel 55-gallon drum which served as a wastewater concentrator, two overflow collection tanks (one stainless steel, the other polyethylene), and several secondary containment structures.</p> <p>Operational: This unit, operational from the mid-1980s until 1999, was used to concentrate non-hazardous wastewater generated from corrosion coolant test facilities. Approximately 5,000 to 10,000 gallons of primary and secondary test coolants and laboratory wastewater was concentrated annually. Approximately 100 gallons of sludge was generated per year from this operation. Building G2 was demolished in 2018, and the area was backfilled, graded, and seeded in 2019.</p> <p>Waste Type/Characteristics: Non-hazardous primary and secondary test coolants, primarily ammoniated water, and laboratory wastewater containing phosphates, nitrates, hydrazine, and morpholine. Sludges generated during the concentration process have been characteristically hazardous for lead.</p> <p>Release Information: No spills or releases to the environment reported or observed.</p> <p>Recommended Action: No action.</p>

Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
K4 Pit, SWMU-027	<p>Physical: This concrete pit, located inside Building K4, measures 7.5 feet wide by 16 feet long by 8.5 feet deep. The integrity of the pit has not been maintained, as evidenced by groundwater seepage.</p> <p>Operational: This pit was installed in the late 1940s during the original Building K4 construction. An oil/water separator consisting of two 55-gallon drums, one fitted with absorbent filters, the other serving an overflow function, was situated within the pit. Condensate from steam-heated fuel oil equipment was passed through the oil/water separator prior to being discharged to the pit. Subsequent to a fuel oil/natural gas conversion, the oil/water separator ceased operation and was removed during the summer of 1995. Besides steam condensate, small volumes of steam condensate analytical waste (i.e., barium sulfate) were discharged to the pit via a laboratory sink. Currently, the sink drains to an ejector sump which is pumped to SWMU-069. Groundwater seepage accumulates within the pit. The pit contents are pumped to the storm drain system.</p> <p>Waste Type/Characteristics: Steam condensate, analytical waste containing hazardous constituents (historically), and groundwater seepage.</p> <p>Release Information: No spills or releases to the environment reported; however, the tank integrity is compromised as evidenced by groundwater seepage.</p> <p>Recommended Action: Sampling Visit.</p>

Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
Site Boilers, SWMU-028	<p>Physical: The unit consists of four Babcock and Wilcox steam boilers housed within Building K4 at the lower level security area. The cumulative boiler design capacity is approximately 100,000 pounds of steam per hour. The boilers burned No. 6 fuel oil from 1950 until 1994. The boilers were converted to natural gas with No. 2 fuel oil as a backup during 1995.</p> <p>Operational: The boilers were operational from the Site's inception until 2002. On occasion, waste oils and solvents were mixed with No. 6 fuel oil and were burned. Blending of fuel oil with solvents ceased in the late 1970s and blending of waste oils ceased during the mid-1980s.</p> <p>Waste Type/Characteristics: Waste oils and solvents blended with fuel oil. Waste quantities and frequency of operation is unknown.</p> <p>Release Information: No spills or releases to the environment reported or observed.</p> <p>Recommended Action: No action. The unit was operated in compliance with Department issued air pollutant emissions permits.</p>

Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
Former K3 Fuel Oil Tank Site, SWMU-029	<p>Physical: This 185,000-gallon, above ground fuel oil storage tank was fabricated of plate steel and was fitted with a concrete secondary containment structure.</p> <p>Operational: The tank was used from the late 1940s until 1995 to store No. 6 fuel oil for the boilers. Spent solvents and used oils stored in an adjacent 275-gallon tank - the Former K3 Oil/Water Separator - were blended with the No. 6 fuel oil in the 185,000-gallon storage tank. Spent solvent and used oil blending ceased in the late 1970s and mid-1980s, respectively. During 1995 the boilers were converted to natural gas. The tank was emptied August 1996 and was dismantlement and removed September 1996.</p> <p>Waste Type/Characteristics: Spent solvents and used oil.</p> <p>Release Information: No spills or releases to the environment reported or observed.</p> <p>Recommended Action: No action.</p>

Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
<p>H2 Processing Facility, SWMU-030* [Transferred to DOE-EM]</p>	<p>Physical: Building H2 was located at the northwest end of the Site's upper level security area and was constructed in the late 1940s to house liquid waste processing equipment for waste generated by the Separation Process Research Unit (SPRU) and SPRU-support facilities. The building was built on a two to three feet thick concrete foundation slab and was constructed of concrete walls over two feet thick. Copper water stops were installed at all construction joints. The building consisted of approximately 27,900 square feet of floor space on three main floors. Nearly 70% of this space was located below grade. The majority of liquid waste processing equipment was fabricated of stainless steel and was located on the two lower levels. Liquid waste processing area walls and ceilings were coated with a sealant or cocooning material while the floor areas were generally lined with stainless steel floor pans.</p> <p>Operational: During the early 1950s, Building H2 was used to process chemical waste and wastewater from SPRU operations. Subsequently, the unit was used to process laboratory wastewater.</p> <p>Chemical wastes were processed in Building H2 during the early 1950s. The chemical waste was transferred via stainless steel drain lines to one of five stainless steel neutralizers where it was neutralized, distilled, and/or concentrated. The neutralizer bottoms were transferred to the Tank Farm for storage, the organic distillate was collected and containerized, and excess water, generated during concentrations, was processed with other wastewaters prior to discharge.</p> <p>SPRU and SPRU-support facility wastewaters were accumulated in one of three stainless steel 10,000-gallon storage tanks. Accumulated wastewater was transferred to one of two evaporators where it was concentrated 400 fold. Distillate from the evaporators was collected in a receiver tank where it was monitored and, if within acceptable Mohawk River Advisory Committee limits, it was discharged to the Mohawk River via the K5 Retention Basin and/or the storm water drain system. Evaporator bottoms, referred to as slurry waste, were either dried in one of two drum driers and containerized in 55-gallon drums or were directly containerized in 55-gallon drums. Containerized slurry waste was staged adjacent to Building H2 prior to being placed in storage at the Slurry Drum Storage Area, the K6 Storage Pad, or the Railroad Staging Area.</p> <p>From 1950 until 1964 the evaporative wastewater processing technique was employed. Subsequent to 1964, wastewater was processed via filtration and ion exchange prior to discharge. Discharge of treated wastewater ceased in 1977 when a water reuse system was installed.</p> <p>In addition to liquid waste processing, solid wastes were compacted in Building H2. The solid waste compaction process commenced in 1972, subsequent to its L7/H2 transfer. The solid waste compaction operation ceased in May 2000. The unit was removed and Building H2 was demolished in 2018.</p>

Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
H2 Processing Facility, SWMU-030* [Transferred to DOE-EM] (Cont.)	<p>Waste Type/Characteristics: Over 20,000 gallons of corrosive chemical waste containing heavy metals, methyl isobutyl ketone, and/or organic diluents and over nine million gallons of heavy metal containing wastewater was processed in Building H2 during the early 1950s. Over 22 thousand gallons of slurry waste, which may have contained heavy metals, was generated in Building H2.</p> <p>Release Information: High water marks on walls in waste processing areas and radioactivity detected in adjacent soil and footing drains indicate a potential release from this unit.</p> <p>Recommended Action: Sampling Visit.</p> <p>Subsequent Action: Sampling Visit (SV) complete. All Corrective Action responsibilities for this waste management unit are assigned to the U.S. Department of Energy – Environmental Management (DOE-EM), formerly DOE-Oakland Operations Office (EPA ID No. NYR000096859) as described in the Separations Process Research Unit (SPRU) Permit # 4-4224-00024/00055 for the former SPRU operation. Subsequent to the SV, a separate groundwater RCRA Facility Investigation (RFI) was performed and a RFI Report was transmitted to the Department in November 2006. In 2017, SWMU-030 was decontaminated in anticipation of demolition in 2018. Following removal of the unit in 2018, confirmation sampling of the excavated area indicated that soil cleanup objectives had been met and backfill of the excavation was completed. No further action was recommended in the ICM Report for the Upper Level SWMUs and AOC which was transmitted to the Department in May 2020. NYSDEC approved the ICM Report in September 2022. All Corrective Action responsibilities are to be assigned to the U.S. Department of Energy – Naval Reactors Laboratory Field Office.</p>

* - Asterisk denotes the unit managed RCRA solid waste potentially containing or mixed with RCRA-solid-waste-exempt special nuclear or byproduct material.

Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
<p>H2 Tank Farm, SWMU-031* [Transferred to DOE-EM]</p>	<p>Physical: One 5,000-gallon and six 10,000-gallon stainless steel storage tanks were located in seven underground concrete vaults. The vaults were arranged in a north-south row on the east side of the H2 Processing Facility. The floors and walls of these vaults were constructed of concrete ranging from two to eight feet thick. A water proof sealant was applied to the vault floors and walls and copper water stops were installed during construction. The vault ceilings were constructed of upright and inverted concrete "T" blocks covered with tar paper, asphalt, and approximately nine feet of fill. A 1989 visual inspection of the tanks and vaults indicated they were intact and in good condition. Groundwater seeps were observed from several vault ceilings.</p> <p>Operational: From 1950 until 1954 processed separations material and waste was accumulated within the various tanks. Materials and waste remained in storage until the mid-1960s when it was removed, processed via evaporation, and transported off-site for disposal. Subsequent to SPRU operations, several tanks were used to accumulate and store liquid waste from materials and chemistry laboratories. During 1978, all tanks were drained and taken out of service. The tanks have been removed.</p> <p>Waste Type/Characteristics: Corrosive liquid waste potentially containing methyl isobutyl ketone, organic diluents, and/or heavy metals were accumulated within these tanks. Approximately 2,100 total gallons of residue remain within the tanks. Analysis of residues sampled show elevated levels of all TCLP metals.</p> <p>Release Information: High water marks were observed on vault walls during a 1989 inspection. They were attributed to water seeping from the vault ceilings. Radioactivity detected in footing drains indicates a potential release from this unit.</p> <p>Recommended Action: Sampling Visit.</p> <p>Subsequent Action: Sampling Visit (SV) complete. All Corrective Action responsibilities for this waste management unit are assigned to the U.S. Department of Energy – Environmental Management (DOE-EM), formerly DOE-Oakland Operations Office (EPA ID No. NYR000096859) as described in the Separations Process Research Unit (SPRU) Permit # 4-4224-00024/00055 for the former SPRU operation.</p> <p>The results of the SV were used to determine that a RFI was necessary for the unit. Groundwater contamination in the vicinity of the unit was characterized in a separate RFI and the RFI Report was submitted in November 2006. Following removal of the unit in 2018, confirmation sampling of the excavated area indicated that soil cleanup objectives had been met and backfill of the excavation was completed. No further action was recommended in the ICM Report for the Upper Level SWMUs and AOC, which was transmitted to the Department in May 2020. NYSDEC approved the ICM Report in September 2022. All Corrective Action responsibilities are to be assigned to the U.S. Department of Energy – Naval Reactors Laboratory Field Office.</p>

* - Asterisk denotes the unit managed RCRA solid waste potentially containing or mixed with RCRA-solid-waste-exempt special nuclear or byproduct material

Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
Former Temporary Waste Storage Facilities, SWMU-032*	<p>Physical: Three small, temporary wooden buildings were located at the lower level, west of where Building L7 is located. The buildings were designated Lt-1, -2, & -3. A concrete slab measuring approximately 20 feet wide by 65 feet long by 2 feet deep fitted with 164 six-inch diameter by ten-inch deep pit wells was located in Lt-1. Magnetite block was used to cover the pit well openings.</p> <p>Operational: From 1950 until 1954 equipment and debris as well as solid and liquid waste were staged at and in the immediate vicinity of Buildings Lt-1, -2, & -3. The buildings were dismantled and removed during October 1954. The concrete slab with resident waste was covered with three feet of fill. The area was subsequently paved over. The slab and resident waste remained buried until September 1980, at which time the slab was excavated, the waste was removed, and the slab was dismantled and removed.</p> <p>Waste Type/Characteristics: Equipment and debris and solid and liquid waste. The RCRA status of the waste stored is unknown.</p> <p>Release Information: Radioactivity detected in soils indicates a potential release from this unit.</p> <p>Recommended Action: Sampling Visit.</p>

* - Asterisk denotes the unit managed RCRA solid waste potentially containing or mixed with RCRA-solid-waste-exempt special nuclear or byproduct material.

Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
Former Pilot Incinerator/Storage Facility, SWMU-033*	<p>Physical: This unit, located at the north end of the Site's upper level security area, northeast of Building H2, initially consisted of an incinerator housed within a three-sided, corrugated transite-sided, steel-framed structure. The unit was subsequently modified into an enclosed waste storage building measuring 24 feet by 24 feet.</p> <p>Operational: The incinerator was operated for an approximate one-year period in the early 1950s. Subsequently, the unit was modified and used to stage solid waste until 1963 and equipment until 1970. The unit was dismantled in 1978.</p> <p>Waste Type/Characteristics: Approximately 20,000 pounds of combustible solid waste, primarily air filters from the SPRU, was incinerated. Methyl isobutyl ketone and slurry waste which potentially contained heavy metals were subsequently stored at this unit.</p> <p>Release Information: Radioactivity detected in soil indicates a potential release from this unit.</p> <p>Recommended Action: Sampling Visit.</p>

* - Asterisk denotes the unit managed RCRA solid waste potentially containing or mixed with RCRA-solid-waste-exempt special nuclear or byproduct material.

Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
L7 Waste Processing Facility, SWMU-034*	<p>Physical: A waste processing facility was located in Building L7, an enclosed, concrete block, structure centrally located at the Site's lower level security area. A hydraulic press was located at this unit. For a brief period of time, a pilot incinerator was also located at this unit.</p> <p>Operational: Compressible solid waste, such as paper and cardboard, was compacted and baled with the use of a hydraulic press from the mid-1950s until the early 1970s.</p> <p>Waste Type/Characteristics: Solid waste; such as, filters, personal protective equipment, and wipes. Based upon employee interviews and waste operations reports, neither hazardous waste nor hazardous constituents were managed at this unit.</p> <p>Release Information: No spills or releases of hazardous waste or hazardous constituents reported or observed.</p> <p>Recommended Action: No action.</p>

* - Asterisk denotes the unit managed RCRA solid waste potentially containing or mixed with RCRA-solid-waste-exempt special nuclear or byproduct material.

Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
<p>Former Slurry Drum Storage Area, SWMU-035* [Transferred to DOE-EM]</p>	<p>Physical: This unit, located outside and east of the Site's upper level security area, consisted of an approximate 900 square feet, earthen-bermed area. The earthen berm was bulldozed and graded in the mid-1950s. No visible evidence of the unit exists today.</p> <p>Operational: During the early 1950s slurry waste, generated from wastewater processing activities in Building H2, was staged at this unit prior to off-site disposal transport. The earthen-berm was bulldozed and graded in the mid-1950s. Clean-up efforts were initiated in the early 1960s and again in the late 1970s. Approximately 1,000 cubic yards of soil have been removed.</p> <p>Waste Type/Characteristics: Slurry waste potentially containing heavy metals.</p> <p>Release Information: Radioactivity detected in soils indicates a potential release from this unit.</p> <p>Recommended Action: Sampling Visit.</p> <p>Subsequent Action: Sampling Visit complete. A RCRA Facility Investigation (RFI) for the Knolls Site Land Disposal Area included areas associated with the Former Slurry Drum Storage Area as recommended for further action in the RCRA Facility Assessment Sampling Visit Report for the Knolls Site Land Disposal Area, which was approved by the Department in January 2008.</p> <p>RCRA Facility Investigation (RFI) fieldwork was conducted in 2009 and 2010. RFI Report was transmitted to the Department in October 2011 with a no further action recommendation for this unit. The Department approved the RFI Report in November 2016.</p> <p>All Corrective Action responsibilities for this waste management unit are assigned to the U.S. Department of Energy – Environmental Management (DOE-EM), formerly DOE-Oakland Operations Office (EPA ID No. NYR000096859) as described in the Separations Process Research Unit (SPRU) Permit # 4-4224-00024/00055 for the former SPRU operation. All Corrective Action responsibilities are to be assigned to the U.S. Department of Energy – Naval Reactors Laboratory Field Office.</p>

* - Asterisk denotes the unit managed RCRA solid waste potentially containing or mixed with RCRA-solid-waste-exempt special nuclear or byproduct material.

Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
Former K6 Storage Pad, SWMU-036* [Transferred to DOE-EM]	<p>Physical: This unit, centrally located at the Site's lower level security area, was a 23 feet wide by 48 feet long, concrete-shielded, concrete storage pad. With the exception of the pad's southern wall, the shielding walls measured eight feet high and are over two and one half feet thick. The southern wall was an eight-inch thick retaining wall. An earthen embankment abuts this wall. The unit was fitted with a roof in 1987. In 2005, the K6 structure was demolished and removed, the area was backfilled, and ground cover was re-established.</p> <p>Operational: This unit was used from the late 1950s until the fall of 1968 to store containerized solid waste potentially containing hazardous constituents. In 1987, a roof was installed over the unit, the above-grade structural components were cleaned-up, the unit's floor was removed, and soil adjacent to the unit was excavated and placed within the unit.</p> <p>Waste Type/Characteristics: Waste, containerized in 55-gallon drums or casks, generally included H2 slurry waste, filters, and equipment. Slurry waste potentially contained heavy metals.</p> <p>Release Information: Radioactivity detected in soils indicates a potential release from this unit.</p> <p>Recommended Action: Sampling Visit.</p> <p>Subsequent Action: Sampling Visit complete. No further action approved by the Department in February 2006. All Corrective Action responsibilities for this waste management unit are assigned to the U.S. Department of Energy – Environmental Management (DOE-EM), formerly DOE-Oakland Operations Office (EPA ID No. NYR000096859) as described in the Separations Process Research Unit (SPRU) Permit # 4-4224-00024/00055 for the former SPRU operation.</p> <p>Corrective action of the lower level areas, which includes SWMU-036, was completed in 2011, and a final Interim Corrective Measures Data Report was issued in July 2011 for the lower level areas. In December 2011, the Department approved the recommendation of no further action for the lower level areas. All Corrective Action responsibilities are to be assigned to the U.S. Department of Energy – Naval Reactors Laboratory Field Office.</p>

* - Asterisk denotes the unit managed RCRA solid waste potentially containing or mixed with RCRA-solid-waste-exempt special nuclear or byproduct material.

Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
Former K7 Storage Pad, SWMU-037* [Transferred to DOE-EM]	<p>Physical: This former unit was centrally located at the Site's lower level security area, west of the K6 Storage Pad. It consisted of a fenced concrete pad.</p> <p>Operational: This unit was used during the 1960s to stage solid waste prior to off-site disposal shipment. Wastes were generally containerized in four feet by four feet square wooden boxes.</p> <p>Waste Type/Characteristics: Solid waste consisted of compacted paper, cardboard, and personal protective equipment from Building L7. Employee interviews indicate hazardous waste or hazardous constituents may have been managed at or in close proximity to this unit.</p> <p>Release Information: Radioactivity detected in adjacent soils indicates a potential release at this unit.</p> <p>Recommended Action: Sampling Visit.</p> <p>Subsequent Action: Sampling Visit complete. No further action approved by the Department in February 2006. All Corrective Action responsibilities for this waste management unit are assigned to the U.S. Department of Energy – Environmental Management (DOE-EM), formerly DOE-Oakland Operations Office (EPA ID No. NYR000096859) as described in the Separations Process Research Unit (SPRU) Permit # 4-4224-00024/00055 for the former SPRU operation.</p> <p>Corrective action of the lower level areas, which includes SWMU-037, was completed in 2011, and a final Interim Corrective Measures Data Report was issued in July 2011 for the lower level areas. In December 2011, the Department approved the recommendation of no further action for the lower level areas. All Corrective Action responsibilities are to be assigned to the U.S. Department of Energy – Naval Reactors Laboratory Field Office.</p>

* - Asterisk denotes the unit managed RCRA solid waste potentially containing or mixed with RCRA-solid-waste-exempt special nuclear or byproduct material.

Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
<p>Railroad Staging Area, SWMU-038* [Transferred to DOE-EM]</p>	<p>Physical: This unit consists of the land area located adjacent to and south of the former rail bed at the Site's lower level.</p> <p>Operational: Four feet by four feet wooden boxes and 55-gallon drums of solid waste, including slurry waste, were staged at this unit prior to off-site disposal transport. Waste staging operations commenced in the early 1950s and ceased in the late 1960s.</p> <p>Waste Type/Characteristics: Slurry waste, potentially containing heavy metals, and solid waste were staged at this unit.</p> <p>Release Information: Radioactivity detected in soils indicates a potential release from this unit.</p> <p>Recommended Action: Sampling Visit.</p> <p>Subsequent Action: Sampling Visit and RCRA Facility Investigation (RFI) completed. All Corrective Action responsibilities for this waste management unit are assigned to the U.S. Department of Energy – Environmental Management (DOE-EM), formerly DOE-Oakland Operations Office (EPA ID No. NYR000096859) as described in the Separations Process Research Unit (SPRU) Permit # 4-4224-00024/00055 for the former SPRU operation.</p> <p>Groundwater contamination in the vicinity of the unit was characterized in a separate RFI and the RFI report was submitted in November 2006.</p> <p>Corrective action of the lower level areas, which includes SWMU-038, was completed in 2011, and a final Interim Corrective Measures Data Report was issued in July 2011 for the lower level areas. In December 2011, the Department approved the recommendation of no further action for the lower level areas. All Corrective Action responsibilities are to be assigned to the U.S. Department of Energy – Naval Reactors Laboratory Field Office.</p>

* - Asterisk denotes the unit managed RCRA solid waste potentially containing or mixed with RCRA-solid-waste-exempt special nuclear or byproduct material.

Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
K4 Laundry Wastewater Pit, SWMU-039*	<p>Physical: This in-ground, concrete pit located on the south side of Building K4 was formerly used to accumulate laundry wastewater.</p> <p>Operational: This unit was used from 1950 until 1959 to accumulate laundry wastewater. Wastewater was transferred to Building H2 for processing, the K5 Retention Basin, or the J4 Filter Bed. The pit was cleaned in the 1980s.</p> <p>Waste Type/Characteristics: Laundry wastewater contained citric and oxalic acids, EDTA, and/or phosphates.</p> <p>Release Information: No spills or releases to the environment reported.</p> <p>Recommended Action: No action.</p>

* - Asterisk denotes the unit managed RCRA solid waste potentially containing or mixed with RCRA-solid-waste-exempt special nuclear or byproduct material.

Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
K5 Retention Basin, SWMU-040* [Transferred to DOE-EM]	<p>Physical: This unit was an in-ground, open-top, concrete basin located on the hillside between the Site's upper and lower levels. The unit measured approximately 22 feet wide by 43 feet long by 11 feet deep and was constructed of one foot thick concrete walls. The unit was equally divided into two 30,000-gallon holding basins. Cracks had been observed in the basin floor. This unit was demolished in 2006.</p> <p>Operational: This unit was operational from 1950 until the late 1960s. Non-hazardous wastewater, potentially containing hazardous constituents, processed in Building H2, and laundry wastewater was accumulated in this retention basin prior to storm water drain discharge. A roof was installed over the basin subsequent to its operational life.</p> <p>Waste Type/Characteristics: Non-hazardous wastewater potentially containing hazardous constituents and laundry wastewater.</p> <p>Release Information: Basin overflows have been reported. Trace levels of barium were detected in concrete samples collected during a 1993 tank clean-up effort. Radioactivity detected in adjacent soil indicates a potential release from this unit.</p> <p>Recommended Action: Sampling Visit.</p> <p>Subsequent Action: Sampling Visit and RCRA Facility Investigation (RFI) completed. All Corrective Action responsibilities for this waste management unit are assigned to the U.S. Department of Energy – Environmental Management (DOE-EM), formerly DOE-Oakland Operations Office (EPA ID No. NYR000096859) as described in the Separations Process Research Unit (SPRU) Permit # 4-4224-00024/00055 for the former SPRU operation.</p> <p>Corrective action of the lower level areas, which includes SWMU-040, was completed in 2011, and a final Interim Corrective Measures Data Report was issued in July 2011 for the lower level areas. In December 2011, the Department approved the recommendation of no further action for the lower level areas. All Corrective Action responsibilities are to be assigned to the U.S. Department of Energy – Naval Reactors Laboratory Field Office.</p>

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Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
J4 Filter Bed, SWMU-041*	<p>Physical: This filter bed is located at the east end of the Site's lower level security area. The bed measures 30 feet wide by 40 feet long by five feet deep. Its walls and floor are constructed of eight inch thick concrete. Three filter mediums were used in the unit: filtering sand, torpedo sand, and gravel. Three four-inch laterals dispensed wastewater over this unit and three four-inch drain tile runners collected and conveyed wastewater to the Site's storm water drain system.</p> <p>Operational: The filter bed was initially used to filter laundry wastewater. Approximately 50,000 gallons of laundry wastewater was processed through this unit per month during the early 1950s. Subsequent to the cessation of laundry operations in Building K4, the filter bed was used for interim storage of soil, the origins of which included the Slurry Drum Storage Area and an area between the K6 and K7 Storage Pads. The filter bed was used for interim storage from 1960 until 1967, at which time the majority of soil was removed, new filter media was added, and the unit resumed its wastewater filtration operation. During the mid-1980s the remaining soil and all filter media was removed and replaced with new filter media.</p> <p>Waste Type/Characteristics: K4 laundry wastewater, soil, and sanitary wastewater. Soil placed in interim storage may have contained heavy metals.</p> <p>Release Information: Radioactivity detected in adjacent soils indicates a potential release from this unit may have occurred.</p> <p>Recommended Action: Sampling Visit.</p>

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Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
RML Mixed Waste Storage Pits, SWMU-042*	<p>Physical: This mixed waste storage unit, located in the Building E4 Extension, consists of four in-floor concrete storage pits with stainless steel liners. Each pit measures five feet by five feet. Pit walls and floors are a minimum of 12 inches thick. An eight-inch thick concrete and steel plate covers each pit when materials and/or waste are not being added or removed. The unit's permitted capacity is 2,600 gallons.</p> <p>Operational: Although constructed in 1986, mixed waste storage did not commence until 1996. All waste stored is solid in form.</p> <p>Waste Type/Characteristics: The unit is permitted for storage of various characteristic and listed mixed wastes.</p> <p>Release Information: No spills or releases to the environment reported or observed.</p> <p>Recommended Action: No action. This unit will be closed in accordance with a Department approved closure plan which will be issued with the facility's Part 373 Permit.</p>

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Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
Former RML Chemical Waste Pit, SWMU-043*	<p>Physical: This former unit, located adjacent to and west of Building E2, at the Site's upper level security area, consisted of an in-ground concrete vault in which resided a concrete-shielded 55-gallon drum. A two-inch diameter, stainless steel drain line encased in two feet of concrete ran from Cell No. 7 - the Chemistry Cell - to this unit.</p> <p>Operational: This unit was constructed in 1957 and was used to collect small quantities of dissolution waste generated by the Chemistry Cell. Approximately 55 gallons of dissolution waste was generated every one to two years. When full, the concrete-shielded drum would be removed and a new concrete-shielded drum would be placed in service. Use of the unit ceased in 1968 upon the discovery of leaks. The unit was cleaned in 1971. Two drums of soil were excavated from an area adjacent to, and northeast of, this unit in 1981. The pit, drain line, and additional soil were removed in 1986.</p> <p>Waste Type/Characteristics: Corrosive liquid waste potentially containing heavy metals.</p> <p>Release Information: Radioactivity detected in adjacent soils indicates a potential release from this unit.</p> <p>Recommended Action: Sampling Visit</p> <p>Subsequent Action: A Scope of Work (SOW) was implemented in August 2012 in lieu of a Sampling Visit (SV) Work Plan; soil results were unremarkable. SOW findings were reviewed with the Department in October 2013 and will be included in a larger Facility Area (i.e., SWMUs-025, 027, 032, 033, 041, 054, and 055) SV Work Plan with a recommendation for no further action for this unit.</p>

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Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
RML Cobalt Pit, SWMU-044*	<p>Physical: This unit, located at RML, Building E4, at the Site's upper level security area, is an 8.5 feet by 8.5 feet by 15 feet deep concrete pit. The pit is covered with a 5/16 inch thick, stainless steel plate.</p> <p>Operational: The unit was initially constructed and used for underwater material loading and unloading. The pit was drained subsequent to its initial use. During the late 1980s, eight stainless steel drums containing solid waste were staged in the unit for an approximate one year time frame. The drums have since been removed and shipped off-site. The pit currently does not contain any waste.</p> <p>Waste Type/Characteristics: Waste stored was solid in nature and included rags, solid zirconium, tools, and metallic test specimens and sample material which may have contained hazardous constituents. No liquid wastes were stored in this unit.</p> <p>Release Information: No spills or releases to the pit or environment reported. The drums were removed intact.</p> <p>Recommended Action: No action.</p>

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Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
RML In-Floor Storage, SWMU-045*	<p>Physical: This metallic test specimen and sample material storage unit, located in Building E4, Room 115, consists of a concrete pit measuring approximately six feet in diameter and six feet deep in which resides a five-tiered "lazy Susan" type device.</p> <p>Operational: This unit was used from the early 1950s until the late 1970s to store test specimens and sample material. Approximately 800 metallic test specimens and samples remain in storage. Each specimen and sample is containerized in a two and one-half-inch diameter, seven-inch long, aluminum can. The aluminum can is in turn contained within a liner can within the "lazy Susan".</p> <p>Waste Type/Characteristics: Process knowledge and laboratory analyses indicate the metallic test specimens and sample material are non-hazardous; however, they may contain hazardous constituents. Waste test specimens and sample material are solid in nature. No liquid wastes are, or were, stored in this unit.</p> <p>Release Information: No spills from containers reported. In consideration of specimen composition and overall storage unit design and location, release to the environment is unlikely.</p> <p>Recommended Action: Sampling Visit: Unit/Container integrity evaluation.</p> <p>Subsequent Action: Area is currently inaccessible. Next action will follow the procedures outlined in Condition E.2.(d) of the Permit Module II.</p>

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Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
RML Building E2 Cask Storage Pit, SWMU-046*	<p>Physical: This recessed concrete floor pit is located in room 108A of Building E2. The pit measures approximately ten feet long by six feet wide by seven feet deep. When operational, a 1/4 inch stainless steel plate covered the unit. Currently the pit is filled with sand and capped with concrete.</p> <p>Operational: Metallic test specimens and sample material containerized in shipping casks were staged in this unit prior to testing and off-site disposition. Currently two or three lead shipping casks containing waste test specimens or sample material from DOE Hanford are stored in the pit.</p> <p>Waste Type/Characteristics: Metallic test specimens and sample material are solid in nature and may contain hazardous constituents. The waste specimen's and material's RCRA characteristics are unknown. No liquid wastes are, or were, stored in this unit.</p> <p>Release Information: No spills or releases to the environment reported. In consideration of specimen composition, containment in shipping cask, and unit construction and location, release to the environment is unlikely.</p> <p>Recommended Action: Sampling Visit: Unit/Container integrity evaluation.</p> <p>Subsequent Action: Area is currently inaccessible. Next action will follow the procedures outlined in Condition E.2.(d) of the Permit Module II.</p>

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Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
RML Cask Storage Facility, SWMU-047*	<p>Physical: This unit consisted of three cask storage structures. These structures were located adjacent to and north of Building E4. They were designated the Cask Storage Shed, Cask Storage Building, and Cask Storage Pit. The Cask Storage Shed, constructed in the mid-1950s, was an enclosed and covered structure measuring 20 feet wide by 38 feet long. The Cask Storage Building was located adjacent to and north of the Cask Storage Shed. It measured approximately 12 feet by 12 feet and was constructed of two feet thick concrete walls. The Cask Storage Pit was located adjacent to and east of the cask storage shed. The shed structure was extended over the pit. The pit measured 20 feet wide by nine feet long by four feet deep. The pit was retro-fitted with lead shielding in the early 1960s. During the mid-1980s, the cask storage shed, building, and pit were dismantled. A new cask storage pit, with similar dimensions, was constructed at the former cask storage pit location. The new cask storage pit is currently active and is used to store metallic test specimens and sample material prior to off-site disposition and/or disposal.</p> <p>Operational: From the mid-1950s until the mid-1980s casks containing metallic test specimens and sample material were staged in these units prior to off-site disposition and/or disposal. The new cask storage pit continues to store metallic test specimens sample material prior to off-site disposition and/or disposal.</p> <p>Waste Type/Characteristics: Process knowledge and laboratory analyses indicate the metallic test specimens and sample material are non-hazardous; however, they may contain hazardous constituents. Waste test specimens and sample material are solid in nature. No liquid wastes are, or were, stored in this unit.</p> <p>Release Information: Radioactivity detected in adjacent soils indicates a potential release from this unit. The radiological release was remediated during the mid-1980s; however, the presence of hazardous constituents is unknown.</p> <p>Recommended Action: Sampling Visit.</p> <p>Subsequent Action: Area is currently inaccessible. Next action will follow the procedures outlined in Condition E.2.(d) of the Permit Module II.</p>

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Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
Building E1 Cask Storage Pit, SWMU-048*	<p>Physical: This recessed concrete floor pit, located in the southeast corner of Building E1, measures approximately eight feet long by five feet wide by six feet deep and was lined with two stainless-steel floor pans that served as revetments. The pit interior, including the concrete floor beneath the stainless-steel floor pans, is coated with an epoxy sealant. The pit was filled with sand and capped with 15 inches of steel reinforced concrete. Seven casks were stored in the pit; two were contained within wooden boxes. The cap, sand, and casks were removed from December 1997 through February 1998. Upon exhumation, the pit and casks were found to be intact and in good condition. The casks were standing in an upright position. There were no visible cracks, chemical stains or residues within the pit, no odors were detected, and no signs of groundwater in-seepage.</p> <p>Operational: Metallic test specimens and sample material, containerized in shipping casks, were staged in this unit prior to testing and off-site disposition. Subsequent to routine use, seven casks were stored in the pit; two were contained within wooden boxes. The largest cask measured 13 inches (outside diameter) by twenty inches tall. Six casks were constructed of lead encased in carbon steel; the remaining cask was entirely lead. Of the seven casks, five were empty, one contained an empty stainless-steel canister (2.5 inch outside diameter and seven inches long), and one contained a polyethylene bottle (approximately 100 milliliters) which contained a corrosive liquid (pH ~1.0 SU). The casks were removed in 1998.</p> <p>Waste Type/Characteristics: Lead casks and sample material which may contain hazardous constituents.</p> <p>Release Information: No known releases to the environment reported. Visual inspection of resident casks, removed sand, and the pit itself revealed no evidence of an environmental release. The casks and pit are intact and in good condition.</p> <p>Recommended Action: No action.</p>

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Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
Former M4 Test Specimen Storage, SWMU-049*	<p>Physical: This former storage unit was located at the northeast end of the Site's upper level security area. It consisted of an in-ground, concrete slab which measured approximately ten feet wide by 45 feet long by ten to 14 feet thick. Two hundred fifty carbon steel pipes were recessed in the slab. The pipes measured four and eight inches in diameter and were eight and 12 feet in length. Each tube was fitted with a one foot or four feet long, concrete-filled, steel pipe cap. A one foot high by one foot wide concrete curb lined the perimeter of the slab. Aluminum sheet-metal covers protected the slab from the elements. Precipitation penetrating the unit's aluminum covers was diverted to the east end of the slab where a 55-gallon drum housed within a concrete pit was located.</p> <p>Operational: This unit was used from 1953 to 1965 to store metallic test specimens and sample material prior to off-site disposition and/or disposal. Specimens and sample materials were containerized in aluminum cans prior to being placed in storage. The unit was dismantled and removed in 1982. Concrete and debris from the former storage unit, that was used as backfill during the early 1980s dismantlement effort, was removed during the 2019 removal effort. The area was subsequently backfilled, and an office building is currently under construction on the former storage unit site.</p> <p>Waste Type/Characteristics: Process knowledge and laboratory analyses indicate the metallic test specimens and sample material are non-hazardous; however, they may contain hazardous constituents. Waste test specimens and sample material are solid in nature. No liquid wastes are, or were, stored in this unit.</p> <p>Release Information: Radioactivity detected in adjacent soils during dismantlement and removal indicates a potential release from this unit. The radiological release was remediated during the 1982 dismantlement and removal project; however, the presence of hazardous constituents is unknown.</p> <p>Recommended Action: Sampling Visit</p> <p>Subsequent Action: A Sampling Visit Work Plan was transmitted to the Department in November 2017 and approved in March 2018. The Sampling Visit was completed in November 2019 during excavation and removal of concrete and debris associated with the former unit. The Sampling Visit Report, transmitted to the Department in August 2020, recommends no further action. The Department approved the Sampling Visit Report in January 2022.</p>

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Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
H2MA Mixed Waste Storage Unit, SWMU-050*	<p>Physical: This interim status, mixed waste storage unit, was located adjacent to and south of Building H2, at the north end of the Site's upper level security area, was a small modular building equipped with leak detection, control, and countermeasure devices. The unit's permitted mixed waste capacity is 1,320 gallons.</p> <p>Operational: This unit had been operational since 1990. Containers of mixed waste were stored in this unit prior to off-site disposal transport. This modular unit was relocated to Building E11 in late 1997 (see SWMU-068: E11 Mixed Waste Modular Additions).</p> <p>Waste Type/Characteristics: Permitted mixed waste includes hazardous debris, elemental lead and mercury, spent solvents and oils, characteristic and listed wastes, and miscellaneous laboratory reagents.</p> <p>Release Information: No spills or releases to the environment reported or observed.</p> <p>Recommended Action: No action.</p>

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Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
Former Q4 Drum Pit, SWMU-051*	<p>Physical: This former unit was located in Building Q4, at the southeast end of the Site's upper level security area. It consisted of a recessed floor pit and several 55-gallon drums. The pit measured six feet by six feet by four feet deep and its walls and floor were constructed of eight inch thick concrete.</p> <p>Operational: The unit was used during the 1950s to collect process waste from Q4 fabrication operations. The unit, originally sand filled and concrete capped, was dismantled and removed in the early 1980s. The Building Q4 above grade structure was demolished in 2023. The building slab remains.</p> <p>Waste Type/Characteristics: RCRA characteristics of stored waste is unknown. Surveys of the pit walls and floor prior to dismantlement indicated historic spills within the unit had occurred.</p> <p>Release Information: No spills or releases to the environment reported; however, a release to the pit, as evidenced by survey results, had occurred. The pit integrity prior to dismantlement is unknown.</p> <p>Recommended Action: Sampling Visit.</p> <p>Subsequent Action: Area is currently inaccessible. Next action will follow the procedures outlined in Condition E.2.(d) of the Permit Module II. In support of near-term building demolition, a Supplemental SOW for SWMUs -051 and the portion of -054 pertaining to Q4 was implemented in July 2021. Soil samples were collected as part of the Q3 Yard RFI and the findings will be included in the Q3 Yard (AOC-005) RFI/ICM Report. Further sampling to evaluate any releases is anticipated upon demolition of Building Q4 and as part of the Q3 Yard ICM.</p>

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Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
M10 Storage Facility, SWMU-052*	<p>Physical: This completely enclosed and covered storage unit, located at the north end of the Site's upper level security area, was a sheet-metal-sided, steel-framed structure with a bermed concrete floor. The unit measured approximately 30 feet by 30 feet and 20 feet high.</p> <p>Operational: Since its 1992 construction, the unit served as materials storage. The unit received RCRA interim waste storage status, August 1996. Containers of mixed waste were staged at this unit prior to off-site disposition (i.e., disposal or recycling). The unit was demolished in 2019.</p> <p>Waste Type/Characteristics: Wastes stored included construction and demolition debris coated with PCB-containing paint, elemental lead and cadmium, characteristically hazardous debris, PCB contaminated oil which was characteristically hazardous for lead and chromium, and acetone laden rags.</p> <p>Release Information: No spills or releases to the environment reported or observed.</p> <p>Recommended Action: No action. This unit was closed on March 18, 2009.</p>

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Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
Industrial Drain System, SWMU-053*	<p>Physical: This unit consists of those drain lines which conveyed chemical waste from RML and Buildings D3, D4, and G2 to Building H2 for processing. The drain lines are fabricated of two and three-inch diameter, welded, stainless steel piping. With the exception of a 225 feet stretch of underground pipe, which extended from Building D3 to G1 and drains located in Building E4 Extension, all industrial drains are housed in basement pipe tunnels. The pipe tunnel walls, floors, and ceilings are constructed of concrete over six inches thick. A waterproof sealant was applied to the pipe tunnel walls and floors during construction. Industrial drain lines within the pipe tunnels appeared intact and in good condition during a 1989 visual inspection.</p> <p>Operational: Industrial drains extending from Building G2 to H2 conveyed waste from separations operations during the early 1950's. Subsequent to their use they were flushed with dilute nitric acid, drained, and capped and/or isolated (i.e., valved off). The D3/G1 industrial drain line was used from the mid-1950's until the mid-1970's to convey metallurgical waste from Building D3 to Building H2 for processing. The D3/G1 drain line was excavated and removed during 1978. The D4 drain lines conveyed waste from ceramics and metallurgical operations in Building D4 via pipe tunnels to Building H2 for processing. Initially after construction, two interceptors were added to the drain lines in the D4 Tunnel to allow for settling of solids. One of the D4 interceptors received solids associated with operations in D4-172 and one interceptor received solids associated with operations in D4-161. The D4 gravity drain that drained to H2 ceased operation in 2002. Subsequently flow was directed to a collection system in Building E11. A 2-inch D4 drain line was abandoned in 2007. The RML industrial drains and the associated interceptors in the E1 basement were inactivated in 2008 in preparation for the demolition of the Separations Process Research Unit (SPRU) systems and buildings.</p> <p>Waste Type/Characteristics: Wastes conveyed were corrosive and contained heavy metals, methyl isobutyl ketone, and/or organic diluents.</p> <p>Release Information: No spills or releases to the environment reported. The excavated D3/G1 drain line trench was radiologically surveyed and released thereby indicating no integrity issue. Also, release from existing lines is highly unlikely in consideration of the construction aspects and containment within tunnels.</p> <p>Recommended Action: No action.</p> <p>Subsequent Action: The Department included this as a Further Action SWMU in Module III of the original Permit in July 1998.</p> <p>In accordance with Module III Condition E.2.(b) of the original Permit, and its Appendix III-F (Industrial Sewer Assessment Workplan Outline), the RCRA Facility Assessment Sampling Visit for the Drain Evaluation - Current Industrial Sewer Condition Report was transmitted to the Department in May 2001. Subsequently, a response to September 2001 Department comments was transmitted in December 2001. Future updates to the Drain Evaluation will include details associated with any recent changes to this unit.</p>

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Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
Wastewater Drain Systems, SWMU-054*	<p>Physical: This unit encompasses all drain lines, associated sumps, trenches, tanks, and lift/transfer stations used to convey wastewater from facilities internal to building structures. Examples include Buildings L2/L3/L6, E1/G1, and D3/C1 drain systems, and Q4 drain system (including an in-floor degreasing pit), as well as the Site's wastewater reuse system. Drain lines are generally constructed of welded stainless steel, carbon steel, or HDPE and are predominantly located within buildings. Some exterior drains are fabricated of vitrified clay. Drains are intact and in good condition.</p> <p>Operational: The wastewater drainage system has been in operation since the Site's 1950 inception. The Q4 drain system (including an in-floor degreasing pit and a drain line extending into Building Q5) is not operational; the Q4 system was progressively phased out of operation from 1954 through 1980. During the 1950s and 1960s waste chemicals were disposed down drains in accordance with the <u>Laboratory Waste Disposal Manual</u> published by the Manufacturing Chemists Association. Future system modifications (i.e., additions/deletions of sumps, trenches, tanks, and lift/transfer stations, etc.) completed under this SWMU designation will be conducted to assure full compliance with the Department issued State Pollutant Discharge Elimination System (SPDES) Permit. The Building Q4 and Q5 above grade structures were demolished in 2023. The building slabs remain.</p> <p>Waste Type/Characteristics: Waste chemicals and dilute industrial and laboratory wastewater potentially containing heavy metals. Elemental mercury has been discovered internal to the piping and was subsequently removed during drain line maintenance operations. Chlorinated solvents may have been used in the Q4 degreasing operation.</p> <p>Release Information: No spills or release to the environment reported. During summer 1996 Yard Neutralization Tank SWMU removal operations, the associated wastewater drain system was removed. No release indicators were observed.</p> <p>Recommended Action: No action.</p> <p>Subsequent Action: The Department included this as a Further Action SWMU in Module III of the original Permit in July 1998. In accordance with Module III Condition E.2.(b) of the original Permit, and its Appendix III-F (Industrial Sewer Assessment Workplan Outline), the RCRA Facility Assessment Sampling Visit for the Drain Evaluation - Current Industrial Sewer Condition Report was transmitted to the Department in May 2001. Subsequently, a response to September 2001 Department comments was transmitted in December 2001. Building Q4 SWMU-054 is currently inaccessible. In support of near-term building demolition, a Supplemental SOW for SWMUs -051 and the portion of -054 pertaining to Q4 was implemented in July 2021. Soil samples were collected as part of the Q3 Yard RFI and the findings will be included in the Q3 Yard (AOC-005) RFI/ICM Report. Further sampling to evaluate any releases is anticipated upon demolition of Building Q4 and as part of the Q3 Yard ICM.</p>

Table II. Knolls Laboratory SWMUs and AOCs

* - Asterisk denotes the unit managed RCRA solid waste potentially containing or mixed with RCRA-solid-waste-exempt special nuclear or byproduct material.

Name	Description & Recommended Action
Laundry Drain System, SWMU-055*	<p>Physical: This unit consisted of drain lines which conveyed laundry wastewater from Building K4 to the K5 Retention Basin or Building H2 for processing. It consisted of two lines extending 300 feet from Building K4 to a hillside valve pit; two lines extending 500 feet from the hillside valve pit to Building H2; and one line extending 75 feet from the valve pit to the K5 Retention Basin. Drain lines were constructed of three-inch diameter carbon steel piping and were located underground. The drain lines were taken out of service during 1969. With the exception of the K5/hillside valve pit line, all drain lines were excavated and removed during the late 1980s.</p> <p>Operational: During the 1950s laundry wastewater was conveyed from Building K4 to the K5 Retention Basin or to Building H2. During the early 1960s, subsequent to the 1959 laundry relocation to Building G2, wastewater was conveyed from Building H2 to the K5 Retention Basin.</p> <p>Waste Type/Characteristics: Laundry wastewater contained citric and oxalic acids, EDTA, and/or phosphates.</p> <p>Release Information: No drain line integrity issues or spills were observed during system removal. No releases to the environment were observed.</p> <p>Recommended Action: No action.</p> <p>Subsequent Action: The Department included this as a Further Action SWMU in Module III of the original Permit in July 1998.</p> <p>In accordance with Module III Condition E.2.(b) of the original Permit, and its Appendix III-F (Industrial Sewer Assessment Workplan Outline), the RCRA Facility Assessment Sampling Visit for the Drain Evaluation - Current Industrial Sewer Condition Report was transmitted to the Department in May 2001. Subsequently, a response to September 2001 Department comments was transmitted in December 2001.</p> <p>The 75-feet stretch of pipe from the valve pit to the K5 Retention Basin was sampled under a RCRA Facility Assessment Sampling Visit. Sampling results were transmitted to the Department in February 2002 and June 2007.</p>

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Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
Storm Water Drain System, SWMU-056*	<p>Physical: This unit consists of those catch basins and drain lines that envelop the Site. Historically the unit consisted of those drain lines which conveyed wastewater from the Yard Neutralization Tank and Building H2 to Outfall 002. This unit includes all associated sumps and transfer and lift stations. The storm water mains are constructed of 24-inch diameter concrete piping. Discharges from Building H2 and Yard Neutralization Tank storm water drain tie-ins are fabricated of eight-inch diameter, carbon steel piping. The H2 tie-in was capped in the mid- to late 1970s. Portions of the stormwater drain system have been modified and/or removed during more recent Site construction and demolition activities.</p> <p>Operational: The storm water drain system has been used since the Site's 1950 inception to convey dilute industrial and laboratory wastewater. Wastewaters entered the drain system via the Yard Neutralization Tank or a Building H2 tie-in. Discharge of H2 processed wastewater ceased in the mid- to late 1970s.</p> <p>Waste Type/Characteristics: Dilute industrial and laboratory wastewater containing trace levels of heavy metals. Inorganics and organics (e.g., PCBs and VOCs) noted in catch basin sediment. Acidic and caustic solutions were reportedly bled into a manhole catch basin north of Building K4's west end.</p> <p>Release Information: Wastewater was and continues to be discharged to the Mohawk River. Discharges were and continue to be governed by water quality standards, permit conditions, and/or guidelines established by the Mohawk River Advisory Committee, the New York State Water Pollution Board, and/or the Department.</p> <p>An Environmental report transmitted to the Department in April 1994 documents perched groundwater conditions associated with backfilled utility lines. Perched groundwater tends to infiltrate storm sewers thereby prohibiting subsurface discharges. This situation occurs at SPDES permitted outfall 003E which receives primarily stormwater and no water from site operations; the outfall discharges groundwater during dry weather periods.</p> <p>Recommended Action: No action.</p> <p>Subsequent Action: The Department included this as a Further Action SWMU in Module III of the original Permit in July 1998.</p> <p>In accordance with Module III Condition E.2. (b) of the original Permit, and its Appendix III-F (Industrial Sewer Assessment Workplan Outline), the RCRA Facility Assessment Sampling Visit for the Drain Evaluation - Current Industrial Sewer Condition Report was transmitted to the Department in May 2001. Subsequently, a response to the September 2001 comments was transmitted in December 2001. Future updates to the Drain Evaluation will include details associated with any recent changes to this unit.</p> <p>Based on a November 2007 agreement with the Department, the portion of the Building Q4 drain system that is exterior of the building footprint has been deleted from this SWMU-056 description and will be subject to further action under SWMU-054.</p>

* - Asterisk denotes the unit managed RCRA solid waste potentially containing or mixed with RCRA-solid-waste-exempt special nuclear or byproduct material.

Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
<p>Pipe Tunnels, SWMU-057* [Transferred to DOE-EM]</p>	<p>Physical: This unit consists of tunnels located in and connecting the basements of Building G2 and H2. The tunnels are over five feet wide and eight feet high. Tunnel walls, floors, and ceilings are constructed of concrete over six inches thick. A waterproof sealant was applied to the unit's floor and walls during construction. Copper water stops were also installed at all construction joints. With the exception of an expansion joint located at the north end of Building G2, the tunnels appeared intact and in good condition during a 1989 visual inspection. Groundwater intrusion was observed at this expansion joint. The unit was removed in 2018 during demolition activities for the Separations Process Research Unit (SPRU) project.</p> <p>Operational: The tunnels were constructed to house industrial and wastewater drain lines from operations in Buildings G2, G1, and E1. Wastewater was allegedly accumulated within these tunnels on occasion.</p> <p>Waste Type/Characteristics: Wastewater potentially containing heavy metals.</p> <p>Release Information: High water marks and stains were observed on tunnel walls and floors during a 1989 visual inspection. Radioactivity detected in the Building H2 footing drains indicates a potential release from this unit.</p> <p>Recommended Action: Sampling Visit.</p> <p>Subsequent Action: Sampling Visit complete. All Corrective Action responsibilities for this waste management unit are assigned to the U.S. Department of Energy – Environmental Management (DOE-EM), formerly DOE-Oakland Operations Office (EPA ID No. NYR000096859) as described in the SPRU Permit # 4-4224-00024/00055 for the former SPRU operation. Following excavation and removal of the unit in 2018, confirmation samples were collected, the results all met soil cleanup objectives, and the area was backfilled. An ICM Report with a no further action recommendation was transmitted to the Department in May 2020. NYSDEC approved the ICM Report in September 2022. All Corrective Action responsibilities are to be assigned to the U.S. Department of Energy – Naval Reactors Laboratory Field Office.</p>

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Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
SPRU Tank 527, SWMU-058* [Transferred to DOE-EM]	<p>Physical: This stainless steel, cylindrical tank measured three feet in diameter and four feet high. It had a 200 gallon capacity. It was located in Cell 3 of the Separations Process Research Unit (SPRU) in Building G2. Cell 3 was constructed of five feet thick concrete walls and had a two feet thick concrete floor and a five feet thick concrete ceiling. The cell was lined with a stainless steel floor pan. A plastic containment coating was applied to the cell walls during construction. The tank and associated piping, plastic wall coating, and stainless steel floor pan appeared intact and in good condition during a 1989 visual inspection. The cell floor was dry.</p> <p>Operational: From February 1950 until October 1953, this tank accumulated aqueous waste generated from SPRU operations. When a significant quantity of waste was accumulated, it was transferred to Building H2 for processing. Immediately subsequent to SPRU operations, the tank was drained, flushed with a dilute nitric acid solution, and rinsed with water. The tank was removed in 2016 prior to building demolition.</p> <p>Waste Type/Characteristics: Liquid waste was corrosive and contained heavy metals.</p> <p>Release Information: No spills or releases to the environment reported or observed.</p> <p>Recommended Action: No action.</p> <p>Subsequent Action: All Corrective Action responsibilities for this waste management unit are assigned to the U.S. Department of Energy – Environmental Management (DOE-EM), formerly DOE-Oakland Operations Office (EPA ID No. NYR000096859) as described in the SPRU Permit # 4-4224-00024/00055 for the former SPRU operation. All Corrective Action responsibilities are to be assigned to the U.S. Department of Energy – Naval Reactors Laboratory Field Office.</p>

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Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
<p>SPRU Tank 531, SWMU-059* [Transferred to DOE-EM]</p>	<p>Physical: This stainless steel, cylindrical tank measured four feet in diameter and five feet high. It had a 500 gallon capacity. It was located in the East Bay of Cell 5 in the Separations Process Research Unit (SPRU). Cell 5 was constructed of two to five feet thick concrete walls and had a two feet thick concrete floor and ceiling. The cell was lined with a stainless steel floor pan. A plastic containment coating was applied to the cell walls during construction. The tank and associated piping, plastic wall coating, and stainless steel floor pan appeared intact and in good condition during a 1989 visual inspection. The cell floor was dry.</p> <p>Operational: From February 1950 until October 1953, this tank accumulated spent organic solvent generated from SPRU operations. When a significant amount of spent solvent was accumulated, it was transferred to SPRU Tank 316 for reclamation. Immediately subsequent to SPRU operations, the tank was drained, flushed with a dilute nitric acid solution, and rinsed with water. The tank was removed in 2016 prior to building demolition.</p> <p>Waste Type/Characteristics: Spent organic solvent, either acidified methyl isobutyl ketone or an organic diluent (either Gulf BP, Amsco 123-15, or Ultrascene) mixed with tributyl phosphate.</p> <p>Release Information: No spills or releases to the environment reported or observed.</p> <p>Recommended Action: No action.</p> <p>Subsequent Action: All Corrective Action responsibilities for this waste management unit are assigned to the U.S. Department of Energy – Environmental Management (DOE-EM), formerly DOE-Oakland Operations Office (EPA ID No. NYR000096859) as described in the SPRU Permit # 4-4224-00024/00055 for the former SPRU operation. All Corrective Action responsibilities are to be assigned to the U.S. Department of Energy – Naval Reactors Laboratory Field Office.</p>

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Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
SPRU Tank 532, SWMU-060* [Transferred to DOE-EM]	<p>Physical: This stainless steel, cylindrical tank measured four feet in diameter and four feet high. It had a 400 gallon capacity. It was located in the East Bay of Cell 5 in the Separations Process Research Unit (SPRU). Cell 5 was constructed of two to five feet thick concrete walls and had a two feet thick concrete floor and ceiling. The cell was lined with a stainless steel floor pan. A plastic containment coating was applied to the cell walls during construction. The tank and associated piping, plastic wall coating, and stainless steel floor pan appeared intact and in good condition during a 1989 visual inspection. The cell floor was dry.</p> <p>Operational: From February 1950 until October 1953, this tank accumulated aqueous waste generated from SPRU operations. When a significant quantity of waste was accumulated, it was transferred to Building H2 for processing. Immediately subsequent to SPRU operations, the tank was drained, flushed with a dilute nitric acid solution, and rinsed with water. The tank was removed in 2016 prior to building demolition.</p> <p>Waste Type/Characteristics: Liquid waste was corrosive and contained heavy metals.</p> <p>Release Information: No spills or releases to the environment reported or observed.</p> <p>Recommended Action: No action.</p> <p>Subsequent Action: All Corrective Action responsibilities for this waste management unit are assigned to the U.S. Department of Energy – Environmental Management (DOE-EM), formerly DOE-Oakland Operations Office (EPA ID No. NYR000096859) as described in the SPRU Permit # 4-4224-00024/00055 for the former SPRU operation. All Corrective Action responsibilities are to be assigned to the U.S. Department of Energy – Naval Reactors Laboratory Field Office.</p>

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Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
<p>SPRU Tank 534, SWMU-061* [Transferred to DOE-EM]</p>	<p>Physical: This stainless steel, cylindrical tank measured four and one-half feet in diameter and six feet high. It had a 750 gallon capacity. It was located in the East Bay of Cell 5 in the Separations Process Research Unit (SPRU). Cell 5 was constructed of two to five feet thick concrete walls and had a two feet thick concrete floor and ceiling. The cell was lined with a stainless steel floor pan. A plastic containment coating was applied to the cell walls during construction. The tank and associated piping, plastic wall coating, and stainless steel floor pan appeared intact and in good condition during a 1989 visual inspection. The cell floor was dry.</p> <p>Operational: From February 1950 until October 1953, this tank accumulated spent organic solvent generated from SPRU operations. When a significant amount of spent solvent was accumulated, it was transferred to SPRU Tank 316 for reclamation. Immediately subsequent to SPRU operations, the tank was drained, flushed with a dilute nitric acid solution, and rinsed with water. The tank was removed in 2016 prior to building demolition.</p> <p>Waste Type/Characteristics: Spent organic solvent, either acidified methyl isobutyl ketone or an organic diluent (either Gulf BP, Amsco 123-15, or Ultrascene) mixed with tributyl phosphate.</p> <p>Release Information: No spills or releases to the environment reported or observed.</p> <p>Recommended Action: No action.</p> <p>Subsequent Action: All Corrective Action responsibilities for this waste management unit are assigned to the U.S. Department of Energy – Environmental Management (DOE-EM), formerly DOE-Oakland Operations Office (EPA ID No. NYR000096859) as described in the SPRU Permit # 4-4224-00024/00055 for the former SPRU operation. All Corrective Action responsibilities are to be assigned to the U.S. Department of Energy – Naval Reactors Laboratory Field Office.</p>

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Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
SPRU Tank 551, SWMU-062* [Transferred to DOE-EM]	<p>Physical: This stainless steel, cylindrical tank measured two feet in diameter and three and one-half feet high. It had a 75 gallon capacity. It was located in the East Bay of Cell 5 in the Separations Process Research Unit (SPRU). Cell 5 was constructed of two to five feet thick concrete walls and had a two feet thick concrete floor and ceiling. The cell was lined with a stainless steel floor pan. A plastic containment coating was applied to the cell walls during construction. The tank and associated piping, plastic wall coating, and stainless steel floor pan appeared intact and in good condition during a 1989 visual inspection. The cell floor was dry.</p> <p>Operational: From February 1950 until October 1953, this tank accumulated aqueous waste generated from SPRU operations. When a significant quantity of waste was accumulated, it was transferred to Building H2 for processing. Immediately subsequent to SPRU operations, the tank was drained, flushed with a dilute nitric acid solution, and rinsed with water. The tank was removed in 2016 prior to building demolition.</p> <p>Waste Type/Characteristics: Liquid waste was corrosive and contained heavy metals.</p> <p>Release Information: No spills or releases to the environment reported or observed.</p> <p>Recommended Action: No action.</p> <p>Subsequent Action: All Corrective Action responsibilities for this waste management unit are assigned to the U.S. Department of Energy – Environmental Management (DOE-EM), formerly DOE-Oakland Operations Office (EPA ID No. NYR000096859) as described in the SPRU Permit # 4-4224-00024/00055 for the former SPRU operation. All Corrective Action responsibilities are to be assigned to the U.S. Department of Energy – Naval Reactors Laboratory Field Office.</p>

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Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
<p>SPRU Tank 536, SWMU-063* [Transferred to DOE-EM]</p>	<p>Physical: This stainless steel, cylindrical tank measured two and one-half feet in diameter and three feet high. It had a 100 gallon capacity. It was located in the East Bay of Cell 5 in the Separations Process Research Unit (SPRU). Cell 5 was constructed of two to five feet thick concrete walls and had a two feet thick concrete floor and ceiling. The cell was lined with a stainless steel floor pan. A plastic containment coating was applied to the cell walls during construction. The tank and associated piping, plastic wall coating, and stainless steel floor pan appeared intact and in good condition during a 1989 visual inspection. The cell floor was dry.</p> <p>Operational: From February 1950 until October 1953, this tank accumulated spent organic solvent generated from SPRU operations. When a significant amount of spent solvent was accumulated, it was transferred to SPRU Tank 316 for reclamation. Immediately subsequent to SPRU operations, the tank was drained, flushed with a dilute nitric acid solution, and rinsed with water. The tank was removed in 2016 prior to building demolition.</p> <p>Waste Type/Characteristics: Spent organic solvent, either acidified methyl isobutyl ketone or an organic diluent (either Gulf BP, Amsco 123-15, or Ultrascene) mixed with tributyl phosphate.</p> <p>Release Information: No spills or releases to the environment reported or observed.</p> <p>Recommended Action: No action</p> <p>Subsequent Action: All Corrective Action responsibilities for this waste management unit are assigned to the U.S. Department of Energy – Environmental Management (DOE-EM), formerly DOE-Oakland Operations Office (EPA ID No. NYR000096859) as described in the SPRU Permit # 4-4224-00024/00055 for the former SPRU operation. All Corrective Action responsibilities are to be assigned to the U.S. Department of Energy – Naval Reactors Laboratory Field Office.</p>

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Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
SPRU Tank 316, SWMU-064* [Transferred to DOE-EM]	<p>Physical: This stainless steel, cylindrical tank measured five feet in diameter and seven feet high. It had a 1,000 gallon capacity. It was located at the south end of Cell 5 in the Separations Process Research Unit (SPRU). Cell 5 was constructed of two to five feet thick concrete walls and had a two feet thick concrete floor and ceiling. The cell was lined with a stainless steel floor pan. A plastic containment coating was applied to the cell walls during construction. The tank and associated piping, plastic wall coating, and stainless steel floor pan appeared intact and in good condition during a 1989 visual inspection. The cell floor was dry.</p> <p>Operational: During the early 1950s, spent solvent was transferred to this tank where it underwent a three step wash cycle. The spent solvent was first washed with water, then a caustic solution, and last with nitric acid. The solvent would then be reused as a process ingredient. The tank was removed in 2016 prior to building demolition.</p> <p>Waste Type/Characteristics: Spent organic diluent, either Gulf BP, Amsco 123-15, or Ultrascene mixed with tributyl phosphate.</p> <p>Release Information: No spills or releases to the environment reported or observed.</p> <p>Recommended Action: No action.</p> <p>Subsequent Action: All Corrective Action responsibilities for this waste management unit are assigned to the U.S. Department of Energy – Environmental Management (DOE-EM), formerly DOE-Oakland Operations Office (EPA ID No. NYR000096859) as described in the SPRU Permit # 4-4224-00024/00055 for the former SPRU operation. All Corrective Action responsibilities are to be assigned to the U.S. Department of Energy – Naval Reactors Laboratory Field Office.</p>

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Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
FCPE Discharge Tank, SWMU-065*	<p>Physical: The Full Core Physics Experiment (FCPE) Discharge Tank is located in the F Building Complex at the north end of the Site's upper level security area. The tank is situated at the lower level of F Building (i.e. below grade), adjacent to a similar "charge" tank. The tanks have a common wall. Each tank measures approximately eight feet wide by 15 feet long by 13 feet deep. The bottom ten feet of the tanks are lined with stainless steel. Access to each tank is provided by a manhole. The tanks are equipped with liquid level indicators.</p> <p>Operational: The tanks, designated the charge and discharge tanks, were constructed in the mid-1960s. The charge tank was used to store coolant (deionized water with traces of hydrazine) prior to use and the discharge tank was used to store coolant subsequent to its use. Coolant was recycled, via deionization columns, and reused. The tanks were drained and taken out of service August 1995. Less than one inch of residue remains within the tanks.</p> <p>Waste Type/Characteristics: Non-hazardous primary coolant.</p> <p>Release Information: No spills or releases to the environment reported.</p> <p>Recommended Action: No action.</p>

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Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
Nuclear Material Storage Vault, SWMU-066*	<p>Physical: This area, located within the F Building Complex, at the north end of the Site's upper level security area, consists of a concrete fuel storage vault which measures approximately 40 feet wide by 30 feet long.</p> <p>Operational: The unit was constructed and initially used to store special nuclear material. When fuel storage operations ceased, the vault was used for a brief period of time during 1994 and 1995 to store construction and demolition debris.</p> <p>Waste Type/Characteristics: Non-hazardous construction and demolition debris.</p> <p>Release Information: No spills or releases to the environment reported.</p> <p>Recommended Action: No action.</p>

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Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
E11 Waste Processing Facility, SWMU-067*	<p>Physical: Building E11 was constructed in 1997 to house waste processing equipment. The structure consists of a reinforced concrete foundation with a combination of reinforced concrete and steel framed prefabricated walls. A reinforced concrete floor slab resides within the structure. The slab slopes toward the center of the building. The slab and concrete walls are coated with an epoxy sealant. The western part of the building is designated as the Waste Processing Facility.</p> <p>Operational: The Waste Processing Facility commenced operation in March 2010. The former ≤90-day area in Building E11 was effectively upgraded and replaced both physically and functionally by the new permitted area. Formal closure of the ≤90-day area in E11 will not be necessary. The Waste Processing Facility is used to store containerized mixed waste.</p> <p>Waste Type/Characteristics: Mixed waste including hazardous debris, elemental lead and mercury, spent solvents and oils, characteristic and listed wastes, and miscellaneous laboratory chemicals.</p> <p>Release Information: No spills or releases to the environment.</p> <p>Recommended Action: No action. The Waste Processing Facility will be closed in accordance with a Department approved closure plan which will be issued with the facility's Part 373 Permit.</p>

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Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
E11 Mixed Waste Modular Additions, SWMU-068*	<p>Physical: These modular, prefabricated mixed waste storage units are located within the Building E11 truck bay. Each unit is self-contained and equipped with leak detection, control, and countermeasures devices. The modular units are designated E11 MA-S and E11 MA-L. E11 MA-S was previously located adjacent to Building H2 and was referred to as H2MA (SWMU-050). E11 MA-L is a new unit. The total permitted mixed waste storage capacity between the two modular units is 1,320 gallons.</p> <p>Operational: These modular units are used to store containerized mixed waste. Storage operations commenced in late 1997. The last waste was transferred out of the E11 MA-S in March 2006.</p> <p>Waste Type/Characteristics: Mixed waste including hazardous debris, elemental lead and mercury, spent solvents and oils, characteristic and listed wastes, and miscellaneous laboratory chemicals.</p> <p>Release Information: No spills or releases to the environment.</p> <p>Recommended Action: No action. Modular units will be closed in accordance with a Department approved closure plan which will be issued with the facility's 6 NYCRR Part 373 Permit.</p> <p>Subsequent Action: Notice of Intent to close the E11 MA-S and the closure plan was transmitted to the Department in September 2019 and approved in November 2019. A Closure Report for the E11 MA-S CSA was transmitted to the Department in May 2020. The Department approved the closure of the E11 MA-S CSA in August 2021.</p>

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Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
K4 Holding Tank, SWMU-069	<p>Physical: This 11,500-gallon, above-ground, insulated, stainless steel tank is located on the north side of Building K4 in a covered, concrete secondary containment structure. The tank measures 11.5 feet in diameter by 16.3 feet long.</p> <p>Operational: This currently active unit has been operational since September 1997. Approximately 3,500 gallons of neutralized boiler blowdown and dealkalizer regeneration wastewater is accumulated within this unit per day. The wastewater is treated with 50% sulfuric acid to achieve a pH range of ~7.0-8.0 SU prior to being released to the Site's storm water drain system.</p> <p>Waste Type/Characteristics: Non-hazardous boiler blowdown (pH range 10.5-12 SU, neutralized in pipe to ~7.0-8.0 SU) and dealkalizer system regeneration wastewater (pH ~10.0 SU, neutralized in pipe to ~7.0-8.0 SU).</p> <p>Release Information: No spills or releases to the environment.</p> <p>Recommended Action: No action. Discharges to a SPDES-regulated outfall.</p>

Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
Q1 ≤ 90 Day Waste Accumulation Area, SWMU-070	<p>Physical: This ≤ 90 day waste accumulation area was located between Building Q1 and former Building M2, and consisted of a box trailer measuring 8 feet wide by 46 feet long. An 8-inch steel curb served as a secondary containment structure within the trailer.</p> <p>Operational: This unit commenced operation July 1996 and was closed in 2002. Containerized wastes were temporarily stored within the unit prior to off-site disposition. Containers generally ranged from 1 to 55 gallons in size.</p> <p>Waste Type/Characteristics: Liquid and solid hazardous and PCB wastes.</p> <p>Release Information: No spills or releases to the environment reported.</p> <p>Recommended Action: No action</p>

Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
L9 ≤ 90 Day Waste Accumulation Area, SWMU-071	<p>Physical: This ≤ 90 day waste accumulation area, was located east of Building L9, consisted of a small modular building measuring 8 feet wide by 20 feet long. The building was completely enclosed and had an integrated secondary containment structure.</p> <p>Operational: This unit commenced operation September 1997 and was closed in 2007. Containerized wastes were temporarily stored within a portion of the building prior to off-site disposition and/or relocation to Building Q1 (SWMU-010). Containers generally range from 1 to 55 gallons in size.</p> <p>Waste Type/Characteristics: Liquid and solid hazardous wastes.</p> <p>Release Information: No spills or releases to the environment reported.</p> <p>Recommended Action: No action.</p>

Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
F4 ≤ 90 Day Waste Accumulation Area, SWMU-072*	<p>Physical: This ≤ 90 day waste accumulation area, located within Building F4, consisted of a floor area measuring approximately 1600 square feet. The area was equipped with a welded stainless steel secondary containment structure. In the vicinity of the area, recyclable materials were prepared for off-site recycling. Preparation included disassembly, segregation, and/or paint stripping. Wastes generated from preparation activities were containerized and stored in this area.</p> <p>Operational: This unit commenced operation July 1996 and was closed May 8, 2015. Containerized wastes were temporarily stored within this area prior to off-site disposition and/or relocation to the E11 Mixed Waste Modular Additions (SWMU-068) or the E11 Waste Processing Facility (SWMU-067). Containers generally ranged from 1 to 55 gallons in size; however, larger box containers may have been used.</p> <p>Waste Type/Characteristics: Liquid and solid hazardous and PCB wastes.</p> <p>Release Information: No spills or releases to the environment reported.</p> <p>Recommended Action: No action.</p>

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Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
H2 ≤ 90 Day Waste Accumulation Area, SWMU-073*	<p>Physical: This ≤ 90 day waste accumulation area was located on the 332-foot level within Building H2 and consisted of a floor area measuring approximately 25 square feet.</p> <p>Operational: This unit commenced operation in November 1996 and was closed in 2004. Containerized wastes were temporarily stored within this unit prior to off-site disposition and/or relocation to the former H2MA (SWMU-050) or the E11 Mixed Waste Modular Additions (SWMU-068). Containers ranged from 1 to 55 gallons in size and were generally stored within or on a secondary containment structure. Building H2 was demolished in 2018.</p> <p>Waste Type/Characteristics: Liquid and solid hazardous wastes.</p> <p>Release Information: No spills or releases to the environment reported.</p> <p>Recommended Action: No action.</p>

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Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
PTR Hold Tank, SWMU-074*	<p>Physical: This unit, located within the Building E5 basement equipment room, adjacent to the Pressurized Test Reactor (PTR) cell, consists of a 4,000-gallon, above-ground, stainless steel-lined, carbon steel tank. The horizontal tank measures 8 feet in diameter by 14 feet long and is equipped with a liquid level indicator (sight glass).</p> <p>Operational: This inactive unit is hard piped to the PTR test facility. It was used to store coolant (deionized water with trace quantities of hydrazine added) during test facility operation. Coolant, pumped from the tank to the test facility, would return to the tank and be reprocessed. Reprocessing consisted of running the spent coolant through a series of mixed bed ion exchange columns. The PTR test facility operated from the late 1950s until the mid-1970s. Subsequent to test facility operation, the tank continued to store coolant in lieu of disposal until the early 1990s, when the coolant was transferred to Building H2 (SWMU-030) for processing and discharge.</p> <p>Waste Type/Characteristics: Non-hazardous deionized wastewater with trace quantities of hydrazine added. Hydrazine converts to ammonia when added to water.</p> <p>Release Information: No spills or releases to the environment reported.</p> <p>Recommended Action: No action.</p>

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Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
Former CWA Hold Tank, SWMU-075*	<p>Physical: This unit was located within the Building E5 Cold Water Assembly (CWA) cell and consisted of a 5,000-gallon, above-ground, stainless steel tank. The horizontal tank measured 8 feet in diameter by 15 feet long.</p> <p>Operational: The former unit was hard piped to the CWA test facility and stored coolant (deionized water, no hydrazine) during test facility operation. Coolant, pumped from the tank to the test facility, would return to the tank and be reprocessed. Reprocessing consisted of running the spent coolant through a series of mixed bed ion exchange columns. The CWA test facility operated from the early 1960s until the early 1980s. Subsequent to test facility operation, the tank contents were transferred to Building H2 (SWMU-030) for processing and discharge. During the early 1980s, the tank was disassembled, sectioned, and transferred off-site for appropriate disposal.</p> <p>Waste Type/Characteristics: Non-hazardous deionized wastewater with no known hazardous constituents.</p> <p>Release Information: No spills or releases to the environment reported.</p> <p>Recommended Action: No action.</p>

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Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
Former CWTA Hold Tank, SWMU-076*	<p>Physical: This unit was located within the Building E7 Cold Water Test Assembly (CWTA) cell and consisted of a 5,800-gallon, above-ground, stainless steel tank. The horizontal tank measured 8 feet in diameter by 17 feet long.</p> <p>Operational: The former unit was hard piped to the CWTA test facility and stored coolant (deionized water, no hydrazine) during test facility operation. Coolant, pumped from the tank to the test facility, would return to the tank and be reprocessed. Reprocessing consisted of running the spent coolant through a series of mixed bed ion exchange columns. The CWTA test facility operated from the early 1960s until the early 1970s. Subsequent to test facility operation in the early 1970s, the tank contents were transferred to the PTR Hold Tank (SWMU-074). During the early to mid-1970s, the tank was disassembled, sectioned, and transferred off-site for appropriate disposal.</p> <p>Waste Type/Characteristics: Non-hazardous deionized wastewater with no known hazardous constituents.</p> <p>Release Information: No spills or releases to the environment reported.</p> <p>Recommended Action: No action.</p>

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Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
Former ATR Hold Tanks, SWMU-077*	<p>Physical: These two identical, above-ground, stainless steel tanks were located within the Building F3 Advanced Test Reactor (ATR) cell and had a combined capacity of 750 gallons. The vertical tanks measured 3.5 feet in diameter and 6 feet high.</p> <p>Operational: The former tanks were hard piped to the ATR test facility and stored coolant (deionized water with trace quantities of hydrazine added) during test facility operation. Coolant, pumped from the tank to the test facility, would return to the tank and be reprocessed. Reprocessing consisted of running the spent coolant through a series of mixed bed ion exchange columns. The ATR test facility operated from the mid-1950s until the early 1970s. Subsequent to test facility operation, the tank contents were transferred to Building H2 (SWMU-030) for processing and discharge. The test facility, including hold tanks, was disassembled and shipped to another Department of Energy facility for use.</p> <p>Waste Type/Characteristics: Non-hazardous deionized wastewater with trace quantities of hydrazine added. Hydrazine converts to ammonia when added to water.</p> <p>Release Information: No spills or releases to the environment reported.</p> <p>Recommended Action: No action.</p>

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Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
Steam Condensate Return System; Discharge Areas, SWMU-078	<p>Physical: The Site heating system consists of a closed-loop steam system. Part of this system is the condensate return system that returns condensate (condensed steam) to the boiler house from buildings throughout the Site. The condensate is reused to provide feedwater to the boilers. The condensate is accumulated in approximately 70 condensate receiver units before being pumped back to a condensate holding tank in Building K1 and the condensate is then pumped to the heating plant to be recirculated in the Site boilers as feed water. Condensate receiver units are vented and have auxiliary drains to bypass the return lines. These bypass drains empty to storm sewers or the ground surface. This process allows the portions of the steam system to remain in operation in case there are problems with the receiver unit tanks or pumps.</p> <p>Operational: This system has been operational since the early 1950s with routine maintenance and repair performed as needed. Use of the bypass drains is infrequent.</p> <p>Waste Type/Characteristics: Boiler water is treated with sulfite and phosphate compounds and Alken Treatment J-669 (2-amino-2-methyl-1-propanol) for corrosion control. These boiler water treatment compounds do not contain hazardous constituents. Condensate water may contain only trace levels of sulfates and phosphates and low levels of Treatment J-669. Condensate may also contain trace levels of metal corrosion products attributable to piping system components (e.g., copper or iron from piping, lead from solder).</p> <p>Release Information: No spills or releases to the environment reported.</p> <p>Recommended Action: No action.</p>

Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
Miscellaneous ≤ 90 Day Waste Accumulation Area, SWMU-079*	<p>Physical: This SWMU consists of ≤ 90 Day Areas that have been or will be established subsequent to original permit issuance (July 1998). As such, this group excludes SWMU-070 through-073, as well as ≤ 90 Day Areas that were established since original permit issuance and subsequently closed.</p> <p>Operational: Not applicable. #</p> <p>Waste Type/Characteristics: Liquid and solid hazardous wastes.</p> <p>Release Information: No spills or releases to the environment to report.</p> <p>Recommended Action: The Permittee shall keep an updated list of these individual areas in the facility operating record, and shall provide the Department with this list on an annual basis, and/or when requested by the Department.</p>

* - Asterisk denotes the unit managed RCRA solid waste potentially containing or mixed with RCRA-solid-waste exempt special nuclear or byproduct material.

- Some of the individual ≤ 90 Day Areas addressed in this unit managed the waste types described by the above footnote.

Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
Canberra Q2 Unit, Building E11, SWMU-080*	<p>Physical: The Canberra Q2 (<u>Q</u>ualitative and <u>Q</u>uantitative) gamma assay system is located in Building E-11. The system performs high resolution gamma spectrometry to identify and quantify radionuclides for mixed waste characterization. The system is a shielded steel enclosure housing detectors and a turntable to allow for radiological assay of sealed containers (drums).</p> <p>Operational: Infrequently, mixed waste samples (e.g., 55-gallon waste drums and smaller) may be moved from a permitted storage area to the Canberra Q2 for non-intrusive gamma assay. The movement and return of the mixed waste will be recorded in the operating record. Information to be recorded includes container identification, the date and time removed and returned, where it was moved, and the reason for the movement. Mixed waste containers removed from the permitted storage area for such purposes are returned to the permitted storage area within one shift of removal and are not opened at any time during this movement.</p> <p>Waste Type/Characteristics: Characteristic and listed mixed waste including debris, elemental lead and mercury, spent solvents, oils, and miscellaneous laboratory chemicals.</p> <p>Release Information: No spills or releases to the environment reported.</p> <p>Recommended Action: No action.</p>

* - Asterisk denotes the unit managed RCRA solid waste potentially containing or mixed with RCRA-solid-waste exempt special nuclear or byproduct material.

Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
SPRU Fractionation Tanks 1, SWMU-081*	<p>Physical: This SWMU consisted of two water treatment units, twelve carbon steel fractionation tanks, a resin liner (carbon-steel tank), and connecting lines. The overall system was used to manage Separations Process Research Unit (SPRU) Upper Level ground/storm water associated with the H2 Processing Facility (SWMU-030) or the H2 Tank Farm (SWMU-031). One water treatment unit, six fractionation tanks, and the carbon steel tank (189 cubic feet capacity) were located on the Lower Level of Knolls Laboratory, north of Building H2. The other water treatment unit (including two 3,200 gallon polyethylene tanks) and two fractionation tanks were located on the Upper Level, north of Building H2. Four fractionation tanks, formerly associated with this unit, were located south of H2. Fractionation tank capacities ranged from 18,000 to 21,000 gallons.</p> <p>Operational: In 2014, the resin liner and water treatment unit in the lower level were removed from the site, and no water was treated at SPRU. The remaining tanks support collection of water for shipment offsite by tanker truck. The system has subsequently been removed.</p> <p>Waste Type/Characteristics: Wastewater containing volatile organic compounds and metals.</p> <p>Release Information: No spills or releases to the environment reported. †</p> <p>Recommended Action: No action.</p> <p>Subsequent Action: In July 2012, the Department designated SWMU-081 as “no further action”, and noted that any subsequent releases would be subject to notification provisions of Module II, Condition D of the DOE-NRLFO permit.</p> <p>All Corrective Action responsibilities for this waste management unit are assigned to the DOE-EM, formerly DOE-Oakland Operations Office (EPA ID No. NYR000096859) as described in the SPRU Permit # 4-4224-00024/00055 for the former SPRU operation. All Corrective Action responsibilities are to be assigned to the U.S. Department of Energy – Naval Reactors Laboratory Field Office.</p>

* - Asterisk denotes the unit managed RCRA solid waste potentially containing or mixed with RCRA-solid-waste-exempt special nuclear or byproduct material.

† - [Sources: U.S. Department of Energy – Environmental Management (DOE-EM) December 2, 2011 newly identified solid waste management unit notification and a January 13, 2012 assessment report to the Department.]

Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
SPRU Fractionation Tanks 2, SWMU-082*	<p>Physical: This SWMU consisted of three carbon steel fractionation tanks (THDS-1, T4, A1274) and connecting lines. The overall system was used to manage Separations Process Research Unit (SPRU) Upper Level ground/storm water associated with the H2 Processing Facility (SWMU-030) or the H2 Tank Farm (SWMU-031). The tanks were located on the Upper Level, north of Building H2. Fractionation tank capacities ranged from 20,000 to 21,000 gallons.</p> <p>Operational: Operation commenced in September 2010. The system was removed in 2013.</p> <p>Waste Type/Characteristics: Wastewater containing volatile organic compounds and metals.</p> <p>Release Information: A volatile organic compound release associated with a THDS-1 was subject of a U.S. Department of Energy – Environmental Management (DOE-EM) November 2010 release notification and assessment to the Department. Spills from T4 and A1274 in March 2011 were subject to a December 2011 newly identified solid waste management unit notification and a January 2012 assessment report to the Department.</p> <p>Recommended Action: Soil sampling associated with THDS-1 is addressed in an Interim Corrective Measures Work Plan transmitted to NYDSEC in November 2011 by DOE-EM.</p> <p>Subsequent Action: The RCRA Interim Corrective Measures Workplan indicates chemical confirmation and characterization sampling will be conducted associated with the water release from THDS-1. In 2018, confirmation sampling of this area was conducted. The results are provided in the ICM Report for the Upper Level SWMUs and AOC, which was transmitted to the Department in May 2020. The ICM Report included the information required to obtain a no further action determination. NYSDEC approved the ICM Report in September 2022.</p> <p>All Corrective Action responsibilities for this waste management unit are assigned to the DOE-EM, formerly DOE-Oakland Operations Office (EPA ID No. NYR000096859) as described in the SPRU Permit # 4-4224-00024/00055 for the former SPRU operation. All Corrective Action responsibilities are to be assigned to the U.S. Department of Energy – Naval Reactors Laboratory Field Office.</p>

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Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
K4 West Wastewater Tank, SWMU-083	<p>Physical: This unit consists of one 225-gallon stainless-steel tank and associated interconnecting piping and valves. The tank is located on the second level of Building K4 in Room 210 on the west end of the building. The tank is intact and in good condition.</p> <p>Operational: Experimental Engineering primary test waters and wastewaters from a wet bench laboratory have been managed in this tank since its installation in the mid-1990s. Approximately 80 gallons of laboratory wastewater is accumulated per month. Wastewater is pH adjusted, if necessary, and is batch discharged to the sanitary drain system.</p> <p>Waste Type/Characteristics: Non-hazardous wastewaters contain demineralized water with low concentrations of ammonia. The pH of accumulated wastewater generally ranges from 6.0 to 9.5 SU. Trace levels of copper and chromium are present in wastewater from system piping corrosion.</p> <p>Release Information: No spills or releases to the environment reported or observed.</p> <p>Recommended Action: No action.</p>

Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
K4 Annex Wastewater Tank, SWMU-084	<p>Physical: This unit consists of one 90-gallon polypropylene tank and associated interconnecting tubing and valves. The tank is located in the Building K4 Annex. The tank is intact and in good condition.</p> <p>Operational: Experimental Engineering secondary test waters and wastewaters from a wet bench laboratory have been managed in this tank since approximately 2013. Originally the system consisted of two 55-gallon poly tanks that were installed in the mid-1990s. These tanks were removed when the current 90-gallon tank was installed. Approximately 15 gallons of laboratory wastewater is accumulated per month. Wastewater is pH adjusted, if necessary, and is batch discharged to the sanitary drain system.</p> <p>Waste Type/Characteristics: Non-hazardous wastewaters contain phosphates, nitrates, as well as morpholine, hydrazine, and organic acids. The pH of accumulated wastewater generally ranges from 6.0 to 9.5 SU. Trace to low levels of copper and chromium are present in wastewater from system piping corrosion.</p> <p>Release Information: No spills or releases to the environment reported or observed.</p> <p>Recommended Action: No action.</p>

Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
SPRU Mixed Waste Storage Area, SWMU-085*	<p>Physical: This unit is currently used to store mixed (radioactive and hazardous) Transuranic Waste (MTRU) and has stored mixed low-level radioactive waste. This unit is designated as Temporary Accumulation Area 003 (TAA-003). Since 2015, DOE has received approvals for 30-day storage extensions for the MTRU waste in this area. An Administrative Order on Consent (Order) between the Department and DOE was executed on February 5, 2018, authorizing storage of the MTRU waste in TAA-003 until a Part 373 Operating Permit is issued by the Department. In 2018, the unit was moved to a new location in the Lower Level area with an asphalt pad. The unit is demarcated by a thick concrete block wall. Five metal conex boxes exist within TAA-003. Four conex boxes are used for storage of MTRU. Each conex box has dimensions of 8 feet wide, 20 feet long and 8 feet tall. Outdoor transient storage of mixed waste containers may occur. The load capacity of each conex box is 52,910 pounds.</p> <p>Operational: 2015 to Present</p> <p>Waste Type/Characteristics: Containerized MTRU and mixed waste including solidified sludges from building sumps, out-of-service process vessels, contaminated lead shielding, mercury-contaminated debris, and less than a liter of containerized contaminated liquid mercury. RCRA characteristic metals.</p> <p>Release Information: A 45-Day Assessment Report for Hazardous Waste Storage Area SWMUs was submitted dated April 18, 2017. There was no evidence of release to environmental media. On May 16, 2017, a determination was made by the Department that no further corrective action activities are required.</p> <p>Recommended Action: No action. All Corrective Action responsibilities for this waste management unit are assigned to the U.S. Department of Energy-Environmental Management, formerly DOE-Oakland Operations Office (EPA ID No. NYR000096859) as described in the SPRU Permit # 4-4224-00024/00055 for the former SPRU operation.</p>

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Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
Conex Box SWMU, SWMU-086*	<p>Physical: This unit consists of three locations where waste subject to a 90-day or 270-day storage limit was stored or is currently stored in conex boxes. One location in the SPRU Lower Level Area, Temporary Accumulation Area 001 (TAA-001) used to store universal waste and small volumes of other hazardous wastes, including spent (non-radioactive) aerosol cans, was removed in 2018. Two locations in the Separations Process Research Unit (SPRU) Upper Level Area where conex boxes were used to store hazardous waste, including universal waste, are no longer in operation. From 2014 until 2015, one other TAA (TAA-002) was used to store small volumes of mixed waste. In 2015, TAA-002 was emptied and no longer exists.</p> <p>Operational: 2011 to Present</p> <p>Waste Type/Characteristics: Containerized hazardous wastes, universal waste, mixed waste. Lead, mercury, acids, aerosol cans.</p> <p>Release Information: A 45-Day Assessment Report for Hazardous Waste Storage Area SWMUs was submitted in April 2017. There was no evidence of release to environmental media, and a determination was made that no further corrective action activities are required.</p> <p>Recommended Action: No action. All Corrective Action responsibilities for this waste management unit are assigned to the DOE-EM, formerly DOE-Oakland Operations Office (EPA ID No. NYR000096859) as described in the SPRU Permit # 4-4224-00024/00055 for the former SPRU operation. All Corrective Action responsibilities are to be assigned to the U.S. Department of Energy – Naval Reactors Laboratory Field Office.</p>

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Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
Building P9 Cooling Tower Blowdown Neutralization Tank, SWMU-087	<p>Physical: This unit is a 135-gallon, above-ground, polypropylene tank. The tank measures 2 feet by 3 feet by 3 feet and is located inside Building P9. Building P9 was recently constructed and is located on the footprint of former Buildings P1, P2, and P3 in the central portion of the Site's upper level developed area. The tank is intact and in good condition.</p> <p>Operational: This unit has operated since December 2018 and is still in service. The Building P9 cooling tower discharges a maximum of 10 gallons per minute of non-hazardous cooling tower blowdown water to the blowdown neutralization tank. The discharge to the neutralization tank occurs when conditions in the tower water warrant an adjustment in order to maintain proper chemical conditions (e.g., conductivity, alkalinity, pH); typically during the summer months. The system is serviced by two small volume carboys of 50 wt% sulfuric acid; approximately 5 to 10 gallons are used per summer for neutralization. Following neutralization, the cooling tower blowdown water is discharged to the Site's Stormwater drain system, and ultimately discharges via a SPDES-permitted outfall.</p> <p>During maintenance on the system in June 2021, an over addition of acid occurred lowering the pH to <2.0 SU. The tank was established as an elementary neutralization unit (ENU) before neutralization of the water. To expedite restoring cooling tower operations, the neutralized water was removed from the tank for off-site disposal as non-hazardous liquid. Though not typical or expected, the tank may need to be operated again as an ENU to treat water that is characteristic for corrosivity.</p> <p>Waste Type/Characteristic: Non-hazardous cooling tower blowdown water with an approximate pH of 9 SU. Occasionally the blowdown tank may experience conditions where a small amount of water needs to be neutralized.</p> <p>Release Information: No spills or releases to the environment reported or observed.</p> <p>Recommended Action: No action.</p>

Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
Hillside Area, AOC-001	<p>Physical: This AOC is located on the west side of the Knolls Laboratory upper level in the hillside land area located west of Buildings D3, D4, G1, and former Buildings G2 and H2. The AOC consists of three primary areas that were found to have been affected by historical incidental chemical product spills. The areas are referred to as the D3-D6 Area, the G1-D4 Alleyway, and the H2-G2 Area. An adjacent area, the D3/D4 Yard, served as a storage location for drums containing various volatile organic compounds (VOCs) used at the facility in the early part of its history.</p> <p>Operational: Incidental chemical product spills have resulted in the contamination of groundwater and soil in this area.</p> <p>Waste Type/Characteristics: Not applicable.</p> <p>Release Information: VOCs detected in soil and groundwater include acetone, carbon tetrachloride, chloroform, 1,1-dichloroethylene, t-1,2-dichloroethylene, hexane, methylene chloride, tetrachloroethylene, tetrahydrofuran, trichloroethylene, and vinyl chloride.</p> <p>Recommended Action: Sampling Visit and Interim Corrective Measures. Pursuant to a Department agreement, an Interim Corrective Measure (ICM) removal action will be performed at the southern end of this AOC.</p> <p>Subsequent Action: RCRA Facility Investigation completed in 2006. ICM fieldwork for D3-D6 Area was completed in 2011. For the D3/D4 yard, which underwent an ICM in 1996/1997, an Interim Corrective Measures Evaluation will be performed in accordance with Condition E.7.(c) of the Permit Module. An ICM was completed in February 2018 for the G1-D4 Alleyway. The G1-D4 Alleyway ICM Report was approved by the Department in April 2021. Post-remediation groundwater monitoring is currently ongoing for the D3-D6 Area, the D3/D4 Yard, and the G1-D4 Alleyway. Next action is an ICM for the H2-G2 Area.</p>

Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
Former PCB-Containing Transformers, AOC-002	<p>Physical: This area of concern consists of seven similar sub-areas where PCB-containing dielectric fluid releases, or suspected releases, from transformers occurred. All PCB-containing transformers were voluntarily replaced with “dry”, non-PCB-containing transformers during the mid-1990s. In some areas, the associated switch gear was neither removed nor replaced due to operational concerns. [Note: Switch gear contains no dielectric fluids.] The individual sub-areas are discussed in detail below.</p> <p><u>Area A:</u> This area consists of the soil beneath the Building L3 transformer room. Transformers and switch gear were housed in this room since the early 1950s. Leaks of PCB-containing dielectric fluid from the transformers penetrated the concrete floor and contaminated the underlying soil. During 1994 and 1995, the transformers, associated switch gear, and concrete floor were removed and the underlying soil was remediated. Confirmation soil sample results show the maximum remaining PCB soil concentration is 23 mg/kg.</p> <p><u>Area B:</u> This area consists of the soil beneath Load Center (transformer) 1 East (LC-1E) and its associated switch gear, located in the Building G1 basement. LC-1E has been housed in the Building G1 basement since the early 1950s. Leaks of PCB-containing dielectric fluid penetrated the concrete floor and contaminated the underlying soil. Swipe samples of the floor showed PCB concentrations up to 316,000 µg/100cm². During 1997, LC-1E was replaced, the contaminated floor was removed, and the underlying soil was remediated. Nine confirmation samples were collected subsequent to the remediation. Confirmation soil sample results show the maximum remaining PCB soil concentration is 0.8 mg/kg. Floor staining beneath the switch gear was visible during transformer removal and may indicate additional PCB-contaminated soil under the switch gear.</p> <p><u>Area C:</u> This area consists of the soil beneath Load Center (transformer) 1 West (LC-1W), located in the Building G1 basement. LC-1W has been housed in the Building G1 basement since the early 1950s and uses the same switch gear identified above in Area B. Leaks of PCB-containing dielectric fluid contaminated the underlying floor. Swipe samples of the floor showed PCB concentrations up to 940 µg/100cm². During 1997, LC-1W was replaced and the floor was decontaminated (double washed and rinsed). Swipe samples subsequent to floor decontamination showed PCB concentrations up to 160 µg/100cm². The floor area was subsequently sealed with two coats of paint.</p>

Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
Former PCB-Containing Transformers, AOC-002, (Con't.)	<p><u>Area D:</u> This area consists of the soil beneath Load Center (transformer) 2 (LC- 2) and its associated switch gear, located in Building K4 - the Boiler House. LC-2 has been housed in the Boiler House since the early 1950s. Leaks of PCB-containing dielectric fluid penetrated the concrete floor and contaminated the underlying soil. Swipe samples of the floor showed PCB concentrations up to 370,000 µg/100cm². During 1996 and 1997, LC-2 was replaced and the floor was removed. Nine confirmation samples were collected from the underlying soil. Confirmation soil sample results show the maximum PCB soil concentration is 4.0 mg/kg. Floor staining beneath the switch gear was visible during transformer removal and may indicate additional PCB-contaminated soil under the switch gear.</p> <p><u>Area E:</u> This area consists of the soil beneath Load Center (transformer) 8 (LC- 8) and its associated switch gear, located in the Building G1 basement. LC-8 has been housed in the Building G1 basement since the early 1950s. Leaks of PCB-containing dielectric fluid penetrated the concrete floor and contaminated the underlying soil. Swipe samples of the floor showed PCB concentrations up to 1,500 µg/100cm². During 1996 and 1997, LC-8 was replaced and the floor was removed. Seven confirmation samples were collected from the underlying soil. Confirmation soil sample results show the maximum PCB soil concentration is 23 mg/kg. PCB contamination under adjacent undisturbed switch gear is not anticipated because no floor stains were visible during transformer removal.</p> <p><u>Area F:</u> This area consists of the soil beneath Load Center (transformer) 22 (LC- 22) and its associated switch gear, located in the Building L4 Pump House. LC-22 has been housed in the Pump House since the early 1950s. Leaks of PCB-containing dielectric fluid penetrated the concrete floor and contaminated the underlying soil. Swipe samples of the floor showed PCB concentrations up to 136,000 µg/100cm². During 1996, LC-22 was replaced and the underlying floor was removed. Two confirmation samples were collected from the underlying soil. Confirmation soil sample results show the PCB soil concentration is <0.3 mg/kg. PCB contamination under adjacent undisturbed switch gear is not anticipated because no floor stains were visible during transformer removal.</p>

Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
Former PCB-Containing Transformers, AOC-002, (Con't.)	<p>Area G: This area consists of the soil beneath Load Center (transformer) 27 (LC-27) and its associated switch gear, located in the Building A1 basement. LC-27 has been housed in the Building A1 basement since the early 1950s. Leaks of PCB-containing dielectric fluid contaminated the underlying floor. Swipe samples of the floor showed PCB concentrations up to 51,000 µg/100cm²; however, floor tile removal revealed a sealed (painted) concrete floor. During 1997 and 1998, the transformer and the associated switch gear were replaced and the underlying concrete floor was decontaminated (double washed and rinsed). Swipe samples subsequent to floor decontamination showed PCB concentrations up to 120 µg/100cm². Concrete was then removed and the area was further investigated per a Department approved Sampling Visit Work Plan. Corrective Action work for Area G was completed in 2000.</p> <p>Area H: This area consists of the soil under the High Voltage Hybrid Pad. The High Voltage Hybrid Pad is located adjacent to the former Z4 High Yard Area (HYA) (SWMU-023) and Commission Avenue. The pad was built in the 1990s and is currently in operation. During the implementation of the High Yard Area Interim Corrective Measure (ICM), PCB concentrations in soil up to 1 ppm were noted in post-excavation confirmation soil samples collected adjacent to and beneath the High Voltage Hybrid Pad.</p> <p>Operational: 1950s to 1997 (Areas A through G). Area H is currently operational.</p> <p>Waste Type/Characteristics: Not applicable</p> <p>Release Information: Subsequent to the removal actions, PCB soil concentrations were <25 mg/kg. PCB soil concentrations in Area H up to 1 ppm noted during HYA ICM.</p> <p>Recommended Action: No action at Area G. Corrective Measures Evaluation at Areas A, B, C, D, E, F and H.</p> <p>Subsequent Action: No further action for Area G. The other areas are currently inaccessible. For Areas A through F, next action will follow the procedures outlined in Condition E.7.(b) of the Permit Module. For Area H, next action will follow the procedures outlined in Condition E.7.(c) of the Permit Module.</p>

Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
Lower Level Parking Lot, AOC-003* [Transferred to DOE-EM]	<p>Physical: This AOC consists of the fill material located below and adjacent to the lower level parking lot.</p> <p>Operational: Fill material obtained from former waste management areas was used to expand the lower level parking lot in August 1962. Fill was obtained from the area between Storage Pads K6 and K7 as well as the Railroad Staging Area.</p> <p>Waste Type/Characteristics: Wastes staged in the areas where fill material was obtained included slurry waste. Slurry waste potentially contained heavy metals.</p> <p>Release Information: Radioactivity detected in fill material indicates a historic release had occurred.</p> <p>Recommended Action: Sampling Visit.</p> <p>Subsequent Action: Sampling Visit and RCRA Facility Investigation (RFI) completed. Interim Corrective Measures (ICM) Report completed and no further action recommendation approved by the Department in December 2011. All Corrective Action responsibilities for this waste management unit are assigned to the U.S. Department of Energy – Environmental Management (DOE-EM), formerly DOE-Oakland Operations Office (EPA ID No. NYR000096859) as described in the Separations Process Research Unit (SPRU) Permit # 4-4224-00024/00055 for the former SPRU operation. All Corrective Action responsibilities are to be assigned to the U.S. Department of Energy – Naval Reactors Laboratory Field Office.</p>

* - Asterisk denotes the unit managed RCRA solid waste potentially containing or mixed with RCRA-solid-waste-exempt special nuclear or byproduct material.

Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
<p>Z5 Sanitary Sewer/CSMA Soil Pile & Copper Release/CSMA Soil Pile AOC-004</p>	<p>Physical Description: <u>Z5 Sanitary Sewer:</u> Sanitary sewer line, Building Z5 west side (north end) and the former Knolls Laboratory Clean Soil Management Area (CSMA). <u>Copper Release:</u> Knolls Laboratory river water infiltration gallery, Knolls Laboratory Lower Level and former CSMA.</p> <p>The CSMA is a small area (< 2 acres) on the east side of the Knolls Laboratory in which clean soil excavated during various site construction projects was placed to reclaim a historical borrow area. The CSMA was operated from 1996 to 2003.</p> <p>Operational History: <u>Z5 Sanitary Sewer:</u> While excavating to repair a water line break in April 1999, it was discovered that an overlying sewer line had lost its integrity and contained droplets of mercury. Although no mercury was observed in soil adjacent to the sanitary line, subsequent analytical results showed elevated mercury concentrations. Approximately 70 cubic yards of this soil was staged in the CSMA and inadvertently commingled with other staged clean soil. The Department was notified of the mercury release in May 1999. Impacted soils adjacent to the sanitary line were excavated in accordance with an Interim Corrective Measure (ICM) work plan, approved by the Department, in May 1999. The impacted soil in the CSMA was recovered in accordance with the supplemental scope of work approved by the Department in July 1999. An ICM report was transmitted to the Department in August 2000. The ICM report was approved by the Department and no further action was required.</p> <p><u>Copper Release:</u> The Knolls Laboratory river water infiltration gallery is part of the pump house that provides cooling water from the Mohawk River to the KAPL test facilities. This pumping system, operational since the 1950s, was outfitted with a copper ion injection system in September 2001 to inhibit the settling and growth of zebra mussels. Sediment must be removed from the infiltration gallery on a one to two year cycle. During the 2002 and 2003 cleanings of the infiltration gallery, sediment (~17 cubic yards) with elevated levels of copper was inadvertently placed in the CSMA. The Department was notified by KAPL in October 2005 via teleconference, and an assessment report was sent in November 2005 via letter.</p> <p>Waste Type/Characteristics: <u>Z5 Sanitary Sewer:</u> Mercury. <u>Copper Release:</u> Copper.</p> <p>Release Information: <u>Z5 Sanitary Sewer:</u> Mercury release was excavated as an Interim Corrective Measure (ICM).</p> <p><u>Copper Release:</u> Sediment was left at the CSMA due to the small amount of copper-impacted sediment relative to the significantly larger CSMA soil volume (30,000 cubic yards).</p> <p>Recommended Action: No action.</p>

Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
Q3 Yard, AOC-005	<p>Physical Description: The Q3 Yard is located inside the security fence on the eastern side of the facility. The Q3 Yard is bounded by Building Q3 to the west and the security fence to the north, Building Q10 to the east and Buildings Q4, Q5, Q7, Q8, and Q9 to the south. The Q3 Yard is mostly paved with asphalt, with a narrow unpaved area adjacent to the north side of Building Q3 and grassy areas present to the south and east of Building Q3.</p> <p>Operational History: The Q3 Yard was historically a staging area for construction materials and heavy equipment used during the construction of the Knolls Laboratory in the late 1940s and early 1950s. Currently, and throughout the operation of the Knolls Laboratory the Q3 Yard has been used for the storage and staging of site support and maintenance equipment and materials. The above grade structures of Buildings Q3, Q4, Q5, Q7, Q8, and Q9 were demolished in 2023. The Buildings Q3, Q4, Q5, Q7, Q8, and Q9 slabs remain. Building Q10 was completely demolished in 2023.</p> <p>Waste Type/Characteristics: Degraded petroleum products in soil, cis-1,2-Dichloroethene (cis-1,2-DCE) in groundwater.</p> <p>Release Information: During construction of Building Q16, a degraded petroleum release was discovered in soil adjacent to the north and east of Building Q3. Samples of groundwater entering the excavation near Building Q3 contained trace amounts of cis-1,2-DCE (5.8 and 23 ppb).</p> <p>Available records offer no documentation of a spill or release of chlorinated solvents such as cis-1,2-DCE and/or parent products in the Q3 Yard. Based on the Q3 Yard AOC Assessment Report provided to the Department in December 2006 and the Petroleum Spill Closure Report for the Knolls Laboratory Q3 Yard NYS Spill Number 0606806 transmitted to the Department in May 2007, there is no significant threat to human health and the environment, and no immediate actions are deemed necessary.</p> <p>Recommended Action: Pursuant to Condition C.3 of the Permit Module, a RCRA Sampling and Analysis Plan (SAP) shall be implemented to further assess both VOCs in soil and groundwater. Further assessment of petroleum related compounds in soil shall also be performed coincident with implementation of the SAP transmitted to the Department in December 2007.</p> <p>Subsequent Action: RCRA SAP fieldwork was completed in 2010. Sampling and Analysis Report (SAR) transmitted to the Department in August 2011 and approved by the Department in April 2012. RFI Soil Vapor Intrusion (VI) Evaluation Work Plan transmitted to the Department in December 2012. VI Work Plan fieldwork performed in March 2013; RFI VI Report transmitted to the Department in August 2013, with recommendation for supplemental work. Supplemental VI fieldwork implemented in March 2014. Supplemental RFI VI Report transmitted to the Department in September 2014 and approved by the Department in February 2015, including approval of the initial RFI VI Report. The RFI Work Plan was approved by the Department in July 2018; RFI fieldwork is ongoing. During RFI fieldwork, an area of PCB contamination was discovered in the northern portion of the AOC, and subsequently was remediated to support ongoing construction in this area. During RFI fieldwork, a supplemental Scope of Work was implemented for pre-demolition information associated with SWMUs-051 and -054, which are situated within the AOC. The next action is to complete RFI/ICM activities in this area which will also include SWMUs-051 and -054.</p>

Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
<p>Red Pines Area, AOC-006* [Transferred to DOE-EM]</p>	<p>Physical: This unit is a 3.5 acre wooded area in the northeast portion of the Land Area. The area is heavily wooded with Red Pine trees approximately 35 years old. The radiologically impacted area is on a gently sloped surface that is bounded to the east by a steep slope that descends to the Mohawk River and to the southwest by an east-flowing ephemeral drainage.</p> <p>Operational: There is no operational information available to determine the source of the radioactivity in this area. There is also no evidence of excavation. However, remnants of a haul road through the wooded area are evident, indicating potential transportation or soil disposal activities. No evidence of subsurface debris or other buried materials was found during the investigations. There is the potential that the radioactivity in soils for this unit was impacted by activities associated with the Former Slurry Drum Storage Area (SWMU-035).</p> <p>Waste Type/Characteristics: Slurry waste potentially containing heavy metals, and other unknown.</p> <p>Release Information: Radioactivity detected in soil indicates a potential release has occurred.</p> <p>Recommended Action: Investigation Report completed in 2010 and no further action approved by the Department in June 2011. All Corrective Action responsibilities for this waste management unit are assigned to the U.S. Department of Energy – Environmental Management (DOE-EM), formerly DOE-Oakland Operations Office (EPA ID No. NYR000096859) as described in the Separations Process Research Unit (SPRU) Permit # 4-4224-00024/00055 for the former SPRU operation. A newly discovered release was documented in an Assessment Report transmitted to the Department in August 2019 with a recommendation for no further action. The Department subsequently approved the report in September 2022. All Corrective Action responsibilities are to be assigned to the U.S. Department of Energy – Naval Reactors Laboratory Field Office.</p>

* - Asterisk denotes the unit managed RCRA solid waste potentially containing or mixed with RCRA-solid-waste-exempt special nuclear or byproduct material.

Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
H1 Cooling Tower, AOC-007	<p>Physical: H-1 consisted of a two-stack, forced circulation non-contact cooling tower and attached Pump House that contained a pumping system to circulate cooled water throughout the KAPL facility. The Cooling Tower was constructed of redwood with PVC corrugated siding. It was approximately 26 feet wide, 48 feet long, and extended 31 feet above grade. The concrete basin and footers extended to approximately 6 feet below grade. The Pump House was constructed of concrete and asbestos corrugated siding. The structure was approximately 22 feet wide, 27 feet long, and extended 14 feet above grade. The concrete sump and footers extended about 14 feet below grade.</p> <p>Operational: H-1 was constructed in 1950 to support operation of the Separations Process Research Unit (SPRU) and after the SPRU shutdown in 1953, continued to support KAPL operations through 1992. Demolition of H-1 was performed in 2006 as part of SPRU Remediation Program to remove the unused SPRU facilities.</p> <p>Waste Type/Characteristics: Chromium.</p> <p>Release Information: Post-demolition sampling at H-1 discovered elevated chromium in soils.</p> <p>Recommended Action: Soil and Groundwater Characterization Report complete. RCRA Facility Investigation required. All Corrective Action responsibilities for this area of concern were originally assigned to the U.S. Department of Energy – Environmental Management (DOE-EM), formerly DOE-Oakland Operations Office (EPA ID No. NYR000096859) as described in the SPRU Permit # 4-4224-00024/00055 for the former SPRU operation. A DOE-EM characterization work plan and a quality assurance project plan were approved by the Department in March 2013. Subsequently, the RFI implementation strategy was revised; fieldwork was rescheduled to occur following dismantlement of Building H2. As a consequence, the characterization work plan will need to be revised to reflect the extent of excavation associated with Building H2 dismantlement. The 2016 DOE-EM and DOE-Naval Reactors RCRA permit modifications transferred Corrective Action responsibilities for H1 to DOE-Naval Reactors. A schedule to develop the RFI work plan was transmitted to the Department by DOE-Naval Reactors in September 2021. The Department approved the schedule in December 2021.</p>

Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
G2 Area of Concern, AOC-008*	<p>Physical: The G2 facility served as the head-end of the process where slugs of partially irradiated materials were dissolved into an acid solution for subsequent separation of recoverable uranium and plutonium. REDOX chemical test runs were performed until the end of 1950 and PUREX test runs until mid-1953. Separation processes were accomplished in equipment located in concrete-shielded G2 cells. Organic waste streams from the PUREX process were washed for reuse in the solvent extraction process in Building G2. The aqueous waste solutions were then transferred via piping to Building H2 for concentration and storage. The processes performed in the G2 Building involved both radioactive and chemical constituents. Spills and releases in the building resulted in significant contamination throughout the cells. These materials have been removed from the facility and decommissioning and demolition operations have been initiated for the G2 Building.</p> <p>Operational: Building G2 was used heavily between 1950 and 1953 to test chemical processes for separating plutonium and uranium from radioactive material encased in aluminum. Other related operations were conducted in the G2 Building through the 1960s. Building G2 was demolished in 2018, and the area was backfilled, graded, and seeded in 2019.</p> <p>Waste Type/Characteristics: No chemical products or wastes are known to have been released or spilled through the G2 Building slab. Residual acids, caustics, solvents, and heavy metals in addition to radiological constituents were documented as potentially remaining in the process systems.</p> <p>Release Information: Toluene was detected in soil samples taken through the G2 basement slab in 2015. A VOC Assessment was conducted and an Assessment Report was submitted, in August 2016, that includes soils in the vicinity of the unit to determine if contaminant releases occurred. An examination of potential or likely release points, as well as a review of the location of previously detected radioactivity in soils, was used in designing the Sampling and Analysis Plan.</p> <p>Recommended Action: No action. The results of the Assessment were used to determine that an Interim Corrective Measures work plan (ICM WP) was necessary for the unit. This work plan was approved in August 2017. In late 2017, the majority of the building basement was excavated. Confirmation sampling of the excavated area indicated that soil cleanup objectives had been met and the excavation was backfilled. The north and west section of the G2 basement slab and walls were removed in 2018. Confirmation sampling of the remaining excavated area indicated that soil cleanup objectives had been met and backfill of the excavation was completed. The ICM Report for the Upper Level SWMUs and AOC was transmitted to the Department in May 2020. NYSDEC approved the ICM Report in September 2022.</p> <p>All Corrective Action responsibilities for this waste management unit are assigned to the DOE-EM, formerly DOE-Oakland Operations Office (EPA ID No. NYR000096859) as described in the SPRU Permit # 4-4224-00024/00055 for the former SPRU operation. All Corrective Action responsibilities are to be assigned to the U.S. Department of Energy – Naval Reactors Laboratory Field Office.</p>

* - Asterisk denotes the unit managed RCRA solid waste potentially containing or mixed with RCRA-solid-waste-exempt special nuclear or byproduct material.

Table II. Knolls Laboratory SWMUs and AOCs

Name	Description & Recommended Action
T1 North, AOC-009	<p>Physical: The unit is approximately 2,400 square feet and is located within the secure operational portion of the Site's upper level, immediately north of Building T1. The unit consists of outdoor lawn areas used to house temporary dewatering revetments and dewatering socks for the dewatering of material associated with a Site catch basin cleaning operation.</p> <p>Operational: The area was used from April to June 2019 to house temporary dewatering revetments and dewatering socks that were used to dewater material from Site catch basins prior to off-site disposal.</p> <p>Waste Type/Characteristics: Catch basin material staged in dewatering revetments contained elevated levels of PCE and TCE at maximum concentrations of 50 ppm and 640 ppm, respectively. Material also contained SVOCs, PCBs, and metals. Revetment footprint soil contained PCE and TCE at concentrations well below unrestricted use SCOs.</p> <p>Release Information: Low concentration VOCs, primarily PCE and TCE were released to soil within and adjacent to the dewatering revetments/sock footprints through the dewatering process. SVOCs, PCBs, and metals were not released to soil given their chemical properties. Notification to the Department of a newly identified AOC was transmitted in May 2019. Following characterization of the soil in this area, and Interim Corrective Measure SOW was provided to the Department in May 2019. The ICM was completed in June 2019 and resulted in 105 cubic yards of soil removed. The ICM Report was transmitted to the Department in March 2020 with a recommendation for no further action. The Department approved the ICM Report in January 2022.</p> <p>Recommended Action: No action.</p>

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Table III. Phased Visual Site Inspection

Phase I, Completed 9/28/1995	Phase III, Completed 5/13/1997
SWMU-001, Closed Landfill SWMU-002, Former Landfill SWMU-003, Mercury Disposal Area SWMU-004, North Field SWMU-005, Pyrophoric Area SWMU-006, West Field SWMU-007, C&D Debris Area No.1 SWMU-010, Current Hazardous Waste Storage Facility SWMU-011, Temp. Hazardous Waste Storage Facility SWMU-012, Former Hazardous Waste Storage Facility SWMU-013, Boiler Blowdown Storage Tank SWMU-014, K4 Neutralization Tank SWMU-015, Yard Neutralization Tank SWMU-016, E1/G1 Wastewater Treatment System SWMU-017, L3 Holding Tanks SWMU-018, L6 Equalization Tank SWMU-019, L6 Holding Tank SWMU-020, D3 Neutralization Tank SWMU-021, Former K3 Oil/Water Separator SWMU-023, High Yard Area AOC-001, Hillside Area	SWMU-030, H2 Processing Facility* SWMU-031, H2 Tank Farm* SWMU-032, Former Temp. Waste Storage Facilities* SWMU-033, Former Pilot Incinerator/Storage Facility* SWMU-034, L7 Waste Processing Facility* SWMU-035, Former Slurry Drum Storage Area* SWMU-036, K6 Storage Pad* SWMU-037, Former K7 Storage Pad* SWMU-038, Railroad Staging Area* SWMU-039, K4 Laundry Wastewater Pit* SWMU-040, K5 Retention Basin* SWMU-041, J4 Filter Bed* SWMU-042, RML Mixed Waste Storage Pits* SWMU-043, Former RML Chemical Waste Pit* SWMU-044, RML Cobalt Pit* SWMU-045, RML In-Floor Storage* SWMU-046, RML Building E2 Cask Storage Pit* SWMU-047, RML Cask Storage Facility* SWMU-048, Building E1 Cask Storage Pit* SWMU-049, Former M4 Test Specimen Storage* SWMU-050, H2MA Mixed Waste Storage Unit* SWMU-051, Former Q4 Drum Pit* SWMU-052, M10 Storage Facility* SWMU-053, Industrial Drain System* SWMU-054, Wastewater Drain Systems* SWMU-055, Laundry Drain System* SWMU-056, Storm Water Drain System* SWMU-057, Pipe Tunnels* SWMU-058, SPRU Tank 527* SWMU-059, SPRU Tank 531* SWMU-060, SPRU Tank 532* SWMU-061, SPRU Tank 534* SWMU-062, SPRU Tank 551* SWMU-063, SPRU Tank 536* SWMU-064, SPRU Tank 316* SWMU-065, FCPE Discharge Tank* SWMU-066, Nuclear Material Storage Vault* AOC-003, Lower Level Parking Lot*
Phase II, Completed 5/13/1997 SWMU-008, C&D Debris Area No. 2 SWMU-009, Scrap Metal Management Areas SWMU-022, Former J3 Incinerator SWMU-024, J7 Scrap and Salvage SWMU-025, Former L3 Sodium Treatment Area SWMU-026, G2 Wastewater Concentrator SWMU-027, K4 Pit SWMU-028, Site Boilers SWMU-029, K3 Fuel Oil Tank AOC-002, Former L3 Transformers	

* - Asterisk denotes the unit managed RCRA solid waste potentially containing or mixed with RCRA-solid-waste-exempt special nuclear or byproduct material.

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Attachment E – SWMU/AOC Information Package

**Supplemental Knolls Laboratory
Waste Management and Release Information**

The purpose of this supplemental information is to briefly describe Knolls Laboratory waste management activities and operations, as well as historic releases, which are not presented or discussed in the solid waste management unit (SWMU) package. This supplement covers three broad areas: waste accumulation, sanitary waste management, and petroleum releases. This supplement, coupled with the attached SWMU information, provides a complete description of current and historic Knolls Laboratory waste management operations, as well as release information.

Waste Accumulation

Solid waste, as defined 40 CFR §261.2, is accumulated in containers at the Knolls Laboratory. Containers are portable devices used to store, transport, treat, dispose, or otherwise handle material, in this case solid waste. Containers alone are not considered solid waste management units, (reference 40 CFR §260.10 *Hazardous waste management unit*). Containers used at the Knolls Laboratory include bottles, bags, boxes, cans, drums, dumpsters, and roll-offs, all of various sizes, shapes and configurations. Containers may be fabricated of paper, cardboard, glass, plastic, and/or metal. Containers are used to accumulate non-hazardous and hazardous waste. All wastes, hazardous and non-hazardous, are accumulated and stored in compatible containers. Examples of non-hazardous waste accumulated include commercial wastes such as paper, cardboard, and plastics, and industrial wastes such as non-hazardous process waste, scrap metal, and construction and demolition debris. Waste containers and/or staging areas are located in offices, laboratories, and process areas, as well as outside buildings and adjacent to construction and demolition sites. Hazardous waste is accumulated in containers at or near the point of generation, at satellite accumulation areas (SAAs) and SAAs are not considered SWMUs in this information package. SAAs are tracked internally by the Knolls Laboratory. These areas are managed in accordance with 40 CFR §262.15 and 6 NYCRR Part 372.2(a)(8)(i)(a). Waste generated is controlled by the operator responsible for the process generating the waste. No more than 55 gallons of hazardous waste, one quart of liquid acute hazardous waste or one kilogram (2.2 pounds) of solid acute hazardous waste, is accumulated at a satellite accumulation area.

Sanitary Waste Management

From the Site's 1950 inception until October 1995, all sanitary waste, except that generated in Building H2, was conveyed to a sanitary waste treatment system prior to Mohawk River discharge. From 1950 until 1968, the facility consisted of a 30,000-gallon, flow-through, Emhoff tank. During 1968, the system was upgraded to a conventional, extended aeration, treatment facility. The upgraded treatment system consisted of a comminutor, 30,000-gallon pre-aeration tank, 30,900-gallon aeration tank, 6,500-gallon clarifier, two parallel sand filtration beds, a chlorinator, and an 8,900-gallon sludge storage tank. Most treatment components were in-ground, open-topped, and constructed of concrete. The conventional, extended aeration, treatment facility operated from 1968 until October 1995, at which time sanitary waste was, and continues to be, discharged, via lift station, to a publicly owned treatment works (POTW). Releases from the sanitary system are not addressed as part of the RCRA Corrective Action program.

From 1950 until 1952, sanitary waste and neutralized industrial and laboratory wastewaters were treated in the sanitary waste treatment facility. During 1952, due to an operational

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capacity limitation, industrial and laboratory wastewaters were re-routed to the Site's storm water drain system. The treatment facility's operational capacity was 21.5 gallons per minute (or 30,900 gallons per day). Treatment facility effluent was discharged to the Mohawk River in accordance with water quality standards, permit conditions, and/or guidelines established by the Mohawk River Advisory Council, New York State (NYS) Water Pollution Control Board, and/or the Department. No spills or undesigned releases from this treatment facility were reported or observed.

Sanitary waste generated in Building H2 is conveyed to a septic system located adjacent to Building H2. This system consists of a septic tank and a leach field with two lateral drains. The system was operational from the Site's inception (1950) until the mid-1990s. No spills or undesigned releases from this septic system were reported or observed.

Petroleum Spills/Releases

As specified in EPA's Subpart S Initiative (61 FR 19432, dated 5/1/1996), specifically regulatory deferral of cleanups, petroleum spills and releases will be addressed in accordance with the Department's Petroleum-Contaminated Soil Guidance Policy and the Commissioner Policy CP-51 Soil Cleanup Guidance separate from the RCRA Corrective Action program.

KNOLLS ATOMIC POWER LABORATORY

KNOLLS LABORATORY

Attachment F PROCEDURES TO PREVENT HAZARDS

EPA I.D. NUMBER NY 6890008992

**6 NYCRR PART 373 PERMIT
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INTRODUCTION

The information included herein is presented in accordance with the requirements of 6 NYCRR § 373-1.5, 2.2, 2.3, 2.5, and 2.9 [40 CFR § 270.14(b)(4), (5), (6), (8), and (9), 264.14, 264.15, 264.17, 264.32]. This attachment describes the procedures used at the Knolls Laboratory hazardous waste and mixed waste management units to prevent hazards to human health and the environment. The items covered include security precautions to prevent unauthorized access to managed wastes and inspection plans for the permitted units.

SECURITY

A. 24-HOUR SURVEILLANCE SYSTEM

The Knolls Laboratory security surveillance includes continuous 24-hour guard patrol and site access control. Entrance to the site is controlled by security personnel who are stationed at the main access gate. The main gate is the only gate which provides routine access to the site for vehicles, facility and non-facility personnel.

B. BARRIER AND MEANS TO CONTROL ENTRY

The entire developed portion of the Knolls Laboratory is enclosed with a fence to prevent accidental or unauthorized access. The main access gate is the primary entry point for routine deliveries, as well as personnel and visitor access. Other gates are available on a case-by-case basis for non-routine business and emergencies. Security personnel control entry through any of the access points. To support new construction, corrective action projects and various demolition activities, the fenced area footprint may be modified. The permitted units will always be located within the controlled fenced area.

In addition to the fence and gates, access to the individual waste management units is controlled by means of locked doors (when not in use) or other comparable means (i.e., the four E4 Extension floor vaults have heavy access covers that require rigging equipment to lift them to allow access).

C. WARNING SIGNS

Warning signs bearing the legend "DANGER-Unauthorized Personnel Keep Out" are posted at the entrances to the active portions of the hazardous waste and mixed waste management units. These warning signs are clearly legible from a distance of 25 feet and can be seen from any access approach to the active portion of each waste management unit.

INSPECTION SCHEDULE

This inspection schedule is intended to provide a mechanism to prevent and detect system malfunctions, equipment deterioration and operator errors which, if allowed to continue without remedial action, may ultimately lead to a release of hazardous waste constituents to the environment or create a threat to human health. The inspection program is designed to provide an early warning of the potential for such events in order that corrective and preventive actions may be taken in a timely manner.

A. GENERAL INSPECTION REQUIREMENTS

The inspection program is specific to the hazardous/mixed waste management units covered under this permit. Each unit and associated equipment and structures are regularly inspected for malfunction, deterioration, failure, operator errors or other causes which would endanger human health or the environment. The types of potential problems and hazards uniquely associated with a general Knolls Laboratory waste management unit were used to establish the parameters and frequency of inspections as presented in Table 1.

Inspections of each waste management unit at the Knolls Laboratory are conducted in accordance with the inspection schedule provided in Table 1. The results of each inspection are recorded on an inspection log sheet, which has been developed to address the applicable information requirements from Table 1. Information entered on the log sheet includes the inspector's name and title, date and time of inspection, items to be inspected, status of each item, observations and comments, including the nature of repairs and remedial action, if any.

Examples of typical problems that may be encountered with each item of inspection are provided on Table 1 to serve as a reminder to the inspector and to ensure a complete inspection. The inspector is required to check the status of each pertinent item and indicate whether its condition is satisfactory or unsatisfactory. If corrective actions are necessary, these items will be noted on the log sheet until the corrective actions are completed.

B. SPECIFIC PROCESS INSPECTION REQUIREMENTS

Inspections of all hazardous and mixed waste management units will be conducted weekly and recorded on an inspection log sheet which has been developed to address the applicable information requirements from Table 1.

Inspection requirements for the four floor vaults in the E4 Extension are unique. Access to the vaults may only be gained through the thick steel covers, which can only be removed by using a crane or similar device. The vaults are kept closed (i.e., covers in place) unless adding waste, removing waste, or performing inspections. Under this inspection plan, removal of the vault cover(s) is not required for those vaults that have not stored mixed waste during the time period between scheduled inspections specified in Table 1.

When the permittee deems it necessary to control radiological exposure associated with the physical inspections, alternative methods (i.e., other than 'walk-through' inspections) capable of detecting leakage and/or deterioration such as remote monitoring devices or television monitors may be used to satisfy the weekly inspection requirements of the permit¹.

C. INSPECTION RESPONSIBILITIES AND REMEDIAL ACTION

The cognizant waste management unit operator/supervisor or designee, at a minimum, performs an inspection of the waste management unit(s) on a frequency specified in Table 1. An inspection log sheet is filled out and filed as part of the operating records.

¹ Re: 60 FR 40204-40211 dated 8/7/95.

Inspections of loading and unloading areas are performed daily² when shipping or receiving waste into or out of a permitted unit. Any comments relative to operational safety/environmental controls are noted on the inspection log and any necessary corrective actions are initiated in compliance with 6 NYCRR 373-2.2(g)(3) [40 CFR 264.15(c)]. Records of the inspections are kept on file for three years.

Any deterioration, malfunction, spill residue or other unsatisfactory condition detected during an inspection must be remedied on a schedule, which ensures that the problem does not lead to an environmental or human hazard.

Operational personnel at each of the waste management units also conduct undocumented daily examinations of loading and unloading areas during days of operation. They survey their respective units for any obvious damage, which could contribute to a possible spill and look for evidence of any spill residue.

Security personnel provide further inspection capability by ensuring that the areas under their cognizance (e.g., fence and gates) are sound and secure.

D. INSPECTION LOG

Inspection log sheets are developed specifically for each unit. Each waste management unit's inspection log sheet is tailored to address only the required information from Table 1 that is applicable to that unit.

PREPAREDNESS AND PREVENTION REQUIREMENTS

A. EQUIPMENT REQUIREMENTS

1. INTERNAL/EXTERNAL COMMUNICATIONS AND ALARMS

Internal communications are provided to each building at the Laboratory by an alarm system, a public address system, a telephone system, cell phones, and (in some cases) a 2-way radio communication system.

Alarms are located in each occupied building at the Knolls Laboratory. Personnel are informed of a particular emergency using the site public address (PA) system.

Each hazardous/mixed waste management unit is equipped with a pull box alarm. Additional fire alarm pull boxes are located in close proximity to the waste management units. In the event that any of these alarms are pulled or the fire suppression systems are activated, emergency response personnel are notified by an alarm system (i.e., a PA system announcement).

Centrally located telephones and the public address system are additional tools used for internal communication. Telephones are located in each building and within or in close proximity to each of the waste management units. The public address system is tested

² Daily means during work days when the waste management unit is in operation.

periodically to ensure proper working order. The telephone system, aside from internal communication, is also used to summon emergency assistance from local police or fire departments in the unlikely event that site personnel could not handle a hazardous waste emergency. Instructions for contacting internal and external assistance are discussed under the Attachment G - Contingency Plan.

Many personnel at the Knolls Laboratory have cell phones which can be used in conjunction with, or in lieu of, the centrally located telephones used for summoning emergency assistance both internally and externally.

Finally, two-way radio communication is also a tool used for internal communication. This tool is utilized primarily by Emergency Services and Systems (ES&S) and Security personnel to maintain a constant link to their respective central coordination points. Two-way radios provide an invaluable service during emergency situations

Weekly inspections of internal/external communications and alarms related to the hazardous/mixed waste management units will only entail verification that they are in working order. Table 1 provides examples of weekly inspection items related to this subject.

2. EMERGENCY EQUIPMENT

Each waste management unit has appropriate emergency equipment (dependent upon the waste types stored/accumulated) for the purposes of: automatic and manual notification of emergency type situations, addressing minor spills, and addressing minor (incipient stage) fires. If needed, supplemental equipment and supplies will be obtained from outside sources. Attachment G, Table 4, identifies the emergency equipment staged/available at each of the specific waste management units. The emergency equipment list will be updated as necessary to reflect any changes in the types of equipment available. Routine weekly inspections of the emergency equipment staged at/within each waste management unit will entail cursory verification of availability and quantity. A more detailed inspection of the equipment is performed on a quarterly basis or after the equipment is used for real events or drill scenarios. Table 1 provides examples of weekly inspection topics for emergency equipment.

Additional emergency equipment is available via the Emergency Services and Systems (ES&S) organization. ES&S has both emergency equipment and the training/ability to handle most incidents that may occur at the Knolls Laboratory during normal work hours. ES&S's emergency equipment is available to respond to all site emergencies. The ES&S organization's equipment is not dedicated solely for the mitigation of RCRA-type incidents. As such, ES&S's equipment is not inspected as part of this permit's inspection plan. A general listing is provided in the latter portion of Attachment G, Table 4.

3. WATER FOR FIRE CONTROL

There is a water tank located on the Knolls Laboratory which stores ~225,000 gallons of water to be used mainly for firefighting. Attached to the water tank is a diesel driven fire pump. The pump is rated to 2,000 gallons per minute (gpm) at 70 pounds per square inch (psi) and provides fire suppression capabilities to all fire hydrants and fire sprinkler systems and standpipe systems connected to the firemain. The closest hydrants to

each of the waste management units are identified in Attachment B, Figure 2 (found in the map pocket at the back of Attachment B). As provided in Table 1, weekly inspections of fire hydrants in the vicinity of the waste management units will only entail a verification of accessibility (i.e., ensure that access is not blocked or restricted).

B. AISLE SPACE REQUIREMENTS

Containers in each of the waste management units are arranged to allow trained personnel to inspect and/or label any stored container and, in emergency situations, to allow for unobstructed access to deploy fire protection, spill control, and decontamination equipment. Any placement or relocation of containers in each of the waste management units is overseen by the cognizant waste management unit operator/supervisor or designee.

Due to the uniqueness of the E4 Extension floor vaults, the conventional aisle space requirements noted above are not applicable. That is, the vaults are below the level of the floor on which egress routes or emergency equipment may be deployed and are kept covered unless adding or removing waste or performing required inspections. Containers will be placed/arranged in the vaults in order to allow for adequate inspections and container removal, placement or rearrangement.

There may be occasions when containers with low exposure rates may be used to provide radiation shielding for containers with higher exposure rates (this is known by the term 'dense packing')³. Dense packing may be used so long as there is a means of detecting, locating the source of, and responding to a release within 24 hours of detection to mitigate any significant release.

Weekly inspections cover aisle space requirements and focus on waste container location in relation to:

- Entryways and emergency egress routes
- Staged emergency equipment (e.g., fire extinguishers, spill control equipment)
- Ventilation and atmospheric control systems (e.g., heating and cooling)
- Cabinet and shelving access (e.g., flammable, incompatible and lab-pack storage)
- Other containers (i.e., allow inspection, movement, compatibility separation)

PREVENTIVE PROCEDURES, STRUCTURES, AND EQUIPMENT

A. LOADING/UNLOADING OPERATIONS

Wastes are transported to all of the hazardous/mixed waste management units by truck, forklift, barrel jack or, if small enough, by hand. The wastes are loaded into and unloaded out of the Building Q1 complex, the modular addition within the Building E11 Truck Bay, and the E11 Waste Processing Facility (E11 WPF) through personnel or vehicle access doorways. Many of these access ways are equipped with sloped ramps to provide ease of entry into and out of the units. Access to the E4 Extension floor vaults may only be gained through the thick steel covers, which can only be removed using a crane or similar device. The wastes are placed into and removed from the vaults using the same device used to remove/replace the covers. The vaults are kept closed (i.e., covers in place) unless adding

³ Re: 60 FR 40204-40211, dated 8/7/95.

waste, removing waste, or performing inspections. Table 1 provides examples of weekly inspection items related to this subject.

B. RUN-OFF MANAGEMENT

None of the Knolls Laboratory's hazardous/mixed waste management units is equipped with run-off management systems (i.e., segregated bays with sloped surfaces and trenches to draw off and accumulate releases). However, all the units are equipped with secondary containment systems that are compliant with the requirements specified in 6 NYCRR 373-2.9(f) [40 CFR 264.175]. There are no floor drains in any of these units.

The closest catch basins in proximity to the waste management units are designated in Figure 2 in Attachment B (located in the map pocket at the back of Attachment B). This figure also shows the catch basins along the primary transport routes for waste leaving the site. Catch basin drain covers are available on site and are located in close proximity to each catch basin as a precautionary measure in the event of spills during waste transportation, loading and unloading operations.

The main storm water system drains most of the Laboratory (including the locations around the E4 Extension and the front of Building E11) through a series of piping into the Mohawk River. There are also auxiliary storm water systems to drain the remaining portions of the Laboratory not covered by the main system. The auxiliary system, specifically around Building Q1, drains to a hillside that slopes toward the Midline Stream and which eventually flows into the Mohawk River.

Table 1 provides examples of weekly inspections related to this subject. These inspections will only entail verifications that storm drain catch basin covers are available for use and located in close proximity to the catch basins in the area of the waste management unit loading/unloading areas.

C. PROTECTION OF WATER SUPPLIES

As noted above, each of the hazardous/mixed waste management units is equipped with secondary containment. Any waste released within the units would be contained and precluded from affecting the environment or ground water supplies in the vicinity of the release.

Also noted above, storm water from the vicinity of the hazardous/mixed waste management units drains via the Laboratory's main storm drain management system directly to the Mohawk River or via a hillside to the Midline Stream, then into the Mohawk River. Each of these discharge points is monitored via the Knolls Laboratory's State Pollutant Discharge Elimination System (SPDES) permit.

Storm drain covers are located in close proximity to each storm drain on site. In the event of a hazardous liquid release, storm drains are covered (to the extent possible) to mitigate hazardous liquids from entering the storm drain system.

Table 1 provides examples of weekly inspections related to this subject.

D. EQUIPMENT AND POWER FAILURES

In the event of a power failure, the Laboratory has emergency equipment which would be used to maintain the safe operation of the waste management units. Available emergency equipment includes: portable lighting, two-way radios, portable pumps and portable electrical generators. Water used for firefighting is not affected by power failures, see *PREPAREDNESS AND PREVENTION REQUIREMENTS A.3.*

Potential hazardous situations from equipment failure, which could affect the safe operation of the hazardous/mixed waste management units where liquids are managed during cold weather periods, would be minimized because each waste management unit is insulated to reduce the potential for freezing and is equipped with secondary containment.

If there has been an equipment failure or power outage which has resulted in a fire, explosion, spill, or release of hazardous waste, or produces conditions which could result in such events, the procedures described for each type of event in the Attachment G - Contingency Plan will be implemented.

Table 1 provides examples of weekly inspection items related to this subject.

E. PERSONAL PROTECTIVE EQUIPMENT

Protective clothing is provided on site for the specific purpose of protecting employees from physical injury, chemical exposure, and heat exposure. Required protective equipment (e.g., gloves, aprons, face shields, etc.) that is appropriate for the work activities performed in a particular waste management unit is staged in or near that unit.

Table 1 provides examples of weekly inspection items related to this subject.

PREVENTION OF REACTION OF IGNITABLE, REACTIVE, AND INCOMPATIBLE WASTES

A. PRECAUTIONS TO PREVENT IGNITION OR REACTION OF IGNITABLE OR REACTIVE WASTE

As discussed in Attachment C - Waste Characteristics, all wastes are characterized prior to receipt in a hazardous/mixed waste management unit covered by this permit to ensure proper segregation and handling.

1. PRECAUTIONS TO PREVENT IGNITION OF WASTES (IGNITABLE, REACTIVE)

Operating and waste handling practices are strictly enforced to prevent the ignition of wastes from sources such as open flames, smoking, cutting, welding, hot surfaces and frictional sparks (static, electrical or mechanical). Specifically:

- a. All waste handlers are trained in safe waste handling practices as discussed in Attachment H - Personnel Training.
- b. There are no open flames, cutting or welding permitted in the waste management unit when handling/transferring ignitable and/or reactive wastes.
- c. No smoking is permitted in the waste management units. No Smoking signs are posted in accordance with 6 NYCRR 373-2.2(i)(1) [40 CFR 264.17(a)].
- d. All drums containing ignitable wastes are grounded while performing transfer or

- sampling operations.
- e. Forklift trucks (non-battery powered) and other internal combustion vehicles are not allowed to be operated in the waste management units when ignitable or reactive waste is being transferred from one container to another.
 - f. No ignitable or reactive wastes are exposed to radiant heat for any extended period of time.
 - g. All containerized ignitable and/or reactive wastes are stored away from electrical equipment.
 - h. All tools used in direct contact with these wastes by waste handlers are spark-proof.

2. PRECAUTIONS TO PREVENT REACTION OF WASTES (IGNITABLE, REACTIVE)

Operating practices are strictly enforced to prevent accidental, uncontrolled reactions of the wastes, which might result in the generation of extreme pressure within the container, causing a fire, explosion, or violent reaction; or production of uncontrolled toxic mists, fumes, dusts or gases which may impact human health or the environment.

The Knolls Laboratory generates minimal amounts of reactive wastes. The small quantity of reactive waste generated is packaged for disposal in laboratory packs. A laboratory pack or lab-pack consists of a larger volume container in which smaller volumes of compatible wastes (usually less than one gallon) are individually placed and separated from other wastes by an absorbent or packing material. As previously mentioned, following the protocols in Attachment C, these wastes have been characterized to avoid the placement of incompatible wastes in the same container. Absorbent material would reduce the likelihood of direct mixing of the wastes, should a spill of an individual or several individual containers occur.

The small volumes of wastes received are stored in clearly marked areas prior to being placed in lab-packs for off-site disposition. These wastes are typically stored in individual trays, which are elevated off the floor by shelves or racks. The trays provide segregation from incompatible materials to preclude heat producing and other adverse reactions.

The handling and packaging of these wastes is performed by trained waste handlers, waste management unit operator/supervisors, or waste vendor employees.

No ignitable or reactive wastes are stored within 50 feet of the property boundary, in compliance with 6 NYCRR 373-2.9(g) [40 CFR 264.176]. The locations of the waste management units in relation to the property line are illustrated in Attachment B, Figure 3.

B. MANAGEMENT OF INCOMPATIBLE WASTES IN CONTAINERS

As discussed above and in Attachment D, the Knolls Laboratory has instituted operating procedures, which are enforced to eliminate the risk of mixing incompatible wastes.

TABLE 1 INSPECTION SCHEDULE		
EQUIPMENT	INSPECTION ELEMENT/PROBLEM	INSPECTION FREQUENCY
Protective Gear (e.g., face shields, goggles, boots, gloves, acid resistant clothing, etc.)	Check accessibility.	Weekly
	Check for adequate supply.	Quarterly/ After each use ¹
	Check for deterioration, damage.	
Spill Kits	Verify adequate supply of absorbents and other materials.	Semi-annual/ After each use ¹
	Check accessibility.	Weekly
Emergency Showers and Eyewash Stations	Visual check for leaks.	Weekly
	Operation check (eyewash).	Quarterly ²
	Operation check (shower).	Quarterly
Catch basin covers	Verify in vicinity.	Weekly
	Verify availability.	
Spill Control Facilities – Secondary Containment	Cracked, degraded, or otherwise defective containment equipment including dikes, spill pans, trenches or other containment equipment.	Weekly
Public Address System	Listen for announcements during week within the waste management unit area.	Weekly
Telephone	Check for dial tone.	Weekly
Alarm Systems	Check accessibility.	Weekly
	Verify quarterly/annual operational test/check.	
Fire Extinguishers	Check inspection tag to ensure monthly inspection complete.	Weekly
	Check seal to ensure no one has used extinguisher.	
	Check to ensure access to units is not blocked.	Daily ¹

TABLE 1 INSPECTION SCHEDULE		
EQUIPMENT	INSPECTION ELEMENT/PROBLEM	INSPECTION FREQUENCY
Emergency Exits	Posted, lighted, accessible.	Weekly
Fire Suppression System	Verify quarterly/annual operational test/check completed.	Quarterly / Annual
	Verify system is charged.	Weekly
Fire Hydrants	Verify accessibility.	Weekly
Container Management	Leaking/corrosion/damaged, secured, completion of waste identification labeling, grounded, number/total volume of containers not exceeding permitted capacity, adequate aisle spacing, proper storage (use of plastic or metal trays) and segregation of incompatible reactive wastes.	Weekly
Buildings/Units (General)	Heated, no unsealed cracks in flooring or curbing, cleanliness, appropriate signs posted (e.g., Danger, Unauthorized personnel keep out).	Weekly
Loading/Unloading Area	Check for evidence of spills, deterioration.	Daily when in use ³
Ventilation & Atmospheric Control Systems	Check for function.	Weekly
	Verify no visible obstructions (e.g., access blocked).	Daily ¹

Notes:

- 'Daily' and 'After each use' inspections are for safety and verification purposes and are not documented. These more-frequent inspections will be checked on the weekly inspection log.
 - 'Daily' means during work days when the waste management unit is in operation.
- The inspection frequency for portable self-contained eyewashes should follow the manufacturer's literature for each device.
- Documented in accordance with 6 NYCRR 373-2.2(g)(2)(iv) and (g)(4) [40 CFR 264.15(b)(4) and (d)].

KNOLLS ATOMIC POWER LABORATORY

KNOLLS LABORATORY

Attachment G Contingency Plan

EPA I.D. NUMBER NY 6890008992

**6 NYCRR PART 373 PERMIT
NUMBER
4-4224-00024/00001**

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INTRODUCTION

In accordance with 6 NYCRR §§373-1.5(a)(2)(vii) and 373-2.4 [40 CFR §§270.14(b)(7) and 264.50 Subpart D], the Knolls Atomic Power Laboratory (KAPL) maintains a contingency plan that details procedures to minimize hazards to human health or the environment from fires, explosions, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to the air, soil, or surface water. The provisions of this contingency plan are carried out whenever the emergency coordinator (hereafter known as the Emergency Director (ED) at the Knolls Laboratory), or a designated alternate, determines that an event may threaten human health or the environment.

It should be noted that full implementation of this contingency plan is not a prerequisite for spill notifications to regulatory agencies. The notification procedures in Appendix G.1 may be activated whenever a potentially reportable quantity of a hazardous substance is released to the environment.

GENERAL INFORMATION

The Knolls Laboratory is owned by the U. S. Department of Energy (USDOE) and operated for the Government under contract. The principal function of the Knolls Laboratory is research and development in the design and operation of naval nuclear propulsion plants. As a result of these operations, the Knolls Laboratory generates hazardous and mixed¹ waste, which may have to be accumulated/stored on site prior to disposition at a permitted off-site facility in accordance with all applicable environmental regulations.

A. Site Identification, Location and Site Plan

Name:	U.S.D.O.E. Knolls Atomic Power Laboratory - Knolls Laboratory Niskayuna, New York
EPA ID#:	NY 6890008992
Location:	In Schenectady County, approximately 2 miles east of the City of Schenectady, New York
Site operator & location:	Fluor Marine Propulsion, LLC Knolls Laboratory 2401 River Road Niskayuna, New York 12309
Site owner & mailing address:	U.S.D.O.E. Naval Reactors Laboratory Field Office P.O. Box 1069 Schenectady, New York 12301-1069

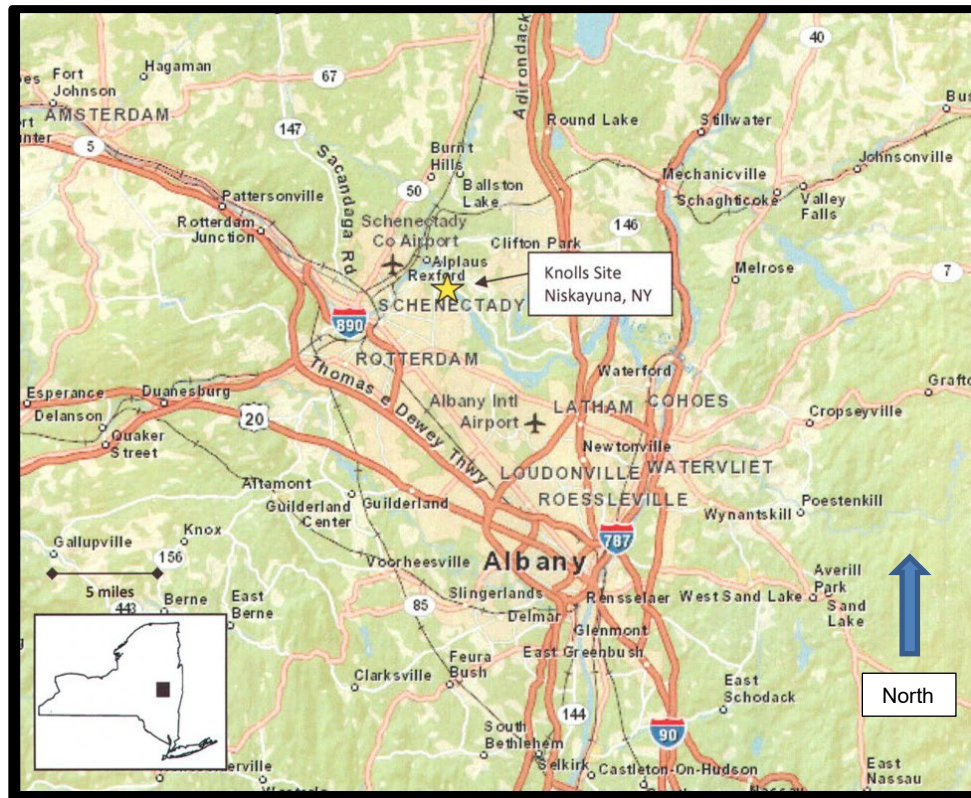
B. Laboratory Operations

The Knolls Laboratory consists of 170 acres on which are located: administrative offices, a boiler house, machine shops, and chemistry, physics and metallurgical laboratories. The

¹ The term, "Mixed waste" describes waste that contains both hazardous waste and radioactive material (source, special nuclear, or by-product material regulated by the Atomic Energy Act of 1954 [42 U.S.C.2011 et seq.])

site is located in the town of Niskayuna, New York, approximately two miles east of the City of Schenectady (see Figure 1) on the south bank of the Mohawk River. The surrounding area is a mixture of open land, other research and development/light industry, parks, municipal facilities, and low-density suburban residential inhabitation.

**FIGURE 1
KNOLLS LABORATORY LOCATION MAP**



1. **Permitted Units** -- Various types of hazardous/mixed wastes are generated during normal operations and are managed for >90-day periods within four permitted waste management units covered by this plan. The following details are provided relative to each of these units:

- a) **The Building Q1 Complex**

The hazardous wastes generated at several locations throughout the Knolls Laboratory that are to be stored on site for >90-days are transported to the Building Q1 complex for management prior to shipment off-site. The Building Q1 complex consists of two management areas: Q1-south and the Q1-extension.

- i. Building Q1-south is a fully enclosed, steel framed, sheet metal and concrete block structure that occupies an internal area approximately 20 ft x 26 ft and has an authorized capacity of 1,650 gallons of waste. The unit has a secondary containment system made of reinforced concrete and is equipped with 6-inch high curbing. Its secondary containment volume is approximately 1,600 gallons (taking obstacles and access ramps into consideration).

Access into Building Q1-south for both personnel and waste is gained via three (3) personnel access doors; (one at the front (west) of the unit, one on the north wall leading into Q1-north, and one on the back (east) wall leading into the Q1-extension); as well as a large roll-up door at the front (west) side of the building. A cinder block wall separates the Q1-south hazardous waste storage unit and the Q1-north portion of the building.

- ii. The Building Q1-extension is located on the eastern side of the Q1 complex. The extension is fully enclosed with concrete block walls both front and back (east and west, respectfully) and by steel framing and metal sheeting on the two sides and atop. Access to the extension for both personnel and waste can be achieved via the three (3) personnel access doors; a front door (west) - leading into Q1-south, a door on the north wall; and another on the back (east) wall; plus a roll-up door on the south side.

The Q1-extension occupies an area approximately 24 ft x 49 ft and has an authorized capacity to manage 4,950 gallons of hazardous waste. The unit is also equipped with a secondary containment system made of reinforced concrete with 6-inch high curbing. Its secondary containment volume is approximately 4,200 gallons (if void of obstacles and considering the access ramps) and the floor of the unit slopes on all sides toward its center.

b) Modular Addition Within the Building E11 Truck Bay

This permitted unit consists of a prefabricated modular structure located within the truck bay of Building E11. This modular structure is designated as E11 Modular Addition - Large (E11 MA-L) and has a total permitted capacity of 1,320 gallons.

- i. The E11 MA-L is a prefabricated modular structure located on the southwest side of the Building E11 truck bay. The dimensions are approximately 26 ft x 9 ft, and it has a manufacturer's capacity of 2,640 gallons. The E11 MA-L is constructed of steel (supports, walls and roof) and is equipped with a 7½ inch deep containment reservoir (capable of retaining 867 gallons) which is coated with a chemically resistant epoxy. The secondary containment reservoir is equipped with a polypropylene liner and is overlaid by removable fiberglass grates on which the containers of waste are placed. Access to the unit is via three sets of large double doors along the front of the structure. Waste is loaded and unloaded through these doors.

c) The Four Floor Vaults in the Building E4-Extension

There are six floor vaults located within the Building E4-extension, four of which have been designated for the management of mixed waste only. Each of these units has dimensions of 5 ft x 5 ft x 5 ft and are constructed of reinforced concrete and fitted with stainless steel liners. The vaults have a combined authorized capacity of approximately 2,600 gallons and each vault is equipped with a thick steel cover (which is only removable by crane).

d) The Building E11 Waste Processing Facility

This permitted unit is located in the Process Area Room located in the western end of Building E11. The permitted unit is approximately 36 feet wide by 46 feet long.

The building is a steel framed structure constructed on a concrete slab. The floor is covered with a chemically resistant epoxy. The floor is sloped to the center of the room and the authorized capacity for this facility is 7,180 gallons of waste. The facility has one vehicle access roll-up door on the east wall and two personnel access doors, one on the east wall and one on the west wall.

2. **Units Exempt from Permitting** -- The Knolls Laboratory manages hazardous and mixed waste in units that are exempt from permitting as specified in §373-1.1(d) (e.g., Satellite Accumulation Area (SAA) units, ≤90-day accumulation units, elementary neutralization units, etc.). Appendix G.2 outlines the protocols used at the Knolls Laboratory for establishing these permit exempt units. Contingency plan actions for emergencies within these established units will be the same as those for the permitted waste storage units provided herein. A listing of continuously operating exempt units is provided in Appendix G.3. This list, which presents information regarding each operating unit and its associated emergency equipment (where required), will be maintained up-to-date as part of the facility operating record. In case of an emergency requiring outside assistance, the updated list will be made available to off-site emergency responders. Updates to Appendix G.3 will be provided to the plan holders on the contingency plan distribution list as required by §373-2.4 and is not subject to the permit modification provisions of §373-1.7.

C. Waste Generation and Control

The Knolls Laboratory has historically generated various wastes, which are hazardous wastes identified and listed in 6 NYCRR Part 371 [40 CFR Part 261]. The Knolls Laboratory identifies/classifies its hazardous/mixed wastes within a number of general waste categories. Table 1 provides a listing of the general waste categories and a brief description of the types of waste that are covered under each category.

TABLE 1
KNOLLS LABORATORY WASTE CATEGORIES

CATEGORY	DESCRIPTION
Oils	Lubricating/cutting, pump, engine and hydraulic oils from maintenance/repair of various equipment and machinery, and remediation activities.
PCB Contaminated Waste	Waste material with PCB concentrations ≥ 50 ppm, meeting the criteria specified in 6 NYCRR §371.4(e).
Debris, Equipment and Solids	Discarded organic (e.g., paper, plastic, cloth, rubber) and inorganic (e.g., glass, metal, ceramic) debris, equipment, and solids containing or contaminated with materials/residues, cleaning/decontamination solutions, surface coatings, inherent hazardous waste, or solidified media.
Sludges and Particulates	Organic and inorganic system residues, sludges, particulates and paint chips from maintenance and remedial operations.
Aqueous Liquids and Slurries	Aqueous waste from laboratory, maintenance, decontamination and remedial operations.
Soils	Waste soils from maintenance, decontamination and remediation activities.
Solvents	Waste solvents from laboratory operations, maintenance, decontamination and remediation activities.
Miscellaneous Lab Chemicals	Small, lab-pack type wastes consisting of discarded portions of unused commercial chemical products, off-specification species, container residues, spill residues and minute laboratory wastes.

The use of hazardous materials at the Knolls Laboratory is limited to the types and quantities essential for operation. Hazardous material is used only by trained personnel. Hazardous materials are monitored during use and stored to prevent exposure of workers and release to the environment. Transportation and disposal off-site is limited to vendors/facilities operating under permits issued by the cognizant State and Federal regulatory agencies.

The entire developed portion of the Knolls Laboratory is enclosed with a fence to prevent accidental or unauthorized access. The main access gate is the primary entry point for routine deliveries, as well as personnel and visitor access. Other gates are available on a case-by-case basis for non-routine business and emergencies. Authorization for entry through any of the access points is controlled by security personnel, who provide continuous 24-hour coverage.

EMERGENCY DIRECTOR

A. Listing

The names, addresses and telephone numbers (office and home) of all persons designated to act as Emergency Director (ED) at the Knolls Laboratory are included on Table 2. If the Primary ED is not available, an Alternate ED should be contacted utilizing the Table 2, Emergency Director List.

B. Training and Responsibilities

The ED or Alternate ED (hereafter known collectively as the ED) is responsible for overall coordination of all response measures during an emergency. The ED typically manages the emergency from a base of operations located in the Knolls Laboratory Emergency Control Center (ECC). The ED has the authority to delegate responsibilities to other employees to assist in controlling the events of the emergency. The ED's training includes emergency preparedness, and knowledge of the site's emergency plan. An ED will always be "on-call" and will be reachable via telephone.

The Incident Commander (IC) acts as the coordinator of the emergency crew and is responsible for control of all activities at the scene during the incident. The IC's training includes knowledge of the site's emergency plan, effective utilization of safety equipment and communication devices, and the hazardous nature of the waste chemical constituents involved.

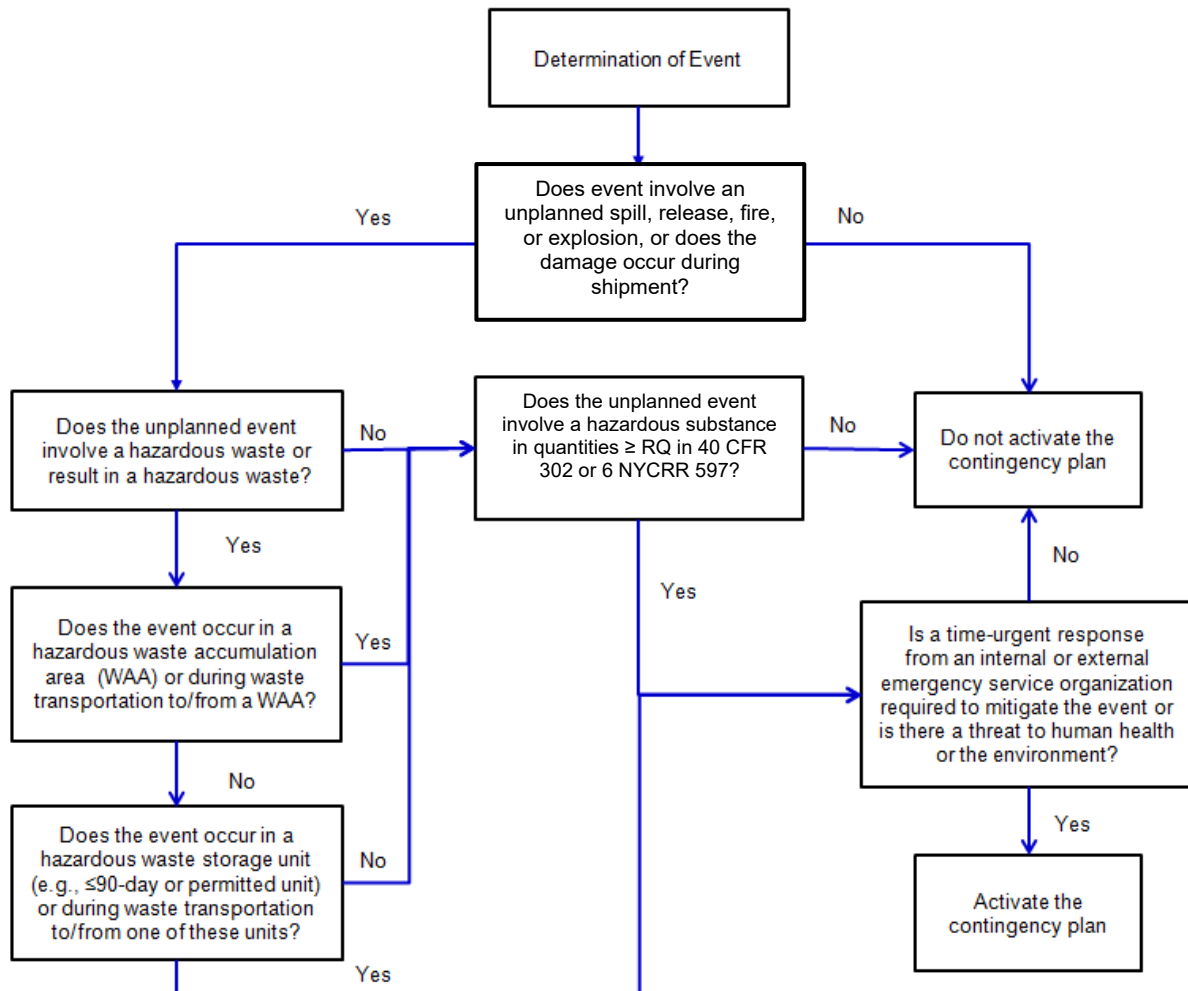
**TABLE 2
EMERGENCY DIRECTOR LIST**

Emergency Director	Prime/Alternate	Home Address	Phone Number
K.L. Kerr	Primary	91 Jones Road Saratoga Springs, NY 12866	(518) 395-6262 (W) (518) 764-3009 (C)
E.J. Lehane	Alternate	23 Deer Run Gansevoort, NY 12831	(518) 395-4323 (W) (518) 817-1353 (C)
D.P. Kammerer	Alternate	1 Sheldon Drive Ballston Lake, NY 12019	(518) 395-7238 (W) (843) 356-5179 (C)
K.F. DeRosa	Alternate	316 Jatski Dr. Ballston Spa, NY 12020	(518) 395-6155 (W) (518) 703-9220 (C)
P.R. Moore	Alternate	27 Pinewood Dr. Glenville, NY 12302	(518) 395-6230 (W) (518) 281-3799 (C)

IMPLEMENTATION

The purpose of this section is to provide guidance to the ED and the IC in making the decision to implement the contingency plan. The implementation of the contingency plan will occur when there is an imminent or actual situation that threatens human health and/or the environment. Such situations are: a fire or explosion, a sudden or non-sudden release of hazardous waste or hazardous constituents, or a flood. The judgment as to whether or not a release threatens human health or the environment shall be made by the IC in conjunction with the ED and other support personnel. In the case of mixed waste, the objective will be to utilize existing procedures for controlling the potential to release radioactivity in conjunction with the emergency procedures for hazardous materials defined herein. In any case, the primary objective will be protection of personnel and the environment consistent with all applicable requirements and procedures. Figure 2 provides a flow-chart summary of the steps provided in paragraphs A and B below.

**FIGURE 2
ACTIVATION OF THE CONTINGENCY PLAN**



A. Full Implementation of the Contingency Plan:

1. Fire and/or Explosion

- A fire or explosion that may cause the release of toxic material or fumes to the environment.
- A fire or explosion that may spread beyond immediate boundaries to outer areas of the Laboratory.
- A fire that threatens to spread to off-site areas.
- Use of water and chemical fire suppressant for a fire and/or explosion that results in contaminated runoff to the soil, or surface water.
- An explosion that could cause a safety hazard because of flying fragments or shock waves.

2. Unplanned Sudden or Non-sudden Releases, Spills, and/or Leaks of Hazardous Waste or Hazardous Constituents

- A spill or leak of hazardous waste or hazardous constituents that could result in release of flammable liquids or vapors, thus causing a fire or gas explosion hazard.
- A spill or leak of hazardous waste or hazardous constituents that could cause the release of toxic liquids or fumes beyond the immediate boundaries of the permitted unit to outer areas of the Laboratory.
- A spill or leak of hazardous waste or hazardous constituents that could result in extensive on-site contamination of soil, or surface water.
- A spill or leak of hazardous waste or hazardous constituents which cannot be contained on-site and could result in off-site soil and/or ground or surface water contamination.

3. Floods

The entire Knolls Laboratory is located above the 100-year flood plain. Therefore, floods are not a likely concern.

B. Partial Implementation of the Contingency Plan:

1. Any fire or explosion within a permitted unit that is of a minor controllable nature that poses no potential hazard to human health or the environment.
2. Any unplanned sudden or non-sudden release, spill, and/or leak of hazardous waste or hazardous constituents which when spilled becomes a hazardous waste, beyond the containment of a permitted unit but within the Laboratory boundaries and within the capabilities of Laboratory personnel (including Laboratory emergency responders) to respond.

Note: If a spill or a leak of hazardous waste or hazardous constituents occurs within or associated with a waste accumulation area (i.e., managed in accordance with §372.2(a)(8)) or of a minor nature within the confines of a permit-exempt unit (as outlined in Appendix G.2) or permitted unit, such that it is readily mitigated by trained/qualified waste handlers or waste chemical coordinators, and poses no threat to human health or the environment, then the contingency plan is not implemented.

EMERGENCY RESPONSE PROCEDURES

These emergency response procedures are not necessarily listed in order that they are taken, rather it may be necessary to perform some of these procedures simultaneously.

A. Notification Procedures

Any employee who discovers a fire or hazardous/mixed waste spill shall dial Extension 911 by landline on the local site phone network or activate the nearest fire pull box (either action will elicit prompt emergency action) or dial (518) 612-5599 by mobile phone.

Whenever there is an imminent or actual emergency situation, the ED, or persons designated by the ED to act on his/her behalf (e.g., the IC under the direction of the ED) will immediately activate internal facility alarms or communication systems, where applicable, to notify all Knolls Laboratory personnel.

[As owner of the Knolls Laboratory, USDOE Naval Reactors Laboratory Field Office (NRLFO) requires that the site-contracted operator notify NRLFO immediately of any occurrences involving hazardous/mixed waste.]

Based on input from the IC and/or an environmental advisor, the ED will recommend to the Fluor Marine Propulsion, LLC (FMP) and NRLFO Senior Management that notification is made to appropriate state or local agencies with designated response roles if their help is needed (See Table 3).

1. Immediate Notifications:

If the ED determines that the Knolls Laboratory has had a release, fire, or explosion, which could threaten human health or the environment outside the Laboratory (i.e., requiring full implementation of the contingency plan), the findings must be reported as follows:

Evacuation Notice: If the ED's assessment indicates that evacuation of local areas may be advisable, appropriate local authorities must be immediately notified. The ED or designee must be available to help appropriate officials decide whether local areas should be evacuated.

Spill Reporting: If there has been a spill or release of a hazardous waste/substance and it is determined that the spill may cause environmental damage or presents a human health hazard and/or exceeded any reportable quantity, the ED must immediately notify NYSDEC (using the New York State 24-hour oil and hazardous material spill notification number), the National Response Center (using their 24-hour toll free number), and the USEPA Region II, as appropriate. See Table 3 for the telephone listing. The information to be included during the notification is covered in §373-2.4(g)(4)(ii) and excerpted in Appendix G.1

2. Additional Notifications:

Following an emergency that required full implementation of the contingency plan, the Commissioner and appropriate State and local authorities must be notified that the facility is in compliance with §373-2.4(g)(8) before operations are resumed in the affected area(s) of the facility.

B. Identification of Hazardous Materials

As soon as possible after receiving notification of a release, fire or explosion, the ED will direct the IC to identify the character, exact source, amount and extent of any released materials. The IC may do this by observation or review of records or manifests and, if necessary, by chemical analysis.

Initial assessment includes the following parameters:

- Condition of the source (e.g., repairable leak, uncontrollable leak, easily moved, unmovable)
- Physical state of the release (e.g., solid [powder, pellet, granular], liquid or gas)
- Odor
- Color of material

- Obvious reactions (e.g., fuming, flaming or gas evolution)
- Approximate quantity of material released

C. Assessment

Concurrently, the ED or the IC, with input from an environmental advisor, will assess possible hazards to human health or the environment that may result from the release, fire or explosion. This assessment must consider both direct and indirect effects of the release, fire or explosion (e.g., the effects of any toxic, irritating or asphyxiating gases that are generated, or the effects of any hazardous surface water runoff from the water or chemical agents used to control fire and/or explosions).

Based on knowledge of the situation and existing conditions, the IC will evaluate the following and relay to the ED:

- Can Laboratory personnel control the emergency? If not, the ED will recommend to the FMP and NRLFO Senior Management that immediate notification be made to the appropriate local and state emergency agencies listed below:
 - Niskayuna Fire District No. 1911[†]
 - New York State Department of Environmental Conservation (NYSDEC) Region 4 (518) 357-2045
 - NYSDEC Spill Hotline (518) or (800) 457-7362
- Does the incident have the potential to affect the environment off-site? If so, the ED will recommend to the FMP and NRLFO Senior Management that contact be made to the following, as conditions warrant:
 - United States Coast Guard/National Response Center (NRC) (800) 424-8802
 - NYSDEC Spill Hotline (518) or (800) 457-7362
 - Director, Emergency Management - Schenectady County (518) 370-3113
 - U.S. Environmental Protection Agency Region II, Spill Hotline..... (732) 548-8730
- Is Laboratory evacuation necessary? If so, activate Evacuation Plan.
- If medical attention is required, a location will be designated as an on-site first aid station(s). If available, the first aid station in the on-site medical clinic is preferred. If a location is unsuitable, the Medical Director or Emergency Services and Systems (ESS)² will designate an alternate location.
- Is evacuation of local area advisable? If so, the ED will recommend to the FMP and NRLFO Senior Management that the necessary information be communicated to at least the following:
 - Knolls Laboratory SecurityExt. 4257
 - Town of Niskayuna Police Department911[†]
 - Director, Emergency Management - Schenectady County (518) 370-3113

The Knolls Laboratory has an external notification plan for releases of hazardous substances to the environment, which is detailed in Appendix G.1. The telephone listing for this plan is provided in Table 3.

² Emergency Services and Systems (ESS) is the Knolls Laboratory emergency response organization. ESS personnel, available on-site 24 hours per day Monday through Friday and on-call on weekends when coverage is minimal, are trained and equipped with appropriate emergency response equipment to respond to most Knolls Laboratory emergencies.

[†] 911 is dialed by "outside line" or by mobile phone unless otherwise noted.

All personnel providing information to outside response groups will do so only after the ED indicates the need and the FMP and NRLFO Senior Management concur with the contact. The person making such notification must include the required information listed in Appendix G.1.

D. Control Procedures/Emergency Response Plan

Each hazardous/mixed waste management unit has been designed/constructed and/or has had operating procedures established for the primary goal of preventing accidents and emergencies. However, the following emergency response procedures are necessary in order to be prepared for unpredictable circumstances, which are inherent in any business where risks, such as those described in the *IMPLEMENTATION* section, are present.

During an emergency, the ED will direct the IC to take all reasonable measures necessary to ensure that fires, explosions and releases do not occur, recur or spread to other areas of the Laboratory. These measures must include, where applicable, stopping operations, collecting and containing released waste, removing or isolating containers, and minimizing the amount of runoff. If operations stop in response to a fire, explosion or release, the ED must ensure that appropriate surveillance of the operations is conducted during the stoppage. Immediately after an emergency, cognizant Laboratory personnel must provide a means for treating, storing or disposing of recovered waste, contaminated soil, or any other waste materials that result from the emergency.

Should a fire, explosion or spill be of a minor controllable nature that poses no potential hazard to human health or the environment, the ED has the discretion whether or not to implement the emergency procedures outlined in this section. The ED will coordinate any necessary reporting, which is described in the *EVACUATION* section and in Appendix G.1.

All employees:

Any employee, who observes, discovers or otherwise detects an emergency involving a fire, explosion or release of hazardous/mixed waste to the air, soil or the environment, will sequentially follow these general emergency response procedures:

In case of an imminent or actual emergency, the person observing the incident will:

- Utilize the Knolls Laboratory's telephone, fire alarm system, go in person, or send a messenger to notify the appropriate area supervisor and/or ESS. ESS will ensure the ED is notified. The locations of the nearest fire pull boxes are:

<u>Waste Management Unit</u>	<u>Nearest Fire Pull Box Locations</u>
Q1 complex	Inside 1,650-gallon room adjacent to west door Inside 4,950-gallon room adjacent to both personnel doors
Modular Addition within the Building E11 Truck Bay	Inside the truck bay, south side, near the personnel access door
E4-Extension Floor Vaults	Inside the E4 Extension near the north personnel door
E11 Waste Processing Facility (WPF)	Adjacent to the west door

- Provide the responders with the location, nature and extent of the incident prior to any action being implemented. Alert other personnel in adjacent areas to potential hazards and inform the area supervisor by the quickest available means. This is done by dialing Ext. 911 by landline or contacting the area supervisor directly.
- Upon hearing the emergency alarm, local operations should stop, and all personnel should exit the workplace.

Incident Commander/Area Supervisor:

The IC and/or area supervisor will set up a command post and take control of the affected area. ESS personnel will arrive on the scene and provide the assistance and equipment necessary to control the incident.

Emergency Director:

The ED has the authority to commit necessary resources until the emergency has been eliminated and any clean up or restoration is completed. The ED will direct the IC to perform the following activities:

- Stop operations and ensure that the release is contained and collected.
- Determine the source and extent of the spilled materials. Assess the potential for primary and secondary hazards.
- Ensure that any materials spilled in the area are isolated from incompatible materials/wastes. Ensure that the site drainage system has been blocked in the immediate area and determine whether any material entered that system.

When a decision has been made to implement the full-scale contingency plan, the ED will direct:

- The IC to initiate containment and control procedures, and coordinate emergency medical services (if casualties are involved).
- An accounting of personnel/visitors (from the area of the incident) by head count and from review of the Site sign-in/sign-out registers.
- Implementation of internal notifications.
- Recommendations to the FMP and NRLFO Senior Management for notification to authorities and requests for assistance, as necessary.
- Activation of the Evacuation Plan described in the *EVACUATION PLAN* section, if required.

Emergency Services and Systems:

ESS will arrive at the scene, assess the situation, identify the materials and associated hazards, and then implement emergency response actions. In addition, ESS will ensure the ED is notified.

Emergency response actions will include:

1. If a fire exists, ESS will take the necessary actions to control the fire.

ESS will make use of available equipment to contain the fire (e.g., by applying water or foam as appropriate). ESS will make a determination of the proper material to apply based on the nature of the hazardous material involved, the potential for the material to spread, and the optimum means to stop the fire. The IC will keep the ED informed of decisions made at the scene:

- If required, ESS or the IC will initiate action to contact the local Fire Department and have them directed to the proper area.

- ESS will take appropriate steps to contain the fire. Other unnecessary personnel are removed from the area.
 - The ED will determine whether to shut down other site operations.
 - A head count is made as soon as practical.
2. In case of an explosion, local operations may be shut down. A fire alarm is sounded, and the following procedures are instituted:
- If no fire occurs, an investigation and head count is made as soon as practical.
 - An investigation of the cause of the explosion and whether it will recur is implemented.
 - Medical assistance is provided to injured personnel.
 - The ED, the IC and area supervisors are notified of any explosion.
3. If a spill, leak or other emergency has occurred, ESS will:
- a. Attempt to minimize the problem by stopping the leak, up-righting the container, transferring the material to a new container or, in other ways, gain control of the situation.
 - b. Cover any storm drains, or other release avenues in the vicinity with storm drain covers, apply Speedi-dry or other compatible absorbent materials.
 - c. Isolate the area with safety ropes and barriers, and request assistance from other supporting emergency team members.
 - d. Use whatever protective equipment is necessary to minimize exposure (e.g., respiratory protection, acid suits, rubber gloves and aprons).
 - e. Secure or establish ventilation, as necessary.
 - f. Monitor for leaks, pressure buildup, gas generation or rupture in valves, pipes, or other equipment, wherever this is appropriate.
 - g. Initiate cleanup.
 - The required corrective action for any particular spill or leak must be tailored to the properties and physical state of the material released. There are personnel specifically trained to assist in the radiological aspects of any potential mixed waste casualty.
 - Information on a particular waste may be obtained from the label, waste analysis, the manufacturer's Safety Data Sheets (SDS) or Material Safety Data Sheet (MSDS - Form OSHA-174 or equivalent), or other literary sources (e.g., Merck Index, Sax-Dangerous Properties of Hazardous Materials, etc.).
 - Site-wide emergency response procedures also include specific preplanned steps to be taken when certain classes of materials are released, whether or not the release originates from one of the waste storage units. These procedures, which emphasize environmental protection, are sometimes applicable to waste materials.

E. Prevention of Recurrence or Spread of Fires, Explosions or Releases

The ED will direct the IC to take all necessary steps to ensure that a secondary release, fire or explosion does not recur after an initial incident.

Procedures that will be carried out in the affected area include:

- Inspection for any leaks or cracks in drums.
- Inspection for gas or vapor generation, using appropriate available instrumentation [e.g., Dräger detector tubes, portable electronic multi-gas (CO, CO₂, O₂, etc.) detectors].
- Segregation of potentially incompatible residues.
- Isolation of all residual waste materials.
- Determination of the most appropriate containment or diking method if required: earthen dikes, excavation or diversion.
- Coordination of activities of supervisory personnel; maintaining constant communication with the response team.
- If a container holding a hazardous waste is not in good condition (e.g., structural damage) or leakage is occurring, the container will either be placed in an over pack or its contents transferred to another container.

Actions to isolate residual waste materials will first focus on segregation of incompatible wastes. As necessary, the IC may order temporary berms or barriers to be placed to segregate potentially incompatible waste residues; alternately, the IC may order in-situ neutralization of corrosive materials if these could contact and react with other incompatible materials and other segregation techniques are not available.

All operations that were initially shutdown in response to the incident will not be reactivated until the ED gives an "ALL CLEAR" signal.

F. Storage and Treatment of Released Material

Once an emergency situation requiring contingency plan implementation has ended, cleanup actions will be initiated (e.g., collection of the residues, and decontamination of the affected areas). Action is taken as soon as possible to prevent further contamination. Any containers that continue to leak after the initial control actions are taken are segregated as soon as possible and drained or repackaged as necessary.

If an occurrence should arise where a waste management location must be established during an emergency situation (i.e., waste that cannot be managed in a permitted unit), the Knolls Laboratory will take advantage of the existing regulations specified in §372.2(a)(8) [40 CFR §262.15] regarding management at the point of generation or in other units exempt from permitting requirements as specified §373-1.1(d)(1) (e.g., ≤90-day accumulation units, elementary neutralization units, etc.). The Laboratory may either utilize an existing unit or establish one utilizing the guidance, which can be found in Appendix G.2.

Absorbent materials expended for controlling spills are recovered and placed into appropriate compatible containers. These collection containers are then transferred to a suitable container for storage prior to disposal. A Waste Chemical Coordinator (WCC) will decide what containers should be used and how the containers must be labeled. Decontamination of any equipment used in recovering spill residues is covered in the *EMERGENCY RESPONSE PROCEDURES* section, *Post-Emergency Equipment Maintenance*.

Isolation and flushing of the spill area following the cleanup is performed under the direction of cognizant personnel. Water or another appropriate solvent is used to flush the area, and then collected for disposal in the same manner as other spill residues.

In the unlikely event that a spill entered the storm water system before the storm drains were covered, the site implements extensive internal procedures for checking discharge locations. Reporting of such incidents is done in accordance with the *REQUIRED REPORTS* section.

The Knolls Laboratory will manage all recovered waste in accordance with applicable waste management regulations and will assume the responsibilities of being the waste generator for all materials shipped off-site for treatment or disposal.

G. Incompatible Waste

There will be no storage of incompatible wastes in the location of the release. If necessary, during the clean-up procedures, temporary berms or barriers will be placed to temporarily segregate the material until cleanup is completed. In the affected area(s), the IC will ensure that no additional waste, which may be incompatible with the released material, is treated, stored and disposed of until clean up procedures are completed.

H. Post-Emergency Equipment Maintenance

Any contaminated clothing, footwear, personal protective equipment, and tools used during a remedial activity will either be decontaminated promptly and readied for future use or appropriately dispositioned and restored with a suitable replacement. Depending on the properties of the contaminant, water, cleansing solutions or solvents may be used. Safety Data Sheets and Material Safety Data Sheets are available as guides for the safe use of decontaminating agents.

Absorbent materials consumed during a cleanup are restocked and personal protective equipment is replaced as necessary. Spill kits are also restocked. If the emergency required the use of fire extinguishers, the units are replaced with charged units. If a pump was used, it is appropriately dispositioned. The affected floor area in the storage area will also be appropriately cleaned.

EMERGENCY EQUIPMENT

The Laboratory maintains a fire alarm system, communications system and emergency response equipment. Each waste management unit covered by this contingency plan has appropriate emergency equipment (dependent upon the waste types stored/accumulated) for the purposes of: automatic and manual notification of emergency type situations; addressing minor spills; and addressing minor (incipient stage) fires. If needed, supplemental equipment and supplies will be obtained from outside sources. Table 4 and Appendix G.3 identify the emergency equipment staged/available at the specific waste management units covered by this plan. The emergency equipment list will be updated as necessary to reflect any changes in the types of equipment available.

ESS has both emergency equipment³ and the training/ability to handle most incidents that may occur at the Knolls Laboratory. In addition, all ESS personnel are NYS Emergency Medical Technician (EMT) qualified.

³ ESS's emergency equipment is available to respond to all Laboratory emergencies. It is not dedicated solely for the mitigation of RCRA-type incidents. A general listing is provided in the latter portion of Table 4.

All emergency equipment listed in the contingency plan is either cleaned or replaced to the extent that it is available for its intended use before operations are resumed.

COORDINATION AGREEMENTS

The Knolls Laboratory has made arrangements with the local fire department and hospital organizations for their support during emergencies that exceed the on-site capabilities. These organizations are provided with copies of this contingency plan as required by §373-2.4(d)(2) [40 CFR §264.53(b)].

The local ambulance service, hospitals and physicians provide assistance as requested during an emergency situation. Periodic joint training sessions are conducted at Ellis Hospital.

Ambulance/Rescue Squad (Niskayuna Fire District)911†
Ellis Hospital..... (518) 243-4000

Niskayuna will supply fire assistance response and police protection if these services are requested in an emergency situation. Periodic joint training sessions are held at the Knolls Laboratory with Niskayuna Fire District No. 1.

Niskayuna Fire District No. 1911†
Niskayuna Police Department.....911†

If required, the Schenectady County HAZMAT Team or a commercial vendor will be called upon to assist with remedial activities (i.e., HAZMAT containment and cleanup).

TABLE 3

KNOLLS LABORATORY - EXTERNAL NOTIFICATION OF RELEASES OF HAZARDOUS SUBSTANCES TO THE ENVIRONMENT TELEPHONE LISTING

Emergency Contact	Phone Number
National Response Center (NRC)	(800) 424-8802
New York State Department of Environmental Conservation (NYSDEC) Spill Hotline	(518) or (800) 457-7362
New York State Department of Environmental Conservation (NYSDEC), Region 4	(518) 357-2045
U.S. Environmental Protection Agency Region II, Spill Hotline	(732) 548-8730
Niskayuna Police Department	911†
Niskayuna Fire Department	911†
Director, Emergency Management – Schenectady County	(518) 370-3113

† 911 is dialed by "outside line" or by mobile phone unless otherwise noted.

TABLE 4
EMERGENCY EQUIPMENT LIST

EQUIPMENT	CAPABILITY	Q1 Complex	E4 Ext.	E11 MA-L	E11 WPF
Fire Extinguishers (Portable)	Extinguish a small scale fire	■	■		■
Automatic Fire Suppression System	Includes sensors that activate an alarm and the fire suppression system to suffocate large scale fires and explosions	■ 1	■ 1	■ 2	■ 1
Communications Device (e.g. telephone, fire alarm pull box, public address system, etc.)	Internal and/or external communications to notify response personnel of an emergency	■	■	■ 3	■
Safety Shower	For emergency use in the event of personnel contact with corrosive, poisons, and fires	■			■
Eye Wash	For emergency use in the event of personnel eye and face contact with harmful chemicals	■		■ 4	■
Protective Clothing	Personal protective equipment for chemical/waste handlers as needed	■	■	■ 3	■
Spill Control Equipment	Spill neutralization, containment or absorbent as needed	■	■	■	■

Notes: ■ indicates applicability
 1 Water Sprinkler
 2 Dry Chemical
 3 Located within E11
 4 Not required if no waste in storage

TABLE 4
EMERGENCY EQUIPMENT LIST (continued)

The following additional equipment is available at the Knolls Laboratory for emergency use site-wide⁴:

Equipment	Capability	Location
Fire Truck	Mitigation of fires and releases	Bldg. Z5
Ambulance	On-scene treatment and transportation of injured personnel	Bldg. Z5
HazMat Trailer	Mitigation of hazardous materials releases	Bldg. Z5
Protective Clothing and Boots	Personal protective equipment	Bldg. Z5

EVACUATION PLAN

All of the waste management units specifically outlined within the main body of this contingency plan (e.g., the Building Q1 complex, the modular structure within the Building E11 truck bay, the E4-extension floor vaults and the E11 WPF) are all contained within four walls and have no obstructions to emergency egress such as stairs or inner walls. More specifically:

- The Building Q1 complex is equipped with a sufficient number of both personnel access doors and vehicle access (roll-up) doors to allow for means of egress.
- The modular addition located within the Building E11 truck bay, has a set of large loading doors on the front of the unit and the truck bay also has a sufficient number of both personnel access doors and vehicle access (roll-up) doors to allow for means of egress.
- The E4-extension waste management units consist of four vaults located in the floor. Each of these vaults is equipped with a heavy steel cover that is kept in the closed position unless adding or removing waste containers. The extension itself is equipped with a sufficient number of both personnel access and vehicle access (roll-up) doors.
- The E11 WPF has two personnel access doors, one on the east wall and one on the west wall, and a vehicle access roll-up door on the east wall to allow for means of egress.

If any emergency is detected by personnel within the waste management units, they would immediately make site notification by activating the fire pull box or using a phone and then leave the immediate area if they cannot safely address the emergency. If the water sprinkler systems in the Building Q1 complex, E4-extension or E11 WPF, or the dry chemical alarm system in the E11 MA-L are activated, ESS is notified automatically by alarms.

A. Release Options

The initial response to an unusual event will involve movement of people away from the immediate scene. Movement will vary depending upon the alarm type and location, but a public address announcement will communicate the movement that is required. After this immediate response, three options are available if further personnel movement is necessary.

⁴ This equipment is available to respond to all Laboratory emergencies and is not dedicated solely for the mitigation of RCRA-type incidents.

1. **Curtailment of Routine Operations** is a controlled movement of personnel from buildings and areas surrounding the scene of an emergency and/or a decision to interrupt routine/ongoing work. All of the personnel moved will remain within the Laboratory Security fence boundary.
2. **Early Release of Nonessential Personnel** is the curtailment of operations in which nonessential personnel are released from the Laboratory before the end of their normal workday. Released personnel may be directed to go to a designated assembly area or home. The purpose of an early release is to reduce Laboratory activity, provide greater concentration on the non-routine event, and keep the number of personnel who may be impacted to a minimum.
3. **Full-scale Site Evacuation** is when all nonemergency personnel are released from the Laboratory and directed to go to a designated assembly area or home. This release option will be used only when there is an unacceptable hazard to personnel safety on site, such as being above allowable Federal exposure limits for toxic materials.

B. Site Evacuation of Nonessential Personnel

The need for a full-scale evacuation of the Knolls Laboratory is extremely remote and would only be used to ensure the safety of nonessential personnel. In the unlikely event that hazardous conditions at a waste management unit should escalate, the early release procedure would most likely be expedited. If the ED determines, however, that the release, fire or explosion threatens the health of all Knolls Laboratory personnel, the ED will order the evacuation of all nonemergency personnel.

In any event, the ED is the only person authorized (after conferring with the FMP and NRLFO Senior Management) to call for a complete evacuation of the site in response to an emergency situation, which threatens the health and safety of Laboratory personnel.

Knolls Laboratory access is restricted. During an emergency, access to the site will be strictly limited to personnel required to respond to the emergency. A list of individuals allowed entry to the site during an emergency would be developed and provided to security personnel. Access to the site during such a situation will be limited to the listed persons, and local, State and Federal emergency response professionals specifically authorized by FMP.

The following procedures will be used in an evacuation:

1. The ED will notify the FMP and NRLFO Senior Management and then order the evacuation.
2. The ED will notify Supervisors who are responsible for supervising evacuation using preplanned or designated evacuation routes and respective assembly areas.
3. Supervisors must verify that all personnel in their areas have been contacted and have evacuated. Supervisors will then evacuate using preplanned or designated evacuation routes.

Following instructions from their cognizant managers/supervisors, personnel will either:

- Proceed south to the MAIN GATE (Primary Route) and assemble in the parking lot just south of the roadway (PRIMARY ASSEMBLY AREA); or

- For Lower Level personnel only -- Proceed northwest to the Lower Level Parking Area.

Alternate assembly areas may be established as necessary to address special situations, which may preclude the use of the primary areas.

In the event that the emergency has escalated to the point where evacuation of the local area (off-site) is advisable, then the ED will request the assistance of the Town of Niskayuna Police Department and the Schenectady County Emergency Management Director to accomplish this task.

REQUIRED REPORTS

The details of the required notifications are contained in the *EMERGENCY RESPONSE PROCEDURES* section, *Notification Procedures*. Details of the required reports are further described in Appendix G.1 of this attachment.

Operating Record: The ED will ensure that the time, date, and details of any incident that required implementing the contingency plan is recorded in the operating record.

Written Reports: A written report must be submitted to the Commissioner within 15 days after an incident requiring full implementation of the contingency plan in accordance with §373-2.4(g)(10). The report will include the required report content listed in Appendix G.1.

AMENDMENTS TO THE CONTINGENCY PLAN

The contingency plan will be reviewed and immediately amended, as necessary, whenever:

1. The plan fails in an emergency.
2. The applicable waste management unit changes in its design, operation, construction, maintenance or other circumstances that materially increases the potential for fires, explosions or releases of hazardous waste or hazardous waste constituents, or changes the response necessary in an emergency.
3. The list of Emergency Directors changes.
4. The list of emergency equipment changes.

The ED has the authority to change and/or modify the contingency plan as necessary. Modifications to the procedures or permitted units or changes to the ED list will be issued in accordance with the permit modification provisions of §373-1.7. In accordance with §373-2.4, information specific to permit exempt units will be submitted to contingency plan holders for information only.

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APPENDIX G.1

KNOLLS LABORATORY: EXTERNAL NOTIFICATION OF RELEASES **OF HAZARDOUS SUBSTANCES TO THE ENVIRONMENT**

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APPENDIX G.1

KNOLLS LABORATORY: EXTERNAL NOTIFICATION OF RELEASES OF HAZARDOUS SUBSTANCES TO THE ENVIRONMENT

1. GENERAL

These instructions summarize necessary steps for reporting releases of hazardous substances. These releases include oil or hazardous substance discharges. Actions will be taken by on-site Emergency Control personnel to ensure notifications are in accordance with applicable State and Federal regulations.

2. NOTIFICATION REQUIREMENTS

A. General Requirement

Several Federal and State statutes, regulations and guidance documents govern the notification requirements for spills or releases of hazardous substances and oils into the environment: navigable waters, surface and groundwater, drinking water supply, land surface, subsurface strata and ambient air. The ED must, as soon as knowledge is learned of a release of a hazardous substance or hazardous waste in excess of a reportable quantity (RQ) in any 24-hour period, report it by phone to the NRC, the NYSDEC Spill Hotline, and other local and State agencies as necessary and take actions as defined in 6 NYCRR §597.4. Oil releases to soil and/or water bodies, in any quantity, must be reported to applicable agencies, but may not necessarily require contingency plan implementation or follow-up written notification.

For releases that require full implementation of the contingency plan, the ED must immediately notify both NYSDEC (using the New York State 24-hour oil and hazardous material spill notification number) and either the government official designated as the on-scene coordinator for that geographical area (in the applicable regional contingency plan under 40 CFR Part 300), or the National Response Center.

B. Exemption from Notification

Notification is not required if the release is insufficient to trigger a requirement to notify under the applicable regulations and permits as described herein.

C. Description of Releases Which Must Be Reported

- 1) Hazardous substances include those materials designated as hazardous by 6 NYCRR Part 597, Superfund Act (including SARA release reporting requirements), Clean Water Act, Clean Air Act, Toxic Substances Control Act and RCRA. Most RQs are one pound except when a higher RQ has been established. A listing of all of the hazardous substances and statutory RQs is codified in 6 NYCRR Part 597 and 40 CFR Part 302.
- 2) Oil means oil of any kind, in any form, and is not limited to petroleum. Oil may be harmful if it violates applicable water standards, causes a film or sheen upon or discoloration of the surface of the water or causes a sludge or emulsion to be disposed beneath the surface of the water.

D. Reporting Procedure

- 1) The individual reporting a spill or release of oil or hazardous substance into the environment should be prepared to provide the following information in accordance with §373-2.4(g)(4)(ii) to the requisite State or Federal spill reporting hotline:
 - a. name and telephone number of reporter;
 - b. name and address of facility;
 - c. time and type of incident (e.g., release, fire);
 - d. name and quantity of material(s) involved, to the extent known;
 - e. the extent of injuries, if any; and
 - f. the possible hazards to human health, or the environment, outside the facility.
- 2) The individual reporting a spill or release should record the following information:
 - a. the time each agency was notified;
 - b. the name of the individual answering the call;
 - c. the unique designator number given by the agency to record the incident; and
 - d. any follow-up telephone calls.

Any special requests from the agencies, such as site visitations, material toxicology or personnel information should be brought to the attention of the ED. A duplicate of any sample requested must be retained at the Knolls Laboratory in case of a dispute or litigation.

E. Written Reports

In accordance with §373-2.4(g)(10), a written report of an incident requiring full implementation of the Contingency Plan must be submitted to the NYSDEC Commissioner within 15 days after the incident. The report will include:

- 1) name, address, and telephone number of the owner or operator;
- 2) name, address, and telephone number of the facility;
- 3) date, time, and type of incident (e.g., fire, explosion);
- 4) name and quantity of material(s) involved;
- 5) the extent of injuries, if any;
- 6) an assessment of actual or potential hazards to human health or the environment, where this is applicable; and
- 7) estimated quantity and disposition of recovered material that resulted from the incident.

APPENDIX G.2

GENERAL PROVISIONS FOR PERMIT EXEMPT UNITS

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APPENDIX G.2

GENERAL PROVISIONS FOR PERMIT EXEMPT UNITS

1. INTRODUCTION

This Appendix outlines provisions and guidelines for the establishment of units for the treatment/accumulation/storage of hazardous/mixed wastes that are exempt from 6 NYCRR Part 373 permitting requirements but require a contingency plan. For the purpose of this appendix, the term "*treatment*" is defined as:

- *Treatment* means treatment of hazardous/mixed waste that is exempt from the RCRA permitting requirements, in the same container used to accumulate the waste in compliance with the provisions outlined in §373-1.1(d)(1)(ix).

These provisions have been drafted to allow the establishment of such exempt units without having to amend the Knolls Laboratory's master contingency plan (Attachment G of the Knolls Laboratory Part B/373 permit). This is, of course, provided that the established unit does not require contingency provisions not outlined in the master contingency plan.

The exempt units covered within this Appendix include:

- satellite accumulation area units per §372.2(a)(8)(i);
- ≤90-day accumulation units per §372.2(a)(8)(ii);
- elementary neutralization units per §373-1.1(d)(1)(xii); and
- on-site ("*simple*") treatment units per §373-1.1(d)(1)(ix).

If the established unit requires contingency provisions not outlined in the master contingency plan, then it may not be established under these provisions. Should this be the case, one of the following must happen -- the unit cannot be established; a separate contingency plan must be written; or the master contingency plan must be amended.

2. Satellite Accumulation Area (SAA) Units

A. Regulations Governing This Type of Unit

In accordance with §372.2(a)(8)(i)(a), a generator may accumulate up to 55 gallons of hazardous/mixed waste or up to 1 quart or 1kg (2.2 lbs) (see applicable 40 CFR 262 requirements below for additional accumulation allowances) of acutely hazardous/mixed waste in containers at or near any point of generation where wastes initially accumulate, which is under the control of the operator of the process generating the waste, without a permit or interim status and without complying with §372.2(a)(8)(ii), provided the generator:

- Complies with §373.3-3.9(b)-(d); and
- Marks the containers as follows:
 1. with the words "hazardous waste",
 2. other words identifying the contents of the container, and
 3. indicates the hazards of the contents (see applicable 40 CFR Part 262 requirements below for additional markings).

In accordance with §372.2(a)(8)(i)(‘b’), a generator who accumulates at or near any point of generation either >55 gallons of hazardous/mixed waste or >1 quart or 1kg (2.2 lbs) (see applicable 40 CFR 262 requirements below for additional accumulation allowances) of acutely hazardous/mixed waste must, with respect to that amount of excess waste, perform one of the following within three days:

- move the waste to a permitted hazardous/mixed waste management unit;
- move the waste to an already operating established/approved ≤90-day accumulation unit;
- establish a new ≤90-day accumulation unit; or
- ship the waste to an approved, appropriately permitted off-site treatment, storage or disposal facility.

40 CFR Part 262 applicable regulations⁵

- §262.15(a) states, a generator may accumulate as much as...1 kg (2.2 lbs) of solid acute hazardous waste...in containers at or near any point of generation where wastes initially accumulate...
- §262.15(a)(5)(ii) states, an indication of the hazards of the contents. Examples include but are not limited to:
 - Listing the applicable hazardous waste characteristic;
 - Hazard communication consistent with DOT requirements at 49 CFR 172 subpart E (labeling) or subpart F (placarding);
 - A hazard statement or pictogram consistent with OSHA Hazard Communication Standard at 29 CFR 1910.1200; or
 - A chemical label consistent with NFPA code 704.
- §262.15(a)(8) states, all satellite accumulation areas operated by a large quantity generator must meet the Preparedness, Prevention, and Emergency Procedures in subpart M of 40 CFR Part 262.

B. Satellite Accumulation Area Unit Provisions

The accumulation of hazardous/mixed waste for SAAs must adhere to the guidelines cited in Section VII below. Provisions specific to this unit include:

- Upon exceeding the amounts listed above, within three days, comply with 372.2(a)(8)(ii).
- During the three-day period, the container must continue to comply with 372.2(a)(8)(i)(a) in addition to marking the container with the date the excess amount began accumulating.
- If the waste is to be transported off-site directly from the accumulation unit, then the labeling and marking requirements in 372.2(a)(5) [40 CFR 262.31] and 372.2(a)(6) [40 CFR 262.32], respectively, must be followed.

The contingency plan requirement of 40 CFR 262.15(a)(8) is fulfilled by the Knolls Laboratory master contingency plan.

⁵ The Hazardous Waste Generator Improvement Rule implemented regulations that are more stringent than current NYSDEC regulations and therefore have no New York State regulatory equivalent.

3. ≤90-DAY ACCUMULATION UNITS

A. Regulations Governing This Type of Unit

In accordance with 372.2(a)(8)(i)(‘b’), a generator who accumulates at or near any point of generation either >55 gallons of hazardous/mixed waste or >1 quart or 1 kg (2.2 lbs) (see applicable 40 CFR Part 262 requirements below for additional accumulation allowances) of acutely hazardous/mixed waste must, with respect to that amount of excess waste, perform one of the following within three days:

- move the waste to a permitted hazardous/mixed waste management unit;
- move the waste to an already operating established/approved ≤90-day accumulation unit;
- establish a new ≤90-day accumulation unit; or
- ship the waste to an approved, appropriately permitted off-site treatment, storage or disposal facility.

The requirements applicable to ≤90-day accumulation units at the Knolls Laboratory are outlined in 373-1.1(d)(1)(iii) and (iv). The contingency plan requirement is fulfilled by the Knolls Laboratory master contingency plan.

Note: In addition to the labeling requirement found at 6 NYCRR 373-1.1(d)(1)(iii)(c)(3), 40 CFR 262.17(a)(5)(i)(B) is more stringent and shall be followed. The labeling requirements for ≤90-day accumulation units would be as follows:

- 1) the words “hazardous waste”,
- 2) other words identifying the contents of the container, and
- 3) indication of the hazards of the contents (see applicable 40 CFR 262 requirements below for additional markings).

40 CFR Part 262 applicable regulations⁵

40 CFR 262.17(a)(5)(i)(B) states:

- an indication of the hazards of the contents. Examples include but are not limited to:
 - Listing the applicable hazardous waste characteristic;
 - Hazard communication consistent with DOT requirements at 49 CFR §172 subpart E (labeling) or subpart F (placarding);
 - A hazard statement or pictogram consistent with OSHA Hazard Communication Standard at 29 CFR §1910.1200; or
 - A chemical label consistent with NFPA code 704.

⁵ The Hazardous Waste Generator Improvement Rule implemented regulations that are more stringent than current NYSDEC regulations and therefore have no New York State regulatory equivalent.

B. ≤90-day Accumulation Unit Provisions

The accumulation of hazardous/mixed waste for ≤90-days must adhere to the guidelines cited in Section VI below. Provisions specific to this unit include:

- Upon completion of the unit's operational lifetime, the unit must be closed in accordance with the applicable closure standards in 373-1.1(d)(1). Documentation of such closure is to be generated and forwarded to the Knolls Laboratory WCC.
- If the waste is to be transported off-site directly from the accumulation unit, then the labeling and marking requirements in 372.2(a)(5) [40 CFR 262.31] and 372.2(a)(6) [40 CFR 262.32], respectively, must be followed.

4. ELEMENTARY NEUTRALIZATION/WASTEWATER TREATMENT UNITS

A. Regulations Governing This Type of Unit

In accordance with 373-1.1(d)(1)(xii), elementary neutralization units (ENU) and wastewater treatment units that are only used to neutralize or treat hazardous waste resulting from the recycling of hazardous wastes or from the reclamation of precious metals from hazardous wastes are exempt from the Part 373 permitting requirements. Elementary neutralization units and wastewater treatment units that are used to commercially neutralize or treat hazardous wastes, generated only at geographically contiguous sites, and transported via dedicated pipelines are also exempt.

B. ENU Provisions

Neutralization of corrosivity characteristic hazardous waste (D002) must adhere to the guidelines cited in Section 6 below.

5. ON-SITE ("SIMPLE") TREATMENT UNITS

A. Regulations Governing This Type of Unit

This portion covers the on-site treatment of hazardous/mixed waste, by the generator, in the same tanks or containers that are used for accumulation and storage of such wastes. Exempt units must comply with the requirements of 373-1.1(d)(1)(ix). Any treatment or placement of hazardous/mixed waste in a manner that constitutes land disposal, as defined in subdivision 370.2(b), does not qualify for this exemption.

B. On-Site ("Simple") Treatment Unit Provisions

Treatment of hazardous/mixed waste on site in the same tanks or containers that are used for accumulation and storage of such wastes must adhere to the guidelines cited in the ≤90-day accumulation unit provisions outlined above and those in Section VI below

6. GENERAL PROVISIONS FOR ALL PERMIT EXEMPT UNITS (Except SAA Units)

The following guidelines are applicable to all exempt units established under this appendix. These guidelines are in addition to any specific requirements stated in the previous sections of this Appendix.

- A. Each unit and its staging location must be approved by the Knolls Laboratory WCC or designee prior to its establishment.
- B. The container management requirements outlined in 373-3.9 must be followed.
- C. All areas and containers used to manage (treat or store/accumulate) the hazardous/mixed waste must be labeled/marked as such:
- 1) with the words "*Hazardous Waste*",
 - 2) other words identifying the contents of container, and
 - 3) an indication of the hazards of the contents. Examples include but are not limited to:
 - Listing the applicable hazardous waste characteristic;
 - Hazard communication consistent with DOT requirements at 49 CFR §172 subpart E (labeling) or subpart F (placarding);
 - A hazard statement or pictogram consistent with OSHA Hazard Communication Standard at 29 CFR §1910.1200; or
 - A chemical label consistent with NFPA code 704.
- D. Personnel working within or operating the unit must be trained in accordance with the training requirements outlined in 373-3.2.
- E. The date on which each period of accumulation begins (*accumulation start date*) must be clearly marked and visible for inspection.
- F. The requirements for preparedness and prevention outlined in 373-3.3 must also be followed.
- G. Areas established for simple treatment and neutralization would remain open only as long as required to perform a specific treatment evolution (typically <1 day to 1 week). Some ≤90-day areas may also be needed for short-term storage. The "Exempt Unit Emergency Equipment List" (Table G.3-1) will not be modified for these 'temporary' units. Temporary is defined as less than one year.
- H. The location and type of each unit placed into service (including temporary units) must be recorded in the facility operating record. In addition, the emergency equipment associated with each unit (where required) must be added to the facility operating record. This will ensure that an up-to-date listing is available to on-site emergency response organizations (e.g., ECC and ESS) as well as for use by off-site emergency response organizations.

The ED has the authority to change and/or modify the contingency plan as necessary. Modifications to the procedures or permitted units or changes to the ED list will be issued in accordance with the permit modification provisions of 373-1.7. Updates to Appendix G.3 will be provided to the plan holders of the contingency plan distribution list as required by 373-3.4 and is not subject to the permit modification provisions of 373-1.7.

7. GENERAL PROVISIONS FOR SATELLITE ACCUMULATION AREA UNITS

The following guidelines are applicable to Satellite Accumulation Area units established under this appendix. These guidelines are in addition to any specific requirements stated in the previous sections of this Appendix.

- A.** Each unit must be on the approved list maintained by the waste engineering group.
- B.** The container management requirements outlined in 372.2(a)(8)(i)(a)(1).
- C.** Waste accumulation areas must be posted as such. All containers used to manage the hazardous/mixed waste must be labeled/marked as such:
 - 1)** with the words "Hazardous Waste",
 - 2)** other words identifying the contents, and
 - 3)** an indication of the hazards of the contents. Examples include but are not limited to:
 - Listing the applicable hazardous waste characteristic;
 - Hazard communication consistent with DOT requirements at 49 CFR §172 subpart E (labeling) or subpart F (placarding);
 - A hazard statement or pictogram consistent with OSHA Hazard Communication Standard at 29 CFR §1910.1200; or
 - A chemical label consistent with NFPA code 704.
- D.** The requirements for preparedness and prevention outlined 40 CFR 262 Subpart M must be followed.
- E.** The location of each SAA placed into service (including temporary units) must be recorded on the waste engineering organization's approval list. In addition, the emergency equipment associated with each unit (where required) must be indicated on the SAA inspection checklist. This will ensure that an up-to-date listing is available to on-site emergency response organizations (e.g., ECC and ESS) as well as for use by off-site emergency response organizations should this information be needed.

The ED has the authority to change and/or modify the contingency plan as necessary. Modifications to the procedures or permitted units or changes to the ED list will be issued in accordance with the permit modification provisions of 373-1.7. Updates to Appendix G.3 will be provided to the plan holders of the contingency plan distribution list as required by 373-3.4 and is not subject to the permit modification provisions of 373-1.7.

APPENDIX G.3
CONTINUOUSLY OPERATING PERMIT
EXEMPT UNIT EMERGENCY EQUIPMENT LIST

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TABLE G.3-1
CONTINUOUSLY OPERATING PERMIT EXEMPT UNIT EMERGENCY EQUIPMENT LIST

EQUIPMENT	CAPABILITY	E11	Q1 ≤90
Fire Extinguishers (Portable)	Extinguish a small-scale fire	■	
Automatic Fire Suppression System	Includes sensors that activate an alarm and fire suppression system to suffocate large-scale fires and explosions	■ 1	■ 2
Communications Device (e.g., telephone, fire alarm pull box, public address system)	Internal and/or external communications to notify personnel of an emergency	■	■
Nearest Fire Alarm Pull Box Location		South exit door	Located outside Q1 west side
Safety Shower	For emergency use in the event of personnel contact with harmful chemicals		
Eye Wash	For emergency use in the event of personnel contact with harmful chemicals	■	■
Protective Clothing (e.g., face shields, gloves, lab coats and aprons)	Personal protective equipment for chemical/waste handlers, as needed	■	■
Spill Control Equipment (e.g., soda ash, inert absorbents)	Spill neutralization, containment or absorbent	■	■

Notes:

- Indicates applicability
1 Water Sprinkler
2 Dry Chemical

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KNOLLS ATOMIC POWER LABORATORY

KNOLLS LABORATORY

CONTINGENCY PLAN QUICK REFERENCE GUIDE

EPA I.D. NUMBER NY 6890008992

**6 NYCRR PART 373 PERMIT
NUMBER**

4-4224-00024/00001

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§262.262(b)(1): Types/Names of hazardous wastes and the hazard associated with each waste.

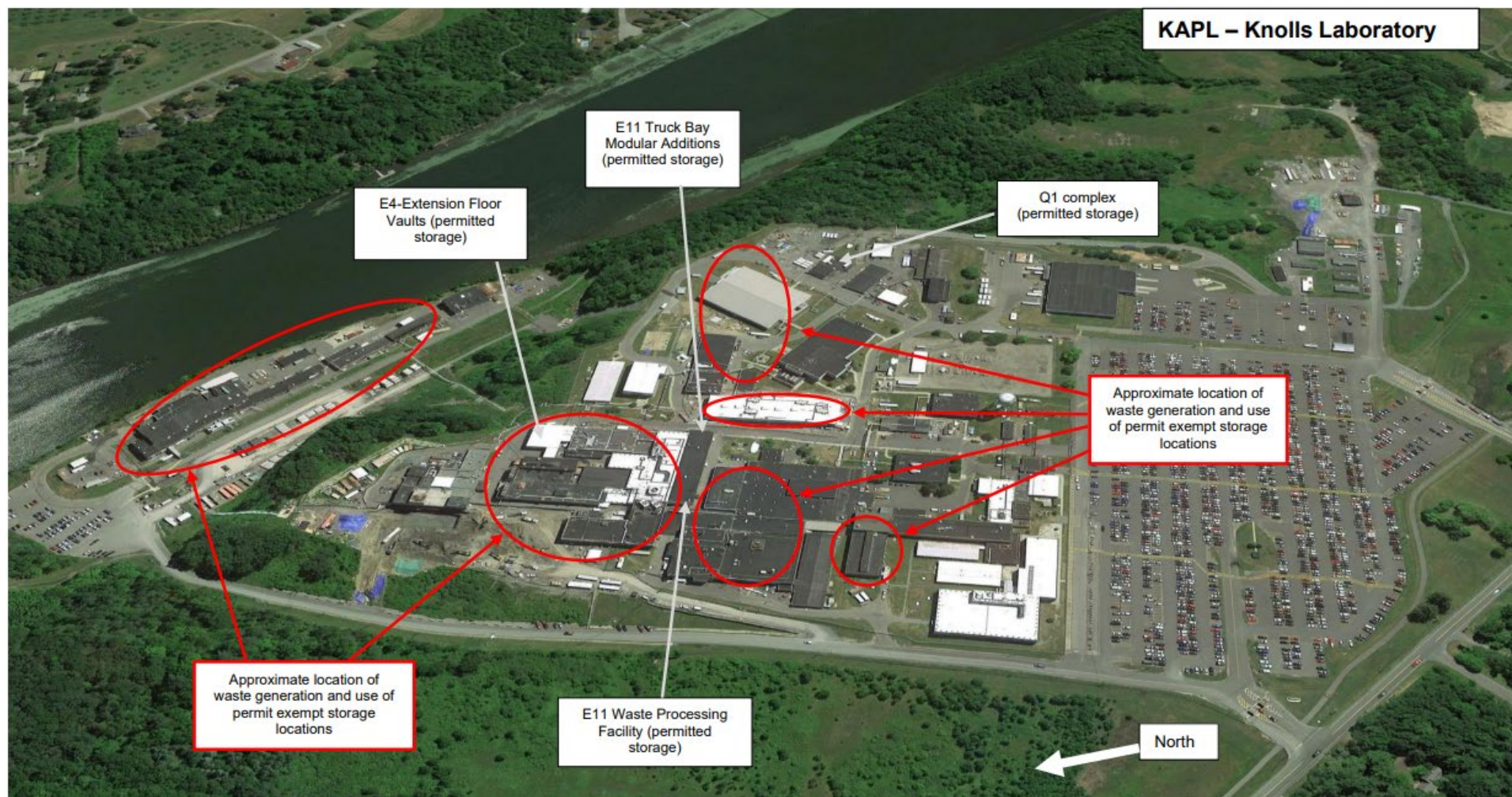
§262.262(b)(2): The estimated maximum amount of each hazardous waste present at any one time

§262.262(b)(3): Identification of any hazardous wastes where exposure would require unique or special treatment by medical staff

KNOLLS LABORATORY WASTE CATEGORIES

CATEGORY/TYPE	DESCRIPTION/HAZARD	Estimated maximum amount on-site at any one time	Special medical treatment required
Oils	Lubricating/cutting, pump, engine and hydraulic oils from maintenance/repair of various equipment and machinery, and remediation activities. Waste oils may be contaminated with low concentrations of toxic metals and solvents that are ignitable and/or toxic. All oils are combustible.	< 2,000 lbs.	None
PCB Contaminated Waste	Waste material with PCB concentrations \geq 50 ppm, meeting the criteria specified in 6 NYCRR §371.4(e). Concentrations of PCBs \geq 50 ppm are hazardous waste in New York State.	< 2,000 lbs.	None
Debris, Equipment and Solids	Discarded organic (e.g., paper, plastic, cloth, rubber) and inorganic (e.g., glass, metal, ceramic) debris, equipment, and solids containing or contaminated with materials/residues, cleaning/decontamination solutions, surface coatings, inherent hazardous waste, or solidified media. This material may contain RCRA toxic metals, organic compounds, oxidizers, and/or corrosives.	< 500 lbs.	None
Sludges and Particulates	Organic and inorganic system residues, sludges, particulates and paint chips from maintenance and remedial operations. This material may contain RCRA toxic metals, organic compounds, oxidizers, and/or corrosives.	< 500 lbs.	None
Aqueous Liquids and Slurries	Aqueous waste from laboratory, maintenance, decontamination and remedial operations. These liquids may contain acidic aqueous solutions, corrosives wastes, RCRA toxic metals, and/or organic compounds.	< 800 lbs.	None
Soils	Waste soils from maintenance, decontamination and remediation activities. These materials may contain organic compounds, RCRA toxic metals, and/or asbestos.	< 6000 lbs.	None
Solvents	Waste solvents from laboratory operations, maintenance, decontamination and remediation activities. The solvents maybe hazardous due to ignitability, corrosivity, reactivity, toxicity, being an oxidizer, and/or containing RCRA toxic metals.	< 50 lbs.	If in eyes, wash eyes for several minutes, consult SDS for medical treatment information
Miscellaneous Lab Chemicals	Small, lab-pack type wastes consisting of discarded portions of unused commercial chemical products, off-specification species, container residues, spill residues and minute laboratory wastes. These wastes may contain wastes that are hazardous due to ignitability, corrosivity, reactivity, toxicity, being an oxidizer, and/or containing RCRA toxic metals.	< 500 lbs.	If in eyes, wash eyes for several minutes, consult SDS for medical treatment information

§262.262(b)(4): Map showing locations of where hazardous wastes are generated, accumulated, and treated



§262.262(b)(5): Street map of the facility in relations to surrounding businesses, schools, and residential areas



§262.262(b)(6): locations of water supply (e.g., fire hydrants and flow rates)

The Knolls Laboratory has a private fire service main with fire hydrants located throughout the laboratory. Water for the private fire service main is supplied from the Town of Niskayuna water supply with and supplemented by an on-site water tower. The entire fire service main and its appurtenances are inspected, tested, and maintained in accordance with current New York State fire codes.

§262.262(b)(7): the identification of on-site notification systems (e.g., a fire alarm that rings off site, smoke alarms)

The Laboratory maintains a fire alarm system, communications system and emergency response equipment. Fire alarms ring at the Knolls Laboratory on-site Emergency Services and Systems (ESS) Organization for immediate response. No alarms ring off site to alert outside fire departments. The on-duty ESSO captain or Emergency Director listed below will request off-site assistance during an emergency. The on-site Knolls ESS Organization has both emergency equipment¹ and the training/ability to handle most incidents that may occur at the Knolls Laboratory. In addition, all ESS personnel are NYS Emergency Medical Technician (EMT) qualified.

The Knolls Laboratory has a full site communication system for delivering information on localized alarms, building or site evacuations, and other emergency information. In addition to fire hydrants and a full site communication system, the entire site is protected by a fire suppression system such as ceiling fire sprinklers or halon systems in select areas.

Each waste management unit covered by the contingency plan has appropriate emergency equipment (dependent upon the waste types stored/accumulated, and if space is readily available to safely store emergency equipment) for the purposes of automatic and manual notification of emergency type situations, addressing minor spills, and addressing minor (incipient stage) fires. If needed, supplemental equipment and supplies will be obtained from other storage locations within the laboratory or outside sources.

¹ ESS' emergency equipment is available to respond to all Laboratory emergencies. It is not dedicated solely for the mitigation of RCRA-type incidents. A general listing is provided in Table 4 of the Knolls Laboratory Contingency Plan.

262.262(b)(8): The names of emergency coordinators and 7/24-hour emergency telephone numbers

Emergency Director	Prime/Alternate	Phone Number
K.L. Kerr	Primary	(518) 395-6262 (W) (518) 764-3009 (C)
E.J. Lehane	Alternate	(518) 395-4323 (W) (518) 817-1353 (C)
D.P. Kammerer	Alternate	(518) 395-7238 (W) (843) 356-5179 (C)
K.F. DeRosa	Alternate	(518) 395-6155 (W) (843) 703-9220 (C)
P.R. Moore	Alternate	(518) 395-6230 (W) (843) 281-3799 (C)

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KNOLLS ATOMIC POWER LABORATORY

KNOLLS LABORATORY

Attachment H Personnel Training

EPA I.D. NUMBER NY 6890008992

**6 NYCRR PART 373 PERMIT
NUMBER
4-4224-00024/00001**

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INTRODUCTION

The information included herein is presented in accordance with the requirements of 6 NYCRR 373-1.5(a)(2)(xii) and 373-2.2(h) [270.14(b)(12) and 40 CFR 264.16]. This attachment describes the training plan to be used to ensure proper operation of the Knolls Laboratory permitted hazardous and/or mixed waste management units to preclude hazards to human health and the environment.

A. General Training Concept

Training is essential to the safe and efficient operation of all facility processes and to ensure rapid and effective responses to emergency conditions. It is KAPL policy that all employees associated with the permitted units be trained in a manner which emphasizes accident prevention to safeguard human health and the environment. An outline of the waste management training provided to hazardous/mixed waste management unit operations personnel is included as Appendix 1. Appendix 2 outlines the training provided to support personnel who transfer wastes to and from the units, and Appendix 3 outlines the training provided to emergency response personnel. The program outlined below discusses the training pertaining to employees who have various responsibilities regarding the operation of the Knolls Laboratory hazardous and/or mixed waste management units covered under this permit.

Each new employee involved in waste handling at a permitted hazardous and/or mixed waste management unit or in a support role is instructed in the emergency procedures which are to be followed in the event of an incident. No employee is permitted to work unsupervised until their supervisor or a Waste Chemical Coordinator (WCC) has certified their successful completion of all elements of the training program applicable to their position. A certification of training completion will occur within six months of the new employee's entry into a specific job or after being assigned to a new position in the case of an existing employee. In addition, every employee will participate in annual refresher training to maintain proficiency.

B. Position Descriptions

The operation of the Knolls Laboratory results in the generation and storage of small quantities of hazardous and/or mixed wastes, which require handling by skilled operations personnel. Training is tailored to prepare each employee to safely and effectively perform the functions of their assigned position.

Position descriptions, including job functions and responsibilities regarding permit-related hazardous and/or mixed waste management, are kept on file as part of the facility's operating record. Table 1 provides a summary of position responsibilities.

TABLE 1
EMPLOYEE POSITIONS/RESPONSIBILITIES

EMPLOYEE POSITION	POSITION RESPONSIBILITY
Waste Chemical Coordinator (WCC)	Provide administrative and technical support for the permit-related hazardous and/or mixed waste management programs. Responsibilities include: handling, transportation requirements, sampling, recordkeeping, vendor coordination, disposition of hazardous and/or mixed wastes in compliance with applicable regulations, and all administrative requirements (e.g., manuals, contracts, quality assurance, and required operating records).
Supervisor	Supervise operations personnel (e.g., Waste Processor(s), Material/ Waste Handlers, etc.) working within the permitted waste management unit. Maintain records, log books and perform required inspections.
Waste Processor	Physical handling of waste containers in transit to the permitted hazardous and/or mixed waste management units from on-site locations, and within the waste management units. Prepares waste chemicals for proper storage and shipment for off-site disposition and assists with maintenance of records and log books.
Material/Waste Handler	Physical handling of waste containers during transit to the permitted hazardous and/or mixed waste management units from on-site locations, loading of waste containers onto vehicles for shipment off-site, and performs associated support duties (i.e., rigging, lifting and handling, etc.).
Drivers, Material Distribution	Responsible for on-site transportation of chemical waste.
Emergency Responders	Provides emergency response capability in the event of a spill, fire or other sudden release.

C. Training Program

Personnel currently employed in the hazardous and/or mixed waste management positions listed in Table 1 have been trained and are fully certified. Certification is attained through completion of training in accordance with this attachment. Furthermore, these personnel will undergo annual refresher training pursuant to this plan. All new hazardous and/or mixed waste management employees will be required to complete this same training and certification process.

1. Scope of Training for New Personnel

Each new employee involved in hazardous and/or mixed waste management at one or more of the Knolls Laboratory permitted waste management units will undergo job specific training to properly prepare them for their assigned positions. Training for waste management unit operations personnel (e.g., WCCs, Supervisors, and Waste Processors) may include topics in each of the following five categories depending on the responsibilities assigned to the individual being trained: control and handling of

hazardous waste, types of chemicals and hazards, sampling protocols, emergency response training, and specific Knolls Laboratory waste management procedures. Training relative to other support positions (e.g., material handlers, waste transport personnel, etc.) will include some, but may not include all aspects of the aforementioned topics. However, all training will include instruction in emergency response procedures.

Training for new employees, and/or those employees who have changed job positions, will be completed within 6 months of their employment or transfer to a new position. These employees will not be allowed to work with waste at a permitted waste management unit unsupervised until they have successfully completed training.

2. Training Program Administration

The selection of qualified instructors, the use of effective training formats, and establishment/use of meaningful methods for evaluating an employee's learning are critical. These considerations are described herein.

a. Training Personnel Qualifications

The WCCs are responsible for the hazardous and/or mixed waste management training program for personnel directly involved in the day-to-day operations of the permitted hazardous and/or mixed waste management units. The WCC may designate specific individuals to carry out portions of the training program. These individuals are recognized as in-house experts for that portion of the training and are familiar with waste management procedures at the Knolls Laboratory.

The job qualifications for the WCC positions are as follows:

- i. Have an appropriate degree or a number of years' experience, and associated knowledge. Specific experience in environmental, safety and health training is preferred.
- ii. Be knowledgeable in hazardous and/or mixed waste management related subjects, such as:
 - (1) Chemical and physical agent hazard characteristics and the common source of these agents;
 - (2) Hazardous and/or mixed waste sampling, characterization, storage, processing and disposal;
 - (3) Environmental, safety and health related legislation, regulations and standards; and
 - (4) Emergency response actions including—hazard recognition, accident prevention techniques, contingency planning, and accident/incident analysis.

b. Training Formats

Training is conducted in classroom meetings, and at an employee's work station (i.e., "on-the-job" training).

Classroom training is most effective when several employees are trained at the same time. Sufficient time for questions and answers is planned so that all participants have the opportunity to clarify their understanding and broaden their knowledge. For some training, courses and teaching materials developed by vendors may be used.

On-the-job training is a teaching format utilized wherever practical. In this format, the employee's supervisor may be designated by a WCC as the individual responsible for assuring that the new employee learns the correct procedures; can perform them accurately, reliably and efficiently; and that safety awareness is incorporated into each task. It would be the responsibility of the supervisor to assist with the instruction and observation of their assigned employees in each task and to evaluate their performance.

c. Training Effectiveness Evaluation

As indicated above, training goals are measured by performance of specific tasks. This demonstrates employee proficiency in actual hands-on situations. The trainer must certify that the employee has successfully completed the training program and file such certification as part of the operating record.

d. Certification of Employees

No employee may perform unsupervised work at the facility until certified as fully trained by a WCC or supervisor. Certification is earned through completion of the training program. The record of certification will be on forms developed to address the applicable topics outlined in Appendices 1, 2, or 3. The information entered on the forms will include the employee's name, position, permitted hazardous and/or mixed waste management unit(s) qualified to work in, date assigned to position, and date qualified. The trainer(s) will certify satisfactory completion for each topic applicable to that employee position.

e. Employee Feedback

Trainee (employee) comments and constructive criticism of the training programs are encouraged throughout the entire training process. These comments are used by the trainers to constantly modify and improve the training program scope, content and format as appropriate.

3. Training Categories

The Lesson Plan followed in training an employee who will be involved in the day-to-day operations of one or more of the Knolls Laboratory permitted hazardous or mixed waste management units has been divided into five main categories. The five categories are: control and handling of hazardous and/or mixed waste, types of chemicals and hazards, sampling protocols, emergency response training, and specific Knolls Laboratory waste management procedures. The main objective stressed throughout the training program is to prepare the employee to perform their job both safely and efficiently.

a. Controlling and Handling of Hazardous Waste

This lesson plan pertains mainly to the proper handling, packaging, and internal waste transportation procedures. It teaches the necessary safety measures to be taken when handling different types of hazardous and/or mixed waste such as acids, alkali's, solvents, and oxidizers. Personnel are also made aware of the proper packaging and labeling suitable for various types of waste they may encounter. Appropriate storage protocols for the various hazardous and/or mixed waste stored in the permitted waste management unit(s) is also an important aspect of the training.

b. Types of Chemicals and Hazards

A strong emphasis is placed on teaching the employee about the various types of chemical waste which are generated on-site and the precautions which should be taken when working with any of them. This training includes information about the waste streams produced on site, their sources, the concerns associated with chemical concentrations which are commonly found at the Knolls Laboratory, the health concerns in the event of a spill, and the precautions that should be taken when working with chemical wastes, such as personal protective equipment (e.g., gloves, aprons, etc.).

c. Sampling Protocols

All permit-related hazardous and/or mixed waste management unit personnel who draw samples for waste analyses purposes shall meet, as a minimum, the following training requirements:

- Individuals must be trained via discussions with a WCC or supervisor regarding the sampling procedures applicable to various waste streams.
- Individuals must take at least one sample under the observation of a WCC, followed by a discussion of the factors which can affect the validity of samples and analyses.
- Individuals must demonstrate an understanding of the importance of and the mechanism for maintaining sample traceability and the procedure to ensure the validity of sample results.
- Requalification observations shall be conducted annually thereafter to ensure that each person retains their certification to draw samples.

d. Emergency Response Training

The training provided under this category will be conducted by a WCC or supervisor and will include the following aspects from the Knolls Laboratory contingency plan:

- Site Communications and Alarm System
- Response to spills, fires, or other sudden releases
- Contingency Plan Implementation; and
- Emergency Equipment Operations

The training related to the contingency plan topics listed above will be tailored to the employee position. For example, Waste Processors would receive more intense training on contingency plan implementation protocols than Material/Waste Handlers.

e. Specific Knolls Laboratory Management Procedures

Topical discussions related to Knolls Laboratory specific hazardous and/or mixed waste management procedures are presented to all personnel involved in permit-related waste management at the Knolls Laboratory. The information provided during these discussions varies with the involvement that each employee position has within the waste management process. Typical topics include:

- Waste labelling requirements
- Internal manifest requirements
- Internal transportation requirements
- Disposal methods for common waste streams, including empty or partially-filled containers
- Storage requirements
- Waste Minimization

The type and amount of training necessary will depend on each employee's specific responsibilities associated with their job function/description. WCCs, Supervisors and Waste Processors may need to receive training in all five training categories (see Appendix 1), while Material/Waste Handlers and Drivers, Material Distribution may need to be trained in all categories except Sampling Protocols (see Appendix 2). Training for Emergency Responders would stress Types of Chemicals and Hazards, Emergency Response Training, and some aspects of Specific Knolls Laboratory Management Procedures (see Appendix 3).

4. Frequency of Training

Training is designed to maintain proficiency in job skills, increase safety and quality consciousness, and teach new skills. The annual "refresher" training provides an opportunity for teaching new operating procedures and new skills to the employee.

5. Documentation of Training

All training records are maintained on site. A file is maintained for all employees identified in Table 1 who handle hazardous and/or mixed waste in the permitted units. The files contain each employee's job description as it pertains to hazardous and/or mixed waste, a list of initial and annual refresher training requirements, and appropriate certification that the requisite training has been satisfactorily completed.

Copies of all training documentation for current employees will be maintained in the Knolls Laboratory permitted unit operating record file until facility closure, or for three years following the date the employee last worked at the facility.

Individual names and job titles will be listed on training records to comply with requirements of 6 NYCRR § 373-2.2(h)(4)(i) and 40 CFR § 264.16.

Appendix 1

Training Outline for WCCs, Supervisors, and Waste Processors

1. Discuss control and handling of hazardous and/or mixed wastes including:
 - a) proper handling, packaging, and internal transportation procedures;
 - b) necessary safety measures to be taken with routine Knolls Laboratory hazardous and/or mixed waste;
 - c) precautions to be taken when packaging waste;
 - d) container labeling requirements;
 - e) internal transfer procedure/requirements for movement of chemical waste;
 - f) proper storage of waste within a waste management unit;
 - g) aisle space requirements; and
 - h) segregation of incompatibles.
2. Discuss types of chemicals and hazards of Knolls Laboratory hazardous and/or mixed waste including:
 - a) routine and non-routine waste streams generated on-site, and specific hazards/concerns associated with these wastes;
 - b) waste label information;
 - c) personal safety measures to be taken when handling waste (e.g., protective clothing, respiratory protection, etc.);
 - d) health concerns during a spill;
 - e) Knolls Laboratory waste minimization program; and
 - f) Discuss external (EPA and NYSDEC) disposal requirements for routine and non-routine waste streams.
3. Proper sampling techniques: Coliwasa, grab, composite, surface, and whole waste.
4. Discuss Knolls Laboratory emergency response actions including:
 - a) site communications and alarm system;
 - b) response to fires and explosions;
 - c) emergency plan implementation; and
 - d) emergency equipment location and operation.
5. Receive on-the-job training in the hazardous and/or mixed waste management unit(s) including:
 - a) tour of the waste management unit;
 - b) emergency equipment location and operation;
 - c) storage and handling practices;
 - d) spill response;
 - e) proper logging procedures for containers and lab pack waste; and
 - f) operation of weighing equipment.

Appendix 2

Training Outline for Material/Waste Handlers and Drivers

1. Discuss control and handling of hazardous and/or mixed wastes including:
 - a) proper handling and internal transportation procedures;
 - b) necessary safety measures to be taken with routine Knolls Laboratory hazardous and/or mixed waste;
 - c) container labeling requirements; and
 - d) types of containers and their uses.
2. Discuss types of chemicals and hazards of Knolls Laboratory hazardous and/or mixed waste including:
 - a) routine and non-routine waste streams generated on-site, and specific hazards/concerns associated with these wastes;
 - b) personal safety measures to be taken when handling waste (e.g., protective clothing, respiratory protection, etc.); and
 - c) health concerns during a spill.
3. Discuss Knolls Laboratory emergency response actions including:
 - a) site communications and alarm system;
 - b) response to fires and explosions;
 - c) emergency plan implementation; and
 - d) emergency equipment location and operation.
4. Discuss Knolls Laboratory chemical waste management program including:
 - a) waste label information;
 - b) internal transfer procedure/requirements for movement of chemical waste to the hazardous and/or mixed waste management units; and
 - c) safety concerns when transporting waste to the hazardous and/or mixed waste management units.

Appendix 3

Training Outline for Emergency Responders

1. Discuss types of chemicals and hazards of Knolls Laboratory hazardous and/or mixed waste including:
 - a) routine and non-routine waste streams generated on-site, and specific hazards/concerns associated with these wastes; and
 - b) necessary safety measures to be taken with routine Knolls Laboratory hazardous and/or mixed waste (e.g., protective clothing, respiratory protection, etc.).
2. Discuss Knolls Laboratory emergency response actions including:
 - a) site communications and alarm system;
 - b) response to spills, fires and explosions;
 - c) contingency plan implementation; and
 - d) health concerns during a spill.
3. Receive on-the-job training in the hazardous and/or mixed waste management unit(s) including:
 - a) tour of the waste management unit;
 - i) emergency equipment location and operation;
 - ii) waste label information;
 - iii) storage requirements;
 - iv) segregation of incompatibles; and
 - v) aisle space requirements.
 - b) emergency equipment location and operation;
 - c) storage and handling practices; and
 - d) spill response.

KNOLLS ATOMIC POWER LABORATORY

KNOLLS LABORATORY

Attachment I CLOSURE PLAN

EPA I.D. NUMBER NY 6890008992

**6 NYCRR PART 373 PERMIT
NUMBER
4-4224-00024/00001**

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INTRODUCTION

The information included herein is presented in accordance with the regulatory requirements. This attachment identifies all of the steps that will be required to partially close any hazardous or mixed waste management unit at any point during its operating life, if necessary, and to completely close the facility at the end of its intended operating life. Pursuant to 6 NYCRR §373-2.7(a)(2) [40 CFR §264.110(b)], a survey plat and post-closure plan are not required because the Knolls Laboratory does not operate a disposal facility, waste piles, surface impoundments, tank systems or containment buildings under the terms of this permit. All wastes will be removed at closure under the provisions set forth in this plan.

A copy of the approved closure plan and all approved revisions to the plan (made in accordance with the applicable provisions in 6 NYCRR §373-2.7(c)(1)(ii) [40 CFR §264.112(a)(2)]) will be maintained at the Knolls Laboratory until the certification of closure completeness has been submitted and accepted by the New York State Department of Environmental Conservation (NYSDEC) Commissioner. A more specific closure plan will be submitted to NYSDEC for approval concurrent with notification of closure, which will address current conditions, specific past history, location specific decontamination procedures, and other pertinent location specific information relevant to closure. The NYSDEC Commissioner will be notified in writing at least 45 days prior to the date on which the Knolls Laboratory expects to begin closure of the facility or waste management unit(s) covered under this permit (per the requirements in 6 NYCRR §373-2.7(c)(4)(i) [40 CFR §264.112(d)(1)]). Upon completion of closure or partial closure, a certification prepared by an independent professional engineer (PE) registered in the State of New York, stating that the facility was closed in accordance with the specifications in the approved closure plan, will be submitted to the NYSDEC Commissioner.

A. CLOSURE PLANS

1. Closure Performance Standard

In accordance with 6 NYCRR §373-2.7(b) [40 CFR §264.111], the closure plan is designed to ensure that a permitted unit will not require further maintenance and controls, will minimize or eliminate threats to human health and the environment, and will prevent the escape of hazardous waste constituents to the ground, surface waters or to the atmosphere after closure. The Knolls Laboratory will achieve this standard of closure for the permitted units by removing and properly dispositioning all hazardous waste residues and all contaminated materials and associated equipment (except salvageable equipment, which will be decontaminated and reused or recycled). The following sections discuss the procedures and actions that will be taken in order to satisfy the closure performance standard.

2. Partial and Final Closure Activities

The procedures outlined in Section B, Inventory Removal and Decontamination represent the general plan which will be implemented for either closure of a hazardous/mixed waste management unit or final closure of the facility.

3. Maximum Waste Inventory

Hazardous and mixed wastes generated at several locations throughout the Laboratory may be transported to one of four permitted waste management units located at the facility, based on the type of waste stored in that unit. The maximum waste inventory that can be stored within any of the four permitted hazardous/mixed waste management units is provided in Table 1. (See Attachments D and G for more detailed information regarding these units.)

TABLE 1
KNOLLS LABORATORY PERMITTED WASTE MANAGEMENT UNITS

UNIT	WASTE TYPE	TYPICAL CONTAINER VOLUME	TOTAL VOLUME CAPACITY OF WASTE MANAGEMENT UNIT
Building Q1 ¹	Refer to Attachment C, Tables 1, 2 & 3	< 1 to 202 gallons	6,600 gallons
E11 Truck Bay Modular Addition ²	Refer to Attachment C, Tables 1, 2 & 3	< 1 to 95 gallons	1,320 gallons
E11 Waste Processing Facility	Refer to Attachment C, Tables 1, 2 & 3	< 1 to 718 gallons	7,180 gallons
E4-Extension Floor Vaults (numbered 2, 3, 5, & 6) ³	Refer to Attachment C, Tables 1, 2 & 3	< 1 to 95 gallons	2,600 gallons

Notes for Table 1:

- (1) The Building Q1 permitted unit consists of both Q1-south (1,650 gallons) and the Q1-extension (4,950 gallons).
- (2) There is a prefabricated structure (E11 MA-L) located on the southwest side of the E11 truck bay. This permitted unit has an authorized capacity of 1,320 gallons .
- (3) The permitted unit within the Building E4-extension consists of four floor vaults.

B. INVENTORY REMOVAL AND DECONTAMINATION

The steps required to close a hazardous/mixed waste management unit (or the facility) include the termination of receipt of hazardous/mixed waste, removal of all stored wastes, review of applicable operating records, decontamination of the management unit(s) and associated equipment (if necessary), and, if necessary, an environmental survey (i.e., sample collection and analysis).

1. Inventory Removal and Records Review

a. Termination of Receipt

At the initiation of closure procedures, a Waste Chemical Coordinator (WCC) will ensure that the receipt of all wastes at the target waste management unit(s) ceases. Notification will be issued to individual generators on site to transfer all hazardous and/or mixed wastes to alternate location(s).

b. Waste Removal

All waste will be removed from the waste management unit(s), using a forklift truck or other appropriate means, and transported to an alternate waste management unit or an off-site permitted treatment, storage or disposal facility (TSDF) for ultimate disposal. All transfers will be supervised to ensure compliance with all applicable regulatory requirements and approved closure protocols.

c. Operating Records Review

In parallel with removal of wastes from the hazardous/mixed waste management unit(s), a thorough review of all records regarding past operations at the unit(s) will be conducted. Examples of records to be reviewed include:

- Waste management records -- to determine the specific types of waste (e.g., streams/categories, matrices, hazardous waste codes, etc.) managed in the unit(s), and what processes (e.g., container storage, etc.) were performed.
- Inspection records -- to determine if there have been any past spills/releases in the unit(s) and where these spills and releases occurred.

2. Decontamination and Environmental Survey

Following waste removal, an inspection of the waste management unit(s) will be conducted to evaluate any indication of past spills or leaks of previously stored materials (whether indicated via records review or not) and the general condition of the floor and wall structures. A scaled grid map should be prepared to document the location of any noted spills, stains, cracks or other anomalies.

a. Decontamination

The decontamination steps will be accomplished as follows:

- i. Establish procedures necessary to prevent the spread of contamination.
- ii. Remove any materials or equipment that were previously used or installed as

- best management practices to serve as contamination control barriers.
- iii. Accumulate precleaning equipment/gear such as personal protective equipment, brooms, brushes, plastic, cleaning solutions, etc.
 - iv. Removal of all dust, dirt or accumulated debris from floor, walls, structural steel and remaining equipment through physical methods such as sweeping, scraping and vacuuming. If determined necessary, an initial washing/scrubbing of some or all surfaces may be performed to remove any large accumulation of dust, dirt or debris and allow clear layout of the grid map. All collected material will be retained until hazard determination has been completed.
 - v. Re-inspection of floor and wall structures for evidence of cracks or latent stains. (To be noted on grid map.)
 - vi. Wash/scrub all potentially contaminated surfaces with appropriate industrial cleaners, high-powered pressure washer, or steam cleaning machine, then follow with a clean water rinse. Collect all solutions, rinses or condensate (if steam is employed) for later composite analysis. Repeat procedure in areas where stains remain. (Note repeated cleaning areas on grid map.)
 - vii. Wipe or otherwise dry all areas and re-inspect for any remaining stains or cracks. (Note on grid map.)
 - viii. If stains remain evident, but no cracks are visible, repeat Step F using an alternate cleaning solution, as necessary, or employ physical methods, if practical, such as chipping or scarification until stained areas are removed. If stained areas cannot be completely removed, repeat physical methods and test representative chip or core samples of the area, if practical. Repeat until area is clean in accordance with the Sample Collection and Analysis Section of this procedure. In extreme cases, complete floor removal may be necessary. (All subsequent cleaning actions should be noted on grid map).
 - ix. If cracks are evident in stained areas, document them on the grid map. Samples should be taken in the area of the crack, approximately 1" wide to a depth of approximately 1/8" or more below the base of the crack and/or stain. Collect representative samples (i.e., approximately 1 to 5 grams for each lineal foot), composite and analyze in accordance with Sample Collection and Analysis Section. If clean, document the results on the prepared grid map.

b. Sample Collection and Analysis

Sample collection (including composites, storage, handling and chain-of-custody) will be accomplished utilizing the latest EPA approved version of USEPA Publication SW-846 as guidance in addition to relevant sections of Attachment C - Waste Characteristics. If necessary, these references may also be utilized as guidance for defining the appropriate number of samples to be taken to adequately evaluate the material sampled (such as concrete or asphalt floors). Utilization of a grid map indicating types, location, and frequency of sampling will provide the basic documentation necessary to ensure complete closure.

In general, a grid map for a particular hazardous/mixed waste management unit will consist of numbered grid coordinates laid out along the longest axis of the unit. All information noted previously will be documented on this layout. Initial sampling will focus on flat areas where cracks or staining are evident. This will ensure all areas of suspected contamination are evaluated. Random sampling of at least 20% of the remaining grids will also be performed. This random sampling will address areas of

potential contamination not apparent during visual inspection. Selection of random sampling locations and specific sampling procedures for selected grids will be done utilizing the latest EPA approved version of USEPA Publication SW-846 as guidance. As outlined previously in subsection B.1., a detailed review of the operating records and spill history will be performed. Any locations where spills or leaks have occurred and where contamination can be expected will be identified. Individual sample analysis will include those hazardous constituents from potential spills identified in the above review. Where cleaning liquids, solvents and debris have been collected, individual or composite sample analysis will include any documented contaminant as related above. For determination of closure criteria and proper disposal as a result of cleanup within the waste management unit, analytical results will be compared with the current toxicity characteristic (TC) standards in effect, or with PCB cleanup guidance in 40 CFR 761.

Closure criteria will comply with closure regulations and requirements that will be in effect at the time of closure. Verification of decontamination will be based on NYSDEC's regulatory clean-up standards at the time of closure.

Because of the high sensitivity of the analysis with respect to precision variability at extremely low analyte concentration levels coupled with the potential contribution from floor coating/sealing materials and the concrete/asphalt itself, an appropriate background control program will be run. Background areas would be selected based on similar materials of construction and past use history and sampled in similar fashion to the waste management unit being closed.

Finally, it should be noted that all personnel designated to perform closure efforts will be properly trained and equipped with appropriate personal protective equipment.

c. Soil Investigation Plan

Should it be necessary, this soil investigation plan will be implemented in the event that contamination is found to have breached the containment structure and entered the soil matrix. This plan includes a sampling plan, laboratory analysis plan and a discussion of the criteria to be used to determine the need for remedial action with regard to soils.

The sampling plan as outlined here could potentially include the drilling of soil borings and installation of monitoring wells.

Approximate depths to the first till layer, believed to be the first relatively impermeable layer, in the vicinity of each waste management unit covered under this permit are provided below:

Waste Management Unit	Approximate Depth to Till
Building Q1 Complex	20 feet
E11 truck bay	9 feet
E4-Extension	9 feet
Building E11 WPF	9 feet

These are assumed to be the initial depths of penetration necessary for soil sampling. The necessity and locations for the borings and analytical parameters will be determined by information obtained during review of the facility operating record and waste management unit decontamination results.

Access to the soil will be obtained through concrete or paved areas as necessary. A drill rig using hollow-stem augers will drill the soil borings. Continuous split-spoon samples will be collected, described and archived. At a minimum, three soil samples will be obtained from each boring for analysis (e.g., from depths of 0-2 feet below grade, 5-10 feet below grade, and from the deepest spoon (determined when either the water table or an impervious till layer is reached)). Split-spoon sample descriptions will include information concerning contact between contaminated soil and that which appears clean. This will provide information concerning the vertical migration of contamination within the soil column.

All equipment that comes in contact with concrete, pavement and soil will be cleaned (via steam or other equivalent method) before reuse at another boring location to eliminate the possibility of cross-contamination. All waste from the equipment cleaning operation will be contained and analyzed for previously established parameters and properly disposed.

d. Soil Analysis Plan

Soil samples will be analyzed for the suspected TC constituents of concern as well as any other contaminants previously established. The analytical results will be compared with criteria established by NYSDEC and in effect at the time of closure. If the analytical results fall below these criteria, no further soil investigation or remediation will be performed. If an analytical result exceeds any of the established criteria, additional soil borings will be performed and sampled as previously described and will be used to determine the lateral and vertical extent of the contamination for remedial purposes. Should the lateral and/or vertical spread of contamination be extensive, an evaluation of the contamination's impact on groundwater will be completed utilizing the NYSDEC's regulatory clean-up standards in effect at the time of closure.

C. CLOSURE SCHEDULE

1. Closure Schedule

The NYSDEC Commissioner will be notified in writing at least 45 days prior to the date on which the Knolls Laboratory expects to begin closure of the facility or waste management unit(s) covered under this permit (per the requirements in 6 NYCRR §373-

2.7(c)(4)(i) [40 CFR §264.112(d)(1)]. All hazardous and mixed wastes will be removed from the waste management unit(s) within 90 days after the initiation of closure. Closure is expected to be completed within 180 days of initiating closure. If a longer period of time is needed (i.e., for removal of all hazardous and/or mixed waste or completion of all closure activities), a permit modification request will be filed within 30 days prior to expiration of the 90-day or 180-day period, respectively, that provides demonstrations in accordance with §373-2.7(d)(1) through (3) [40 CFR§ 264.113(a) through (c)].

A schedule of the closure activities and their anticipated time frame is given in Table 2. Table 2 utilizes a bar graph to illustrate the relationship of these activities during the closure process. Upon closure of a permitted unit, all equipment that has been in contact with hazardous or mixed wastes will be chemically decontaminated or removed and transported for reuse or disposal in accordance with all applicable Federal and State regulations. Removal of wastes and decontamination of the unit at the time of closure eliminates the need for post-closure care. The closure schedule presented in Table 2 is for planning purposes, and intermediate time frames at completion dates may vary from those given in the schedule.

2. Post-Closure Plan

Pursuant to 6 NYCRR §373-2.7(a)(2) [40 CFR §264.110(b)], a post-closure plan is not required because the Knolls Laboratory does not operate a disposal facility, waste piles, surface impoundments, tank systems or containment buildings under the terms of this permit. Removal of waste and decontamination of the permitted unit(s) at the time of closure also precludes the need for post-closure care.

D. CERTIFICATION

Pursuant to 6 NYCRR §373-2.7(f)(1) [40 CFR §264.115], after closure is complete, an independent State of New York registered professional engineer (PE) and the owner or operator will certify that the closure was conducted according to the approved closure plan. The certification will be submitted by the owner or operator within 60 days following completion of closure activities to the New York State Department of Environmental Conservation (NYSDEC).

E. EXEMPTIONS

Pursuant to 6 NYCRR §373-2.7(a)(2) [40 CFR §264.110(b)], because the Knolls Laboratory is not a disposal facility the following closure requirements do not apply:

Requirement	State (6 NYCRR §)	Federal (40 CFR §)
Post-closure care and use of property	373-2.7(g)	264.117
Post-closure plan; amendment of plan	373-2.7(h)	264.118
Post-closure notices	373-2.7(i)	264.119
Certification of completion of post-closure care	373-2.7(j)	264.120

Under 6 NYCRR Section 373-2.8— "Financial Requirements-Applicability" (specifically 373-2.8(a)(3)), 40 CFR 264 Subpart H—"Financial Requirements" (specifically 264.140(c)), facilities owned by the federal government are exempt from the following requirements:

Requirement	State (6 NYCRR §)	Federal (40 CFR §)
Cost estimate for closure	373-2.8(c)	264.142
Financial assurance for closure	373-2.8(d)	264.143
Cost estimate for post-closure care	373-2.8(e)	264.144
Financial assurance for post-closure care	373-2.8(f)	264.145
Use of a mechanism for financial assurance of both closure and post-closure care	373-2.8(g)	264.146
Liability requirements	373-2.8(h)	264.147

TABLE 2
ANTICIPATED CLOSURE SCHEDULE FOR PERMITTED WASTE MANAGEMENT UNIT(S) ¹

ACTIVITY	DAYS													
	Pre	0	20	40	60	80	100	120	140	160	180	200	220	240
1. Submittal of a more specific closure plan to NYSDEC for approval. (2)														
2. Notification submitted to NYSDEC.	-45													
3. Public Notice publication initiating 30-day comment period.	-30													
4. Receipt of NYSDEC approval, comment, etc.		0												
5. Stop receipt of hazardous waste at unit. (3)		0												
6. Packaging of wastes received for transfer or shipment.			1-90											
7. Determine if extension of inventory removal period is necessary. Submit extension request to regulator. (4)			1-60											
8. Inventory removal complete. (4)							90							
9. Records Review (e.g., past operations and inspection records).			1-90											
10. Decontamination and environmental survey sampling). (4)							90-120							
11. Determine if subsurface sampling is necessary and perform. (4)									121-160					
12. Determine if extension of closure period is necessary. Submit extension request to regulator. (4)			1-150											
13. Complete analysis and decontamination documentation									121-180					
14. Complete closure activities (5)											180			
15. Certification of closure submitted to NYSDEC. (6)												181-240		

Notes for Table 2:

1. This closure schedule will be adhered to as necessary to ensure compliance with 6 NYCRR §373-2.7(d) [40 CFR §264.113]. It is assumed that these actions may be initiated prior to the date indicated and be complete by those dates indicated.
2. A more specific closure plan will be submitted to NYSDEC for approval, which will address current conditions, specific past history, location specific decontamination procedures, and other pertinent location specific information relevant to closure.
3. Actual start date of waste management unit(s) or facility closure is dependent upon receipt of NYSDEC approval of specific closure plan and Knolls Laboratory's issuance of "Notice to Proceed" to a subcontractor that will actually perform closure activities.
4. If a longer period of time is needed (i.e., for removal of all hazardous and/or mixed waste or completion of all closure activities) a permit modification request must be prepared and submitted within 30 days prior to expiration of the 90-day or 180-day period, respectively, that provides demonstrations in accordance with §373-2.7(d)(1) through (3) [40 CFR §264.113(a) through (c)].
5. If closure activities will take longer than 180 days, demonstration and request for approval must be prepared and submitted 30 days before the end of the 180-day period pursuant to 6 NYCRR §373-2.7(d)(2) & (3) [40 CFR §264.113(b) & (c)].
6. Pursuant to 6 NYCRR §373-2.7(f)(1) [40 CFR §264.115], a certification, signed by the owner or operator and an independent NYS registered PE, must be submitted to the regulator within 60 days following completion of partial or final closure activities.

KNOLLS ATOMIC POWER LABORATORY

KNOLLS LABORATORY

Attachment J Permits and Compliance

EPA I.D. NUMBER NY6890008992

**6 NYCRR PART 373 PERMIT
NUMBER
4-4224-00024/00001**

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PERMITS AND COMPLIANCE

The Knolls Laboratory holds a number of permits that were issued pursuant to the Clean Water Act, the Clean Air Act, the Resource Conservation & Recovery Act, and the New York State Environmental Conservation Law. These permits are identified in the Attachment A – Hazardous Waste Permit Part A Form, Section 4 - Other Environmental Permits.

Other laws applicable or potentially applicable to site operations include the Atomic Energy Act, the Safe Drinking Water Act, the Federal Insecticide, Fungicide, Rodenticide Act, the Comprehensive Environmental Response, Compensation, and Liability Act, and the Superfund Amendments and Reauthorization Act of 1986. The site is currently in compliance with applicable provisions of these statutes.

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KNOLLS ATOMIC POWER LABORATORY

KNOLLS LABORATORY

Attachment K Application Certification

EPA I.D. NUMBER NY 6890008992

**6 NYCRR PART 373 PERMIT
NUMBER**

4-4224-00024/00001

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ATTACHMENT K

RCRA PART B/373 PERMIT APPLICATION CERTIFICATION

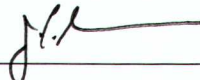
CERTIFICATION:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

OWNER CERTIFICATION

Name: J. P. Showman

Official Title: Manager, Naval Reactors Laboratory Field Office

Signature and Date Signed:  5/6/2024

OPERATOR CERTIFICATION

Name: M. D. Johnson

Official Title: Site Director, Knolls Laboratory

Signature and Date Signed:  4/23/2024

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