1243711
[00716274]

CLASSIFICATION/UCNI REVIEW

TO: Document Clearance/Processing and Distribution

SUBJECT: Review of ~~WHC-~~ ISO 1108
requested by: Kathy Whittington
Battelle

☑ This document contains neither CLASSIFIED nor UCNI material.

☐ This document is CLASSIFIED at the following level and category and may not be released:

Level	Category
☐ Top Secret	☐ Restricted Data
☐ Secret	☐ Formerly Restricted Data
☐ Confidential	☐ National Security Information

☐ This document contains UCNI material and any release must be in accordance with DOE approved distribution lists.

Paul Casey — 2/30/92
(Authorized Derivative Classifier and Authorized Reviewing Official) (Date)

Please submit this completed form and document for distribution to:

[redacted]

RECEIVED
APR 06 2017
EDMC

Central Files - Lana Perry
L8-04

Reviewed and Approved for
Public Release by the NSAT
D Watrous PNNL ADD
2/14/2000 Date

A-6000-292 (07/88)

200-CR-1
TS-2-1 TS-2-2

209

BORN UNCLASSIFED

APPROVED FOR PUBLIC RELEASE

ISO-1108

1. PREFACE

ISO-1108
266 pages

3. INTRODUCTION TO MANUAL

The Redox Deactivation Manual is designed to record plans and instructions required to deactivate the Redox Plant to a stand-by status; the plans for stand-by operations and maintenance; and the basic information and reference essential to reactivation of the plant.

A supplemental manual entitled, "Redox Deactivation Manual-Detailed Procedures" is used for field implementation of Deactivation Instruction supported by existing procedures and those Deactivation Instructions and their related special Deactivation Detailed Procedures.

The Deactivation Manuals are concerned with broad subjects involving primary responsibilities of others outside the Deactivation Operation, and their advice and assistance has been very essential and valuable to the authors of the original Programs and Instructions; namely, C. E. McMahill, J. R. Cartmell, and C. B. Foster.

Terminal Process scope assistance was provided by M. C. Jacobs of Redox Process Control.

Mrs. C. M. Brawner, secretary to the Manager, coordinated all activities associated with publication of the Manuals.

The Deactivation Manuals are designed for flexibility in recognition that stand-by status is a transition condition subject to modifications in light of changing objectives. The Programs, Instruction, and Detailed Procedure forms have revision blocks which facilitate changes as deactivation progresses.

Four forms were developed for deactivation of the Redox Plant:

1. Program
2. Instruction
3. Detailed Procedures
4. Completion Report

1. PREFACE TO DEACTIVATION PROGRAM

The Atomic Energy Commission and Isochem Inc. Production Planning has scheduled charging of irradiated fuel to the Redox Plant through December, 1966, with deactivation to a stand-by status complete by July 1, 1967. The deactivation program is a balanced plan to accomplish the following principal objectives:

1. To facilitate startup of the plant within six months. Condition II as covered in Deactivation Manual section 4.15 Property Management.
2. To minimize deactivation expense.
3. To minimize stand-by expense.
4. To permit operation of the 222-S Laboratory.
5. To allow storing, blending and silica gel treatment of Purex UNH solution in the 203, 204, and 205 UNH facilities.

Deactivation of the Redox Plant is the responsibility of the Redox Deactivation Operation. Responsibility includes the development of plans to achieve the broad program objectives and direction of deactivation work to be performed by a composite organization consisting of Operations, Maintenance and Radiation Monitoring personnel supported by the Redox Laboratory and other service groups as required by the program.

C. B. Hoster

Manager, Redox Deactivation

1a. Preface to Deactivation Program - Extension

On August 8, 1969, the AEC changed the Redox Plant status to that of layaway condition, Abandonment-Category V. Under these conditions, part of the Redox Plant not needed for the D Board waste concentration is to be placed in the layaway status. Detailed procedures follow that implement these instructions.

Manager, Tank Farm Management

REDOX DEACTIVATION INDEX

3. INTRODUCTION TO MANUAL

3.1 Program

3.2 Instruction

3.3 Detailed Procedure

3.4 Completion Report

3. INTRODUCTION TO MANUAL (Continued)

The Program, Instruction, Completion Report forms and Redox Deactivation drawings are used in the Redox Deactivation Manual; and Instruction, Detailed Procedure, and Completion Report forms are used in the Redox Deactivation Manual-Detailed Procedures.

Exhibits of forms follow:

C B Hooster

Manager, Redox Deactivation

REDOX PLANT DEACTIVATION PROGRAM	PROGRAM NUMBER	
	REVISION	PAGE OF
SUBJECT:		
APPROVED BY:	DATE:	

3.1 PROGRAM

The Program form is used for general subject matter of sufficient scope and importance to warrant a summary description of deactivation plans and objectives which provide the basis for Deactivation Instructions. Each program will bear the signature approval of the Manager, Redox Deactivation.

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO.	
	REVISION	PAGE OF
SUBJECT:	LOCATION	
APPROVED BY:	DATE	

3.2 INSTRUCTION

The Instruction form is used to provide the direction and criteria to perform a phase of deactivation. The Instruction may be brief and complete or it may cover a complex subject completed through the use of existing procedures or special Deactivation Detailed Procedures.

Copies of all Instructions will be included in the Deactivation Manual. Instructions to be completed entirely through office implementation will be limited to the Deactivation Manual. Instructions, and if required, related Detailed Procedures requiring field implementation will be included in the Deactivation Detailed Procedure Manual.

The Instruction form may be used when necessary to amplify the Program section by using the related Program number on the Instruction and inserting the Instruction in back of the Program. Similar use will be made of the Instruction form for designation of personnel authorized to approve Deactivation forms.

The Deactivation Instruction will be approved by the Manager, Redox Deactivation or others authorized by name.

3.3 DETAILED PROCEDURES

When work is of a complex, non-routine nature specifically related to the deactivation of the Redox Plant, the Instruction will be supplemented by a Detailed Procedure bearing the same number with the last digit followed by a "D". The author will sign the Detailed Procedure and signature approval will be by the Manager, Redox Deactivation, or others authorized by name.

REDOX PLANT DEACTIVATION COMPLETION REPORT	INSTRUCTION NO. DETAIL PROCEDURE NO.
SUBJECT:	PAGE OF
PREPARED BY	

3.4 COMPLETION REPORT

The Completion Report form will be processed when an Instruction or an Instruction and its supplemental Detailed Procedure are completed and will be distributed to manual holders to appraise them of progress of the work and to serve as a terminal report on each phase of deactivation. The report is to be a brief summary of work performed, significant results, observations regarding terminal conditions and specific deficiencies requiring action for reactivation of the plant. The Completion Report will be signed by the Supervisor responsible for performance of the work. The Manager of Redox Deactivation will assure that Completion Reports are properly processed.

4. DEACTIVATION PROGRAMS

4.1 Schedule

4.2 Performance of Work

4.3 Standby Status - Canyon and Silo

4.4 Manpower Planning

4.5 Safety - Industrial, Radiological, Nuclear

4.6 Fire and Explosion Protection

4.7 Nuclear Materials Accountability

4.8 Terminal Processing

4.9 Decontamination

4.10 Heating and Ventilation

4.11 Facility Testing and Inspection

4.12 Corrosion and Preservation

4.13 Status Identification

4.14 Drawings

4.15 Property Management

4.16 Security

4.17 Records Disposition

REDOX PLANT DEACTIVATION PROGRAM	PROGRAM NUMBER 4.1	
	REVISION New	PAGE 1 OF 1

SUBJECT:

SCHEDULE

APPROVED BY: C. B. Foster

DATE: June 1, 1966

4.1 SCHEDULE

Production Planning has scheduled charging of irradiated fuel to the Redox Plant through December, 1966. The final feed solution inventory will be processed through the plant during January, 1967. Implementation of deactivation plans designed to establish a stand-by condition will begin February 1, 1967. The scheduling critical path involves non-routine remote processing and decontamination dependent on detailed procedures which have not been finished and equipment which is in design stage. Other deactivation work must be phased so that the progress of critical path work is uninterrupted; yet deactivation of systems must be integrated closely in order to meet the schedule with available man-power. Scheduling is complexed further by the need to balance work involving radiation exposure to personnel with non-exposure work. Although the original deactivation period has been reduced by one month and interim experience has revealed the need for more extensive and complex terminal flushing the June 30, 1967, target date for completion of the work is considered feasible barring serious contingencies. The following are projected target dates for key phases of the deactivation schedule based on present planning and uncertainties:

Activity	Date-Start	Date-Complete
Product Recovery	2-1-67	3-25-67
Decontamination Flushing	3-28-67	4-30-67
Systems Deactivation	1-14-67	6-30-67

A Produc-Trol system will be used for phase scheduling of deactivation work to assure compatible sequency of activities.

4. DEACTIVATION PROGRAMS

4.1 Schedule

4.2 Performance of Work

4.3 Standby Status - Canyon and Silo

4.4 Manpower Planning

4.5 Safety - Industrial, Radiological, Nuclear

4.6 Fire and Explosion Protection

4.7 Nuclear Materials Accountability

4.8 Terminal Processing

4.9 Decontamination

4.10 Heating and Ventilation

4.11 Facility Testing and Inspection

4.12 Corrosion and Preservation

4.13 Status Identification

4.14 Drawings

4.15 Property Management

4.16 Security

4.17 Records Disposition

REDOX PLANT DEACTIVATION PROGRAM	PROGRAM NUMBER 4.3	
	REVISION New	PAGE 1 OF 3

SUBJECT: STANDBY STATUS - CANYON AND SILO

APPROVED BY: C. B. Foster

DATE: June 1, 1966

4.3 STANDBY STATUS - CANYON AND SILO

Deactivation of the Redox Plant as described in other Deactivation Programs will establish the following conditions for the remotely maintained and operated Canyon and Silo for stand-by operations, surveillance and maintenance.

1. Normal heating and ventilation will be maintained.
2. Essentially all Canyon rotary equipment will remain operable and the associated process instrumentation will remain in operation.
3. Surveillance of the Canyon cells will be maintained by keeping the sump manometers and alarms in service.
4. Sump jets will remain in service and provisions will be established for disposal of any sump collections.
5. Provisions will be made to prevent chemicals and/or radioactive wastes from entering the Canyon and Silo and remotely installed equipment.
6. Steam and water not required for stand-by operations will be physically isolated from the Canyon and Silo areas and the remotely installed equipment.
7. The remote cranes will remain in service for inspection and maintenance purposes.

The above provisions are considered essential to assure the integrity of the plant to the degree necessary for startup within six months

REDOX PLANT DEACTIVATION PROGRAM	PROGRAM NUMBER 4.2	
	REVISION 1	PAGE 1 OF 1

SUBJECT:

PERFORMANCE OF WORK

APPROVED BY C. B. Foster	DATE: March 3, 1967

4.2 PERFORMANCE OF WORK

No deactivation work of a Project nature is anticipated. Work will be performed by the Redox Operation with normal Isochem Inc. supporting services with the following exceptions:

1. Fencing of the UNH storage blending and treatment facility.
2. Installing an underground tie-in to supply raw water to the swamp.
3. Installing underground valves to permit draining deactivated water lines.
4. Installation of Nitric and Caustic unloading facilities for the 222-S laboratory.

The above exceptions will be installed by J. A. Jones Construction Company.

4.3 STANDBY STATUS (Continued)

of a startup directive.

Normal heating and ventilation will be maintained to assure contamination control through adequate air flow and correct ventilation balance; to protect active utility and process lines from freezing; to avoid structural and mechanical damage; and for personnel comfort.

Periodic water transfers through specified processing systems are planned during stand-by. Although a dry stand-by condition may be feasible such a deactivation could jeopardize startup of the plant within six months. Complete deactivation of process instrumentation would add to the time and complexity of a startup. Periodic operation of rotary canyon equipment will provide current knowledge of equipment condition and avoid possible gross deterioration over an extended period of inactivity. The dissolvers and concentrators will not be operated because it is considered that the structural damage which may result from intermittent operations may exceed any possible benefits.

Gasket deterioration during stand-by will require some replacements with the extent correlated to the duration of the stand-by period. It is expected that gasket deterioration during stand-by will be significantly less than during normal operations because of reduced radiation levels, and the infrequent operations will cause

SUBJECT:

STANDBY STATUS - CANYON AND SILO

APPROVED BY: C. B. Foster

DATE: June 1, 1966

4.3 STANDBY STATUS (Continued)

less damage from thermal changes and chemical erosion. Any serious leaks in active systems will be corrected during stand-by. Regasketing of other systems will be performed if startup operability tests indicate failures.

The decision to operate canyon equipment with concurrent flows through silo equipment does involve a commitment to maintain pumps and jets required to transport water through the systems. The transfer of water through the systems can be accomplished in about 40 hours and is planned once every two weeks. On this basis the limited operations should not require crisis maintenance. The reduced radiation levels should permit equipment renovation either in the Redox Plant or at the T Plant equipment reclamation facility. Although Redox spare parts and equipment will be held in reserve for use as required the objective will be to salvage equipment through repair to the maximum extent possible within time and economic limitations.

Inasmuch as the stand-by program for the Redox Plant is based on judgments founded on operating and maintenance experience coupled with design knowledge the program is subject to revision according to experience under stand-by conditions.

REDOX PLANT DEACTIVATION PROGRAM	PROGRAM NUMBER 4.4	
	REVISION New	PAGE 1 OF 2

SUBJECT:

MANPOWER PLANNING

APPROVED BY: C. B. Foster

DATE: June 1, 1966

4.4 MANPOWER PLANNING

Manpower requirements for Deactivation of Redox were forecasted and included in the FY 1967 Budget and the Stand-by force is budgeted for FY 1968. The curtailment of activities at Redox and expansion of the Waste Management Program are phased so that seasoned personnel may be transferred from Redox as the increased scope of Waste Management work requires additional personnel.

Personnel released by deactivation of Redox will exceed known Isochem Inc. manpower requirements and as a result of concern for personnel involved personnel studies were made to identify the number classification and talents of personnel in order to match personnel excesses with employment opportunities within Isochem Inc. and thus assure a timely, and orderly force adjustment.

The requirements for laboratory and technically trained personnel are such that no lay-offs are contemplated for personnel of these disciplines.

L. M. Meeker was assigned the task of personnel placement integration within Isochem Inc.

When the impact of deactivation is crystallized to the extent of knowing the total excess of personnel and they are identified by name, personnel to be effected will be advised of probable lay-off to afford each employee as much time as possible to find employment

SUBJECT: MANPOWER PLANNING

APPROVED BY: C. B. Foster

DATE: June 1, 1966

4.4 MANPOWER PLANNING (Continued)

outside of Isochem Inc.

Employee Relations will determine employment opportunities outside of Isochem Inc. and the names of Employers who are recruiting personnel will be passed along to employees who may have the required qualifications.

SUBJECT:

SAFETY

APPROVED BY: C. B. Foster

DATE: January 25, 1967

4.5 SAFETY (Continued)

environs will continue throughout the deactivation program with modifications being made as changing conditions indicate the feasibility and desirability to alter surveillance. The frequency of routine surveys will be reduced and ultimately nuclear criticality alarms, gaseous and aqueous effluent monitoring devices will be deactivated and in-service personnel monitoring devices will be reduced to a minimum practical level.

Terminal operations will be conducted and controlled within RL-SEP-315 - "Process Specifications - U - Pu Separations at Redox" and within Supplemental Specifications as required to assure nuclear criticality control. When product removal is judged to be completed to the extent nuclear control of processing is no longer required nuclear safety controls will be canceled by written concurrence of signatories of RL-SEP-315 and its supplements. Reactivation of the Redox Plant for processing of nuclear materials will require issuance of new nuclear control specifications.

The written concurrence by signatories of RL-SEP-315 is necessary for total removal of nuclear criticality control of processing until such time as the plant is reactivated by the introduction of fissionable nuclear materials.

SUBJECT:

SAFETY

APPROVED BY: C. B. Foster

DATE: June 1, 1966

4.5 SAFETY (Continued)

environs will continue throughout the deactivation program with modifications being made as changing conditions indicate the feasibility and desirability to alter surveillance. The frequency of routine surveys will be reduced and ultimately nuclear criticality alarms, gaseous and aqueous effluent monitoring devices will be deactivated and in-service personnel monitoring devices will be reduced to a minimum practical level.

Terminal operations will be conducted and controlled within RL-SEP-315 "Process Specifications - U - Pu Separations at Redox", to assure nuclear criticalities control. Deviations will require a waiver signed by all signatories until Research and Engineering agree that product removals are complete to the extent nuclear control of processing is no longer required.

The written concurrence by signatories of RL-SEP-315 is necessary for total removal of nuclear criticality control of processing until such time as the plant is reactivated by the introduction of fissionable nuclear materials.

REDOX PLANT DEACTIVATION PROGRAM	PROGRAM NUMBER 4.6	
	REVISION 1	PAGE 1 OF 1

SUBJECT:

FIRE AND EXPLOSION PROTECTION

APPROVED BY: C. B. Foster	DATE: January 25, 1967

4.6 FIRE AND EXPLOSION PROTECTION

After final solvent extraction processing has been completed, the remaining hexone inventory will be disposed of as specified by Instruction 7.1.2 and following water flushing of the canyon; silo and 276 facilities fire and explosion potential will have been reduced to a minimal risk and the following services will be deactivated:

1. The inert gas generators and associated systems.
2. The 276-S fire water deluge system.

Following canyon and silo decontamination the assoicated fire deluge system will be deactivated to prevent an inadvertent flooding of the canyon and silo.

All other fire detection systems and installed fire fighting capabilities will remain in service, with normal inspection and testing.

Combustibles, including solvents, paints and chemicals will be removed from the plant to the minimum practical level. The fire inspection plan conducted by Redox personnel will be continued as modified in view of conditions established for stand-by, to minimize fire risk.

The lightning arrestor system will be inspected to assure its integrity.

REDOX PLANT DEACTIVATION PROGRAM	PROGRAM NUMBER 4.7	
	REVISION New	PAGE 1 OF 1

SUBJECT:

NUCLEAR MATERIALS MANAGEMENT

APPROVED BY: C B Foster C. B. Foster	DATE: June 1, 1966

4.7 NUCLEAR MATERIALS MANAGEMENT

The policies and procedures governing the accounting for nuclear materials will remain in effect until the final disposition of all nuclear materials has been made and the Redox account has been closed. Nuclear materials in the Redox account requiring separations processing will be reassigned by Production Planning with the concurrence of plant management and charged to the account of the plant scheduled to process the material. Source data will be stored according to records retention policies.

REDOX PLANT DEACTIVATION PROGRAM	PROGRAM NUMBER 4.8	
	REVISION New	PAGE 1 OF 1

SUBJECT:

TERMINAL PROCESSING

APPROVED BY: C. B. Foster	DATE: June 1, 1966

4.8 TERMINAL PROCESSING

Terminal processing associated with the deactivation of the Redox Plant is scheduled to begin February 1, 1967, following the final processing of the accumulated inventory of Neptunium. Final processing is designed to remove residual uranium, plutonium and neptunium and to salvage products within practical and economic limitations. Further objectives are to minimize stand-by complications and product purity problems in the event the Redox Plant is commissioned to perform new chemical processing operations. It is anticipated that final processing and flushing operations may result in product discards as high as 2,000 pounds of uranium, 1,500 grams of plutonium, and 250 grams of neptunium. Terminal processing Instructions will be found in Section 5. and 6. of this manual.

SUBJECT:

DECONTAMINATION

APPROVED BY:
C. B. Foster

DATE:
June 1, 1966

4.9 DECONTAMINATION

Deactivation decontamination activities are designed to protect the environs, to minimize migration of contamination within and between plant interfaces and for personnel protection. The activities are balanced in view of the potential to reactivate the plant or to carry the deactivation to a layaway condition.

Internal decontamination flushes of canyon and silo equipment will facilitate transport of equipment should it become necessary or desirable to change out equipment for maintenance, salvaging or revisions for alternate processing. This is particularly important in the case of silo equipment which can be removed by the remotely operated crane; but must be handled by conventional methods after transport by the silo carrier beyond shielding provided by the silo structure. External flushing of this silo equipment will further reduce equipment radiation levels and result in improved contamination control. External decontamination flushing of the canyon equipment, cells and deck will be beneficial to contamination control, during inspections and maintenance. The external decontamination flushes will establish more favorable conditions for eventual deactivation of plant ventilation facilities in the event a layaway condition is decided at some future time. The decontamination flushes planned for in the canyon and silo are not intended to establish contact maintenance radiation levels nor is it considered feasible to establish such radiation levels without the benefit of

4.9 DECONTAMINATION (Continued)

radiation decay. Flushing of the 233-S processing equipment and the greenhouse will reduce exposure level and contamination control problems during contact maintenance and decontamination activities. Surface decontamination in personnel access areas will be performed to varying degrees throughout the plant to prevent spread of contamination and to minimize personnel exposure during surveillance and maintenance.

The 60 T canyon and 10 T silo cranes will be decontaminated as required and feasible for inspection and painting purposes. Temporary radiation zones will be eliminated or properly isolated and/or posted.

Instructions regarding decontamination are provided in sections of the manual concerned with specific zones. The radiation and contamination levels provided are proposed for deactivation, but are not specific criteria for acceptable stand-by conditions. The radiological objectives of decontamination are to satisfy the requirements of the Isochem Inc. Radiation Protection Manual which is in preparation.

REDOX PLANT DEACTIVATION PROGRAM	PROGRAM NUMBER 4.10	
	REVISION 1	PAGE 1 OF 1

SUBJECT:

HEATING AND VENTILATION

APPROVED BY: C. B. Foster CBFoster	DATE: October 20, 1966

4.10 HEATING AND VENTILATION

There are no plans to alter the heating and ventilation operations of the 202-S and 233-S Building and ventilation support facilities. Heating and ventilation will be discontinued or modified in the contact maintained facilities which will be placed in a layaway status permitting a start up within six months. The facilities in this catagory are the:

276-S Organic Storage and Treatment Facilities - Instruction 7.2

293-S Nitric Acid Recovery Facilities - Instruction 7.3

2710-S Gas Generator Facility - Instruction 12.5.2

SUBJECT:

TESTING AND INSPECTION

APPROVED BY: C. B. Foster

DATE: June 1, 1966

4.11 TESTING AND INSPECTION

Routine tests and inspections including third party examination of elevators and unfired pressure vessels will continue throughout the deactivation program to assure safe continuity of operations. Such programs will be revised as deactivation results in layaway of equipment and changing conditions warrant modified programs.

It is planned to use visual aids such as optics and TV to examine canyon cells for evidence of product buildup; and structural and concrete deterioration, in so far as such inspections can be accomplished without disassembly of systems. These observations may reveal the need for more extensive evaluations of conditions during stand-by operations. The Facilities Engineering Section is building a TV unit for inspection of the wind tunnel via four inch ventilation ports and if this unit proves operative the wind tunnel and pipe tunnel will be inspected for evidence of product deposition and general conditions in these areas.

Integrity of canyon vessels coils and jackets will be determined by a one week water flow test with evidence of internal failure measured by the vessels weight factor recording devices. There are no broad plans to test in-trench piping because of the time involved and the complexity and uncertainty of remote hydrostatic pressure testing. If at the end of the deactivation program in-use piping has questionable integrity testing may be scheduled and can be performed

SUBJECT:

TESTING AND INSPECTION

APPROVED BY: C. B. Foster

DATE: June 1, 1966

4.11 TESTING AND INSPECTION (Continued)

with the plant in stand-by condition. The Facilities Engineering Section was requested to determine the feasibility of testing in-trench piping by other methods. If a less difficult test is established, plans will be made to test selected piping.

Deactivated cold side chemical systems will be examined visually for evidence of solids and corrosion damage. Solids will be removed. Tanks and piping will be scheduled for audigaging and for hydrostatic testing if visual examination supports additional testing.

Plans are to retain water flow to the Redox swamp but, samples of swamp soil have been obtained and will be analyzed to determine a course of action should it become necessary to discontinue keeping the swamp area water blanketed.

Both the 60 ton canyon crane and the 10 ton silo crane will be examined for mechanical and electrical deterioration. Deficiencies will be corrected to increase crane reliability for stand-by operations. Radiation levels and available "know-how" will favor corrective actions at this time.

Remotely employeed yokes and hooks will be dye checked for integrity.

Tests and inspections required by CPD Safety Bulletins are required for deactivation work.

SUBJECT:
TESTING AND INSPECTION

APPROVED BY:
C. B. Foster

DATE:
June 1, 1966

4.11 TESTING AND INSPECTION (Continued)

The program as detailed here is not all inclusive. Deactivation and instruction preparation may reveal that other testing and inspections are appropriate and will be incorporated.

Stand-by inspections are prescribed in Section XIX.

REDOX PLANT DEACTIVATION PROGRAM	PROGRAM NUMBER 4.12	
	REVISION New	PAGE 1 of 2

SUBJECT:

CORROSION AND PRESERVATION

APPROVED BY: C. B. Foster	DATE: June 1, 1966

4.12 CORROSION AND PRESERVATION

In considering corrosion and preservation, advantage was taken of the extensive studies made by the Hanford Reactor Deactivation Operation, through review of documents, consultation with members of the planning organization and a tour of the deactivated 100-DR areas. In addition, experience gained with the Deactivated Separation Plants and consultation with Facilities Engineering and Research and Engineering aided in reaching conclusions regarding the nature and extent of corrosion and preservation required to meet Redox Deactivation requirements.

The terminal processing and water flushing, through the canyon and silo will establish a relatively non-corrosive atmosphere for stand-by operations which will consist of periodic water transfers through the canyon and silo systems with normal heat and ventilation of these areas. Under these conditions there should be relatively no significant deterioration of the plant as a result of corrosion. Movement of water through the systems will require replacement of failed pumps, jets, etc., but keeping the equipment and required instrumentation in operation will provide current knowledge regarding the systems and an improved start up confidence.

Ventilation, required for contamination control, and heating of the 202-S and 233-S buildings, will minimize the possibility of significant structural and mechanical deterioration during stand-by.

SUBJECT:

CORROSION AND PRESERVATION

APPROVED BY: C. B. Foster

DATE: January 27, 1967

4.12 CORROSION AND PRESERVATION (Continued)

Equipment and systems in stand-by operation will be maintained with the established preventive maintenance, inspection and repair policies and procedures.

With the typically mild temperature and low humidity at Hanford, deactivation requirements can be met by thorough removal of corrosive chemicals, thorough draining and drying of systems. Deactivated systems and associated piping will be left open to atmosphere for further drying.

Thin film coatings, desiccants and special preservative lubricants will be used sparingly in the absence of justification supporting such expense and to avoid the associated start up complications.

It is planned to layaway the 276-S, solvent storage and treatment and the 293-S nitric acid recovery facility. This work will be completed early and will be inspected periodically during the latter phases of the deactivation program to assure that a satisfactory condition has been established before sealing the structure. Periodic inspections will be scheduled.

REDOX PLANT DEACTIVATION PROGRAM	PROGRAM NUMBER 4.13	
	REVISION New	PAGE 1 OF 2

SUBJECT:

STATUS IDENTIFICATION

APPROVED BY: C. B. Foster	DATE: June 1, 1966

4.13 STATUS IDENTIFICATION

Special Deactivation Tags have been provided to attach to deactivated systems and components to provide a method of accounting for deactivation progress and to remain affixed for status identity. These tags are not to be used for any other purpose and are not to be confused with or take the place of other tags prescribed by CPD Safety Bulletins.

These tags are not intended to detail the status or indicate the condition of deactivated facilities with respect to operability, inherent hazards, etc. Accordingly it is emphasized that facilities affected by deactivation will require special attention on any subsequent activities such as activation, removal, transfer etc.

Exhibit shown on page two:

REDOX PLANT DEACTIVATION PROGRAM	PROGRAM NUMBER 4.13	
	REVISION New	PAGE 2 OF 2

SUBJECT:

STATUS IDENTIFICATION

APPROVED BY: C. B. Foster	DATE: June 1, 1966

4.13 STATUS IDENTIFICATION (Continued).

DEACTIVATED

Service _____

Equipment _____

Instruction Number _____

Remarks _____

_____

_____

_____

_____

_____

_____

(over)

Deactivation Complete:

Date _____

Supervisor _____

CAUTION:

Equipment, systems and facilities affected by deactivation are to remain as deactivated unless change is approved by Supervision. Such approval will be granted only after investigation to determine status and condition. Safe working conditions and procedures shall be established prior to any maintenance, alteration or removal.

REDOX PLANT DEACTIVATION PROGRAM	PROGRAM NUMBER 4.14	
	REVISION New	PAGE 1 OF 1

SUBJECT:

DRAWINGS

APPROVED BY: C. B. Foster	DATE: June 1, 1966

4.14 DRAWINGS

Early in the planning stage of deactivation the value of as-built drawings of "cold" side chemical and service systems became apparent to assist in preparation of deactivation instructions, their implementation and finally to serve as a permanent record of deactivation work. Drawings made specifically for this purpose are a part of this manual, and "as-completed" drawings will replace these after the work has been done. Copies of other drawings made prior to deactivation planning will be marked to identify changes required by Deactivation Instructions and new "as-deactivated" drawings will be made a part of the deactivation record.

REDOX PLANT DEACTIVATION PROGRAM	PROGRAM NUMBER 4.15	
	REVISION New	PAGE 1 OF 5

SUBJECT:

PROPERTY MANAGEMENT

APPROVED BY: C. B. Foster	DATE: June 1, 1966

4.15 PROPERTY MANAGEMENT

Redox Section property is controlled as detailed in the Isochem Inc. Property Manual. During deactivation and stand-by involved property will be controlled according to Chapter 12 - "Control Of Laid-Up Facilities" which provides the procedures to be followed by Isochem Inc. for the property management of facilities removed from operational status (laid up) together with their associated spare parts, equipment and essential materials.

Deactivation planning is programmed to establish conditions favorable to a start up within six months employing capabilities in place when Redox Plant processing is discontinued.

Implementation of deactivation plans will place the Redox Plant in a status designed as Condition II. Held under AEC Plan start up time greater than 30 days but less than six months. Agreement with the plans for Condition II status must be reached between the Manager, Manufacturing Department and the AEC. The agreement will be formalized into an approval letter by General Accounting and required approvals obtained. The same procedure will be required for any subsequent change in status.

Deactivation planning deviates in some respects from property status requirements for Condition II and waiver agreements will be processed through General Accounting.

SUBJECT:

PROPERTY MANAGEMENT

APPROVED BY: C. B. Foster

DATE: January 27, 1967

(a) General Supply Stock Items

Specified	Deviation
Will be removed prior to layaway of the facility and disposed of through routine disposal procedures.	Inventories will be reduced to a minimum consistent with requirements for stand-by operations and maintenance.

(b) Essential Materials

Specified	Deviation
Will be transferred to other plant processes if usable, if not usable will be held.	In process, contaminated Hexone, is not compatible with other processes and will be discarded for safety reasons and to permit deactivation of the inert gas generation and distribution system.

(c) Spare Parts

Specified	Deviation
Will be returned to Spare Parts prior to layaway of the facility. May be utilized for other plant use with the written approval of the Custodial Manager if items are readily replaceable and do not affect operational status.	None

(d) Movable Equipment (Machine tools, shop equipment, etc.)

Specified	Deviation
Will not be transferred to other use except in case of an emergency and only upon written approval of the Custodial Manager.	None

(e) In-Service Spare Equipment

Specified	Deviation
Will not be transferred to other use except in case of an emergency and only upon written approval of the Custodial Manager.	None - NOTE: Spare agitators and pumps will be moved from the 272-E Shop to 2101-M. Spare columns in 277-S will remain in place on mock-up supports. Mock-up facilities are to be retained as installed in the 277-S Shop.

(f) Fixed Process Equipment (Tanks, pumps, agitators, etc.)

Specified	Deviation
Will not be removed except in the	None

case of an emergency and only upon written approval of the Department Manager.

(g) Building Services (Lighting, ventilation, etc.)

Specified	Deviation
Will not be removed until final disposition is made at a building.	None

3. Custodians

The Department Manager will name a Property Control Custodian who will be responsible for all assigned property transactions. At the time it is placed in a laid-up status, an inventory (or other adequate property verification)will be taken by the custodian under the direction of General Accounting. The custodian will maintain a log book history record of the facility covering matters affecting it, including property transfers (showing items, date of transfer, receiving activity, transfer document and number, authorizing authority, etc.) so that status of the facility will be a matter of record at all times.

The custodian will insure the facility is maintained in a clean and orderly condition and necessary safeguards taken to prevent unauthorized removal of items therefrom.

SUBJECT:

PROPERTY MANAGEMENT

APPROVED BY: C. B. Foster

DATE: June 1, 1966

4. Condition Status Review

The prescribed status report will be prepared by Financial for review by the Department Manager.

5. Property Accounting Category

The deactivated Redox Plant facilities will be placed in Property Accounting category Plant and Equipment in Stand-by.

6. Reference to Related Chapters

Chapter 2, "Management of Government Property"

Chapter 7, "Control of Materials and Supplies"

Chapter 9, "Control of Capital Plant and Equipment"

REDOX PLANT DEACTIVATION
COMPLETION REPORT

INSTRUCTION NO.

DETAIL PROCEDURE NO.

SUBJECT: SECURITY

PAGE 1 OF 1

PREPARED BY C. B. Foster January 1967

Program 4.16

SECURITY:

Conditions were established as specified by Security Program 4.17 to change the Redox Area Security Status from "Exclusion" to "Limited". N. L. Gross and C. B. Conrad of Isochem Security counseled employees, inspected and approved the area for the Status Change. At 4:30 p.m., December 24, 1966, the Redox Area perimeter gates were opened and the ITT/FSS Security Patrol coverage at the Redox Badge House was discontinued. The Redox Area is now controlled as a "Limited" zone within the 200 West Area.

To enhance property management signs were posted which read: "Unauthorized Removal of Equipment and Supplies Prohibited".

For traffic control a "Stop" sign was installed at the plant exit.

The area registration system established for personnel accounting in the event of a nuclear incident was continued pending complete flushing of the plant and because of continuing 222-S Laboratory programs.

Construction of the UNH area fence shown on Deactivation drawing H-2-4590 Plot Plan 202-S vicinity was installed by J. A. Jones forces (Isochem Work Order C-65576) at a cost of $2,499.24 charged to Deactivation Code 6780.

5. TERMINAL PROCESSING - CANYON AND SILO

5.1 Product Recovery

- 5.1.1 Vessels and Piping
- 5.1.2 Pipe Trench
- 5.1.3 Wind Tunnel
- 5.1.4 Silo and Cells

5.2 Decontamination

- 5.2.1 Vessels and Piping
- 5.2.2 Column Carrier
- 5.2.3 Canyon Deck
- 5.2.4 Cells and Equipment

SECTION 5.1 PRODUCT RECOVERY

INTRODUCTION:

Terminal processing is scheduled to start the latter part of January, 1967, immediately following the year-end production period and completion of the final neptunium recovery campaign. Three weeks are allotted to neptunium processing in order to obtain maximum recovery for transfer to Purex, and to preclude significant pickup with plutonium during the acid flushes, which mark the initial phase of terminal processing.

Recovery of uranium and plutonium from the process system is a two-phase operation. The initial effort involves dissolution and flushing of product heels from vessels and piping employing a standard flush solution of 57% nitric acid - 1% boric acid. Product residuals retained in undissolved solids are more vigorously treated by sludge dissolution in a reagent composed of 20% nitric acid - 6% ammonium fluoride - 1% boric acid.

Concurrent with sludge removals from each of the 24 vessels scheduled for this treatment, a series of large volume leaches of the pipe trench, wind tunnels, cell enclosures and silo shaft are to be made. The reagent generally specified for these unconfined areas is a dilute acid composition, except for pipe trench application where the mild steel pipe supports preclude use of corrosive chemicals. A 1% boric acid solution would suffice as a pipe trench flush.

The products accumulated from these sources are adjusted for solvent extraction treatment and final recovery operation.

HAZARDS CONTROL:

Concentrated nitric acid (57%) flushes have been performed periodically during the production life of the Redox Plant in accordance with requirements of RL-SEP-315, "Process Specifications U-Pu Separations At Redox". Sludge removal operations, although completed infrequently, are regulated by RL-SEP-323 Rev., dated June 7, 1965. In addition, due to the nature and specific problems associated with sludge dissolution, a hazard review by task force determined the conditions required for safe performance of this work. The detailed procedures have been prepared to comply with both instructions. In order to provide ready reference

SECTION 5.1 PRODUCT RECOVERY

HAZARD CONTROL (Continued)

the document (Secret) is to be kept on hand; the hazard review is included as an addendum to this instruction.

1. Nuclear Safety Control

All flush solutions prepared for recovery of product will contain 1% by weight boric acid as a neutron poison. The requirement for boron will remain in effect throughout the flushing operation as prescribed, until such time as process samples confirm product pickup to be minimal and deletion of the neutron poison is given formal authorization. Formal authorization consists of written notice by Research and Engineering and acceptance by signatories of RL-SEP-315.

2. Chemical Hazards Control - Hydrogen Evolution

The approach to be used in sludge dissolution is to blanket the vessel with 50 cfm of inert gas, thereby limiting the oxygen concentration and without attempting to limit the hydrogen concentration in the vessel. During the dissolution of product - bearing solids hydrogen is formed and discharged to the vent system. To preclude the presence of an explosive atmosphere, in the event of spark from some remote source, dissolution must take place under an inert gas blanket, and may not be authorized to proceed until the oxygen content of the vapor space within the vessel is measured and determined to be less than 4%. Since it is not possible to blanket the vent header with an inert atmosphere a safe system will be maintained by diluting the off-gas stream as it enters the header by removing a vent jumper upstream of the subject vessel. The combustible gas analyzer will be calibrated for hydrogen and provide a continuous measure of hydrogen evolved as well as a control for the rate of sludge dissolutions.

3. Hexone

Prior to introduction of concentrated nitric acid to the process system, hexone is to be displaced with water to storage in 276-S and completely isolated from any contact with the acid. Lock and tag procedures must be in force. Before hexone is reintroduced for

SECTION 5.1 PRODUCT RECOVERY

3. Hexone (Continued)

product recovery operations, residual heels of acid are displaced with water from all vessels, piping and sample pots, and an acid boiloff completed.

Similar controls are in effect for sludge dissolution to preclude contact between hexone and the nitric acid - ammonium fluoride solution.

4. Corrosion

For dissolution of the intermetallic compounds, predominantly uranium tri-silicide, a mixture of nitric acid, ammonium fluoride, ammonium nitrate, boric acid and sodium dichromate will be used. Fluoride compounds in the presence of sodium dichromate in acid solution are particularly corrosive to stainless steel, especially at higher temperature. In order to avoid excessive corrosion of the vessels, the incremental addition of reagent should be modified to a gradual rate of rise in temperature - on a continuous record - and the temperature never permitted to exceed 80°C. When the reaction is judged to be complete, the resulting solution should not be permitted to stand in excess of two hours before the free fluoride is complexed with ANN.

SECTION 5.1 ADDENDUM - EXCERPT - HAZARDS REVIEW TASK FORCE REPORT ON SOLIDS DISSOLUTION IN REDOX VESSELS

In a preliminary review of the hazards control philosophy and operating procedures prepared for a sludge dissolution campaign, the task force followed a line of reasoning and discussion which can be summarized as follows:

A. Chemical Hazards

The only chemical hazard recognized to date is that of hydrogen evolution from the dissolution reaction.

Actual laboratory dissolution of a sludge sample gave reasonable indication that the gas evolved in the reaction is mostly H_2.

SECTION 5.1 ADDENDUM - EXCERPT - HAZARDS REVIEW TASK FORCE REPORT ON SOLIDS DISSOLUTION IN REDOX VESSELS (Continued)

B. Chemical Hazards Control

1. The concept of preventing an explosive H_2-O_2 mixture from occurring in the tank vapor space by blanketing the tank with an inert gas purge of up to 20 cfm was questioned as follows:

   a) If H_2-N_2-O_2 mixtures having H_2 concentrations greater than 4% are to be nonflammable, the oxygen content must be maintained at less than 5%(1).

   b) Calculations based on 20 cfm inert gas purge and 4% H_2 in the tank vapor space show that an air in-leakage to the tank of only 6.6 cfm will cause the oxygen concentration to equal the 5% limit.

   c) If (as an example) the J-5-A vent blender does collect the estimated 600 cfm of air and vapors from tanks H-1, H-7, H-8, H-9, H-10, and G-5, then without direct measurement of the H-8 and H-9 tanks it is unreasonable to assume anything but an air in-leakage rate to the H-8 or H-9 tanks (prime candidates for sludge removal) which is considerably greater than the 6.6 cfm limit.

   d) Increasing the inert gas purge rate from 20 cfm to 40 cfm would permit an air in-leakage rate of about 13 cfm to the tank; however, a practical limit to these supply rates is soon reached.

   Thus, an inert gas blanketing technique cannot be shown (without direct measurement) to be a safe practice and is quite possibly unsafe.*

*Subsequent to issuance of the foregoing as a preliminary review by the hazards task force, it was successfully demonstrated that air in-leakage to H-8 and H-9 vessels could be regulated to 3% O_2 content under an inert gas flow to the vessels of 50 cfm. This was achieved by removing a four inch blank to the vent header upstream of each tank and by regulating the vent jet pressure.

(1) H. F. Coward and G. W. Jones Limits of Flammability of Gases and Vapors Bulletin 503, Bureau of Mines, 1952.

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 5.1 REVISION New / PAGE 5 OF 5
SUBJECT: TERMINAL PROCESSING	LOCATION Canyon and Silo
APPROVED BY: C. B. Foster	DATE June 1, 1966

SECTION 5.1 ADDENDUM - EXCERPT - HAZARDS REVIEW TASK FORCE REPORT ON SOLIDS DISSOLUTION IN REDOX VESSELS

B. Chemical Hazards Control (Continued)

2. Control of the hydrogen concentration in the off-gas system by adjustment of the fluoride addition rate while continuously monitoring the off-gas with a combustible gas analyzer seems acceptable.

   a) If the tanks can be made safe by inert gas blanketing, the analyzer sample should be drawn from the vent header.

   b) If, instead, hydrogen concentration control must be used in the tanks, then the analyzer sample should be drawn from the tank vapor space.

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 5.1.1	
	REVISION New	PAGE 1 of 11
SUBJECT: TERMINAL PROCESSING	LOCATION Canyon and Silo	
APPROVED BY: C B Foster C. B. Foster	DATE June 1, 1966	

5.1.1 VESSELS AND PIPING

INTRODUCTION:

Vessel cleanouts for recovery of product depositions is scheduled to start on or about February 2, 1967. The initial flushes, which should accumulate the bulk of product, are made up of 57% nitric acid - 1% boric acid, heated to 70°C in the 505 tank and added batchwise to vessels and columns. Pump and jet transfers through connecting jumpers and fixed trench piping remove increments of dissolved product to sampling points where duplicate samples are taken. As the flush progresses through the system, laboratory assays are tabulated and summarized to maintain an accurate measure of the total units of plutonium accumulated in D-13 waste receiver. Six thousand gallons of acid are used for these flushes which should take one week to complete.

The second phase of product recovery flushing is more complex and time consuming in that sludge dissolution, due to control requirements, must be completed for each vessel before another may be started. Preliminary work involves establishing the proper conditions for an inert gas blanket and an Orsatt measurement of O_2 content within the vapor space of the subject vessel. Some crane work is also required for several of the 24 vessels scheduled for sludge removal in order to provide means of agitation, where it does not now exist, for the incremental addition of fluoride. An accurate account of product accumulations are recorded, as required for the acid flushes, and disposition made on the basis of individual results.

Although one period of rework processing for extraction of all accumulated product is scheduled following the 35 days allotted to sludge dissolution, it is presumed that some individual recoveries from solids will be sufficiently low to warrant discard. The overall schedule may be tenuous to this extent; in the event that each recovery is substantial, lack of in-process storage spaces would require an intermediate solvent extraction operation and delay the start of decontamination flushing by an estimated two weeks.

Concurrent with sludge removals from the canyon vessels, dilute flushes of the pipe trench and wind tunnel are to be made to reclaim product from those sources. There should be no conflict, from the standpoint of

5.1.1 VESSELS AND PIPING (Continued)

incompability with sludge dissolution, in conducting each in sequence with two weeks assigned to pipe trench work and three weeks to the wind tunnel; although, where decision as to use of the crane is required the sludge removal operation generally should be given precedence. Since the wind and pipe tunnel sections are flushed with very dilute solutions, continuous boil-off is scheduled in the idle concentrators.

SAFETY:

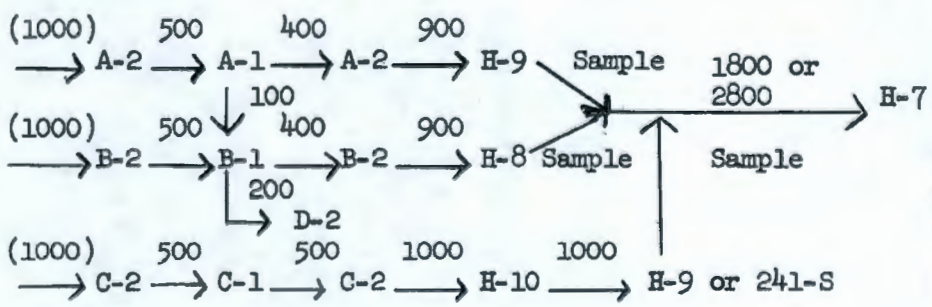
This instruction and the detailed operating procedures are written to comply with provisions of RL-SEP-315 for nuclear safety, and the hazard review task force recommendations for sludge dissolution. Existing safety rules provide the protection required for personnel in the handling of corrosive chemicals.

A. Instructions - Acid Flushes

Product remaining in process vessels and interconnecting piping is dissolved in hot nitric acid and accumulated in the waste section where approximately 6000 gallons of product solutions are reduced to a minimum volume and prepared for recovery processing. Several parts of the flush procedure may be conducted simultaneously where there is no conflict with subsequent steps in the detail procedure, and where samples removed from a given vessel are representative of final recoveries from that section of the process. The following outline shows schematically the routine order of flushing approximate solution volumes, vessel capacities and flushing routes.

General Order of Acid Flushes

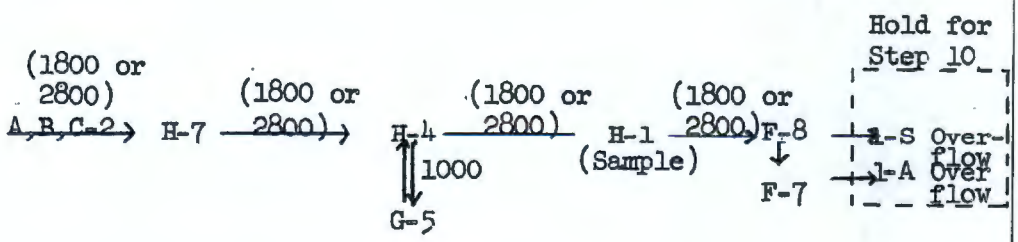
1. Dissolvers



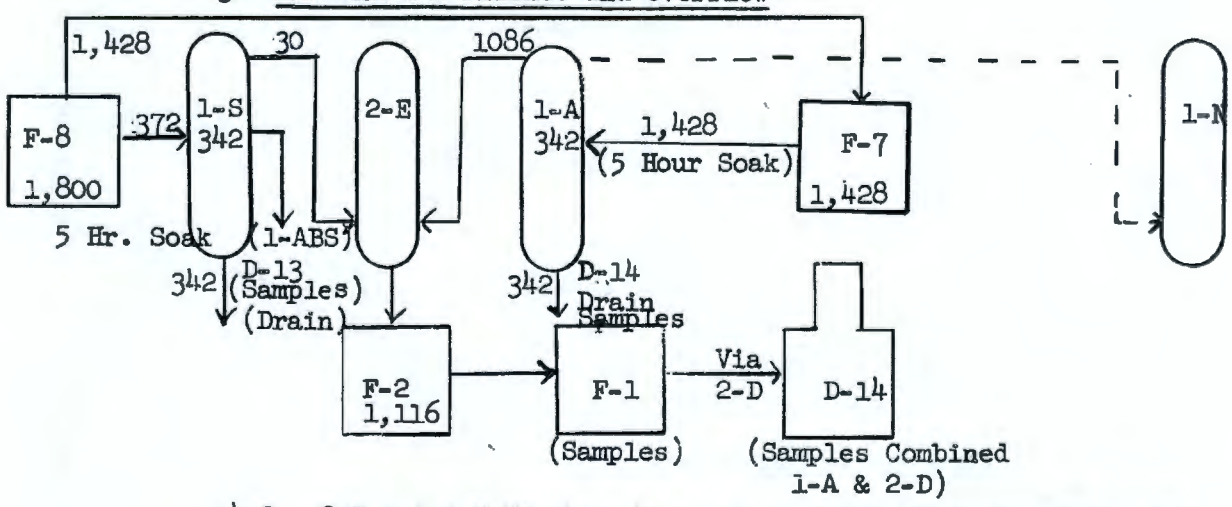
5.1.1 VESSELS AND PIPING (Continued)

2. Head End

2.

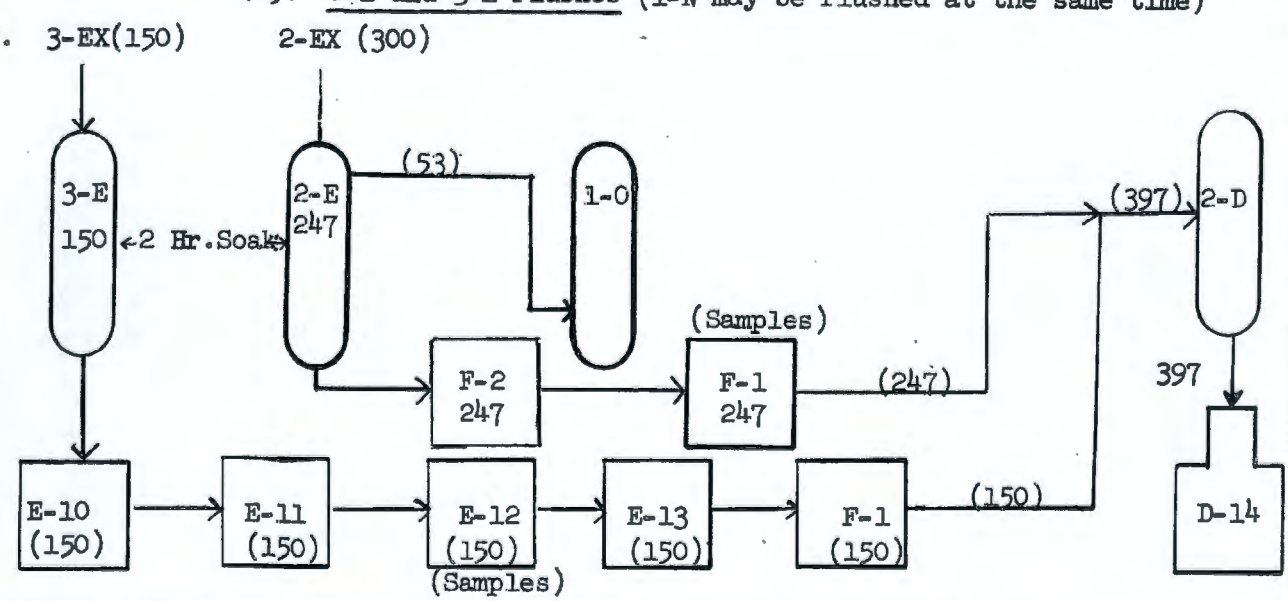


3. 3. 1-S and 1-A Flushes and Overflow

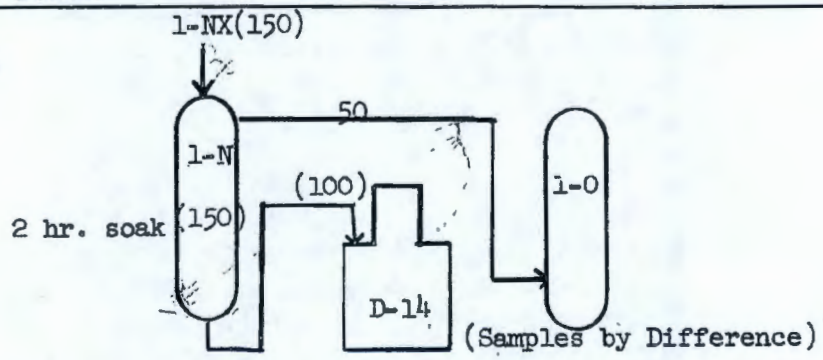


4-5. 2-E and 3-E Flushes (1-N may be flushed at the same time)

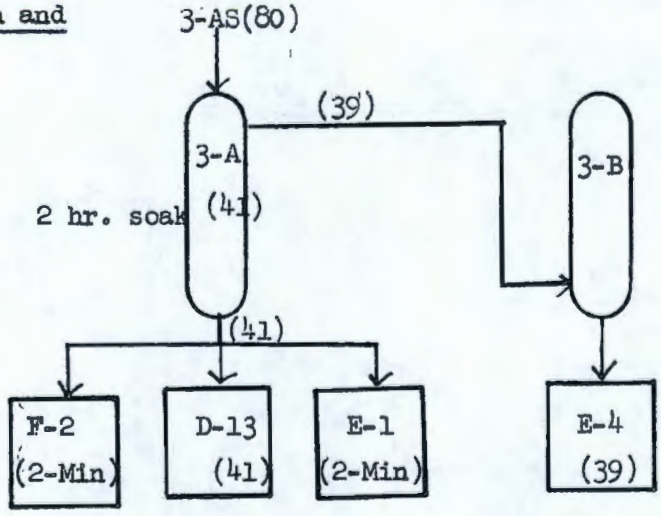
4 - 5.



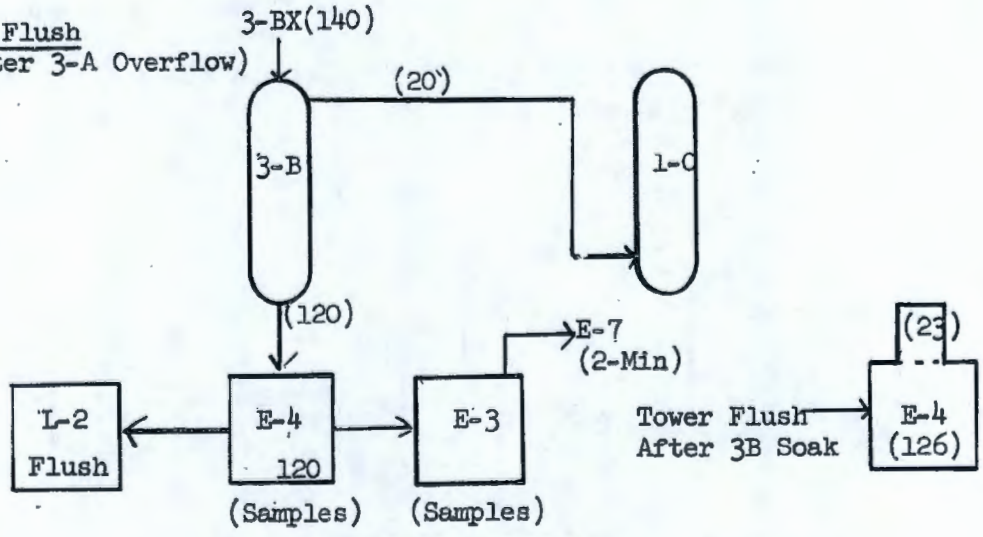
6. 1-N Flush



7. 3-A Flush and Overflow



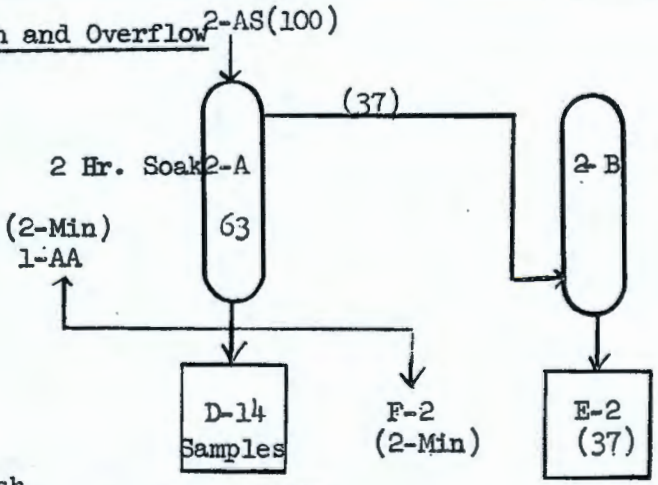
8. 3-B Flush (After 3-A Overflow)



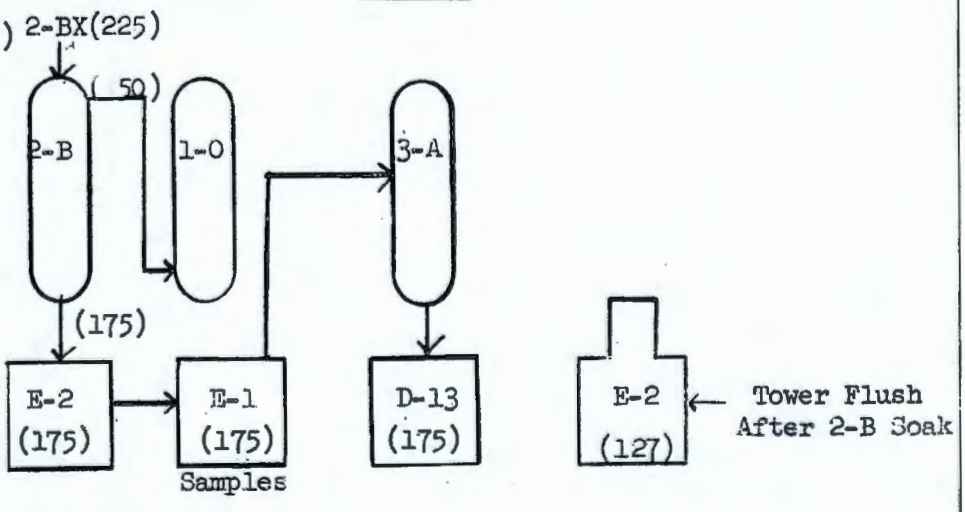
Hold E-3 & E-4 for 233 flush - Step #21

~ 150 gallons

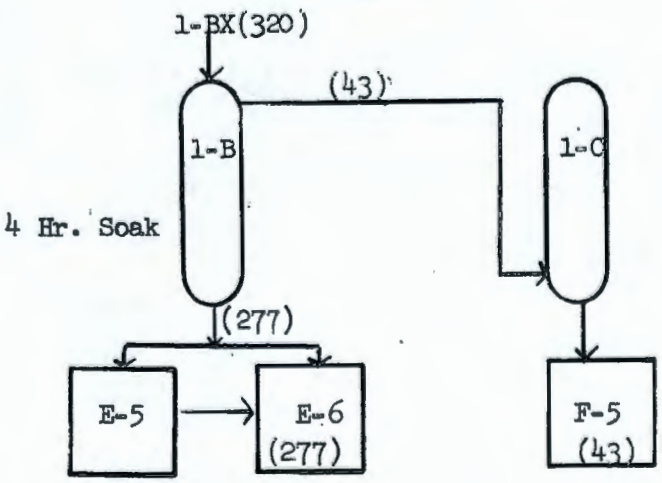
9. 2-A Flush and Overflow



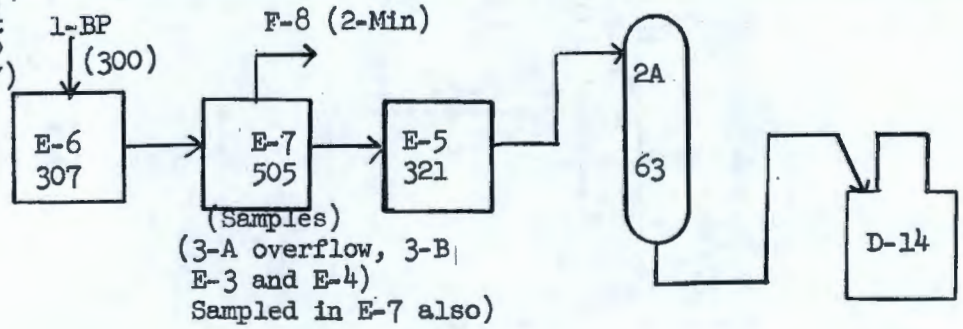
10. 2-B Flush
(After 2-A overflow)



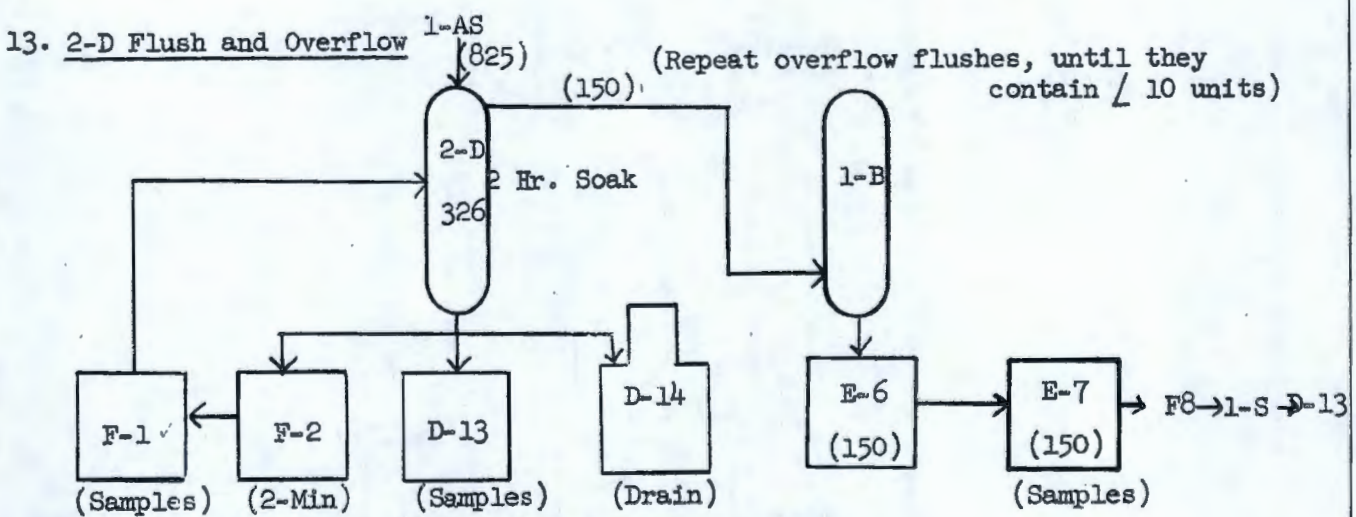
11. 1-B Flush



12. E-Board (E-5, E-6 and E-7)

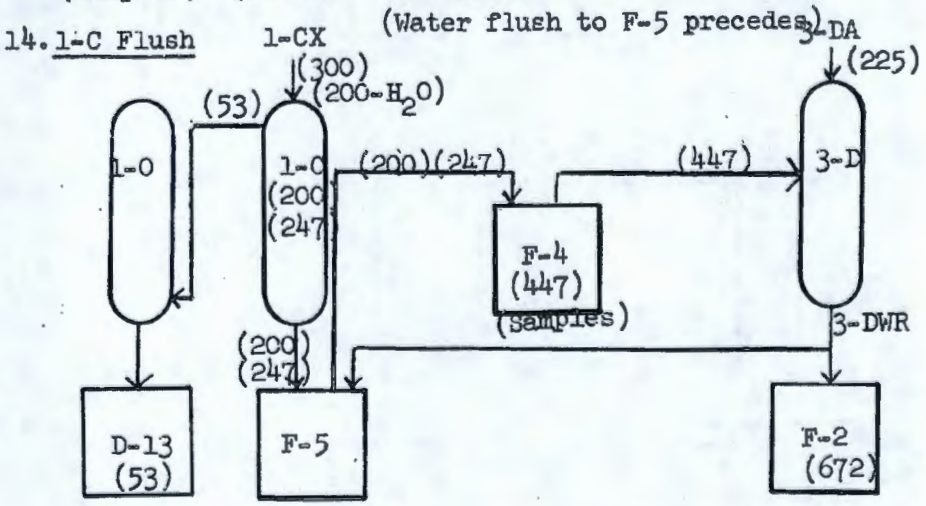


13. 2-D Flush and Overflow



(Water flush to F-5 precedes)

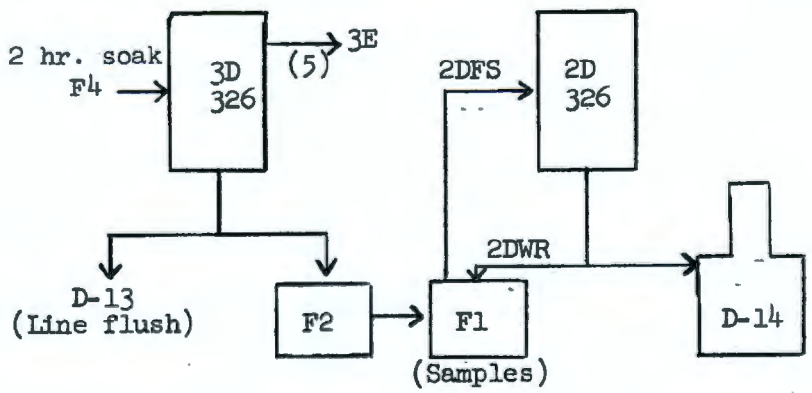
14. 1-C Flush



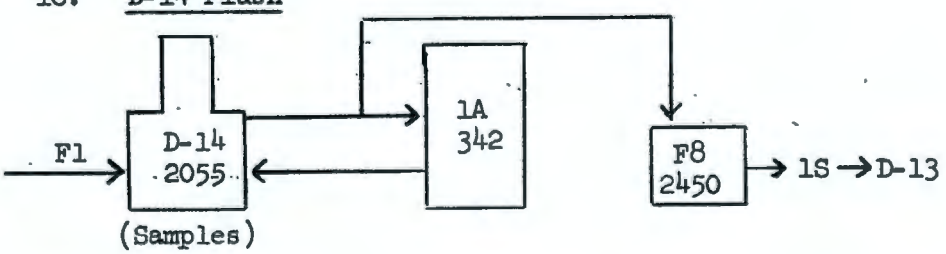
(Hold until 2-E Flush Clears F-2)

5.1.1 VESSELS AND PIPING (Continued)

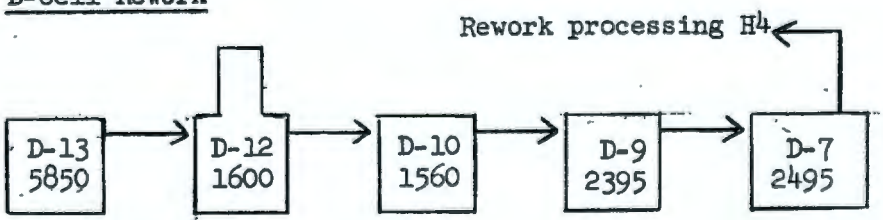
15. 3D Column Flush (When F-2 ready to receive from 3D and F-4)



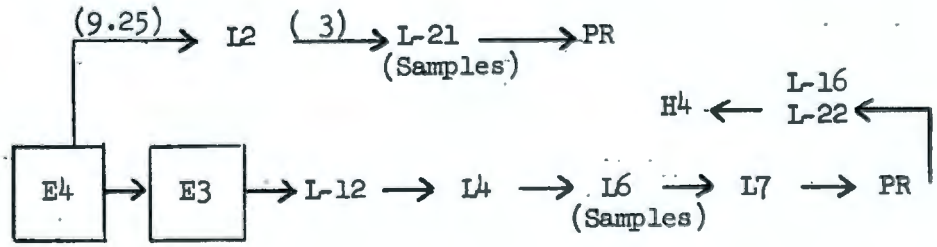
16. D-14 Flush



17. D-Cell Rework



18. 233-S Flush - (See part 4)



5.1.1 VESSELS AND PIPING (Continued)

B. Instructions - Solids Removal Flushes

When it is determined that the acid flushes are complete, and product recovery is acceptable without need for additional flushes of this nature, hold the solution in D-7 pending completion of solids removal operations. Preliminary plans are to process all recoveries in a single rework operation unless limitations are imposed at some point short of completion in the event of significant plutonium recoveries. Another impediment to a single rework operation may result from inability to provide tank space for the relatively large volumes of solution that could accumulate from sludge dissolution. However, for planning purposes, it may be presumed that a number of the 24-vessel group would not produce product in amounts sufficient to justify processing for recovery. Discard could then be authorized. Should these assumptions prove fallacious sludge dissolution will be interrupted to perform the first of two solvent extraction passes. Safety regulations with respect to hexone clearance must be in effect prior to and following rework processing.

Thirty-five days are scheduled for removal of solids from the following vessels listed according to the vent systems servicing each unit:

Dissolver Vents

A-2, B-2, C-2(1)

Air Vent J-5-A

D-7(2), D-8, D-9, D-10, G-5, H-1, H-7, H-9, H-10

Inert Gas Vent J-5-N

D-1, D-13, F-1, F-4, F-7, F-8

Condenser Vent J-6

D-12, D-14, F-2, F-5

H-5 Vent

H-4(3)

5.1.1 VESSELS AND PIPING (Continued)

(1) C-2 Dissolver is not equipped to monitor hydrogen in the off-gas. Control data obtained from A-2 and C-2 Sludge dissolution may serve as a basis to conduct the C-2 operation without monitoring for hydrogen concentration.

(2) Under normal processing conditions D-7 vessel is not vented directly to an off-gas system. To prepare for sludge removal install a vent jumper from nozzle 3 on the vessel to D-T37.

(3) The H-4 Oxidizer off-gas discharges directly to the wind tunnel via the H-5 vapor system and is not amenable to hydrogen monitoring. The requirement for monitoring may be waived for H-4 based on control data obtained during sludge dissolutions from the metal feed storage and feed preparation vessels.

The order in which vessels are scheduled for solids removal is spelled out in the detailed procedures, although considerable latitude is assumed since preparatory work, availability of equipment, and routing considerations may dictate changes in plan.

Preparation for solids removal is the most time-consuming element of the work. The actual dissolution and sampling that follows should be complete within a shift period of eight hours once the reagent addition is ready to proceed. Except for qualifications noted above with respect to monitoring the off-gas for hydrogen evolution during sludge dissolution in C-2 and H-4, each of the following capabilities is required for orderly and safe conduct of the work:

1) Agitation

Mechanical agitation is preferred. Some vessels, including: A-2, B-2, C-2, H-4, D-12, D-14, F-2, and F-5 are not equipped by layout for agitator installation and will, therefore, require an acceptable recirculation device for proper agitation and mixing of vessel contents.

2) Temperature Record

The sludge dissolution reaction is characterized by the rapid evolution of heat. A continuous temperature

5.1.1 VESSELS AND PIPING (Continued)

record must be provided as the primary control device for use in regulating the addition rate of fluoride reagent.

3) Chemical Addition

Ammonium fluoride is added in 25 lb. increments. Since the volumetric amount is small the addition must be made from a weigh tank, in a direct shot to the subject vessel, and through as short an addition line as layout conditions permit.

4) Inert Gas Blanket

The vessel in operation is to be set up for an inert gas purge measured at 50 cfm. The addition is made via a weight factor or specific gravity leg (introduction of inert gas above or below liquid level is immaterial). with the reference leg reserved for sampling of O_2 content within the vapor space. Approximately one-half hour after the purge is started draw a gas sample into the vapor trap of a sampling apparatus located in the pipe gallery. Before dissolution is permitted to proceed two samples must be measured at $\leq$ 4% O_2 by volume. Adjustment of valve pressure to the off-gas jet presumably will be required to contain excessive in-leakage of cell air to the vessel. It should be observed that during sludge removal operation in either of the four evaporators, the other three must be at rest since relatively little negative pressure will be drawn on the condenser vent system.

5) Hydrogen Monitoring

Before proceeding with each sludge removal operation the Davis analyzer (Dissolvers) or hexone monitor (vent systems) should be calibrated for hydrogen. After incremental additions of reagent to a vessel, at the rate prescribed by the detailed operating procedures, a chart reading is taken for correlation with the temperature record. As hydrogen is evolved and measured, the Supervisor in attendance will exercise his good judgment as to reagent addition rate, based on gas sampler response which is to be maintained below 3%, and the temperature record gradient which should not be permitted to exceed 80°C.

5.1.1 VESSELS AND PIPING (Continued)

6) Vent Header

Also prior to proceeding with the operation and inert gas blanketing a vent jumper to the pipe trench header is to be removed upstream of the subject vessel to provide adequate dilution of the hydrogen laden off-gas. The vessel itself is to be sealed against in-leakage of air from connected vessels by additions of seal water to preclude cross-venting.

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 5.1.2	
	REVISION 1	PAGE 1 OF 2
SUBJECT: TERMINAL PROCESSING	LOCATION Canyon	
APPROVED BY: C B Foster C. B. Foster	DATE January 27, 1967	

SECTION 5.1.2 PIPE TRENCH

INTRODUCTION:

The Redox Pipe Tunnel is laid out on the long axis of the process structure; located between the canyon cells and immediately above the main exhaust ventilation tunnel. It contains all of the fixed piping and headers used for transfer of solutions to and from the extraction batteries, for disposal of process effluents, and for transfers between cell vessels remotely located with respect to each other.

During plant life several pipe trench lines were retired from service because of leaks that developed. Although it is believed the failures were detected reasonably early and spare headers activated without delay, it must be assumed as a deactivation philosophy that the pipe trench enclosure holds some accumulated products. It is planned to flush the trench with a dilute solution of boric acid. Two weeks are allotted for this operation, to be conducted during the initial stage of solids removal from process vessels scheduled to begin on February 10, 1967.

SAFETY:

This instruction and the detailed operating procedures are written to comply with provisions of RL-SEP-315 and ISO-672 for nuclear safety. Since the pipe supports in the trench are of mild steel construction no corrosive chemicals may be used as a diluent. A 1% boric acid solution is specified. *

INSTRUCTION:

The pipe trench is a structure 18-feet in height and 8-feet, 7-inches wide running longitudinally between the North and South process cells over the entire length of the building. It houses all of the fixed piping that ranges upward in size from 2-inches, mounted on unistrut pipe supports, to the 24-inch utility outlet header, laid on the trench floor. Some 442 laterals originating at tunnel wall nozzles in the process cells are connected at welded joints to the header piping.

Minimum access is available to the pipe trench through any of five cover block openings spaced equidistant along the length of canyon deck. However, these do not

SECTION 5.1.2 PIPE TRENCH (Continued)

afford a practical means of inserting an effective flushing device. Assuming the bulk of any product present in the trench is deposited on the floor and not held up on the maze of pipe overhead, it is planned to introduce a 1% boric acid solution through the trench spray down nozzles located on the north wall, 4-feet above the floor. Pipe trench drainage, which collects only in the north cell sumps, should be transferred to D-1, sampled, and disposition made on the basis of sample results. Since the flush is planned as a precaution rather than in expectation of recovering more than token amounts of product discard may be considered a probability.

The trench sprays are serviced with raw water from the north side. Since a dilute solution of boric acid is prescribed, the detailed procedures are written to call for disconnect from the normal supply. A new portable pump provided for canyon and cell flushing, shown on the schematic diagram - Instruction No. 5.1.4, page 4 - may then be connected to each pipe trench supply lateral using a flush solution made up in 505-tank.

*Research and Engineering is in receipt of formal request to consider waiving the requirement for use of boric acid in the pipe trench flush. Should such a judgment be made prior to executing this phase of deactivation work, an addendum to this Instruction will be issued, accompanied by appropriate signatures in accordance with Instruction 5.1, page 2.

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 5.1.3	
	REVISION 1	PAGE 1 OF 5
SUBJECT: TERMINAL PROCESSING	LOCATION Canyon	
APPROVED BY: C. B. Foster	DATE April 1, 1967	

5.1.3 WIND TUNNEL

INTRODUCTION:

Eight jets from separate process vessels or combined vent systems discharge directly to the Canyon main ventilation duct. On infrequent occasions during process upsets the vessels have pressurized to cause droplets of product to be entrained with the off-gas and deposit material in the wind tunnel. Recoveries were completed as recently as September of 1965, by the addition of copious quantities of a dilute mixture of nitric and boric acids to the tunnel, which drains to sumps in the adjacent cells. Since that time, after the flushing operation was judged to be quite thorough as indicated by sampling results, three of the off-gas systems, most offensive in this respect, were redesigned to provide a "knock-out" and demister arrangement that have effectively contained entrained product.

By virtue of earlier recoveries, and as a result of successful product containment during the intervening period it may be forecast that only nominal product deposits are held in the wind tunnel. However, a full scale flush is scheduled to cover a three week period from February 24 to March 16, starting after the pipe trench flush is complete and conducted concurrent with solids removal from the process vessels.

SAFETY:

This Instruction and the Detailed Operating Procedures are written to comply with provisions of RL-SEP-315 and supplement ISO-672 for nuclear safety. Existing safety rules provide the protection required for personnel in the handling of corrosive chemicals.

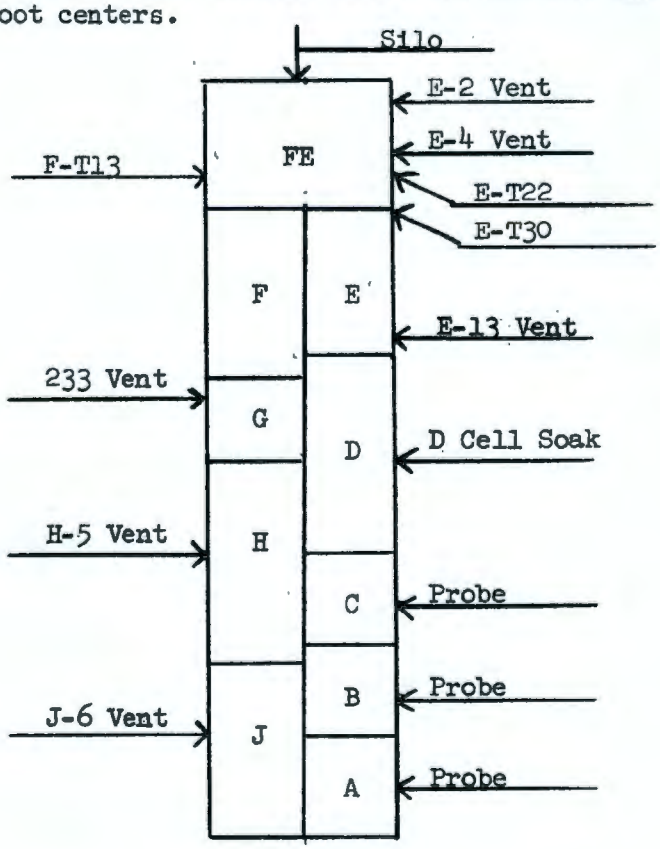
INSTRUCTION:

Access to the wind tunnel for the addition of flush solution is to be made through the 4-inch main exhaust ventilation tiles from the process cells. In addition to use of the off-gas discharge pipe already existing, several other inserts are planned for maximum flush coverage of wind tunnel compartments sectionalized by a 2-foot barrier running the complete length of the tunnel, and intersected along its length by cross members at intervals corresponding with adjacent process cell boundaries.

Entry points for the flushes are illustrated in the following diagram. Tunnel wall nozzles identify the relative position

5.1.3 WIND TUNNEL (Continued)

of the 4-inch tiles located below the nozzles and spaced on 2-foot centers.



The wind tunnel flushes conducted in September of 1965 were of large volume and made by gravity drain from aqueous make-up to the Canyon, or an 8th level head tank via a silo jumper and column. For the deactivation flushes it is planned to provide better distribution of flush solutions applied under pressure, thereby enabling smaller volumes and reducing the time required for concentration of the accumulated dilute solutions. Facilities Engineering forces are developing the proposed methods to be used for inclusion with detailed procedures.

Flushes are to be made incrementally and in sequence starting from the west end of the wind tunnel. The same precautions taken for preceding flushes are to be observed here; samples of each flush increment are to be taken, and the assays reported and summarized before starting the next flush.

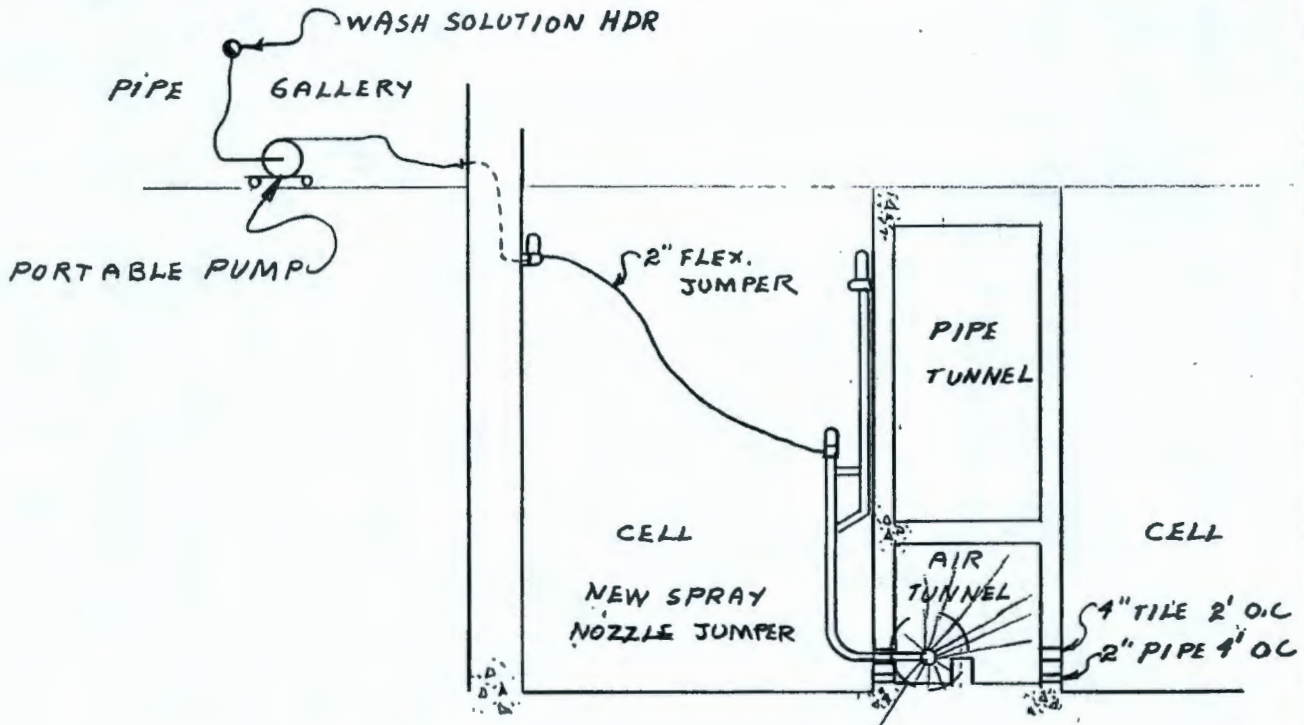
5.1.3 WIND TUNNEL (Continued)

Two methods are advised for the flushes. They may be seen as diagramatically shown in sketches on pages 4 and 5.

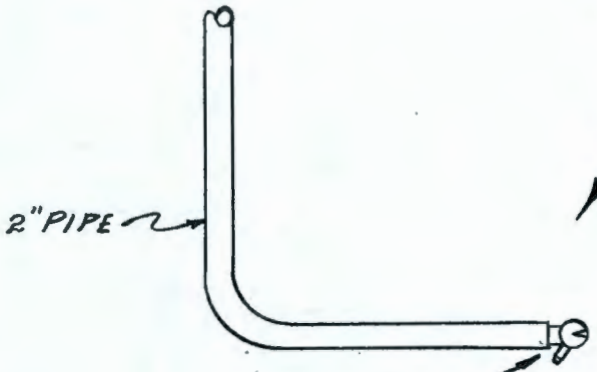
REDOX PLANT DEACTIVATION

INSTRUCTION

INSTRUCTION NO.	
5.1.3	
REVISION: New	PAGE: 4 OF 5
SUBJECT: TERMINAL PROCESSING	LOCATION: Canyon
APPROVED BY: C. B. Foster	DATE: June 1, 1966



ELEVATION



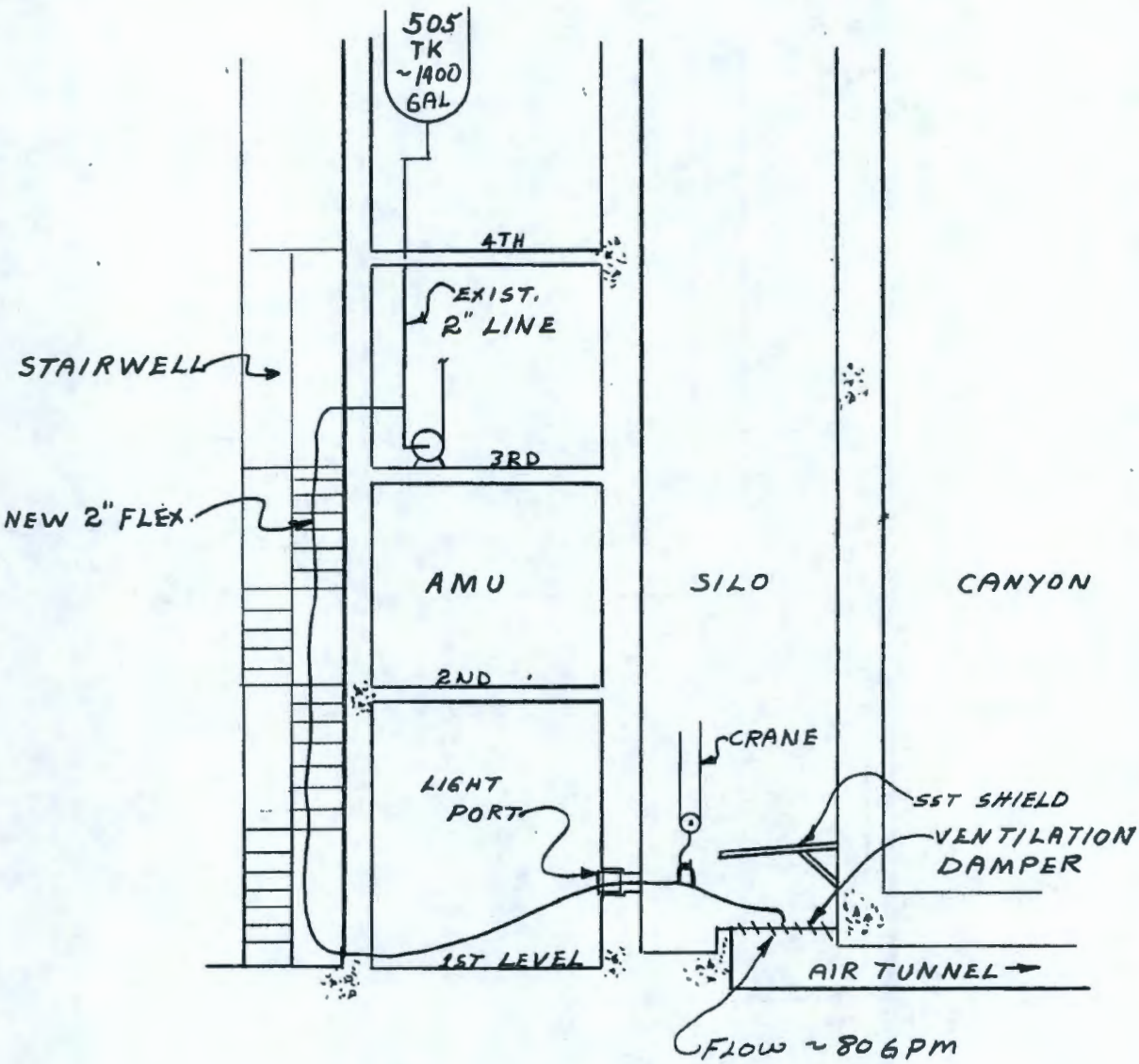
SCHEMATIC DIAGRAM
AIR TUNNEL
FLUSHING

DDW

REDOX PLANT DEACTIVATION

INSTRUCTION

INSTRUCTION NO.	
5.1.3	
REVISION: New	PAGE: 5 OF 5
SUBJECT: TERMINAL PROCESSING	LOCATION: Silo
APPROVED BY: C. B. Foster	DATE: June 1, 1966



ELEVATION

SCHEMATIC DIAGRAM
AIR TUNNEL
FLUSHING

ODW

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 5.1.4	
	REVISION New	PAGE 1 OF 3
SUBJECT: TERMINAL PROCESSING	LOCATION Silo and Canyon	
APPROVED BY: C. B. Foster	DATE June 1, 1966	

5.1.4 SILO AND CELLS

INTRODUCTION:

In the final stage of preparation for the product recovery phase of terminal processing the column and U-frame surfaces, silo shaft floor, and canyon cell floors are to be flushed, the flushes accumulated and reduced to minimum volume for solvent extraction treatment with product recovered from other sources. At this point it is not anticipated that much product pickup will materialize. The earlier flushes of pipe and wind tunnels will have drained to the north cell sumps, and approximately one-half of the wind tunnel flush, drained to the south cell sumps, will have collected product from that source. Throughout plant life connector head jumper leaks and other equipment failures have contributed to cell floor deposits, but any significant event was followed by a recovery flush to preclude any serious buildup. The flushes are limited therefore to raw water leaches, These collections represent the final accumulations of product planned for concentration, treatment and recovery processing with the bulk of product dissolved from the vessels, wind tunnel and pipe trench.

SAFETY:

Due to the relatively large volumes of flush solution used in the wind tunnel and pipe trench, that also serve as a preliminary flush of process cells, only nominal product values are expected from the final raw water flushes. However, the initial transfers from each sump to D-1 must be sampled and the results known before proceeding to the next step in the detailed operating procedures.

INSTRUCTION:

A. Silo

Two systems are used to flush the silo: The floor washdown spray system, and a crane-operated flushing line. The floor washdown spray system is existing and is supplied with raw water.

A new crane-operated flushing line will be provided for column and wall flushing. This flushing will be gravity flow from the eighth level head tanks. The flush solution can be prepared in the 505 tank and pumped to the head tanks. From the head tanks, it will flow to a wall connector in the silo and then through a new flexible flushing line which will be handled by the crane. Two positions will be used as feed points so that

SILO AND CELLS (Continued)

the flexible line can be shorter. These are the U-12 connectors at the 3D and 1S columns. Head tanks are 803DS and 801AS, respectively. A sketch of the system is shown on page 3 of this Instruction.

After all the floors have been flushed and the sumps are essentially emptied solutions held in process vessels may be prepared for product recovery processing.

B. Canyon Cells

Flushing of cell floors is confined to operation of the lower cell sprays. Two, 30-second flushes of each cell with pickup and sampling in D-1 between water applications should suffice.

REDOX PLANT DEACTIVATION

INSTRUCTION

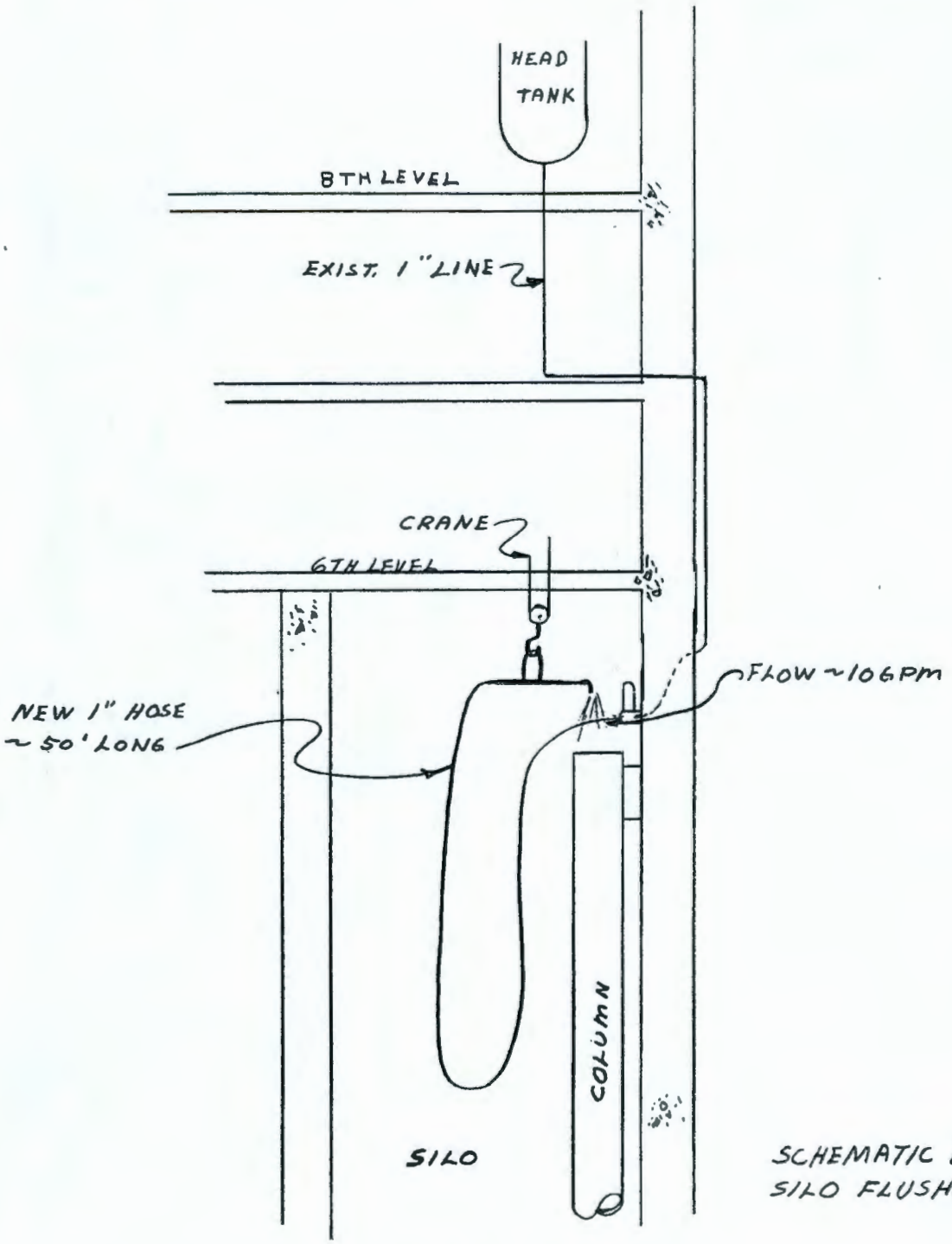
INSTRUCTION NO.	
5.1.4	
REVISION: New	PAGE: 3 OF 3

SUBJECT: TERMINAL PROCESSING

LOCATION: Silo and Canyon

APPROVED BY: C. B. Foster C. B. Foster

DATE: June 1, 1966



SCHEMATIC DIAGRAM
SILO FLUSHING

ELEVATION

DDW

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 5.2	
	REVISION New	PAGE 1 of 2
SUBJECT: TERMINAL PROCESSING	LOCATION Canyon and Silo	
APPROVED BY: C B Foster C. B. Foster	DATE June 1, 1966	

SECTION 5.2 DECONTAMINATION

INTRODUCTION:

When, in the judgment of operations management, the recovery flushes and subsequent processing have reduced product residuals to minimum values, and no additional economic advantages may be gained from extending recovery operations, the decontamination flushes of vessels and piping are authorized to begin. If the deactivation schedule is on target this should occur on or about March 28, 1967. Since extraction processing from the decontaminating reagents is not feasible it may be assumed that product contained in the flushes is subject to discard.

The flushes are essentially a two-phase treatment in each of two categories: internal to vessels and piping, and external to vessels and piping including the process cells. The objective of decontamination flushes is simply an effort to achieve a reduction in radiation levels throughout the process system and to fix or minimize potential for migration of radioactive particulate during the projected standby. It is not expected to reduce radiation levels to a degree that would permit contact maintenance.

Internally, the vessels and lines are to be flushed with an alkaline permanganate solution of 1% potassium permanganate in 25% sodium hydroxide. This solution is applied fresh at a selected number of starting points in the system for more effective decontamination and to avoid mere transfer or smearing of contamination to a location downstream. Each reagent application is chased with water prior to introduction of 10% nitric acid, which is used to remove the film and associated contamination left by the alkaline permanganate.

For the external flushes, to be limited to the Canyon cells because the extraction batteries have not been subject to the same degree of corrosion evident in the Canyon, alkaline permanganate is also specified as the flushing agent. However, due to the extensive use of mild steel in Canyon cell appurtenances a 10% oxalic acid solution replaces nitric acid for the passivation flush.

Distribution of the internal flushes follows a plan similar to the earlier product recovery flushes except

SECTION 5.2 DECONTAMINATION (Continued)

that permanganate is introduced to the system at a greater number of intermediate points. The external flush of cell equipment and enclosures is more difficult and time consuming in that remote manipulation of a flushing wand from the crane is involved. Facilities Engineering is providing applicator design.

During the internal equipment flushes, as time and manpower permit concurrent treatment, the Silo column carrier pit and the Canyon deck are to be decontaminated. In any event the deck flush should precede that of the cell enclosures. Prior to deck decontamination all extraneous material of any nature must be cleared. Column carrier decontamination is well suited by location to use of equipment and techniques employed by the WH&DO group, and may be scheduled by them at any time after the product recovery operations are complete.

SAFETY:

Thorough flushes planned for product recovery should leave only nominal amounts of plutonium deposited in the process vessels and piping for pickup in the decontamination flushes. Experience from the bismuth phosphate plants, documented after deactivation of each precipitation process facility, indicated some accumulations warranting extended recovery operations were associated with the solvent action of dilute nitric acid following the alkaline decontamination flushes. However process dissimilarities and the fact that sludge removal operations are planned in the Redox deactivation program to preclude product leaching from vessel solids during the decontamination flushes, offer sufficient assurance that earlier recoveries will have been quantitative.

Safety regulations with respect to chemical handling remain in effect.

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 5.2.1	
	REVISION 1	PAGE 1 OF 3
SUBJECT: TERMINAL PROCESSING	LOCATION Canyon and Silo	
APPROVED BY: C. B. Foster	DATE Sept. 15, 1966	

SECTION 5.2.1 VESSELS AND PIPING

INTRODUCTION:

The alkaline permanganate decontamination flushes are conducted separately in four process sections of the plant. They are:

1. Hexone Recovery and Waste Sections
2. Plutonium Cycles
3. Uranium and Partition Cycles
4. Precycle and Neptunium Accumulation Cycles

Fresh solutions of 1% potassium permanganate in 25% sodium hydroxide are prepared in 505-tank, introduced at elevated temperatures to each system in the order outlined, and terminally routed to underground storage after sampling for product content. Total volumes of reagent are designed to fill each vessel to capacity without overflow. Three follow-up flushes are planned; the first using demineralized water to displace residue, and the second using 10% nitric acid for passivation of stainless steel surfaces. Followed by another water flush for the third.

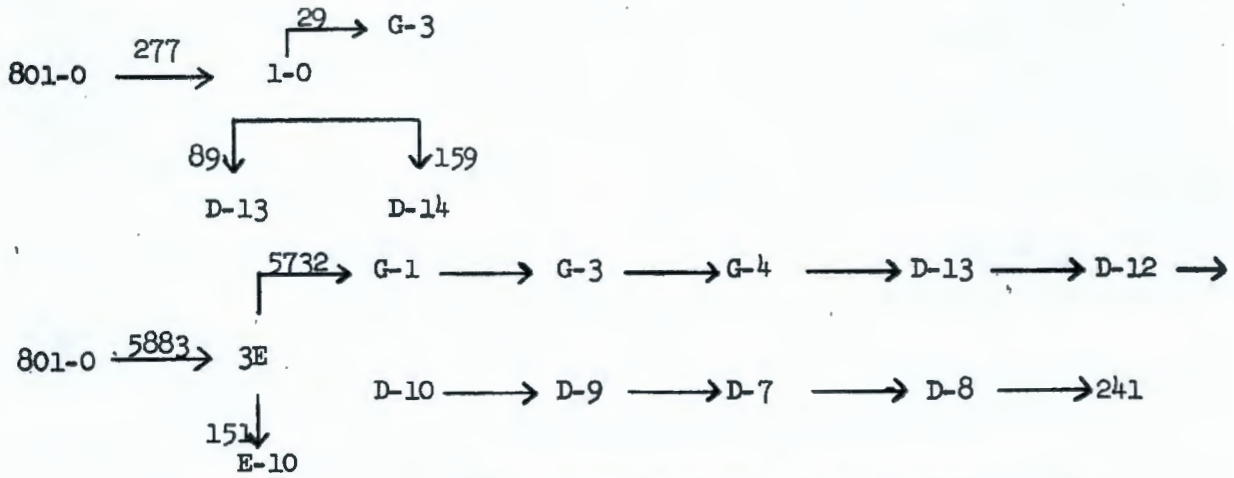
SAFETY:

Before proceeding to the decontamination flushes it must be a reasonable certainty that acid flushes and recovery processing have reduced product inventories to a minimum to avoid plutonium precipitation with sodium hydroxide.

INSTRUCTION:

Alkaline permanganate decontamination flushing follows the outline shown in the accompanying sketches. Solution flow is directed in each of the four cases according to normal process routings except that each receiver is filled to near overflow to contact the underside of the vessel cover during agitation. Diverted flows are also shown to complete flush solution contact with alternate routes normally not used in process service. Since the reagent is alkaline to start with there should be no need for a reverse strike in D-8 neutralizer prior to disposal; however, for each batch sampled in D-9 a caustic factor should be requested in addition to the product assay. The demineralized water flush and the 10% nitric acid flush to follow in order duplicate the alkaline permanganate in every respect except that neutralization of the acid will be required in D-8.

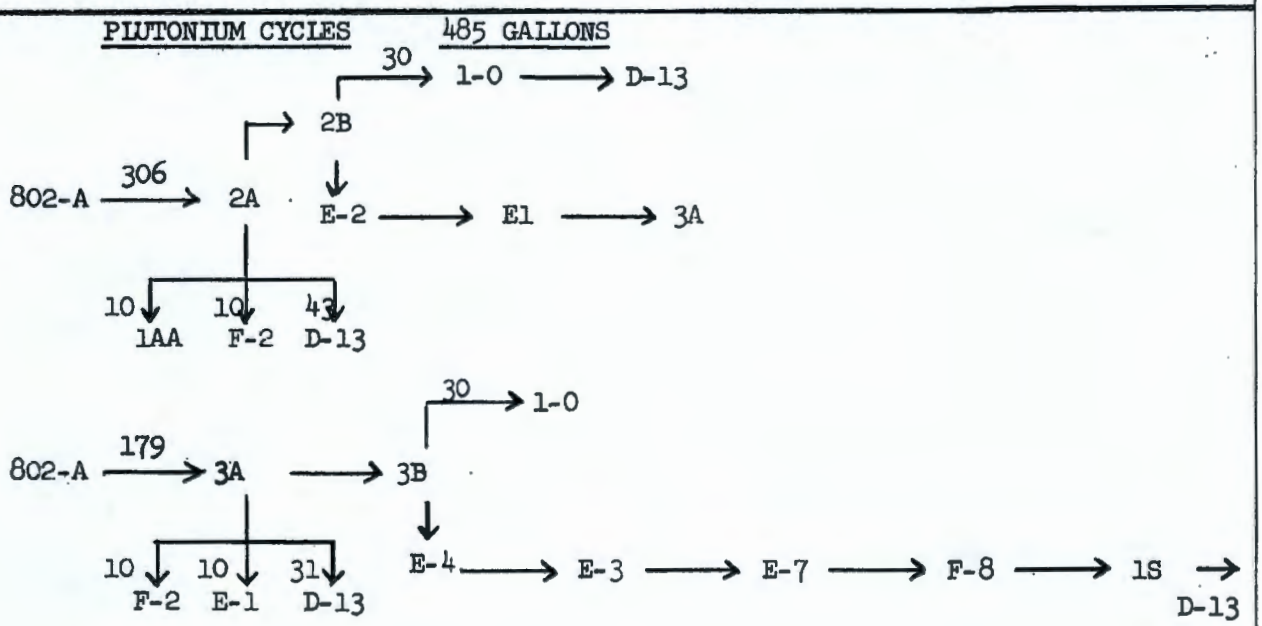
HEXONE RECOVERY AND WASTE SECTIONS — 6160 GALLONS



Rate transfers to keep each vessel full without overflow

1. Duplicate flush with water.
2. Duplicate flush with 10% nitric acid.

PLUTONIUM CYCLES — 485 GALLONS



1. Duplicate flush with water.
2. Duplicate flush with 10% nitric acid.

REDOX PLANT DEACTIVATION

INSTRUCTION

INSTRUCTION NO.	
5.2.1	
REVISION 1	PAGE 3 OF 3

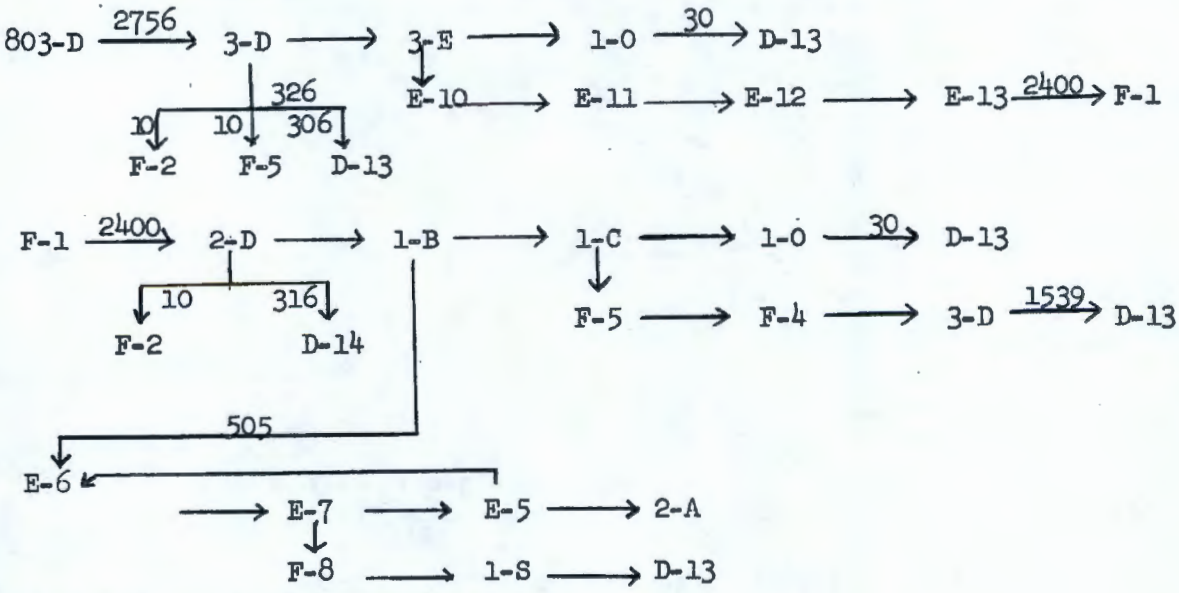
SUBJECT: TERMINAL PROCESSING

LOCATION: Canyon and Silo

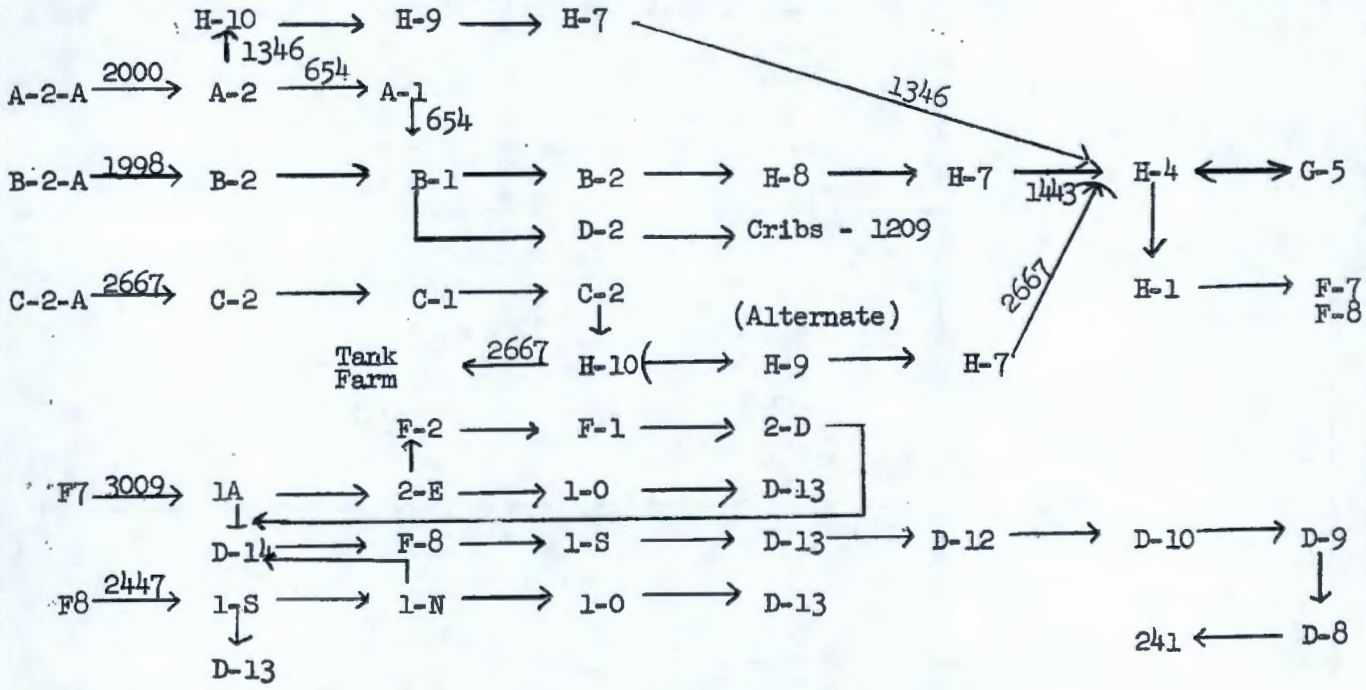
APPROVED BY: C. B. Foster

DATE: 9-1 6-66

URANIUM AND PARTITION CYCLES — 2756 GALLONS



1. Duplicate flush with water.
2. Duplicate flush with 10% Nitric Acid.



1. Duplicate flush with water.
2. Duplicate flush with 10% Nitric Acid.

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 5.2.2	
	REVISION New	PAGE 1 OF 1
SUBJECT: TERMINAL PROCESSING	LOCATION Canyon and Silo	
APPROVED BY: C. B. Foster	DATE June 1, 1966	

5.2.2 COLUMN CARRIER

INTRODUCTION:

The column carrier, located in the northwest section of the plant provides subway access to the silo shaft for equipment to be installed or removed for disposal. It is laid out normal to the building, approximately 15-feet below grade, 6-feet across and may be exposed to the open over the entire 65-feet of length by the removal of steel cover sections. A cable connected dolly mounted on rails and powered by an electrically controlled winch is used to transport columns or jumpers into the shaft where the equipment is handled remotely with the silo crane.

When the carrier is not in use shielding against high dose rates from the silo is provided by a concrete barrier that may be raised to clear the opening. However, the door does not offer a complete seal and contaminated solutions from process leaks have back-flowed into the column carrier enclosure. Prompt water flushing reduced radiation to a reasonable background, but projected plant deactivation now requires more stringent treatments to preclude migration of particulate to the environs or inadvertent exposure to casual observers in an unmanned plant.

SAFETY:

Safety regulations with respect to handling chemicals remain in effect.

INSTRUCTION:

Column carrier decontamination is to be performed by the T-Plant equipment reclamation group who has the mobile facilities and techniques required for this work. Consistent with flushing requirements within the plant alkaline permanganate is to be used as the decontaminant, followed by water and oxalic acid. Disposal of solutions via the silo drains to E and F cells sumps may be routed to D-1 vessel and cribbed. Timing of the flushes for schedule purposes is flexible and may be completed at any time the plant decontamination flushes are in progress.

Deactivation of the column carrier dolly motor control follows Instruction 11.2.9. The only other equipment requiring attention is the A-frame hoist used to remove column carrier covers. Wrap the hoist in plastic sheet for layaway in the 233-PR container storage vault.

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 5.2.3	
	REVISION New	PAGE 1 OF 2
SUBJECT: TERMINAL PROCESSING	LOCATION Canyon and Silo	
APPROVED BY: C. B. Foster	DATE June 1, 1966	

SECTION 5.2.3 CANYON DECK

INTRODUCTION:

Two systems are planned for use in flushing and decontaminating the canyon deck. The existing canyon wash down facility, consisting of many fixed spray nozzles located below the roof trusses and supplied with raw water is used first to remove accumulations of dust and loose contamination. The main flushes with alkaline permanganate and oxalic acid then follow to dissolve contaminated deposits from the deck by action of a spray applicator. Design of the spray rig shown on page 2 of this Instruction has been provided by FEO.

SAFETY:

Existing safety rules provide the protection required for personnel in the handling of chemicals.

INSTRUCTION:

Preparatory to flushing, all extraneous material should be removed from the deck. This includes: yokes, hooks, spare rotating equipment, wrenches, jumpers, blank connector heads, etc. The plan is to send the equipment to T-Plant for cleaning and reclamation or inspection. After canyon decontamination it may be returned for storage. Other material for which there is no further use may be discarded in the final burial.

When the deck is cleared flush the canyon several times with copious quantities of water. The length of time each spray section is operated from the control panels at J-Board is left to the judgment of the supervisor who should base his estimate on the ability of the sump jets to keep pace with transfers to D-1 vessel, where samples are taken prior to discard of flush water to cribs.

After it has been satisfied that water flushing has accomplished its purpose prepare the designed arrangement for application of decontaminating agents. The spray rig shown on page 2 receives alkaline permanganate and oxalic acid solutions under pressure from a booster pump located in the south pipe gallery. As the crane operator moves the wand across the deck every square foot of deck surface should be covered. Waste solutions collected and sampled in D-1 are sent to cribs. Water flushes to chase the oxalic acid then follow.

REDOX PLANT DEACTIVATION

INSTRUCTION

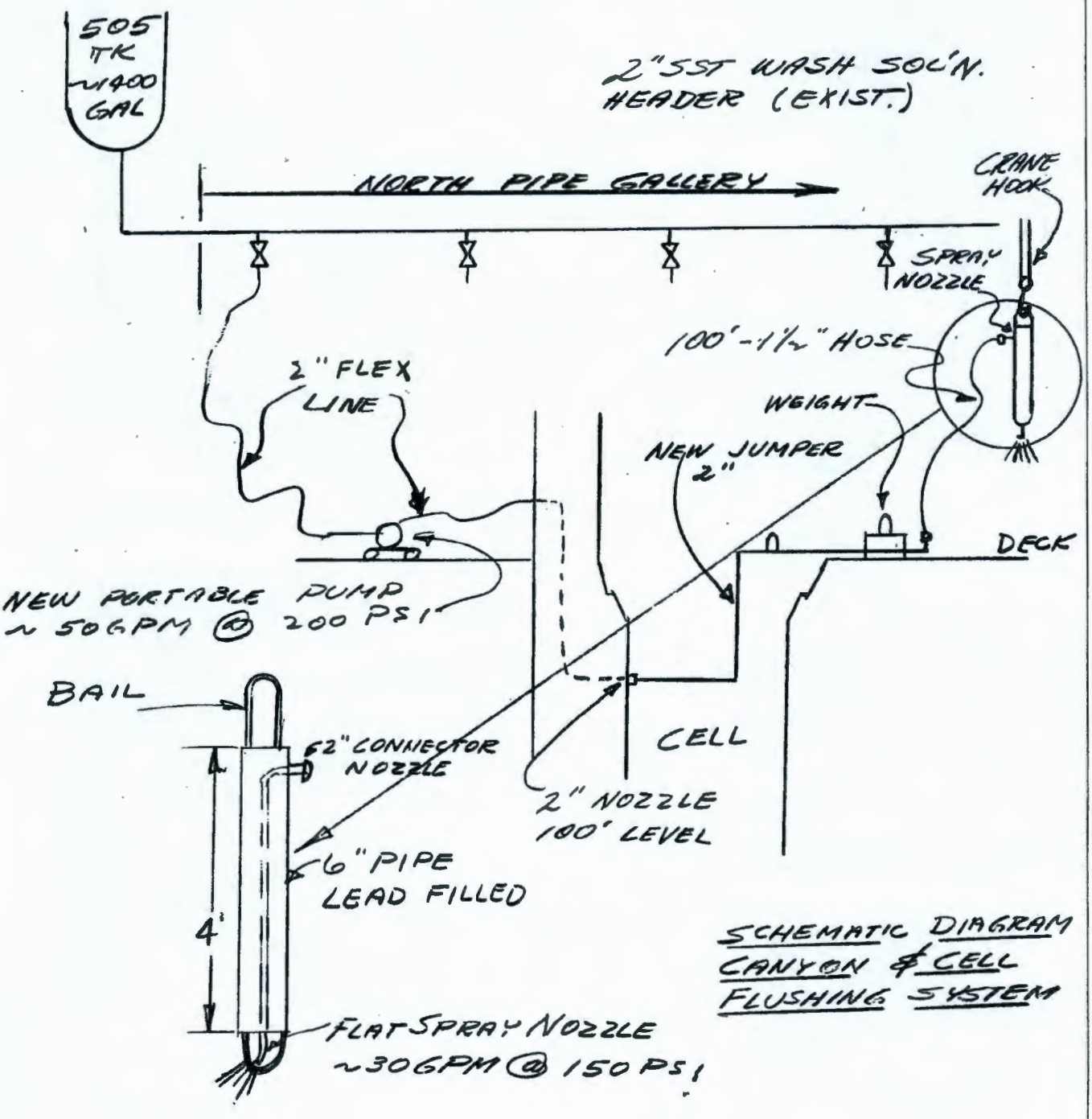
INSTRUCTION NO.	
5.2.3	
REVISION	PAGE
1	2 OF 2

SUBJECT: TERMINAL PROCESSING

LOCATION: Canyon and Silo

APPROVED BY: C B Foster C. B. Foster

DATE: February 17, 1967



SCHEMATIC DIAGRAM CANYON & CELL FLUSHING SYSTEM

DDW RCT

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 5.2.4	
	REVISION New	PAGE 1 OF 1
SUBJECT: TERMINAL PROCESSING	LOCATION Canyon and Silo	
APPROVED BY: C B Foster C. B. Foster	DATE June 1, 1966	

SECTION 5.2.4 CELLS AND EQUIPMENT

INTRODUCTION:

When the canyon deck flushes are complete similar chemical flushes of the cells are to be made using alkaline permanganate and oxalic acid as the decontaminating agents.

INSTRUCTION:

The cell flushes are an extension of the deck flushes and may be conducted immediately afterward where they do not conflict with crane work required for internal flushes of the vessels and piping. As the crane operator moves the spray nozzle above the equipment, reasonable care should be exercised in avoiding contact with the gallery wall electrical receptacles. Water flushes to chase the oxalic acid then follow.

6. 233-S BUILDING

6.1 Terminal Processing

- 6.1.1 Vessels and Piping
- 6.1.2 Greenhouse
- 6.1.3 Loadout Hood

6.2 Regulated Zones

- 6.2.1 Vessels and Piping - Process
- 6.2.2 Greenhouse
- 6.2.3 Loadout Hood
- 6.2.4 Loadout Room
- 6.2.5 Can Storage Room
- 6.2.6 Viewing Room
- 6.2.7 Viewing Room Stairwell
- 6.2.8 Viewing Room Airlocks
- 6.2.9 Pipe Gallery

6.3 Heat and Ventilation

6.4 Utilities

6.5 Equipment

6.6 Operating Gallery

6.7 Change Room

6.8 Storage Building

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 6.	
	REVISION New	PAGE 1 of 1
SUBJECT: 233-S BUILDING	LOCATION 233-S	
APPROVED BY: C. B. Foster	DATE June 1, 1966	

6. 233-S BUILDING

The 233-S Building is a contact maintenance facility for the concentration of plutonium and neptunium. Following concentration products are loaded into shipping containers and placed in storage pending shipment. Out-of-specification products are recycled through the 233-S facility into the 202-S Canyon for reprocessing.

Inasmuch as this facility is maintained by contact maintenance methods and is primarily a concentrating and loadout facility with a minimum of rotating equipment, stand-by operation of processing equipment is not required to assure startup capability within six months of notification.

The building will be heated and ventilated.

Deactivation will be performed through the use of methods and procedures which have been developed over the years and there are no new processing or safety risks involved. Deactivation flushing will be performed and controlled within requirements of document, RL-SEP-315, "Process Specifications-U-Pu Separations At Redox".

This Section of the Manual provides the Instructions required to deactivate the building within program objectives.

REDOX PLANT DEACTIVATION **INSTRUCTION**	INSTRUCTION NO. 6.1.1	
	REVISION New	PAGE 1 OF 1
SUBJECT: VESSELS AND PIPING - Terminal Processing	LOCATION 233-S	
APPROVED BY: C. B. Foster	DATE June 1, 1966	

INTRODUCTION:

After the 57% nitric acid flushes have cleared the 233-S vessels, and the L-16 tank is no longer required for recycle of product solution to H-4, the external surfaces of all vessels and piping within the greenhouse may be flushed with a dilute solution of nitric acid. The purpose of this flush is to remove dust and to bring down any product held on the process pipes as a result of leaks.

SAFETY:

Provisions of RL-SEP-315 apply with respect to nuclear safety.

INSTRUCTION:

Starting at the 4th level of the viewing room, from points of vantage that provide access with a wand to all equipment within a given area apply the spray to the tops of vessels and piping. The flush solution, made up of 10% nitric acid is fed from L-1-A tank under pump pressure via the most direct route. As the solution is collected in the sump transfer continuously to L-16 until the vessel is full, at which time flushing is interrupted pending sample results. Continue to flush batchwise, contacting the equipment at each viewing room level in turn. After a reasonable number of sample assays have been reported the Supervisor may exercise his judgment to decide on continuous rather than batch operation through L-16; interrupting the flush for sampling but not waiting for results. When the acid flush is complete repeat the operation using demineralized water.

This Instruction is supplemented by a detailed procedure which defines in more specific terms the equipment to be used, techniques to follow, and points of access and supply for the flush.

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 6.1.2	
	REVISION New	PAGE 1 OF 1
SUBJECT: GREENHOUSE - Terminal Processing	LOCATION 233-S	
APPROVED BY: C. B. Foster	DATE June 1, 1966	

INTRODUCTION:

Following the external flush of vessels and piping within the greenhouse a similar flush of the floor and sump area is in order. The same solution and technique employed in 6.1.1 may be used here.

SAFETY:

Provisions of RL-SEP-315 apply with respect to nuclear safety.

INSTRUCTION:

Contact every portion of the floor by manipulating the flushing wand from the first level of the viewing room. Sample batchwise as required in 6.1.1 until the Supervisor determines that continuous operation through L-16 is in order.

See the detailed procedure supplement to 6.1.1 for application to this Instruction.

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 6.1.3	
	REVISION New	PAGE 1 of 1
SUBJECT: LOADOUT HOOD - Terminal Processing	LOCATION 233-S	
APPROVED BY: C. B. Foster	DATE June 1, 1966	

INTRODUCTION:

The final effort to flush product deposition is made in the container loadout section of 233-S loadout hood. It is done at the same time the greenhouse floor section is flushed since the hood drains to the same sump. The enclosure should not be expected to yield more than nominal amounts of plutonium. When this flush is complete the loadout section and the two sections housing the L-7 and L-22 vessels are to be decontaminated according to Instructions contained in 6.2.3.

SAFETY:

Particular caution must be observed in applying the acid flush solution to prevent spread of contamination outside the hood. An applicator may be used, but do not supply the solution under pump pressure.

INSTRUCTION:

A 55-gallon drum or some other satisfactory source defined in the detailed procedure should be used to supply 10% acid for the loadout section flush. The drum may be pressurized, but only sufficient to maintain a steady flow of flush solution from the tip of a wand which is manipulated to cover all sections of the hood. Follow with a water flush. When this phase is complete follow Instructions contained in 6.2.3 for removal of dust, lint and gross contamination from the three sections of the hood.

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 6.2.1	
	REVISION New	PAGE 1 OF 1
SUBJECT: VESSELS AND PIPING - Process	LOCATION 233-S	
APPROVED BY: C. B. Foster	DATE June 1, 1966	

INSTRUCTION:

Internal decontamination of 233-S process vessels and piping will be accomplished by the terminal 57 percent nitric acid flushes which are specified for product recovery by Terminal Processing 6.1.1 Vessels and Piping. No further internal flushing will be required.

External flushing plans are included in Instruction 6.1.2 Greenhouse and 6.1.3 and 6.2.3 Loadout Hood.

REDOX PLANT DEACTIVATION

INSTRUCTION

INSTRUCTION NO.	
6.2.2	
REVISION	PAGE
New	1 OF 1

SUBJECT: GREENHOUSE

LOCATION: 233-S

APPROVED BY: C. B. Foster

DATE: June 1, 1966

INSTRUCTION:

The 233-S Greenhouse decontamination flushing will be accomplished by product recovery flushes specified by Instruction 6.1.2, Greenhouse. In addition to recovery of products the flushes will remove dust and lint and thus create more favorable conditions for future maintenance work and/or ventilation revisions. Combustibles and uninstalled foreign objects are to be removed.

REDOX PLANT DEACTIVATION

INSTRUCTION

INSTRUCTION NO.	
6.2.3	
REVISION: New	PAGE: 1 of 1

SUBJECT: LOADOUT HOOD

LOCATION: 233-S

APPROVED BY: C. B. Foster

DATE: June 1, 1966

SCHEDULE: Decontamination of the 233-S Loadout Hood will follow product removal accomplished by Instruction 6.1.3.

1. Surfaces inside the loadout hood are to be swabbed with a 5 percent aqueous Turco WO-2, Wedax, or approved substitute solution to remove dust, lint and gross contamination.

2. Remove maintenance tools and supplies from loadout hood and discard to contaminated waste container.

3. Clean exterior of hood to /1,000 d/m alpha and /500 c/m B&G smearable.

4. Install small filter to vent hood.

5. Seal hood openings with plastic and pressure sensitive tape.

REDOX PLANT DEACTIVATION **INSTRUCTION**	INSTRUCTION NO. 6.2.4	
	REVISION New	PAGE 1 of 1
SUBJECT: LOADOUT ROOM	LOCATION 233-S	
APPROVED BY: C. B. Foster	DATE June 1, 1966	

SCHEDULE: Loadout room work is to follow completion of Instruction 6.2.3 Loadout Hood.

1. Remove loose paint from floors and walls.

2. Vacuum dust and lint.

3. Using 5 percent aqueous solution of Turco WO-2, Wedax, or approved substitute, decontaminate the floors and walls to ⁄1,000 d/m alpha and 500 c/m B&G smearable.

4. Brush paint bare spots of floors and walls with No. 88 semi-gloss Amercoat or equal.

5. Inspect the sealing of doors to the viewing room and reseal if necessary.

6. Seal the door to the air lock with pressure sensitive tape.

7. Deactivate scale according to Instruction 11.1.3.3 Scales.

8. Remove clothes hampers - leave racks.

9. Remove portable radiation survey instruments and disconnect alpha burst monitor.

10. Close valves on air samplers.

11. Perform radiation survey.

12. Remove shop supplies.

REDOX PLANT DEACTIVATION
INSTRUCTION

INSTRUCTION NO.	
6.2.5	
REVISION: New	PAGE: 1 OF 1

SUBJECT: CAN STORAGE ROOM

LOCATION: 233-S

APPROVED BY: C. B. Foster

DATE: June 1, 1966

SCHEDULE: The Can Storage Room is to be deactivated following completion of Instruction 6.2.4 Loadout Room.

1. Ship PR and RC cans.

2. Transfer decontaminated regulated tools to the 202-S Building SWP Lobby regulated tool room.

3. Close and seal door to Loadout Room with pressure sensitive tape.

4. Remove shop supplies and combustibles.

5. Close air sampler valves.

6. Disconnect C1A unit.

7. Close Can Storage Room doors and make certain they are locked.

REDOX PLANT DEACTIVATION

INSTRUCTION

INSTRUCTION NO.	
6.2.6	
REVISION	PAGE
New	1 OF 1

SUBJECT: VIEWING ROOM

LOCATION: 233-S

APPROVED BY: C. B. Foster

DATE: June 1, 1966

SCHEDULE: Deactivation of the 233-S Viewing Room is to be started after completion of Instruction 6.1.2 Greenhouse.

1. Remove loose paint.

2. Vacuum dust from grating and floor.

3. Flush the L-6 sampler box with a small quantity of 10 percent nitric acid. Swab surrounding area with a 5 percent aqueous solution of Turco WO-2, Wedax, or approved substitute. Seal box with plastic and pressure sensitive tape.

4. Swab Greenhouse window ledges to remove gross contamination with solution as noted in item 3.

5. Remove strip coat from floor.

6. Brush paint bare spots on walls and floor with No. 88 semi-gloss Amercoat or equal.

7. Mask viewing room windows with paper and spray paint grating with No. 88 semi-gloss paint or equal to fix residual contamination.

9. Close air sampler valves.

10. Disconnect ClA unit.

11. Remove all combustibles and other supplies from viewing room.

12. Close doors.

REDOX PLANT DEACTIVATION **INSTRUCTION**	INSTRUCTION NO. 6.2.7	
	REVISION New	PAGE 1 OF 1
SUBJECT: VIEWING ROOM STAIRWELL	LOCATION 233-S	
APPROVED BY: C. B. Foster	DATE June 1, 1966	

SCHEDULE: Deactivation of the Viewing Room Stairwell will follow completion of Instruction 6.2.6 Viewing Room.

1. Seal doors to Viewing Room with pressure sensitive tape.

2. Remove loose paint.

3. Vacuum dust.

4. Caulk voids on the stairwell side of the outside wall.

5. Brush paint bare spots of walls and floor with No. 88 semi-gloss Amercoat or equal.

6. Spray paint stairs and floor with No. 88 semi-gloss Amercoat or equal to fix contamination.

7. Remove all combustibles and supplies.

8. Perform radiation survey.

9. Close doors leading to airlocks.

BM-6700-060 (4-66) AEC-RL RICHLAND, WASH

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 6.2.8	
	REVISION New	PAGE 1 OF 1
SUBJECT: AIRLOCKS	LOCATION 233-S	
APPROVED BY: C. B. Foster	DATE June 1, 1966	

SCHEDULE: Deactivation of Airlocks will follow completion of Instruction 6.2.7 Viewing Room Stairwell.

1. Switch heaters to off position.

2. Remove laundry bags - leave racks.

3. Decontaminate area with a 5 percent aqueous solution of Turco WO-2 or Wedax to ⌊1000 d/m and 500 c/m smearable.

4. Remove combustibles and supplies.

5. Disconnect electrical service to Poppys and leave in Airlock.

6. Close and lock doors.

REDOX PLANT DEACTIVATION

INSTRUCTION

INSTRUCTION NO.	
6.2.9	
REVISION: New	PAGE: 1 of 1

SUBJECT: PIPE GALLERY

LOCATION: 233-S

APPROVED BY: C. B. Foster

DATE: June 1, 1966

SCHEDULE: The Pipe Gallery is to be deactivated following completion of Terminal Processing Instruction 6.1.

1. Empty, water flush and drain liquid from the L-1A tank.

2. Measure and record free board above boron rachig rings.

3. Change out ventilation filter between the pipe gallery and viewing room.

4. Complete Deactivation Instructions 6.4 and 6.5.

5. Remove loose paint and brush paint bare spots with No. 88 semi-gloss Ameroid paint or equal. Spray paint if necessary to reduce contamination to less than 5000 d/m alpha and 1000 c/m B&G smearable.

6. Remove combustibles, tools and shop supplies from pipe gallery and airlocks.

7. Remove laundry hampers - leave racks.

8. Remove Radiation Monitorings portable instruments.

9. Disconnect portable electrical devices.

10. Close air sampler valves.

11. Close and lock door.

REDOX PLANT DEACTIVATION

INSTRUCTION

INSTRUCTION NO.	
6.3	
REVISION: New	PAGE: 1 OF 1
LOCATION: 233-S	
DATE: June 1, 1966	

SUBJECT: HEATING AND VENTILATION

APPROVED BY: C. B. Foster

INSTRUCTION:

Normal heating and ventilation will be maintained in the 233-S facility.

Pipe Gallery filters will be changed out as noted in Instruction 6.2.9 and the No. 1 and No. 2 inlet filters of the 233-S exhaust facility are to be replaced.

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 6.4	
	REVISION New	PAGE 1 OF 1
SUBJECT: UTILITIES	LOCATION 233-S	
APPROVED BY: C. B. Foster	DATE June 1, 1966	

SCHEDULE: Deactivation of utilities will be started following completion of Instruction 6.1, 6.2.

1. Sanitary water to the ventilation units will remain in service. All other water systems will be deactivated according to Instructions 11.22, 11.26, and 12.3.

2. Process and breathing air service will be deactivated according to Instructions 11.22 and 12.2.

3. Instrument air servicing the heat and supply ventilation and exhaust units and associated controls will remain active.

4. Instrument air associated with sump weight factor instrumentation will remain in service.

5. Instrument air not required for items 3 and 4 of this Instruction is to be deactivated according to Instructions 11. and 12.2.

6. Steam servicing the heat and supply ventilation units will remain active. All other steam services will be deactivated according to Instructions 11.2 and 12.1.

7. Deactivation of steam, water, air and chemical services to the 233-S Greenhouse shall include physical isolation by blanking or capping inlets to Greenhouse.

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 6.5	
	REVISION New	PAGE 1 OF 1
SUBJECT: EQUIPMENT	LOCATION 233-S	
APPROVED BY: C. B. Foster	DATE June 1, 1966	

6.5 EQUIPMENT

INTRODUCTION: Equipment associated with the following will not be deactivated:

1. Ventilation Supply and Exhaust Systems.
2. Greenhouse Sump Weight Factor indication and Alarm.
3. Fire Detection and Alarms.

Lighting deactivation will be consistent with Instruction 11.2.10.

SCHEDULE: All other equipment will be deactivated consistent with Instructions 6.2, 6.4, and 6.7.

INSTRUCTION:

All equipment deactivation will be according to Instruction 11.1 - Instrument and 11.2 - Mechanical-Electrical.

Deactivation of equipment associated with Utilities will be according to Instructions 12.1.2, 12.2, 12.3, and 12.7.

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 6.6	
	REVISION New	PAGE 1 OF 1
SUBJECT: OPERATING GALLERY	LOCATION 233-S	
APPROVED BY: C B Foster C. B. Foster	DATE June 1, 1966	

SCHEDULE: Deactivation of the 233-S Operating Gallery is to follow completion of Instruction 6.1, 6.2 and 6.5.

1. Deactivation Instructions 4.17 and 16.5 are to be completed.

2. The operating gallery is to be decontaminated to ⟨500 d/m alpha and 200 c/m B&G smearable.

3. Disconnect portable electrical devices.

4. Close air sampler valves.

5. Disconnect the alpha burst monitor.

6. Combustibles and shop supplies are to be removed.

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 6.7	
	REVISION New	PAGE 1 OF 1
SUBJECT: CHANGE ROOM	LOCATION 233-S	
APPROVED BY: C B Foster C. B. Foster	DATE June 1, 1966	

SCHEDULE: Deactivation of the 233-S Change room is to follow completion of Instructions 6.1 through 6.6 and 7.12.

1. The restroom is to be deactivated according to Instruction 16.4.

2. Remove all materials from lockers.

3. Remove electrical service to water fountain and drain water from unit. Cover water inlet and top of fountain with plastic and pressure sensitive tape.

4. Remove and discard wood bench and other combustibles.

5. Transfer shop supplies to 202-S store room.

6. Remove used laundry hampers and send to laundry.

7. Remove and ship SWP apparel to laundry.

8. Sweep and mop floor.

9. Remove janitorial equipment and supplies - discard since they are potentially contaminated.

10. Leave Chemox Mask in storage rack.

11. Perform radiation survey - if necessary decontaminate to $\angle$500 d/m alpha and 200 c/m B&C smearable.

12. Close and lock door to loadout room.

REDOX PLANT DEACTIVATION

INSTRUCTION

INSTRUCTION NO.	
6.8	
REVISION: New	PAGE: 1 of 1

SUBJECT: STORAGE BUILDING

LOCATION: 2713-S

APPROVED BY: C. B. Foster

DATE: June 1, 1966

SCHEDULE: Deactivation of the Storage Building outside the 233-S Building will follow completion of Instructions 6.1 through 6.7 and 7.2.

1. Ship SWP apparel to laundry.

2. Transfer shop supplies from operations section of building to the 202-S Store room.

3. Remove all combustibles from the building.

4. Deenergize electric power to building.

5. Sweep

6. Close and lock doors.

7. CHEMICAL SYSTEMS

7.1 General Bulk Storage - 211-S

7.1.1 Make-up and Distribution

7.2 Organic System 276-S and 202-S

7.3 Nitric Acid Recovery and Distribution - 293-S and 202-S

7.4 Tank Farm Sodium Nitrate

7.5 Propane Storage and Distribution, 2726-S, 222-S, 2710-S

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 7.
	REVISION New / PAGE 1 OF 1
SUBJECT: CHEMICAL SYSTEMS	LOCATION General
APPROVED BY: C. B. Foster	DATE June 1, 1966

7. CHEMICAL SYSTEMS

INTRODUCTION:

No chemicals will be stored in the Redox Plant and its chemical handling systems after Deactivation terminal decontamination flushing has been completed. Chemical inventories will be reduced and final chemical deliveries are planned to satisfy anticipated consumption or the minimum inventory required for the service. If there are residual inventories of solid chemicals the chemicals will be returned to the 200-E warehouse. Liquid chemical inventories except Hexone, of economical significance will be transferred by tank car to the Purex Plant. The Hexone inventory is a process recycled contaminated stream and will be discarded. It will not be necessary for Isochem Inc. to dispose of chemicals through the excess sale procedure.

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 7.1
	REVISION New / PAGE 1 of 1
SUBJECT: GENERAL BULK STORAGE	LOCATION 211-S
APPROVED BY: C. B. Foster	DATE June 1, 1966

7.1 GENERAL BULK STORAGE

INTRODUCTION: The 211-S bulk chemical storage area located West of the 202-S structure is shown on Deactivation drawing H-2-H-2-45900 - Plot Plan 202-S Vicinity. Deactivation will be accomplished through these Deactivation drawings, Instructions, and Detailed Procedures as required.

INSTRUCTIONS:

1. Dispose and account for chemical inventories and drain* demineralized water from tank SW 131.

   *After completing Instruction 7.1.1.

2. Water flush tanks (except SW 131) and associated equipment and piping, including the 202, 603 and 604 AMU tanks.

3. Inspect interior of vessels and perform additional flushing to clear surfaces of deposits.

4. Neutralize as necessary.

5. Drain and dry interior surfaces.

6. Drain associated piping and air blow where necessary.

7. Tanks are to be left vented to atmosphere and vents are to be covered with 1/4" or 1/2" hardware cloth.

8. Water flush drains to chemical sewers.

9. Blank inlet flange at tank car or truck unloading station. Attach metal deactivation tag to the flange bolts.

10. Deactivate associated equipment according to Deactivation Instruction 11.2 and Deactivation drawings:

    H-2-45900 through H-2-45906 and H-2-45913, sheet 2, and H-2-45916, sheet 1.

BM-5700-060 (4-66) AEC-RL RICHLAND, WASH

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 7.1.1	
	REVISION New	PAGE 1 OF 2
SUBJECT: MAKE-UP AND DISTRIBUTION	LOCATION 202-S - etc.	
APPROVED BY: C. B. Foster	DATE June 1, 1966	

7.1.1 MAKE-UP AND DISTRIBUTION

INTRODUCTION: This Instruction concerns the deactivation of the cold chemical vessels, associated equipment and distribution systems within the 202-S Building, and the piping servicing the 233-S, 222-S, 293-S, and the 219-S Buildings. Applicable Equipment Deactivation Instructions 11.1 and 11.2 are to be followed:

SCHEDULE: This Instruction is to be implemented following completion of Instruction 7.1, except for the 211-S demineralized water system which will be deactivated after completion of this Instruction.

INSTRUCTION:

1. Dispose of all residual chemicals from the AMU, 7th level, 8th level, and N&S Operating Galleries according to Deactivation Detailed Procedures.

2. Account for all chemicals.

3. Deactivate all agitators as per Instruction 11.2.4.

4. According to Deactivation Detailed Procedure, water (demineralized) flush systems in the following sequence:

   A. All vessels on AMU levels 2 through 5.

   B. The 7th and 8th level vessels, piping valves, and rotometers and the AMU level feed pumps.

   C. Distribution piping to the Galleries and external facilities (233-S, 219-S, 222-S, and 293-S).

   D. North and South Gallery chemical addition tanks.

   E. Discharge piping and metering pumps from the chemical addition tanks to the Canyon vessels.

5. Close all valves in chemical lines between addition tanks or metering pumps and their points of entry into the Canyon or Silo. Affix a deactivation tag.

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 7.1.1
	REVISION: 1 — PAGE: 2 OF 2
SUBJECT: MAKE-UP AND DISTRIBUTION	LOCATION 202-S - etc.
APPROVED BY: J. R. Cartmell JRC	DATE April 26, 1967

MAKE-UP AND DISTRIBUTION (Continued)

6. Leave all other chemical (Not water) valves full open minus one turn.

7. Deactivate all pumps except 501 according to Instruction 11.2.3.

8. In conjunction with this Instruction, Instruction 16.8, and Detail Procedure 12.3.3.1DM; a)blank off the routing from the 407 pump to 803-DS and 801-AS vessels, b)blank off the 409 pump routing to 803-A, 802-B, and 803-B vessels, c)blank off the routing from the 501 pump to the Flush Header.

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 7.2	
	REVISION New	PAGE 1 OF 3
SUBJECT: ORGANIC TREATMENT AND STORAGE	LOCATION 276	
APPROVED BY: C. B. Foster	DATE June 1, 1966	

7.2 ORGANIC TREATMENT AND STORAGE

INTRODUCTION: The 276 organic treatment and storage facility will be completely deactivated.

SCHEDULE: Disposal of the hexone inventory and deactivation through this Instruction cannot begin until it has been conclusively determined that solvent extraction processing has been completed. Initiation of this Instruction requires the prior approval of the Manager, Redox Deactivation. The signatory approval on this Instruction is not authorization to start deactivation.

INSTRUCTION:

1. Obtain authorization of Manager, Redox Deactivation to begin work.

2. Dispose of Hexone inventory (including contents of tanks 141 and 142) by Deactivation Detailed Procedure based on Research and Engineering recommendation. Report quantity discarded to Production Planning and Financial.

3. Water flush tank unloading line to 276 and blank at car spot. Affix metal deactivation tag.

4. Perform decontamination flushes of vessels according to Detailed Procedures. A series of two flushes will be used as follows:

    1. 20% NaOH, 1% $KMNO_4$
    2. Water
    3. 10% HNO_3
    4. Neutralize and crib

    The 276 line to the 804 tank, the 804 tank, and the silo organic header will be included in terminal flushing. Flushing of the G-1 to 276 line must be included.

5. Remove "G" cell jumper H-2-9645 and install blank connector on nozzle G-T3.

7.2 ORGANIC TREATMENT AND STORAGE (Continued)

6. Flush external surfaces of equipment and jet to crib.

7. If Laboratory analyses of final flush solution indicate the 01, 02, 03, 141 and 142 tanks are free of Hexone continue with this procedure. Otherwise additional flushing and testing will be required.

8. Deactivate automatic fire fog sprinkler and alarm systems according to Detailed Procedure.

9. Deactivate raw, sanitary and demineralized water system according to Instruction 12.3 and Deactivation drawing H-2-45900.

10. Add anti-freeze to chemical sewer traps.

11. All valves are to be left full open minus one turn.

12. Verify that sumps are empty.

13. Deactivate steam and inert gas system according to Instructions 12.1 and 12.5.2. Instruction 12.5.2 will be accomplished by Deactivation Detailed Procedure.

14. Deactivate equipment according to Instructions 11.1 and 11.2.

15. Forced ventilation systems will be deactivated and air control alterations to duct work will be made according to print H-2-5298, Revision 4, and Deactivation Detailed Procedure.

16. Remove combustibles including laundry hampers.

17. Verify that no portable electrical devices are connected to electrical outlets.

7.2 ORGANIC TREATMENT AND STORAGE (Continued)

18. Transfer shop supplies to 202-S store room.

19. Place regulated brass tools in tool box and leave on grating in "hot" side. Transfer any other regulated tools to the 202-S tool decontamination room.

20. Perform radiation surveys.

21. Transfer chemox mask to 202-S store room.

22. Remove radiation survey instruments.

23. Sweep cold side operating room.

24. Deenergize electrical circuits according to Instructions 11.2.9 and 11.2.10, during last week of June, 1967.

25. Seal cold side south doors with pressure sensitive tape on the inside of doors. Seal East door of cold side on outside with tape. Seal "hot" side West door on inside with tape and East side door on outside with tape.

26. Lock all doors and turn keys into Deactivation office.

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 7.3	
	REVISION New	PAGE 1 OF 3
SUBJECT: NITRIC ACID RECOVERY AND STORAGE	LOCATION 293-S	
APPROVED BY: C. B. Foster	DATE June 1, 1966	

7.3 NITRIC ACID RECOVERY AND STORAGE

INTRODUCTION: The 293-S Building recovers nitric acid from the dissolver off-gases and provides additional iodine decontamination. This contact maintenance facility will be fully deactivated.

SCHEDULE: The 293-S deactivation will begin following final dissolver cleanout as prescribed in Instruction 5.1.1 and associated Deactivation Detailed Procedures.

INSTRUCTION:

1. The terminal acid inventory and flushes will be transferred and disposed of through the dissolver system according to Deactivation Detailed Procedures.

2. All vessels and associated piping will be drained and air blown as necessary to prevent freezing.

3. Verify that all sumps, seals, and sample pots are empty.

4. Blank nitric acid line to 202-S at 293-S pump discharge flange.

5. Blank 2" water line to 293-S scrubber (original caustic service line) at the East end of the N pipe gallery in 202-S in accordance with Instruction 11.2.2.2 and drawing H-2-31018, Revision 3.

6. Flush and drain 1" wash header and blank in South pipe gallery per Instruction 11.2.2.2 and drawing H-2-31018, Revision 3.

7. Install blank in the scrubber off-gas outlet to the 292 vent jets so as to isolate the 293 vessels from the Redox stack exhaust plenium. The vessels will be vented back to the dissolver cells. Existing H-2 drawings will be revised to record these changes.

7.3 NITRIC ACID RECOVERY AND STORAGE (Continued)

8. Deactivate 292-S vent jets by removing motive (steam and air) to the control valves.

9. Remove electric power to the interlocks on the off-gas routing control valves and affix deactivation tag on the controls at dissolver boards in 202-S.

10. Deactivate 293-S instruments as per Instruction 11.1.

11. Deactivate pumps according to Instruction 11.2.3.2.

12. All drain traps are to be filled with a permanent type anti-freeze.

13. Forced ventilation system will be deactivated and air control alteration to duct work will be made according to print H-2-31010, Revision 3, and Deactivation Detailed Procedure.

14. Remove combustibles including laundry hampers - leave racks.

15. Verify that no portable electrical devices are connected to electrical outlets.

16. Transfer regulated tools to the 202-S decontamination room.

17. Perform radiation surveys.

18. Transfer masks to 202-S Building.

19. Remove portable radiation survey instruments.

7.3 NITRIC ACID RECOVERY AND STORAGE (Continued)

20. Perform housekeeping in all areas of the building.

21. All electrical supply to the 293-S Building will be deenergized during the last week of June, 1967.

22. Seal outside doors with pressure sensitive tape.

23. Lock all exterior doors and turn keys in to Deactivation Office.

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 7.4	
	REVISION 1	PAGE 1 OF 1
SUBJECT: TANK FARM SODIUM NITRATE	LOCATION 241-SX, 202-S	
APPROVED BY: C. B. Foster	DATE March 8, 1967	

7.4 TANK FARM SODIUM NITRATE

INTRODUCTION: The sodium nitrate recycle facility consists of the 103-SX tank, a vertical turbine pump which is operated remotely from the B-2 dissolver panel board which pumps sodium nitrate solution from the 103-SX tank to the 202-S A and B dissolvers via the 241-SX-152, 241-SX-151, 241-S-151 and 240-S-151 diversion boxes.

SCHEDULE: Deactivation of the tank farm sodium nitrate system will be scheduled following final coating removal operations in the A and B dissolvers.

INSTRUCTION:

1. The deactivation of the sodium nitrate system must be integrated with management responsible for tank farm and diversion box operations.

2. Deactivate the electrical power to the 103-SX pump and affix deactivation tag.

3. Open valve to by-pass the check valve at the SX tank farm.

4. Water flush the sodium nitrate delivery system from the A and B dissolver cells to the dissolvers (A and B) and to the 103-SX tank.

5. Remove A and B cell jumpers, H-2-45282, and store them on top of the filter vessels.

6. Install blanks on nozzles A-T11, A-T15, B-T12, and B-T16.

7. Remove the air supply to Panel Board addition valve Control Units and affix a deactivation tag.

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 7.5	
	REVISION New	PAGE 1 OF 1
SUBJECT: PROPANE STORAGE AND DISTRIBUTION	LOCATION 2726-S, 222-S, 2710-S	
APPROVED BY: C. B. Foster	DATE June 1, 1966	

7.5 PROPANE STORAGE AND DISTRIBUTION

INTRODUCTION: The propane receiving storage and distribution system supplies the 222-S Laboratory Building and the 2710-S Gas Generator Building.

SCHEDULE: Deactivation according to this Instruction is to follow completion of Instructions 5.1, 7.2, and 12.5.2.

INSTRUCTION:

1. Service to the 222-S Laboratory is to remain active.

2. The underground propane valve East of the 2710-S Building as shown on Deactivation print H-2-45900 is to be closed.

3. The propane lines inside 2710-S will be capped.

8. LABORATORY - 222-S

8.1 Utilities

8.1.1 Electricity
8.1.2 Steam
8.1.3 Raw Water
8.1.4 Sanitary Water
8.1.5 Demineralized Water
8.1.6 Inert Gas
8.1.7 Instrument Air

8.2 Chemicals

8.2.1 Nitric Acid
8.2.2 Sodium Hydroxide
8.2.3 Propane

8.3 Radioactive Waste Disposal

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 8.1	
	REVISION New	PAGE 1 OF 1
SUBJECT: UTILITIES	LOCATION 222-S, 210-S, 202-S	
APPROVED BY: C. B. Foster	DATE June 1, 1966	

8.1 UTILITIES

SCHEDULE: Alternate supply methods will be provided for those services to be deactivated prior to actual deactivation.

INSTRUCTION: 8.1.1 - Electricity

No changes are to be made.

INSTRUCTION: 8.1.2 - Steam

No changes are to be made.

INSTRUCTION: 8.1.3 - Raw Water

No changes are to be made.

INSTRUCTION: 8.1.4 - Sanitary Water

No changes are to be made.

INSTRUCTION: 8.1.5 - Demineralized Water

The Demineralized Water supply from 202-S will be deactivated. The water supply to the Laboratory Still will be changed to Raw Water according to the recommendations of Facilities Engineering and Detailed Procedure.

INSTRUCTION: 8.1.6 - Inert Gas

The piping supplying Inert Gas from 202-S will be changed so as to supply Process Air. All piping identification will be changed to indicate air service. This change will be according to Instruction 12.5.2.

INSTRUCTION: 8.1.7 - Instrument Air

No changes are to be made.

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 8.2	
	REVISION New	PAGE 1 OF 1
SUBJECT: CHEMICALS	LOCATION 222-S, 219-S, 202-S	
APPROVED BY: C. B. Foster	DATE June 1, 1966	

8.2 CHEMICALS

SCHEDULE: Alternate supply methods will be provided for those services to be deactivated prior to actual deactivation.

INSTRUCTION: 8.2.1 - Nitric Acid

The Nitric Acid supply from 202-S will be removed and the piping deactivated according to Redox Deactivation Drawings H-2-45910 and Instructions 7.1.1, and 11.2.2.2.

INSTRUCTION: 8.2.2 - Sodium Hydroxide

The supply from the 202-S building will be removed and the piping deactivated according to Redox Deactivation Drawing H-2-45912, and Instructions 7.1.1, and 11.2.2.2.

INSTRUCTION: 8.2.3 - Propane

No changes to this service to 222-S are to be made.

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 8.3	
	REVISION 1	PAGE 1 OF 1
SUBJECT: RADIOACTIVE WASTE DISPOSAL	LOCATION 222-S 219-S, 202-S	
APPROVED BY: C. B. Foster	DATE Sept. 13, 1966	

8.3 RADIOACTIVE WASTE DISPOSAL

INTRODUCTION: With the deactivation of 202-S, the tank that is presently used for the neutralization of laboratory wastes from tank 103 in the 219-S facility will no longer be available for this purpose.

Upon completion of deactivation of the D-8 vessel in the 202-S building, laboratory wastes will be neutralized in the 219-S facility and transferred directly to underground storage.

SCHEDULE: Prior to and/or concurrent with the deactivation of the D-8 vessel in the 202-S building and Instruction 8.2.2.

INSTRUCTION:

1. Piping changes will be made in the 219-S facility according to Facilities Engineering recommendations.

2. Remove D-cell jumper D-T44-D8-4 and the D-8 pump discharge to D-T41.

3. Install a new jumper on the D-8 pump discharge nozzle to route the flow to the D-2 vessel.

4. Install a new jumper D-T43-D-T41.

9. UNH STORAGE AND TREATMENT 203, 204, 205

9.1 Terminal Status

- 9.1.1 Flushing
- 9.1.2 Silica Gel, 205
- 9.1.3 Instrumentation
- 9.1.4 Transport Systems
- 9.1.5 Utilities
  - 9.1.5.1 Steam
  - 9.1.5.2 Air
  - 9.1.5.3 Water
  - 9.1.5.4 Electrical Power
  - 9.1.5.5 Telephones
  - 9.1.5.6 Inert Gas

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 9.1	
	REVISION New	PAGE 1 OF 1
SUBJECT: TERMINAL STATUS	LOCATION UNH and 202-S	
APPROVED BY: C B Foster C. B. Foster	DATE June 1, 1966	

9.1 TERMINAL STATUS

With exceptions as noted in Instruction 9.1.4, the 203, 204, and 205 Areas will remain active for receiving, storing, blending, decontaminating, and shipping of Purex UNH solution. The Area will be secured as noted in Deactivation Program 4.16, Security.

Blue prints, information manuals, operating procedures, process and equipment history records will be retained in the Redox Plant or transmitted to the organization responsible for operation and maintenance of this area.

The Redox nuclear material account will be closed following terminal flushing and this area will be established within the Purex account.

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 9.1.1	
	REVISION New	PAGE 1 OF 1
SUBJECT: FLUSHING	LOCATION UNH and 202-S	
APPROVED BY: C. B. Foster	DATE June 1, 1966	

9.1.1 FLUSHING

INTRODUCTION: Inasmuch as the UNH area will remain in service the main objective of water flushing is to clean the system of uranium in order to prepare the system for a final uranium Redox nuclear material inventory.

SCHEDULE: Final water flushing will be performed following completion of Instructions 5.1.4 and 9.1.4 and related Detailed Procedures.

INSTRUCTION:

All tanks, lines, pumps and valves are to be water flushed according to Detailed Procedures. Flushing of the 151-152 and the 204 tanks is to continue until the uranium concentration is less than 0.5 pounds per gallon.

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 9.1.2	
	REVISION New	PAGE 1 OF 1
SUBJECT: SILICA GEL, 205	LOCATION UNH and 202-S	
APPROVED BY: C. B. Foster	DATE June 1, 1966	

9.1.2 SILICA GEL, 205

The water flushed silica gel system is to be regenerated with the standard oxalic acid procedure unless a recent regeneration obviates the necessity for such treatment.

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 9.1.3	
	REVISION 1	PAGE 1 OF 1
SUBJECT: INSTRUMENTATION	LOCATION 203-S, 204-S, 205-S	
APPROVED BY: J. R. Cartmell	DATE April 24, 1967	

INSTRUCTION:

The instruments for this Facility will remain in active, operable condition.

The only change in the instrumentation will be to supply Instrument Air instead of Inert Gas to the 204-S Weight Factor Manometer Purges. This will be accomplished by making a piping change in the 202-S Building as per Instruction 12.5.2.

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 9.1.4
	REVISION New / PAGE 1 OF 1
SUBJECT: TRANSPORT SYSTEMS	LOCATION UNH and 202-S
APPROVED BY: C. B. Foster	DATE June 1, 1966

9.1.4 TRANSPORT SYSTEMS

INTRODUCTION: In-Specification UNH solution is pumped from the UNH area through a pipe above ground, to the UO_3 Plant and the system is to remain active. UNH solution can be reprocessed in the 202-S Canyon. Solution is pumped from the 204-3 tank via a header designed to service the E-13 UNH ozonator, the D-7 Rework Tank and the F-5 UNH concentrator and is to be deactivated to preclude pumping UNH solution into the 202-S building. Following completion of vessel flushing per Instruction the E-13 UNH pumping system to the UNH area is to be deactivated.

SCHEDULE: The Instruction is to be initiated following completion of Instruction 5.1.4 and in conjunction with Instruction 9.1.1.

INSTRUCTION:

1. Inspect the UNH manifold in the 202-S pipe gallery to assure that pipe gallery jumper to flange DG66 has been removed and a blank is installed on the manifold and on DG66.

2. Flush the entire manifold from the pipe gallery at FG106 to the top of the 204-3 tank with 500 gallons of water allowing about 100 gallons to flow to the E-13 UNH ozonator via nozzle EG133.

3. Air blow manifold to the 204-3 tank.

4. Blank FG106 at the pipe gallery flange.

5. Blank pipe gallery wall flange EG149.

6. Following completion of Instruction 5.1.4 deactivate the pumping system from the E-13 UNH ozonator to the UNH storage area per Instruction 11.2.3.1 and by removing jumper EG133-E12-E13. Store jumper on top of the E-11 vessel. Blank open end of jumper H-2-39873 and wall nozzle E133 in E-cell.

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 9.1.5	
	REVISION New	PAGE 1 of 1
SUBJECT: UTILITIES	LOCATION 203-S 204-S, 205-S	
APPROVED BY: C. B. Foster	DATE June 1, 1966	

INTRODUCTION:

Utilities serving the 203-S, 204-S, and 205-S facility are High Pressure Steam, Electrical Power, Telephones, Sanitary Water, Process Air, and Inert Gas.

9.1.5.1 INSTRUCTION - Steam

This system will not be deactivated.

9.1.5.2 INSTRUCTION - Process Air

This system will not be deactivated.

9.1.5.3 INSTRUCTION - Sanitary Water

This system will not be deactivated.

9.1.5.4 INSTRUCTION - Electrical Power

This system will remain activated.

9.1.5.5 INSTRUCTION - Telephones

All telephones in this area will remain activated.

9.1.5.6 INSTRUCTION - Inert Gas

The Inert Gas service will be changed to Instrument Air* by disconnecting the supply PRV in the 276-S Building from the 100 PSI Inert Gas Header and connecting the PRV inlet to the 276-S Instrument Air Supply.

*NOTE:

Since this Instrument Dip Tube Supply Header also supplies the Dip Tube Purge for the 276-S Underground Organic Storage tanks, these tanks must be free of further Organic service and Instruction 7.1.2 completed before changing to Instrument Air.

REDOX DEACTIVATION

10. EFFLUENT SYSTEMS

10.1 Aqueous

10.1.1 Open Pond
10.1.2 Cribs
10.1.3 Diversion Boxes
10.1.4 Tank Farms

10.2 Gaseous

10.2.1 Canyon and Silo - 291-S - 293-S
10.2.2 233-S

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 10.1.1	
	REVISION New	PAGE 1 OF 2
SUBJECT: OPEN POND (SWAMP)	LOCATION Ref. H-6-362	
APPROVED BY: C. B. Foster	DATE June 1, 1966	

10.1.1 OPEN POND (SWAMP)

INTRODUCTION: During normal operations most of the process equipment cooling water is discharged via a 24" water header to an open pond covering about 30 acres (Print H-6-362). Cooling water will not be used during stand-by and water will be blanked to process coils and jackets to eliminate a possible canyon flood. Analysis of pond soil samples taken in May, 1966, indicate the presence of long lived radionuclides in concentrations requiring long term control. To preserve the swamp for future operations and to provide radiological control water required to blanket the pond will be provided by a raw water field tie-in to the 24" utility sewer as shown by Deactivation Drawing H-2-45900.

Should it become necessary to discontinue the pond water blanket, the integrity of the pond area shall be maintained by adequate control of vegetation and animals, soil sterilization, back-fill and visible markers.

SCHEDULE: Initiation of this Instruction will follow completion of Instruction 5.2.

INSTRUCTION:

1. Make field tie-in of raw water to the 24" tile sewer to the pond area.

2. Close raw water and steam valves to coils and jackets discharging to the utility header terminating at the open pond. Affix a deactivation tag to each valve handle. Leave administrative control sign in place. Compensate for water curtailment through the process cooling systems by adjustment of raw water to sewer at field tie-in.

3. Install a blank in the pipe gallery flange of the coils and jackets which discharge to the utility water header terminating at the open pond.

4. Deactivate the proportioned sampler according to Detailed Procedure 10.1.1.1D.

10.1.1 OPEN POND (SWAMP) (Continued)

5. Deactivate the utility sewer monitor according to Instruction 11.1.5.

REDOX PLANT DEACTIVATION **INSTRUCTION**	INSTRUCTION NO. 10.1.2
	REVISION: New / PAGE: 1 of 1
SUBJECT: CRIBS	LOCATION: Ref. H-6-362
APPROVED BY: C. B. Foster	DATE: June 1, 1966

10.1.2 CRIBS

INTRODUCTION: The Redox Plant uses three cribs: The S-13 crib for organic waste associated with the 276 organic treatment facility, the S-9 for process condensates, and the S-6 for cooling water from high activity process vessels. The S-6 and S-13 cribs will become inactive. The S-9 crib will remain active to provide a method for disposal of any sump collections.

The 222-S Laboratory will continue to use the 216-S-20 crib for low level activity waste disposal.

The 216-S-21 crib will remain active for disposal of the SX Tank Farm condensates from the self boiling tanks.

SCHEDULE: The S-13 crib will become inactive when the 276-S facility is deactivated. The S-6 crib will become inactive with completion of terminal processing.

INSTRUCTION:

1. The S-13 crib will become inactive and the routing from the 02 tank will be blanked by Instruction 7.2 and associated Detailed Procedures.

2. The S-6 crib will become inactive by completion of Instructions 14. and 10.1.3.

3. Nuclear Materials Management is to be notified when the S-13 and S-6 cribs become inactive.

4. Disposals from the D-2 vessel and the S-9 crib must be neutralized to a ph of 7, sampled, and the volume and activity quantities reported to Nuclear Materials Management on a monthly basis.

5. Effective July, 1967, the 222-S Laboratory will begin reporting disposal of low level activity directly to Nuclear Materials Management in a Monthly Report.

6. This Instruction assumes that Waste Management has assumed responsibility for the SX Tank Farm and is reporting cribbing activity.

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 10.1.3
	REVISION: New / PAGE: 1 OF 2
SUBJECT: DIVERSION BOXES	LOCATION 200 West Area
APPROVED BY: C. B. Koster	DATE June 1, 1966

10.1.3 DIVERSION BOXES

INTRODUCTION: The Redox Plant is serviced by the 240-S-151 and associated diversion boxes for the delivery of tank farm sodium nitrate solution; discharge of process wastes to the tank farms and to the 216-S crib; and discharge of process condensates and potentially contaminated cooling water and steam to the S-6 crib. Discharge to the S-6 and S-9 crib is through the 240-S-151 directly to the crib. In view of the many canyon nozzles associated with these headers the system will not be blanked. Control will be established by preventing the inadvertent changing of jumpers in the 240-S-151 diversion box as noted in this Instruction. The D-2 collection tank will continue to discharge via the 240-S-151 diversion box to the S-9 crib. The D-1 sump receiver vessel will be connected to the D-2 vessel to provide a crib routing.

The Canyon is to be secured from liquids which could be transferred into the Canyon via established diversion box routings by in-canyon blanking as specified in this Instruction.

SCHEDULE: This Instruction will be initiated following completion of Instruction 5.2.

INSTRUCTION:

1. In service jumpers in the 240-S-152, 240-S-151, 241-S-151, 241-SX-151, and 241-SX-152 will remain installed.

2. Water segregation canyon jumpers are to be left installed.

3. The 240-S-141 diversion box covers are to be tied together by chain and fastened with a lock. Affix a metal sign to chain reading, "Controlled by Redox Supervision".

4. The following canyon cell nozzles are to be blanked to isolate the piping from the diversion boxes: A-T 11, A-T 15, B-T 12, B-T 16, D-T 1, D-T 8, D-T 40, D-T 74, D-T 75, G-T 25, G-T 27, H-T 65, and H-T 67.

10.1.3 DIVERSION BOXES (Continued)

5. Many of the above jumpers are presently blanked, but blanking must be verified. Installed jumpers removed to permit the above blanking will be stored on the nearest tank.

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 10.1.4	
	REVISION New	PAGE 1 OF 1
SUBJECT: TANK FARMS	LOCATION 200 West Area	
APPROVED BY: C. B. Foster	DATE June 1, 1966	

10.1.4 TANK FARMS

Lines to the Tank Farms will be water flushed by Deactivation Procedures and routings to underground tanks will be blanked in the Canyon. The SX Tank Farms will remain in operation until heat in the self-boiling tanks has dissipated sufficiently to permit the cooling water to be removed from the condensers. Operation of the Tank Farm will be the responsibility of the Waste Management organization. Reserve space will have to be held for future operations of the Redox Plant.

For additional information regarding Tank Farms refer to Deactivation Instructions:

7.4	Tank Farm Sodium Nitrate
8.3	Radioactive Waste Disposal - 222-S
10.1.3	Diversion Boxes

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 10.2.1	
	REVISION New	PAGE 1 OF 1
SUBJECT: CANYON AND SILO	LOCATION 291-293-S	
APPROVED BY: C. B. Foster	DATE June 1, 1966	

10.2.1 CANYON AND SILO

INTRODUCTION: During normal operations continuous samples from air streams exhausted to the 291-S Stack are monitored on a 24 hour per day schedule. The purpose of this program is to provide both operational control and emergency notification of high radiation releases to the environment. The present system at Redox is comprised of four monitors which are:

1. Sand filter inlet Beta-Gamma Monitor.
2. 293-S Dissolver off-gas I-131 Monitor.
3. 291-S Stack I-131 Monitor.
4. 291-S Stack Beta-Gamma Particulate Monitor.

SCHEDULE: The 293-S Dissolver off-gas I-131 Monitor will be deactivated following final dissolution of uranium by Deactivation Instruction 7.3 including Instruction 11.1.5. The other monitoring systems will be deactivated when evaluation of data indicates a constant gases discharge which no longer requires monitoring.

INSTRUCTION:

1. The 293-S monitor will be deactivated by Instructions 7.3 and 11.1.5
2. The other three monitoring systems will be deactivated by Instruction 11.1.5 with the concurrence of Redox Radiation Monitoring Supervision and Nuclear Materials Management.

REDOX PLANT DEACTIVATION

INSTRUCTION

INSTRUCTION NO.	
10.2.2	
REVISION: New	PAGE: 1 OF 1
SUBJECT: 233-S	LOCATION: 233-SA
APPROVED BY: C. B. Foster	DATE: June 1, 1966

10.2.2 233-S

The 233-S stack gaseous waste discharge is continuously monitored and there are no plans to deactivate this monitoring system. Should stand-by monitoring data indicate that monitoring is unnecessary the system will be deactivated by Instruction 11.1.5 contingent upon approval of Nuclear Materials Management.

11. EQUIPMENT

11.1 Instruments

- 11.1.1 Transmitters
  - 11.1.1.1 Republics
  - 11.1.1.2 D/P Cells
- 11.1.2 Recorders and/or Controllers
  - 11.1.2.1 Pneumatic
  - 11.1.2.2 Electronic
- 11.1.3 Indicators
  - 11.1.3.1 Manometers
  - 11.1.3.2 Gauges
  - 11.1.3.3 Scales
- 11.1.4 Rotometers - Transmitting
  - 11.1.4.1 Cold - Contact
  - 11.1.4.2 Hot - Remote
- 11.1.5 Monitors
- 11.1.6 Radiation Survey Instruments
  - 11.1.6.1 Poppies
  - 11.1.6.2 Hand Held-Portable
  - 11.1.6.3 Hand and Shoe Counters

11.2 Mechanical - Electrical

- 11.2.1 Remote Cranes
- 11.2.2 Piping
  - 11.2.2.1 Hot
  - 11.2.2.2 Cold
- 11.2.3 Pumps
  - 11.2.3.1 Liquid Transfer - Canyon
  - 11.2.3.2 Liquid Transfer - Support Facilities
  - 11.2.3.3 Liquid Transfer - Metering
  - 11.2.3.4 Inert Gas - Compressors
  - 11.2.3.5 Instrument and Process Air - Compressors
  - 11.2.3.6 Ozone and Breathing Air - Compressors
  - 11.2.3.7 Radiation Monitoring Sampling - Vacuum
- 11.2.4 Agitators
  - 11.2.4.1 Remote
  - 11.2.4.2 Contact
- 11.2.5 Traps
  - 11.2.5.1 Automatic Liquid Ejection
  - 11.2.5.2 Chemical Addition - Seal Pots
  - 11.2.5.3 Catch Pots

11. EQUIPMENT (Continued)

11.2.6 Valves
- 11.2.6.1 Diaphragm Operated
- 11.2.6.2 Manual
- 11.2.6.3 Pressure Reducing

11.2.7 Filters
- 11.2.7.1 Liquid (Strainers)
- 11.2.7.2 Oil
- 11.2.7.3 Water Vapor (Dryers)

11.2.8 Switch Gear

11.2.9 Motor Control Centers

11.2.10 Lighting
- 11.2.10.1 Normal
- 11.2.10.2 Emergency

REDOX PLANT DEACTIVATION **INSTRUCTION**	INSTRUCTION NO. 11.1.1
	REVISION: New; PAGE: 1 OF 1
SUBJECT: TRANSMITTERS	LOCATION: General
APPROVED BY: C. B. Foster	DATE: June 1, 1966

INTRODUCTION:

Differential Pressure Transmitters (D/P Cells) are used to measure flow, liquid weight factor, specific gravity, pressure and differential pressure.

Republic Transmitters are most extensively used for the measurement of specific gravity; however a few are used for pressure, differential pressure and flow measurements.

11.1.1.1 INSTRUCTION - Republic

1. The instrument air supply will be removed.
2. The pressure across the diaphragm will be equalized except in units with internal Hg. suppression. (The Mercury will not be drained.)
3. Those units having integral (mechanical spring) suppression will have the tension removed by adjustment.
4. Where radioactive contamination is present, the extent will be indicated on an affixed tag or label.
5. Upon completion of the instrument deactivation - a deactivation tag will be attached.

11.1.1.2 INSTRUCTION - D/P Cells

1. The instrument air supply to the unit will be removed.
2. The pressure across the diaphragm will be equalized.
3. Those units having integral (mechanical spring) suppression will have the tension removed by adjustment.
4. In steam or water flow service the interior of the sensing unit (both sides of the diaphragm) as well as impulse lines and orifice flange will be drained or blown dry.
5. Where radioactive contamination is present, the extent will be indicated on an affixed tag or label.
6. Upon completion of the instrument deactivation - a deactivation tag will be attached.

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 11.1.2
	REVISION 1 / PAGE 1 OF 1
SUBJECT: RECORDERS AND/OR CONTROLLERS	LOCATION General
APPROVED BY: C. B. Foster	DATE March 31, 1967

INTRODUCTION:

Recorder-Controllers are generally of the pneumatic input - pneumatic output type. Exceptions are the temperature Recorder--Controllers and the Rotometer flow Recorder-Controllers, which have an electronic input and a pneumatic output. In such latter cases the instruction for both pneumatic and electronic instruments will be followed:

Recorders are either pneumatic input or electronic input.

11.1.2.1 INSTRUCTION - Pneumatic

1. Remove the instrument air supply to the controller.
2. Aneriod instruments will have the pressure across the bellows equalized.
3. Remove, clean and replace the chart pens, capillary tubes and ink bottles. Install a clean chart.
4. Remove the electrical power to the instrument.
5. After deactivation is complete - a deactivation tag will be affixed.

11.1.2.2 INSTRUCTION - Electronic

1. Remove the electrical power to the Instrument.
2. Remove the dry cell batteries.
3. If the recorders will be subjected to freezing temperatures, remove the standard cells and place in a central heated storage.
4. Remove, clean and replace the chart pens and install a clean chart.
5. After deactivation is complete a deactivation tag will be affixed.

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 11.1.3	
	REVISION New	PAGE 1 of 1
SUBJECT: INDICATORS	LOCATION General	
APPROVED BY: C. B. Foster	DATE June 1, 1966	

INTRODUCTION:

Indicators are of three basic types: Manometers, Gauges, and Weigh Scales. A variation is the Taylor Aneroid Instrument with dial indicator which should be treated as per the instruction on Recorders - Pneumatic except for pen cleaning.

11.1.3.1 INSTRUCTION - Manometers

1. Drain, flush clean and blow dry both the manometer and the manometer surge pot.
2. Replace the manometer drain plug finger tight.
3. Affix a deactivation tag.

11.1.3.2 INSTRUCTION - Gauges

1. Drain both gauge and the pigtail where service is steam or liquid.
2. Remove the calibration plug or open the impulse line so as to vent the gauge.

   (Both impulse lines on differential pressure gauge)
3. Affix a deactivation tag.

11.1.3.3 INSTRUCTION - Scales

1. Lock the dial mechanism.
2. Coat the pivots with grease.
3. Affix a deactivation tag.

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 11.1.4	
	REVISION New	PAGE 1 of 1
SUBJECT: ROTOMETERS - TRANSMITTING	LOCATION General	
APPROVED BY: C. B. Foster	DATE June 1, 1966	

INTRODUCTION:

Transmitting Rotometers are considered to be one of two services; Cold (Non or low level radioactive process streams) which permit contact maintenance or "Hot" (High level radioactive process streams) which prohibits or limits contact maintenance.

"Hot" rotometers are used in the 202-S Canyon and in the 233-S Greenhouse whereas the cold rotometers for the most part are located at the seventh level of 202-S Building.

11.1.4.1 INSTRUCTION - Cold Rotometers

1. Flush and drain dry the rotometer body and the stem guide bleed line.

2. Affix a deactivation tag to the rotometer.

11.1.4.2 INSTRUCTION - "Hot" Rotometers

1. During process stream (piping) cleanout, open the rotometer feed control valve full for maximum velocity flushing.

2. Drain where liquid traps and freezing conditions may exist.

3. Affix a rotometer deactivation tag to the associated readout instrument.

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 11.1.5	
	REVISION New	PAGE 1 OF 1
SUBJECT: MONITORS	LOCATION General	
APPROVED BY: C. B. Foster	DATE June 1, 1966	

INTRODUCTION:

Monitors are considered to be those radioactivity detection and measuring instruments used for Health or Process monitoring purposes such as Beckmans, In-line samplers, etc. Portable hand held Survey Instruments, Hand and Shoe Counters, Pencil Readers, etc. are excluded.

11.1.5 INSTRUCTION *

1. Remove the Electrical power to the Instrument. (Includes the Flow alarm unit on in-line Monitors.)
2. Flush and drain the process stream (cell and piping) on the in-line samplers.
3. Remove the filter paper from the Strip Samplers.
4. Remove the cooling water supply and drain the Condensate Monitor Scintillation Unit. (205 Area)
5. Affix a deactivation tag to the Instrument.

*NOTE:

Prior approvals of the Managers of Nuclear Material Subsection and the Manager, Personnel Protection are required to deactivate the continuous gases effluent monitors.

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 11.1.6	
	REVISION New	PAGE 1 OF 1
SUBJECT: RADIATION SURVEY INSTRUMENTS	LOCATION General	
APPROVED BY: C. B. Foster	DATE June 1, 1966	

INTRODUCTION:

Radiation Survey Instruments are Poppies, Portable, and the Hand and Shoe Counters.

11.1.6.1 INSTRUCTION - Poppies

Deactivation of these instruments will consist only of removing the Electrical Power to the unit to be deactivated.

The timing for deactivating specific units will be determined by Radiation Monitoring Supervision.

11.1.6.2 INSTRUCTION - Hand Held Portable

Units in excess of requirements for stand-by operation will be returned to the Battelle Northwest portable instrument pool.

11.1.6.3 INSTRUCTION - Hand and Shoe Counters

Deactivation will consist only of removing the Electrical Power to the unit, removing the Battery from the Voltage Control Deck, and affixing a deactivation tag.

The timing for deactivating specific units will be determined by the Radiation Monitoring Supervisor.

One transistorized hand and shoe counter will remain in service in the office hallway (Corridor No. 1).

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 11.2.1	
	REVISION 1	PAGE 1 OF 1
SUBJECT: REMOTE CRANES	LOCATION 202-S	
APPROVED BY: C. B. Foster	DATE Sept. 15, 1966	

INTRODUCTION:

The 60 Ton crane which services the 202-S Canyon and the 10 Ton crane servicing the Silo will not be deactivated. They will be maintained in good operating condition and will be operated for inspection and maintenance purposes. In the absence of need to use the cranes their systems will be exercised once every two weeks. The 10 Ton Silo crane will not require deactivation work.

SCHEDULE:

This Instruction is to be initiated following completion of Instructions 5.2.1, 5.2, 5.2.3 and 5.2.4.

11.2.1 INSTRUCTION - 60 Ton Crane

1. Clean all external surfaces of the crane with the chlorothene spray method to remove dust, grease and associated contamination.

2. Spot clean other areas as necessary with 5 percent aqueous solution of Turco WO-2 or approved equal.

3. Crane surfaces will be painted as needed and feasible to prevent corrosion.

4. A thorough examination of the mechanical and electrical systems will be performed and repairs are to be made or scheduled.

5. The crane cab air supply course and ultra filters will be replaced.

6. Surfaces inside the crane cab will be smeared and surfaces are to be cleaned to less than 500 c/m B&G and less than 500 d/m non-smearable.

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 11.2.2	
	REVISION New	PAGE 1 OF 2
SUBJECT: PIPING	LOCATION General	
APPROVED BY: C. B. Foster	DATE June 1, 1966	

INTRODUCTION:

Piping is considered to be one of two services; Cold (Non or low level radioactive process streams) which permit contact maintenance or Hot (high level radioactive process streams) which prohibits or limits contact maintenance.

The major portion of the Hot piping is located in the 202-S Canyon (cells and pipe trench), 233-S Greenhouse, and the lines exiting 202-S to 233-S, 276-S, 292-S, 293-S, cribs and to the Tank Farm.

11.2.2.1 INSTRUCTION:- Hot Piping

Deactivation will consist of flushing during associated vessel cleanout and decontamination. Verification of drainage is required where there are low points and freezing conditions may exist.

Manual valves will be left full open minus one turn, except in locations where adequate blanking can not be installed to assure control of contamination and/or liquid transfer. In such instances the manual valve or valves will be locked and tagged.

11.2.2.2 INSTRUCTION - Cold Piping

The type of service will determine the method of deactivation of cold piping.

1. Chemical service piping (includes filters) will be flushed, neutralized, and drained at the low points. Valves including drains will be left full open minus one turn. To minimize the number required, blanks will be installed only at key points - such as the inlet of the first head tank. Blanks will be installed adjacent to and downstream from a valve.

2. Process Air and Instrument Air Piping will be drained at the low points, valves (including the drains) will be left full open minus one turn.

3. Breathing air piping will be drained at the low points but the drain valves will be closed after draining. This system must remain sealed to prevent the entry of contamination.

11.2.2.2 INSTRUCTION - Cold Piping (Continued)

4. Inert Gas piping will be air blown* and drained at the low points. Manual valves (including drains) on deactivated piping will be left full open minus one turn.

   *NOTE: Results of the air blow of the Humidifed Gas line in the South Operating Gallery may dictate a water flush of this section.

5. Ozone piping has a built-in vent system and is purged with dry air after each operation. No other venting* and no draining will be required on this piping; however the air supply piping to the Ozonators will be drained and vented at the low points.

   Manual valves (including the Flow Control Valve Bypass Valve and the valves on the Air Dryers) are to be left full open minus one turn.

   *NOTE: Additional vents in this system could be hazardous in the event of a future start-up of the Ozonators.

6. Water and Steam piping (including traps, strainers, and mud legs) will be drained at the low points or air blown. Blanks or caps will be installed for isolation and the manual valves left full open minus one turn.

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 11.2.3	
	REVISION New	PAGE 1 OF 2
SUBJECT: PUMPS	LOCATION General	
APPROVED BY: C. B. Foster	DATE June 1, 1966	

INTRODUCTION:

Pumps are considered to be one of five services; Liquid Transfer, Inert Gas Compressing, Instrument and Process Air Compressing, Ozone and Breathing Air Compressing, or Radiation Monitoring Sampling (Vacuum Pumps). Liquid Transfer Pumps are further divided as to the specific type and/or physical locations ie. Canyon, Support Facilities, (ie. 276-S, 293-S, AMU, etc.) or Chemical Addition (Metering Pumps).

11.2.3.1 INSTRUCTION - Liquid Transfer - Canyon

With the exception of D-8 to 241-S, E-3 to L-12, E-12 to D-14-S, E-13 to 204-3 and G-1 to O-2, deactivation will consist of flushes during associated vessel clean out and vessel decontamination. These exceptions will also receive this flushing but in addition new discharge jumpers will be designed, fabricated, and installed to provide circulation through these pumps during the water runs and the identification on the motor control stations will be changed to indicate the new routings.

11.2.3.2 INSTRUCTION - Liquid Transfer - Support Facilities

Deactivation of these pumps will consist of flushing and neutralization at the time of associated vessel deactivation, disconnecting the electrical power to the Motor leads at the Motor Control Unit, and affixing a deactivation tag indicating the method of deactivation to the Motor Control Unit. In addition, it must be assured the pump housing is free of liquid and that the pump is given a final lubrication. If assurance can not be had that the pump bowl will remain liquid free in place, the pump will be removed from associated piping, and the inlet and outlet covered with plastic and/or pressure sensitive tape.

11.2.3.3 INSTRUCTION - Liquid Transfer - Metering Pumps

Deactivation of the Milton-Roy Metering Pumps will consist of flushing the process stream section including the Back Pressure and Relief Valves. The Hydraulic oil reservoir and Lubricating oil reservoir (202-S pumps have common reservoir), will be drained, cleaned, and refilled. The Electrical Power to the Control Unit will be removed and a deactivation tag affixed to the Control Unit.

11.2.3.4 INSTRUCTION - Inert Gas Compressors

The Joy Compressors will be deactivated from Inert Gas service but will be operated periodically during the Stand-by Operation. To accomplish this condition the following work will be performed on each Compressor:

1. Remove the gas inlet piping ell from the manual valve and rotate it 180 degrees so that it is pointing down from the compressor head.

2. Remove the safety valve from the compressor discharge piping and store it in the Maintenance Shop. The piping opening left by the removed valve is to remain open.

3. Connect 100 PSI Instrument Air to the load-unload valves on the compressor head so that the compressor will always be in an unloaded (not pumping) condition when it is running.

11.2.3.5 INSTRUCTION - Instrument and Process Air Compressors

Plans are to forego any deactivation of these compressors. Each compressor will be operated periodically to supply the post-deactivation air requirements.

11.2.3.6 INSTRUCTION - Ozone and Breathing Air Compressors

The Compressors will be drained dry*. The Ozone Air Compressor will be left vented but the Breathing Air Compressors will not be vented. (Intakes of Breathing Air Compressors will be covered with plastic and pressure sensitive tape.)

The Electrical Power will be removed by disconnecting the motor lead wires at the Motor Control Unit. A deactivation tag will be affixed to this unit.

*NOTE: Deactivation of Breathing Air will be determined by the status of 233-S deactivation, and crane painting.

11.2.3.7 INSTRUCTION - Radiation Monitoring Sampling (Vacuum Pumps)

The Radiation Monitoring Sampling Pumps will be used for stand-by monitoring and will not be deactivated.

REDOX PLANT DEACTIVATION

INSTRUCTION

INSTRUCTION NO.	
11.2.4	
REVISION: New	PAGE: 1 OF 1
SUBJECT: AGITATORS	LOCATION: General
APPROVED BY: C. B. Foster	DATE: June 1, 1966

INTRODUCTION:

Agitators are considered to be one of two services: Remote (202-S Canyon installation) or Contact (other than 202-S Canyon installation).

11.2.4.1 INSTRUCTION - Remote Agitators

No deactivation is planned for these Canyon Agitators other than operating during associated vessel cleanout and flushing. During this operation the vessel liquid level must be sufficient to flush the agitator shaft bearing. These agitators will remain operable in a stand-by status.

11.2.4.2 INSTRUCTION - Contact Agitators

Deactivation will consist of operating during associated vessel cleanout and flushing for agitator cleanup. In addition, the Electrical Power will be removed by disconnecting the motor lead wires at the Motor Control Center and affixing a deactivation tag indicating the method of deactivation to the Motor Control Unit.

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 11.2.5
	REVISION: New / PAGE: 1 OF 1
SUBJECT: TRAPS	LOCATION General
APPROVED BY: C. B. Foster	DATE June 1, 1966

INTRODUCTION:

Traps are divided into three categories: Automatic Liquid Ejection, Chemical Addition Seal Pots, and Catch Pots.

The Automatic Liquid Ejection traps are normally considered those in Steam service; however there are a few of this type used in Air and Inert Gas Service.

Chemical Addition Seal Pots are those used in conjunction with Process Vessels to provide a seal off to the Cold side piping in the event of slight vessel pressurization.

Catch Pots are the various vessels and piping used to separate liquid from the Inert Gas System. They include the Water Separators and the Sample Gas Seal in the 2710-S Generator Building.

11.2.5.1 INSTRUCTION - Automatic Liquid Ejection Traps

These traps will be deactivated by completely draining and/or blowing dry. Assurances will be made that water will not accumulate in the trap after deactivation.

11.2.5.2 INSTRUCTION - Chemical Addition Seal Pots

These Pots will be removed, flushed, drained dry, and replaced.

11.2.5.3 INSTRUCTION - Catch Pots

The Water Separators and the Sample Gas Seal Pot located in the 2710-S Inert Gas Generator Building will be drained dry and left vented.

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 11.2.6	
	REVISION New	PAGE 1 OF 1
SUBJECT: VALVES	LOCATION General	
APPROVED BY: C. B. Foster	DATE June 1, 1966	

INTRODUCTION:

Valves are divided into three basic types: Diaphragm Operated Valves (DOV's), Manual Valves, and Pressure Reducing Valves (P.R.V.S.).

11.2.6.1 INSTRUCTION - Diaphragm Operated Valves

Deactivation will consist of flushing and where freezing conditions may exist, also draining. During the flushing operation the valve must be fully open to obtain maximum velocity of the flushing stream. The air pressure to the valve bonnet will be removed at the valve Control Station and a deactivation tag affixed to the Control.

11.2.6.2 INSTRUCTION - Manual Valves

An extreme effort will be made to install blanks in a manner to facilitate leaving the Manual Valves in a full open minus one turn position. Upon the completion of piping deactivation the number of closed, locked and tagged valves will be at an absolute minimum.

11.2.6.3 INSTRUCTION - Pressure Reducing Valves

Pressure Reducing Valves on air or gas systems will be blown down and the blow down port left full open minus one half turn. Steam PRV's (including the pilot regulator) will be drained and blown dry and a deactivation tag affixed to these valves.

REDOX PLANT DEACTIVATION

INSTRUCTION

INSTRUCTION NO.	
11.2.7	
REVISION	PAGE
New	1 OF 1

SUBJECT:	LOCATION
FILTERS	General
APPROVED BY: C. B. Foster	DATE: June 1, 1966

INTRODUCTION:

Filters are divided into three categories: Liquid (Strainers), Oil, and Water Vapor (Dryers).

Liquid Filters (usually referred to as "Cuno" filters) are those filters installed on the feed lines exiting the Head or Makeup Vessels.

Oil Filters are those installed downstream from the Inert Gas Compressors.

Water Vapor Filters are the Dryers for Inert Gas and the Dryers for Ozone air.

11.2.7.1 INSTRUCTION - Liquid Filters (Strainers)

These units will be flushed during associated line and vessel flushing, cleanout, and neutralization. In addition, the units will be drained of all liquids.

11.2.7.2 INSTRUCTION - Oil Filters

The Oil Filters on the Inert Gas System will be cleaned internally and the filter Media changed.

11.2.7.3 INSTRUCTION - Water Vapor Filters (Dryers)

The Ozone Air Dryers will be completely deactivated but will receive no deactivation treatment other than called for on Redox Deactivation Instruction 12.6.

The Inert Gas Dryers will be completely deactivated. All associated piping will be deactivated as per Redox Equipment Deactivation Instructions. In addition, the Electrical Power to the Dryer controls will be removed and a deactivation tag affixed to the Electrical Control Box, and the dryer Media changed.

REDOX PLANT DEACTIVATION
INSTRUCTION

INSTRUCTION NO.	
11.2.8	
REVISION: New	PAGE: 1 OF 1

SUBJECT: SWITCH GEAR

LOCATION: 202-S

APPROVED BY: C. B. Foster

DATE: June 1, 1966

INTRODUCTION:

All Electrical Power for the Redox Facility including the 222-S Building, Fence Lighting, and the 241-S Tank Farm is supplied via the 202-S Main or the 202-S Sub-Switch Gear.

This Switch Gear* is on the 2.4 K.V. Main Bus No. 1; 2.4 K.V. Main Bus No. 2; 2.4 K.V. Emergency Bus; North Sub 480 V Bus No. 1; North Sub 480 V Bus No. 2; North Sub 480 V Emergency Bus; South Sub 480 V Bus No. 1; South Sub 480 V Bus No. 2; and the South Sub 480 V Emergency Bus.

*NOTE: Motor Control Centers are covered by Redox Deactivation Instruction 11.2.9, and are not considered a part of Switch Gear.

11.2.8 INSTRUCTION - Switch Gear

No deactivation is planned on this Switch Gear.

REDOX PLANT DEACTIVATION
INSTRUCTION

INSTRUCTION NO.	
11.2.9	
REVISION: New	PAGE: 1 OF 1

SUBJECT: MOTOR CONTROL CENTERS

LOCATION: General

APPROVED BY: C. B. Foster

DATE: June 1, 1966

INTRODUCTION:

The Motor Control Centers are the 503 series and are located in various sections of the 202-S Building and Support Facilities. These Centers contain the Control Units for individual Pump, Agitator, Welder, Silo Crane, and Ventilation Fan Motors.

11.2.9 INSTRUCTION - Motor Control Centers

It is not planned to deactivate any Motor Control Center as a whole; however, the Control Units for deactivated equipment will be deactivated. The method of deactivation will be the disconnecting of the motor lead conductors inside the Control Unit and affixing a deactivation tag to the unit indicating this method.

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 11.2.10
	REVISION: New / PAGE: 1 of 1
SUBJECT: LIGHTING	LOCATION: General
APPROVED BY: C. B. Foster	DATE: June 1, 1966

INTRODUCTION:

Lighting is via two Lighting Circuits, Normal and Emergency. During normal operation both Circuits are supplied from the Regular Power Feed. In the event of loss of the Regular Power Feed the Emergency Circuit is automatically switched to the Emergency Power Feed.

There are four Emergency Lighting Panels plus the Breaker for Fence Lighting in the 202-S Building. In addition, Emergency Lighting Circuits are provided at certain Support Facilities via the Control Centers located at the Support Facilities.

11.2.10.1 INSTRUCTION - Normal Lighting

No extensive deactivation of the Normal Lighting is planned, however, in those locations where reduced lighting is warranted, the Breakers will be opened on those Circuits not required. In addition, the Breakers for the circuits in these specific locations that are to remain active will be painted an ORANGE - RED color.

11.2.10.2 INSTRUCTION - Emergency Lighting

Emergency lighting will not be deactivated unless a facility is completely deactivated and no further routine entry is planned.

12. UTILITIES

12.1 Steam

- 12.1.1 High Pressure
- 12.1.2 Medium Pressure
- 12.1.3 Low Pressure

12.2 Air

- 12.2.1 Process
- 12.2.2 Instrument
- 12.2.3 Breathing
- 12.2.4 RM Sampling (Vacuum)

12.3 Water

- 12.3.1 Raw
- 12.3.2 Sanitary
- 12.3.3 Demineralized

12.4 Electrical Power

12.5 Propane and Inert Gas

- 12.5.1 Propane - Receiving, Storage, Distribution
- 12.5.2 Inert Gas Generation and Distribution

12.6 Ozone - Generation and Distribution

12.7 Communications

- 12.7.1 House (PAX) Telephones
- 12.7.2 Public Telephones
- 12.7.3 Intercom (Teletalk)
- 12.7.4 TV
- 12.7.5 Data Transmission

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 12.1.1	
	REVISION New	PAGE 1 OF 1
SUBJECT: HIGH PRESSURE STEAM	LOCATION General	
APPROVED BY: C. B. Foster	DATE June 1, 1966	

INTRODUCTION:

High Pressure (225 PSI) Steam is supplied to the Redox Facility via a 10 inch main. Laterals of various sizes from this main line are routed to 202-S, 203-S, 204-S, 211-S, 219-S, 222-S, 276-S, 291-S, 292-S, and 2710-S. Except for the 291-S Ventilation Exhaust Turbine the High Pressure Steam is reduced to Medium (125 PSI) or Low Pressure Steam before supplying equipment.

12.1.1 INSTRUCTION - High Pressure Steam

1. The High Pressure Steam supply will be removed from the following:

   211-S, 276-S, 2710-S, and the 202-S Ozone Air Dryers as indicated on Redox Deactivation Drawing H-2-45900, H-2-45903, and H-2-45907.

2. High Pressure Steam to all other locations will remain active.

3. Piping and equipment such as valves and traps will be deactivated according to Instructions 11.2.2, 11.2.5, and 11.2.6.

REDOX PLANT DEACTIVATION **INSTRUCTION**	INSTRUCTION NO. 12.1.2	
	REVISION New	PAGE 1 OF 1
SUBJECT: MEDIUM PRESSURE STEAM	LOCATION General	
APPROVED BY: C. B. Foster	DATE June 1, 1966	

INTRODUCTION:

The Medium Pressure (125 PSI) Steam Systems related to this Instruction are those in 202-S, 233-S, 276-S, and 293-S.

The Medium Pressure Steam for 202-S is normally supplied by via the pressure reducing valve located at the East end of the South Pipe Gallery. A spare supply point is the pressure reducing valve located just beyond the door at the West end of the North Pipe Gallery. This system is a complete loop of the North and South Pipe Galleries, with take offs for various services such as jets, heating coils, and PRV's for Low Pressure Steam.

12.1.2 INSTRUCTION - Medium Pressure Steam

1. The Medium Pressure Steam to 293-S will be deactivated as indicated on Redox Deactivation Drawing H-2-45900 and consistent with Instruction 7.3.

2. The 276-S Steam will be deactivated consistent with Instruction 7.2.

3. The steam for the 233-S Heating and Ventilation System will remain active but all other services will be deactivated by physically isolating all of the services from the steam header. Blanks, caps, or plugs must supplement isolation valve to prevent leakage into the Process Area. Deactivation will be consistent with Instructions 6.1 and 6.4.

4. Steam service will be removed to all Canyon vessel coils, spargers, and samplers by physically isolating with blanks, caps, or plugs.

5. Steam service will remain active to those transfer jets required for the stand-by condition.

6. Deactivation of Medium Pressure Steam will be in accordance with Redox Deactivation Drawings H-2-45900, H-2-45907, Instructions 11.2.2, 11.2.5, 11.2.6, and Detail Procedures.

7. All deactivation will be consistent with Instructions 12.1.1, and 12.1.3.

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 12.1.3	
	REVISION New	PAGE 1 of 1
SUBJECT: LOW PRESSURE STEAM	LOCATION General	
APPROVED BY: C. B. Foster	DATE June 1, 1966	

INTRODUCTION:

Low Pressure Steam services related to this Instruction are; those used for building heating in 276-S, 2710-S, 293-S, steam tracers on piping that is to be deactivated, and the service to process and cold side vessels, vessel Jackets and Coils including those located in 211-S. Although certain canyon vessels will remain active during stand-by, vessel heating will not be required.

12.1.3 INSTRUCTION - Low Pressure Steam

1. All piping and equipment used for heating 2710-S will be deactivated according to Instructions 11.2.2, 11.2.5, 11.2.6, 11.2.7.1 and consistent with Instruction 12.1.1.

2. Steam tracers on lines exiting 202-S to outside facilities 204-S, 293-S, 219-S, 2710-S, 211-S, 222-S, and 276-S will be deactivated,

3. Low pressure steam heating systems in 276-S and 293-S will be deactivated.

4. All steam tracers and vessel heating in the 211-S area will be deactivated consistent with Instruction 7.1.

5. Low pressure steam service to all 202-S Process and Cold side vessels will be deactivated.

6. Deactivation will be in accordance with Redox Deactivation Drawings H-2-45903, H-2-45907, Instructions 11.2.2, 11.2.5, 11.2.6, 11.2.7.1, and Detail Procedures.

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 12.2	
	REVISION New	PAGE 1 OF 1
SUBJECT: AIR	LOCATION General	
APPROVED BY: C. B. Foster	DATE June 1, 1966	

INTRODUCTION:

The Air Systems are of four categories: Process, Instrument, Breathing (Mask), and RM Sampling (Vacuum System).

Process Air is supplied to 202-S, 203-S, 205-S, 233-S, 292-S, and 293-S.

Instrument Air is supplied to 202-S, 222-S, 276-S, 291-S, and 233-S.

RM Sampling (Vacuum) serves 202-S, 233-S, and the Sand Filter Sampling Shack.

12.2.1 INSTRUCTION - Process Air

This system will not be deactivated; however, the supply to 233-S, and 293-S will be shut off as per Deactivation Instructions for those locations.

12.2.2 INSTRUCTION - Instrument Air

This system will not be deactivated; however, the supply to 2710-S will be shut off.

12.2.3 INSTRUCTION - Breathing Air

This system will be completely deactivated after determination as to no future need at 233-S and the CMP.

The equipment will be deactivated as per Redox Equipment Deactivation Instructions.

12.2.4 INSTRUCTION - RM Sampling

This system will not be deactivated.

REDOX PLANT DEACTIVATION **INSTRUCTION**	INSTRUCTION NO. 12.3.1	
	REVISION New	PAGE 1 OF 2
SUBJECT: RAW WATER	LOCATION General	
APPROVED BY: C. B. Foster	DATE June 1, 1966	

INTRODUCTION:

This Instruction has reference to the Raw Water systems for 202-S, 233-S, 276-S, 293-S, and 2710-S.

The Raw Water system in 202-S includes the Fire Protection Water System for Silo and Cell Fire Fog Sprays.

12.3.1 INSTRUCTION - Raw Water

1. The Raw Water supply to 293-S will be removed according to Redox Deactivation Drawing H-2-45900, Instructions 7.3, 11.2.2.2, and Detail Procedure.

2. The supply to 233-S will remain active to the Exhaust Filter Building for filling drain Seal Pot. All other 233-S services will be blanked or capped off according to Instruction 6.4.

3. The Raw Water system for 276-S will be completely deactivated according to Redox Deactivation Drawing H-2-45900, Instruction 11.2.2.2, Detail Procedure and consistent with Instruction 7.2.

4. The Raw Water supply to 2710-S (Inert Gas Generator Building) will be removed by valving off according to Redox Deactivation Drawings H-2-45900 and H-2-45915, Sheet 1; Instructions 11.2.2.2, 11.2.5.3, and consistent with Instruction 12.5.2.

5. The Raw Water Loop Header in the 202-S Building will remain active.

6. The Fire Department shall be notified before the Fire Fog system is deactivated.

7. Deactivation of other 202-S Building laterals will be consistent with Instructions 5.1, 5.2, and 7.2.

8. The Fire Fog system will be completely deactivated by; a)isolating it from the Raw Water Header, b)draining all lines including the feed from the Siamese Pumper truck connection, c)closing the valves to the cell sprays after deactivation, d)removing the Siamese Pumper truck connection.

9. The Cell and Pipe Tunnel Washdowns will be deactivated by; breaking the lines down stream from the valves and capping the lines to the cells and tunnel.

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 12.3.1
	REVISION New / PAGE 2 OF 2
SUBJECT: RAW WATER	LOCATION General
APPROVED BY: C. B. Foster	DATE June 1, 1966

12.3.1 RAW WATER (Continued)

10. Raw Water to the samplers in the North and South Sample Galleries will be removed by blanking the supply lines in the Pipe Galleries.

11. Raw Water to the Canyon Coils and Jackets will be removed (by blanking at the gallery-cell wall) after an alternate feed to the swamp has been activated. See Instruction 10.1.1 - Swamp.

12. Raw Water and Fire Fog System piping deactivation will be according to Redox Deactivation Drawings H-2-45915, sheets 1 and 2; and Instruction 11.2.2.2.

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 12.3.2	
	REVISION New	PAGE 1 OF 1
SUBJECT: SANITARY (FILTERED) WATER	LOCATION General	
APPROVED BY: C. B. Foster	DATE June 1, 1966	

INTRODUCTION:

Where Sanitary Water is supplied to a facility it is supplied directly from the underground main. Those facilities related to this Instruction are: 202-S, 211-S, 233-S, and 276-S.

12.3.2 INSTRUCTION - Sanitary (Filtered) Water

1. Sanitary water to the 233-S Ventilation System will remain active. All other 233-S services will be capped off.

2. Sanitary water to the 276-S will be deactivated in accordance with Redox Deactivation Drawings H-2-45900, H-2-45905, Instruction 7.2 and Detail Procedure.

3. Outside safety showers will be deactivated as shown on Redox Deactivation Drawing H-2-45905.

4. Sanitary water to the safety showers located on the 7th level, 8th level, and in the North and South Sample Galleries will be deactivated* in accordance with Redox Deactivation Drawings H-2-45913, sheets 1 and 2.

   *NOTE: The lamps will be removed from the Safety shower light fixture at the time of deactivation.

5. Sanitary water to the 7th level Men's rooms and the North Pipe Gallery Men's rooms will be deactivated in accordance with Redox Deactivation Drawing H-2-45913, sheet 1.

   In addition, a)all traps will be filled with a permanent type anti-freeze, b)the electrical power removed from the hot water tanks and the tanks drained, and c)doors to these rooms are to be locked.

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 12.3.3	
	REVISION 1	PAGE 1 OF 1
SUBJECT: DEMINERALIZED WATER	LOCATION General	
APPROVED BY: C. B. Foster	DATE 10-24-66	

INTRODUCTION:

The Demineralized Water System is composed of two Demineralizers located on the 2nd AMU level, two pumps (501 and 602) on the 3rd AMU level, the 602 head tank on the 5th level, three pumps and a storage tank (SW-131) located in the 211-S area plus the interconnecting and distribution piping.

12.3.3 INSTRUCTION - Demineralized Water

1. Except for the 602 tank and the 501 pump (which are to be used for water runs during the stand-by period) this system will be completely deactivated consistent with the 222-S building Still Piping modifications, Instructions 7.1 and 7.1.1 and according to Redox Deactivation drawings H-2-45902, H-2-45713, and H-2-45914, sheets 1 and 2.

2. The Demineralizers will be deactivated by: a)Draining the units, b)Removing the resin (store or discard - depending on condition) and c)Flushing and venting.

3. The Instrumentation will be deactivated (remove electric power to Solubridge units and drain water meters) and left in place.

4. The electrical power to all pumps except the 501 will be deactivated according to Instructions 11.2.3.2 and 11.2.9.

5. All piping not needed to accomplish the water runs during stand-by operation will be deactivated according to Instruction 11.2.2.2. This instruction includes those lines to 222-S, 233-S, and 276-S.

6. New piping will be installed according to Detail Procedure which will permit filling the 602 tank with sanitary water for use during the stand-by water runs.

7. An automatic high liquid level cutoff system will be fabricated and installed on the new filling system.

REDOX PLANT DEACTIVATION
INSTRUCTION

INSTRUCTION NO.	
12.4	
REVISION: New	PAGE: 1 OF 1
SUBJECT: ELECTRICAL POWER	LOCATION: 202-S
APPROVED BY: C. B. Foster	DATE: June 1, 1966

INTRODUCTION:

The Electrical Power is supplied to the 202-S Building via two 13.8 K.V. Normal Feeders and one 2.4 K.V. Emergency Feeder. The 2.4 K.V. Emergency Feeder is from the 284W Power House. The 13.8 K.V. Feeders are transformed to 2.4 K.V. before entering the 202-S Building Switch Gear*. These Feeders are terminated on the M&E 501-B Main Bus No. 1, and the M&E 501-D Main Bus No. 2. The 2.4 K.V. Emergency Feeder terminates on the M&E 501-E Emergency Bus.

*NOTE: See Redox Equipment Deactivation Instruction 11.2.8 - Switch Gear.

12.4 INSTRUCTION - Electrical Power

No deactivation is planned.

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 12.5	
	REVISION 1	PAGE 1 OF 1
SUBJECT: PROPANE AND INERT GAS	LOCATION General	
APPROVED BY: J. R. Cartmell JRC	DATE April 24, 1967	

INTRODUCTION:

The Propane receiving, storage and distribution system supplies the 222-S Laboratory Building and the 2710-S Gas Generator Building.

The Inert Gas System is composed of variable rate Propane Burners, Seal Pots, Water Separators, Gas Receivers, Compressors, Filters, Aftercoolers, Dryers, a Humidifier, various Instruments, Valves, Controls, and Piping. Distribution is via a 100 PSI Dry Gas Header Loop and a 25 PSI Humidified Gas Header Loop.

12.5.1 INSTRUCTION - Propane Receiving, Storage and Distribution

The 222-S Laboratory Building will continue to be supplied by the present System but the supply to the 2710-S Building will be capped off.

12.5.2 INSTRUCTION - Inert Gas Generation and Distribution

The Inert Gas Generation system will be completely deactivated after all Organic has been disposed and the purge supplies to Non-deactivated Instruments and Gang Valves have been changed to air instead of Inert Gas.

After the Propane supply has been removed the system will be air purged by operating* the Generators and Compressors and bleeding off the High Pressure Receiver.

*NOTE: Ignitors and Generator shutdown Interlocks must be disabled for the Operation and then restored to their original condition after purging is completed.

All equipment deactivation will be in accordance with Redox Deactivation Instructions. In addition the Electrical Power to the Gas Generators will be removed by disconnecting the conductors at the Motor Control Unit and affixing a deactivation tag to the Unit.

Piping changes will be made to the Distribution System so that the 100 PSI Inert Gas Loop Header will carry 100 PSI Process Air and the 25 PSI Inert Gas Loop Header will carry 25 PSI Process Air. The Humidifier will be deactivated and all Inert Gas Piping identification will be changed to be compatible with the altered service. (See Drawings H-2-7913 Rev. 4, H-2-9403 Rev. 6, and H-2-45916 Sheets 1 and 2).

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 12.6	
	REVISION New	PAGE 1 OF 1
SUBJECT: OZONE	LOCATION 202-S	
APPROVED BY: C. B. Foster	DATE June 1, 1966	

INTRODUCTION:

This System is composed of a Nash Hy-tor water seal Compressor, air receiver, air dryers, Ozonators, High Voltage transformers, various Instruments, controls, valves and piping.

12.6 INSTRUCTION - Ozone Generation and Distribution

This system will be completely deactivated. The compressor, air receiver, valves, piping (including Steam and Cooling Water), and Instruments will be deactivated as per Redox Deactivation Instructions. In addition, the Electrical Power to the High Voltage transformers will be removed by disconnecting the transformer primary leads at the Motor Control Center in the Hi-Vox Room. A deactivation tag indicating the method of deactivation will be affixed to each (total of four) Control Unit.

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 12.7	
	REVISION New	PAGE 1 OF 2
SUBJECT: COMMUNICATIONS	LOCATION General	
APPROVED BY: C. B. Foster	DATE June 1, 1966	

INTRODUCTION:

Communication Systems are: House (PAX) telephones, Public telephones, Intercom (Teletalk), T.V., and Data Transmission (IBM).

12.7.1 INSTRUCTION - House (PAX) Telephones

This system will remain active and there will be no removal of telephones.

12.7.2 INSTRUCTION - Public Telephones (Federal Support Services, Inc.)

Service for the following phones will be discontinued and the phone sets will be removed by FSS, Inc. on an individual basis when the service is no longer required.

Electric Foreman	2-7439	Room 116B	2-7497
Tool Room	2-7646	Room 114	2-7493
K Gallery	2-7476	Room 103	2-7268
Store Supply Room	2-7488	Room 114	2-7468
South Cable Room	2-7431	Room 105	2-7415
South Cable Room	2-7692	Room 105A	2-7634
Room 101	2-7407	Room 113	2-7779
Room 103	2-7456	Room 104	2-7416
Room 112	2-7419	Room 113	2-7408
Room 116A	2-7440	Room 108	2-7413
Room 121	2-7453	Room 107	2-7457
Room 116A	2-7469	Bldg. 233-S	2-7423
Room 111	2-7479	Bldg. 276-S	2-7423

The following phones will remain in service in addition to phones in the 222-S Laboratory:

Maintenance Room 116	2-7754
Electric Shop	2-7469
Compressor Room	2-7451
R.R. Gate	2-7436
Disaster Shelter	2-7476
Dispatcher Room 110	2-7411
Redox Processing Room 109	2-7445

12.7.3 INSTRUCTION - Intercoms (Teletalk)

1. This system will be deactivated by removing the Electrical Power supply to each individual station.

2. Units will be left in their present locations.

12.7 COMMUNICATIONS (Continued)

12.7.4 INSTRUCTION - TV

1. All television cameras will be deactivated and stored in the locked electrical shop TV service room.

2. All Consoles will be deactivated.

3. All Consoles except the one located in the Dispatchers office will be stored in the locked Electrical Shop TV service room. The Console in the Dispatchers office will remain in place.

12.7.5 INSTRUCTION - Data Transmission (IBM)

The Isochem Business Information Systems group will be advised when there is no further need for this equipment.

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 13.	
	REVISION New	PAGE 1 OF 1
SUBJECT: VENTILATION	LOCATION 202-S, 233-S	
APPROVED BY: C. B. Foster	DATE June 1, 1966	

13. VENTILATION

Program 4.10 "Heating and Ventilation" fully covers present Deactivation planning. This section was established because the systems are complex; and should further deactivation be decided the subject is sufficiently important and involved to justify separate study and treatment.

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 14.	
	REVISION New	PAGE 1 of 2
SUBJECT: GALLERIES	LOCATION 202-S	
APPROVED BY: C. B. Foster	DATE June 1, 1966	

14. GALLERIES

INTRODUCTION: Deactivation of the 202-S Galleries will be limited to the extent that: a)Equipment required for transferring water through Canyon vessels with installed pumps and agitators and remote Canyon-Silo routings with rotometers and flow control valves will remain operable, b)Normal ventilation will be maintained, c)R.M. sampling (vacuum) pumps will remain in service; d)Sump weight factor instruments and alarms will remain active and the sump jets operable, and e)Weight Factor indication on those vessels used for water transfers during stand-by will be maintained.

This Instruction concerns the work to be performed in the North and South operating, pipe and sample galleries and also the Silo operating and sample galleries to establish the required conditions for stand-by.

SCHEDULE: Performance of the work covered in this Instruction is depended on the completion of Instructions 5.1, 5.2, and 6.1.

INSTRUCTION:

1. All vessel vent jets will be deactivated except those required for vessel pressure control when transferring water during stand-by.

2. All metering pumps will be deactivated.

3. All cold side pumps and agitators will be deactivated.

4. The Canyon spray down system will be deactivated.

5. The Gang Valves assemblies on un-needed liquid transfer jets will be deactivated but remain in place.

6. All samplers will be deactivated except D-2.

7. All "cold" rotometers will be deactivated.

14. GALLERIES (Continued)

8. High level sump weight factors will alarm in the Dispatcher's office.

9. Process temperature recorder-controllers will be deactivated.

10. Specific gravity instruments will be deactivated.

11. Pressure and differential pressure process instruments not required for water runs through the columns will be deactivated.

12. On those vessels used for water runs during stand-by the weight factor instruments will remain active but recordings will not be made. All other weight factor instruments will be deactivated.

13. All health monitoring instruments will be deactivated, however the timing of deactivation of these will be determined by the Supervisor of Radiation Monitoring and according to Instruction 10.2.

14. All process radioactivity monitors (includes - In-Line Samplers) will be deactivated.

15. All weigh scales will be deactivated.

16. All deactivation of equipment, effluent systems, chemical systems, and utilities will be according to applicable Instructions and Detailed Procedures.

17. Reference Instructions for canyon cell work to be performed in conjunction with this Instruction are: 7.3, 7.4, 10.1.1, 10.1.3, and 19.3. In addition jumpers will be installed to provide circulation through the following pumps: D-8, E-3, E-12, E-13, and G-1.

18. Housekeeping and Decontamination will be performed according to Detailed Procedures.

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 15.1	
	REVISION New	PAGE 1 of 1
SUBJECT: CRANEWAYS	LOCATION 202-S	
APPROVED BY: C B Foster C. B. Foster	DATE June 1, 1966	

15.1 CRANEWAYS

INTRODUCTION: The 202-S craneway runs the full length of the canyon and is the area traversed by the shielded canyon crane.

The Silo crane operates over the six level silo cover blocks.

Deactivation work consists of housekeeping and decontamination. The area will be in use during stand-by.

SCHEDULE: This Instruction will be initiated following completion of Section 5 Instructions.

INSTRUCTION:

1. Remove tools from silo deck, remove grease from deck with solvent, flush deck with water. Return decontaminated tools. Remove all combustibles.

2. Sweep canyon crane way with sweeping compound. Use fresh air masks.

15. REGULATED AREAS - 202-S

15.1 Craneways

15.2 Crane Maintenance Platform

15.3 Remote Shop, Decontamination Room and Regulated Shop

15.4 Railroad Tunnel and Cut

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 15.2	
	REVISION New	PAGE 1 OF 1
SUBJECT: CRANE MAINTENANCE PLATFORM	LOCATION 202-S	
APPROVED BY: C. B. Foster	DATE June 1, 1966	

15.2 CRANE MAINTENANCE PLATFORM

INTRODUCTION: This area will remain in use as an access way to the crane and for inspection and maintenance of the crane.

SCHEDULE: This Instruction will be initiated following completion of Instruction 11.2.1.

INSTRUCTION:

1. Inspect hoses and electric cords - discard deteriorated units.

2. Inspect tools - discard unsafe tools if present. Decontaminate and store other tools.

3. Steam clean the floor with a 10 percent solution of Kelite E25, to a maximum of 75 mr/hr 2" from the floor.

4. Unplug electrical devices.

5. Remove all combustibles.

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 15.3	
	REVISION New	PAGE 1 OF 1
SUBJECT: REMOTE SHOP, DECONTAMINATION ROOM AND REGULATED SHOP	LOCATION 202-S	
APPROVED BY: C. B. Foster	DATE June 1, 1966	

15.3 REMOTE SHOP, DECONTAMINATION ROOM AND REGULATED SHOP

INTRODUCTION: The Remote shop will be used for maintenance work so this area and the associated Decontamination room and Regulated shop will remain in service.

SCHEDULE: This Instruction may be performed in conjunction with Instruction 15.2.

INSTRUCTION:

1. Remove equipment and tools from the remote shop and steam clean surfaces with a 10 percent solution of Kelite E25, to reduce gross radiation dose level to $\angle$100 mr/hr at 2' from surfaces.

2. Decontaminate surfaces of the Decontamination room with 10 percent Kelite E25, to $\angle$1,000 d/m alpha smearable and $\angle$2,000 c/m B&G smearable.

3. Replace the four ultra filters of the Decontamination room exhaust system.

4. Remove combustibles including used laundry. Leave racks in place.

5. Deenergize trouble lights and electrical implements by pulling plugs or throwing switches.

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 15.4	
	REVISION New	PAGE 1 OF 1
SUBJECT: RAILROAD TUNNEL AND CUT	LOCATION Canyon	
APPROVED BY: C. B. Foster	DATE June 1, 1966	

15.4 RAILROAD TUNNEL AND CUT

INTRODUCTION: The railroad tunnel and cut will remain in service for the movement of equipment into and out of the Canyon.

SCHEDULE: This Instruction will be initiated following completion of Section 5 Instructions.

INSTRUCTION:

1. Flush the tunnel floor with water and scrub smears /5,000 c/m B&G.

2. Wipe the railroad tunnel tracks with a solution of Tide or solvent until smearable contamination is /2,000 c/m B&G.

3. The railroad cut is to be housekept by removal of any waste material and debris.

4. Materials and equipment in the 2706-S building are to be inspected and disposed of as appropriate or retained for future use. Combustibles are to be removed.

5. The shack at the end of the railroad cut is to be cleared of combustibles such as regulated clothing, waste and used laundry. The electric power supply is to be removed from this building.

6. Deactivate the tunnel radiation signal light system by Instruction 11.1.5.

7. Do not deactivate the monorail hoist outside the railroad tunnel door.

16. SERVICE AREAS

16.1 Storage Gallery

16.2 SWP Lobby and Change Room 202-S

16.3 Ladies Lounge

16.4 Restrooms

16.5 Offices

16.6 Dispatchers Offices

16.7 Shops

- 16.7.1 Mechanical
- 16.7.2 Electrical
- 16.7.3 Instrument
- 16.7.4 Paint
- 16.7.5 Laggers Shack

16.8 AMU Levels

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 16.1	
	REVISION New	PAGE 1 of 1
SUBJECT: STORAGE GALLERY	LOCATION 202-S	
APPROVED BY: C. B. Foster	DATE June 1, 1966	

16.1 STORAGE GALLERY

INTRODUCTION: This gallery runs under the south pipe gallery and is no longer used as a storage gallery.

SCHEDULE: This work may be done at any time except that the Beckman monitors on the 24" utility sewer will be deactivated by Instruction 10.1.1.

INSTRUCTION:

1. The PAX battery room is to remain in service.
2. The blower which discharges air from the gallery into the battery room will remain in operation.
3. The sump pump is to remain active.
4. Remove DOV stored in SW corner.
5. Transfer wood benches to north and south operating galleries.
6. Discard the two short wood ladders.
7. Remove all combustibles.
8. When utility sewer monitors are deactivated transfer the trouble light to the maintenance store room.
9. Remove laundry hamper - leave rack.
10. Perform final radiation survey and post area if required.

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 16.2	
	REVISION New	PAGE 1 OF 1
SUBJECT: SWP LOBBY AND CHANGE ROOM	LOCATION 202-S	
APPROVED BY: C. B. Foster	DATE June 1, 1966	

16.2 SWP LOBBY AND CHANGE ROOM

INTRODUCTION: The SWP Lobby and Change Room will remain in service except for the CMP monitoring station which will be deactivated.

SCHEDULE: This is no firm schedule for this work except that it is to be completed before July 1, 1967.

INSTRUCTION:

1. Reduce SWP protective equipment to a minimum inventory.
2. Reduce inventory of miscellaneous supplies and store all supplies in locker store room.
3. Unplug welding machine from power supply.
4. Retain plastic patterns.
5. Full rolls of paper and plastic are to be sold to other Isochem operations.
6. Empty all lockers.
7. Remove used laundry.
8. Deactivate CMP monitoring station according to Instruction 12.7.4.

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 16.3	
	REVISION New	PAGE 1 OF 1
SUBJECT: LADIES LOUNGE	LOCATION 202-S	
APPROVED BY: C. B. Foster	DATE June 1, 1966	

16.3 LADIES LOUNGE

INTRODUCTION: The Ladies Lounge will be completely deactivated.

SCHEDULE: This Instruction is to be completed prior to July 1, 1967.

INSTRUCTION:

1. Disconnect and cap the hot and cold sanitary water supply piping.
2. Add permanent type anti-freeze to traps to displace water and provide seal.
3. Unplug refrigerator, defrost, clean and leave door ajar.
4. Remove electric power and clean the stove.
5. Remove materials from lockers.
6. Transfer portable electric space heater to the electric shop store room.
7. Disconnect clock.
8. Remove combustibles.
9. Turn off lights.
10. Close and lock door - identify keys with a key tab and turn into Deactivation office.
11. Affix a deactivation tag to door.

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 16.4	
	REVISION New	PAGE 1 of 1
SUBJECT: RESTROOMS	LOCATION 202-S - 233-S	
APPROVED BY: C. B. Foster	DATE June 1, 1966	

16.4 RESTROOMS

INTRODUCTION: Restrooms are located in the 233-S Building, Silo Operating Gallery, the North Pipe Gallery, SWP change room and North of the mens locker room. The ladies lounge is treated by Instruction 16.3. The SWP locker restroom and the mens restroom North of the mens locker room will remain in service.

SCHEDULE: The restrooms are to be deactivated prior to July 1, 1967.

INSTRUCTION:

1. Disconnect and cap sanitary water supply.
2. Add permanent type anti-freeze to traps to displace water and provide seal.
3. Remove electrical power to hot water tank.
4. Drain water from hot water tank and leave drain valve open.
5. Remove combustibles.
6. Empty trash receptacle.
7. Turn out lights.
8. Close door and affix deactivation tag.

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 16.5	
	REVISION New	PAGE 1 OF 2
SUBJECT: OFFICES	LOCATION 202-S	
APPROVED BY: C B Foster C. B. Foster	DATE June 1, 1966	

16.5 OFFICES

INTRODUCTION: With few exceptions offices of the Redox Plant will not be required by the stand-by organization and may be used by others. This Instruction is applicable for those offices being abandoned. Responsibility for deactivation of offices occupied by more than one employee will be assigned to one individual except that each employee will be responsible for compliance with instructions applicable to his assigned office furniture and equipment. The Security Program 4.16 regarding classified documents must be satisfied prior to January 1, 1967.

SCHEDULE: This Instruction is to be performed so that the work is accomplished at the time of occupants departure and in total by July 1, 1967.

INSTRUCTION:

1. Records are to be disposed of according to Instruction 4.17.

2. File cabinets are to be emptied. Keys to files are to be taped to the top of cabinet.

3. Combination file cabinets are to be left unlocked. Post file combination by attaching a note to top of cabinet and notify Isochem Security Office in writing that the combination file cabinet is not in use. Provide the file serial number, room number and date.

4. Electrical devices including clocks are to be deenergized by removing electric plugs.

5. Desks are to be emptied. Tape keys to top of desk.

6. Stationery cabinets are to be emptied and keys are to be attached.

7. Table drawers and book cases are to be emptied.

8. Waste paper baskets are to be emptied.

9. The office is to be cleared of all combustibles and shop supplies so that the office is empty with the

16.5 OFFICES (Continued)

exception of office furniture and office equipment.

10. Stationery and other office supplies are to be returned to the Deactivation office. The employee may elect to take such supplies to his new assignment.

11. With the concurrence of his or her new Supervision an employee may transfer furniture and office equipment to a new assignment (within Isochem) and will arrange for such transport.

12. A Completion Report is to be filled out for each office. The report will inventory the office and will list office equipment transferred out of the plant and designate its destination.

13. The office doors are to be locked and posted with a deactivation tag.

14. Office keys are to be identified with a key tab and turned into the Deactivation Office.

15. The Deactivation Office will cancel phone service.

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 16.6
	REVISION New / PAGE 1 OF 2
SUBJECT: DISPATCHER OFFICE	LOCATION 202-S
APPROVED BY: C. B. Foster	DATE June 1, 1966

16.6 DISPATCHER OFFICE

INTRODUCTION: During normal operations the Dispatcher office is a multipurpose area for control, surveillance, communications and processing. The area will be deactivated except for radiation zone door controls, alarms and communication devices. Surveillance devices will be connected to the call bell system to notify surveillance personnel of an abnormal condition.

SCHEDULE: This Instruction is to be initiated following completion of Instructions 5.2 and 6.2.

INSTRUCTION:

1. Deactivate process instruments and controls in conjunction with deactivation of the associated gallery according to Instruction and Detail Procedures for those sections.

2. Deactivate the Radiation Monitoring instruments and alarms consistent with Instruction 10.2.1.

3. Disconnect the following from the surveillance console:
   a) 0-3 pump alarm
   b) Cell Fire Fog alarms
   c) 276-S Fire Fog alarm
   d) 804 enclosure Fire Fog alarm

   All other alarms and controls on the surveillance console will remain operable and connected so as to actuate the call bell system.

4. Connect all north side canyon sump alarms (pressure switches) in parallel and to one alarm - indicator on the console.

5. Connect all south side canyon sump alarms (pressure switches) in parallel and to one alarm - indicator on the surveillance console.

6. Connect the following pressure switches or actuators to separate alarm - indicators on the surveillance console:

   a) 233-S Sump - High weight factor
   b) 233-S Fire Alarm

16.6 DISPATCHER OFFICE (Continued)

c) 276-S Sump - High weight factor
d) Remote Shop Sump - High weight factor

7. Deactivate the teletalk, TV, and Data Transmission Printer according to Instruction 12.7.

8. The telephones are to remain operable. Telephone 2-7411 will remain connected to the crash alarm and the telephone call bell system is to be reactivated.

9. The Area Fire Alarm annunciator is to remain in service.

10. The Redox Steam Flow Meter is to remain in service as an indicator and the chart pen is to be cleaned of ink.

11. The canyon cell temperature recorder is to remain in service.

12. The instrument air header is to remain active to supply the UNH area. (See Instructions 9.1.3 and 9.1.5.6).

13. The timer control for the end of shift bell is to remain in service.

14. Revise Electrical drawings to show wiring changes in accordance with Instruction 18.

15. Dispose of records according to Instruction 4.17.

16. Reverse the security access sign.

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 16.7	
	REVISION New	PAGE 1 OF 3
SUBJECT: NON-REGULATED SHOPS	LOCATION 202-S	
APPROVED BY: C. B. Foster	DATE June 1, 1966	

16.7 NON-REGULATED SHOPS

INTRODUCTION: Non-Regulated Shops are: Mechanical Maintenance, Electrical, Instrument, Paint, and the Laggers Shack. Except for the Laggers Shack these shops are located within the 202-S Building; however, these Instructions are pertinent to storage areas of associated shops. Tools valued at $50 or more and all powered hand tools are to be inventoried.

INSTRUCTION: 16.7.1 - Mechanical Maintenance

This shop will not be deactivated but the following conditions will be met:

1. At the time of transfer, personal issue Hand Tools will be inventoried and either stored in the tool crib or accompany the craftsman.

2. All small portable tools will be locked in the tool crib.

3. Surplus material and scrap will be disposed in the prescribed manner.

4. Extraneous combustibles will be removed from the tool crib, main shop and storage areas.

INSTRUCTION: 16.7.2 - Electrical

This shop will remain active consistent with the following:

1. All small portable tools and television gear will be locked inside the Electrical Store Room and the TV Service Rooms.

2. At the time of transfer personal issue hand toools will be inventoried and either stored in the Mechanical Maintenance Tool Crib or accompany the craftsman.

3. Excess materials and scrap will be disposed in the prescribed manner.

4. Assigned tool lockers of transferred craftsmen will be empty.

5. The refrigerator will be unplugged, defrosted, cleaned, and the door left ajar.

6. All information (marked up drawings, sketches, manuals, etc.)

16.7 NON-REGULATED SHOPS (Continued)

pertinent to the Redox Facility will be stored in a locked metal file cabinet in the TV Service Room.

7. Combustibles will be removed.

INSTRUCTION: 16.7.3 - Instrument

This shop will remain active consistent with the following:

1. At the time of transfer personal issue hand tools will be inventoried and either stored in the Mechanical Maintenance Tool Crib or accompany the Craftsman.

2. Assigned tool lockers of transferred craftsmen will be empty.

3. All information (marked up drawings, sketches, manuals, etc.) pertinent to the Redox Facility will be stored in a locked metal file cabinet in the Instrument Office.

4. All excess material and scrap will be disposed in the prescribed manner.

5. Dry cell batteries will be removed from test and calibration Instruments that are not expected to be used routinely.

6. Surplus inventories, lubricants, ink, manometer fluid, etc. will be reduced by transfering to other CPD facilities.

7. Radioactive sources other than that used for Poppy Probe Checking will be returned to the Supervisor - Radiation Monitoring.

8. Combustibles will be removed from the Instrument Storage areas and reduced to a minimum in the Instrument Shop.

9. Bottled mercury is to be inventoried.

INSTRUCTION: 16.7.4 - Paint Shop

1. This shop will be completely deactivated.

2. All paint, paint thinner, solvent, brushes, blasting grit, etc. will be transferred to other CPD facilities.

3. All painting guns and associated containers will be cleaned and stored in the Paint Shop.

16.7 NON-REGULATED SHOPS (Continued)

4. All hoses will be stored in the Mechanical Maintenance tool crib or transferred to other CPD Paint Shops.

5. The water and electrical supply to the Paint Spray Hood will be removed and the Hood drained.

6. All combustibles will be removed from the Hood and Shop.

7. Post sign - "No paint solvent or combustibles are to be stored in this room".

INSTRUCTION: 16.7.5 - Laggers Shack

1. The Laggers Shack - 2708-S, will be deactivated, however a moderate supply of material will remain stored at this location.

2. The electrical power to the Building will be removed.

3. The steam and water service will be shut off and the lines winterized.

4. The Laggers Portable Work Bench (Cart) is to be cleared of material and stored in the North pipe gallery.

5. Combustibles removed from the Shack.

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 16.8	
	REVISION New	PAGE 1 OF 2
SUBJECT: AMU LEVELS	LOCATION 202-S	
APPROVED BY: C. B. Foster	DATE June 1, 1966	

16.8 AMU LEVELS

INTRODUCTION: This Instruction is pertinent to the following levels: 1 through 5 AMU, 8th level head tank, and chemical storage.

SCHEDULE: This Instruction is to be initiated following the completion of Instructions 7.1, 7.1.1, 12.1, and 12.3.

INSTRUCTION:

1. Deactivate all manometers according to Instruction 11.1.3.1.
2. Deactivate weigh scales in accordance with Instruction 11.1.3.3.
3. Deactivate the Taylor-Recorders on the 4th and 5th levels according to Instruction 11.1.2.1.
4. Deactivate the liquid level alarms on vessels 201, 202, 601, 603, and 604, by removing the electrical power to the alarm units.
5. Deactivate the vessel vent blowers located on the 3rd and the 5th levels according to Instruction 11.2.9.
6. Deactivate the vessel vent jet located on the 8th level by removing the motive air supply in accordance with Instruction 11.2.2.2.
7. Large scale test weights will remain in the assigned storage area but small weights and scale parts are to be moved to Instrument Storage in the No. 3 Blower Room and the wood cabinet disposed.
8. Verify that all pump and agitator motor controls have been deactivated according to Instruction 11.2.9.
9. Return the electrical powered Fork Lift to Federal Support Services and deactivate the battery charger.
10. All chemicals are to be removed in accordance with Instruction 7.
11. Transfer manuals, procedures, and calibration charts to the Deactivation Office.
12. Return supplies to the operations store room.
13. Transfer wooden chemical pallets to the 200-E area

16.8 AMU LEVELS (Continued)

chemical warehouse.

14. Transfer wooden desks, tables and chairs to Federal Support Services.

15. Unplug all electrical devices.

16. Empty all cabinets. Transfer protection acid clothing to other CPD facilities.

17. Remove extraneous combustibles.

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 17.
	REVISION New / PAGE 1 OF 4
SUBJECT: ENGINEERING	LOCATION 202-S
APPROVED BY: C. B. Foster	DATE June 1, 1966

17. ENGINEERING

INTRODUCTION: When the Redox Deactivation Component was formed Douglas United Nuclear Manufacturing representatives W. W. Windsheimer and H. C. Copeland were consulted regarding the Reactor Deactivation Program. Discussions helped set the stage even though the problems and requirements for reactor deactivation were different than those associated with the deactivation of a solvent extraction plant. Messrs. Cartmell, McMahill, Foster, and W. H. Koontz (Facility Engineering) toured deactivated reactor facilities to gain additional information. We appreciate the guidance and cooperation extended us by Messrs. Windsheimer and Copeland.

The Deactivation Component has been assisted by the parent Redox organization and by both the Facilities Engineering and Research and Engineering Sections. Consultation with these sections has helped to establish philosophy reflected throughout the Programs and Instructions. This section gives synopsis treatment of subjects which have been resolved or are receiving engineering attention.

1. Deactivation Drawings were made by Facility Engineering for study, instruction and record purposes.

2. Redox Open Pond - Swamp

   Redox swamp soil samples were taken, and analysis confirmed the presence of radionuclides in concentrations requiring long term control. During stand-by the swamp will be blanketed by the addition of raw water directly to the 24" utility header as shown on Deactivation Drawing H-2-45900.

3. Processing with Boric Acid

   Research and Engineering is evaluating the necessity for using Boric Acid as a nuclear safeguard during terminal flushing and processing.

4. Neptunium Processing

   Research and Engineering is studying alternate methods of processing the final neptunium

17. ENGINEERING (Continued)

inventory in an attempt to establish a high yield flowsheet designed to recover essentially all the neptunium to avoid multiple campaigns. This may result in compromising product purity and decontamination to the extent that special load out and shipping provisions are required. The product would be purified and decontaminated at Purex.

5. Hexone Disposal

Research and Engineering was asked to provide a recommendation for disposal of spent hexone and advised that residual, contaminated hexone be discarded on a specific soil retention basis by pumping overground to a ditch which must be backfilled immediately.

6. Sludge Dissolution

Dissolution of solids from canyon vessels requires agitation. Facility Engineering has scoped the requirements and is designing the required jumpers for vessels which are not equipped with agitators.

7. Demineralized Water

Facility Engineering was requested to recommend a method for deactivation of demineralizers and a proposal for supplying water to the 222-S Laboratory still. Recommendations were received and are reflected in the associated Deactivation Instruction.

8. Silica Gel Operation

The Silica Gel operating procedure specifies the use of demineralized water for regeneration of the bed. Research and Engineering is evaluating the need to use demineralized water should it be necessary to regenerate the bed following deactivation of the Plant. It may prove necessary to leave one of the demineralizer units available for use, but other means of providing demineralized water are being examined.

17. ENGINEERING (Continued)

9. Waste Neutralization and Waste Handling for 219-S Facility

Facility Engineering reviewed and confirmed the adequacy of planning for neutralization of laboratory wastes in the 219-S facility and direct transfer via the 202-S canyon to underground storage.

10. Terminal Flushing

Facility Engineering scoped the methods for flushing the wind tunnel, pipe tunnel, canyon cells, silo and the canyon deck. Detail design will be provided. The necessity for providing protection for in-cell electrical heads during spray down is being evaluated and if required, design will be provided.

11. In-Trench Piping

Facility Engineering has been requested to explore the feasibility of testing in-trench piping by a method other than hydrostatic testing which is a difficult, time consuming and unreliable when remote techniques and optics are employed.

12. Absorber Tower, 293-S

The 293-S absorber vessel is made up of thirteen segments connected by twelve, 60-inch diameter flanged joints. Most of these joints have liquid seepage and Facility Engineering was requested to recommend methods of repair in the event of a Redox start-up.

Recommendations are included in a letter from D. D. Wodrich to C. B. Foster, dated May 23, 1966. The recommendation to regasket the flanges and replace the backup flanges is being reviewed. Cost of repair is estimated in $15,000 to $25,000 range depending on whether the flanges used are carbon or stainless steel.

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 17.
	REVISION New / PAGE 4 OF 4
SUBJECT: ENGINEERING	LOCATION 202-S
APPROVED BY: C. B. Foster	DATE June 1, 1966

17. ENGINEERING (Continued)

INSTRUCTION: To achieve the desired deactivation status Deactivation Instructions and Detailed Procedures are to reflect Engineering recommendations.

18. DRAWINGS

DRAWINGS	TITLE
H-2-45900	Plot Plan 202-S Vicinity
H-2-45901	211-S Tank Farm Nitric, Caustic, Dichromate and Ammonium Fluoride
H-2-45902	211-S Tank Farm Demineralized Water
H-2-45903	211-S Tank Farm Steam
H-2-45904	211-S Tank Farm ANN System
H-2-45905	211-S Tank Farm Sanitary Water System
H-2-45906	211-S Tank Farm Process Drainage
H-2-45907	Piping - Steam System
H-2-45908	Piping - Instrument and Plant Air Systems
H-2-45909	Piping - Breathing Air and Ozone Systems
H-2-45910	Piping - Sodium Nitrate, ANN, and Nitric Acid Systems
H-2-45911	Piping - Ammonium Fluoride, Wash, and Dichromate Systems
H-2-45912	Piping - Caustic System
H-2-45913 (Sheets 1 and 2)	Piping - Filtered or Sanitary Water
H-2-45914 (Sheets 1 and 2)	Piping - Demineralized Water
H-2-45915 (Sheets 1 and 2)	Piping - Raw Water
H-2-45916 (Sheets 1 and 2)	Piping - Inert Gas

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 18.	
	REVISION New	PAGE 1 OF 1
SUBJECT: DRAWINGS	LOCATION General	
APPROVED BY: C. B. Foster	DATE June 1, 1966	

18. DRAWINGS

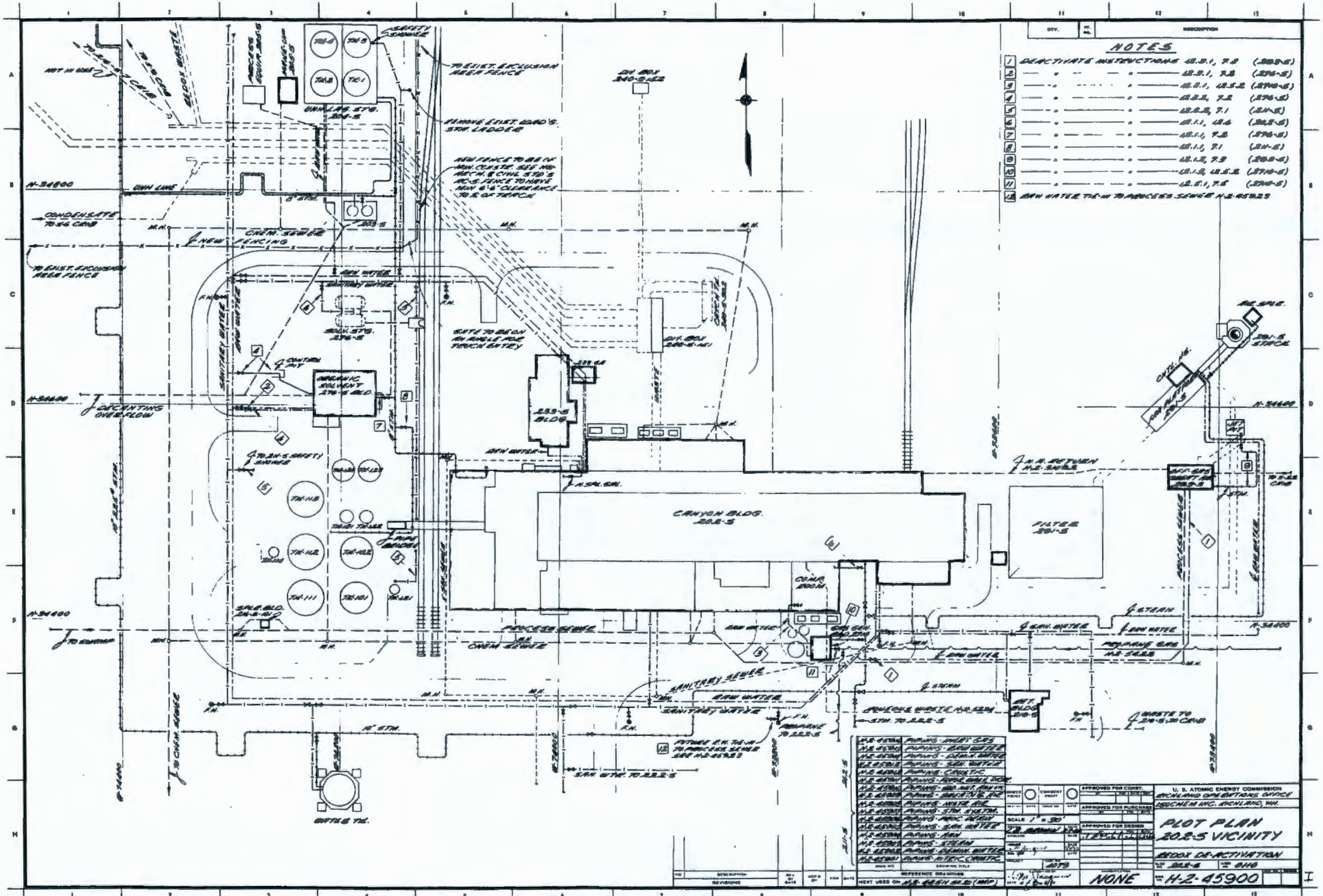
Deactivation Drawings are provided to expedite work to be performed and to record this work for future reference. In addition to the Deactivation Drawings, reference to other drawings is made in specific Deactivation Instructions.

INSTRUCTION:

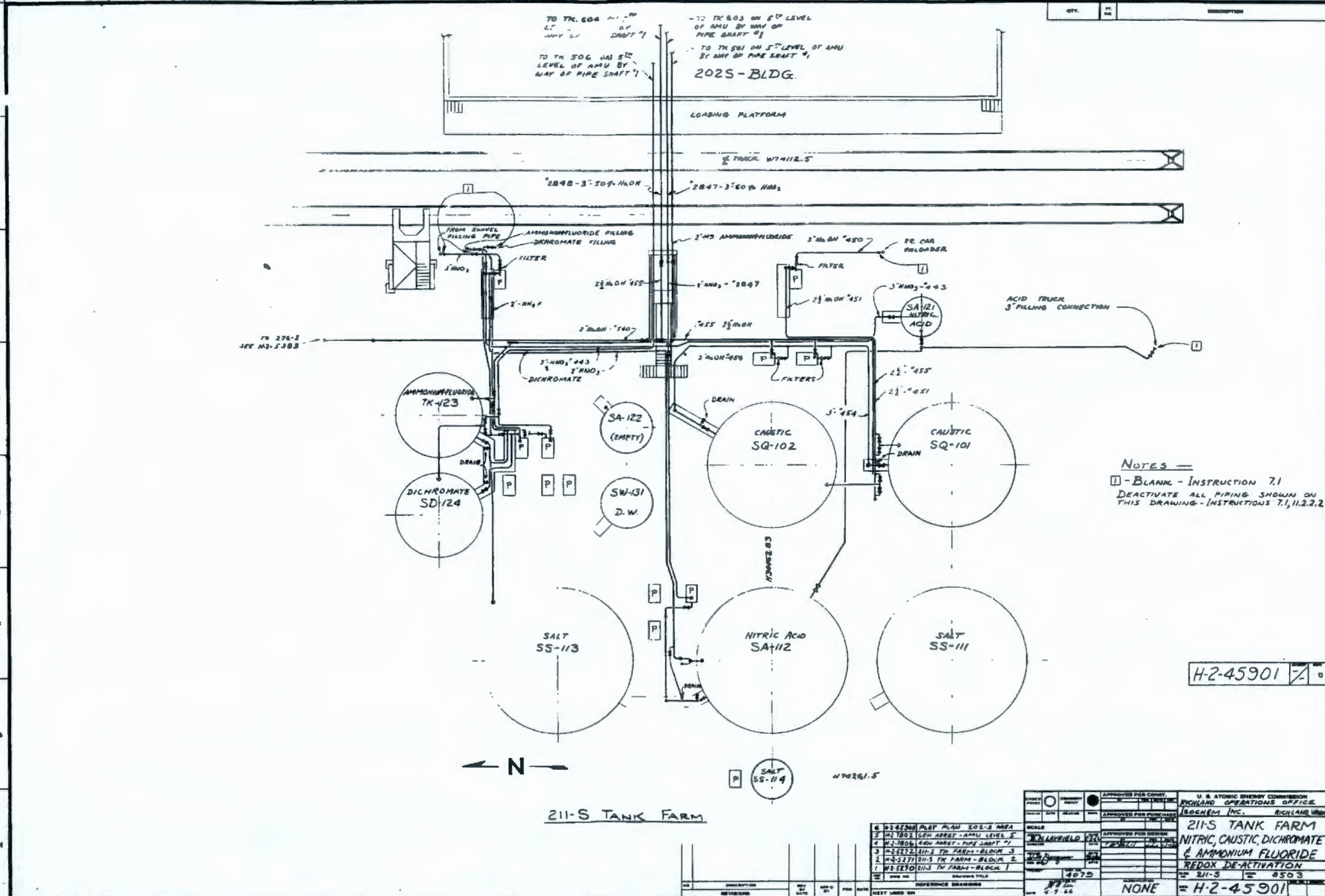
1. Deviation from the work called for on the Deactivation Drawings must be approved by the Manager - Redox Deactivation.

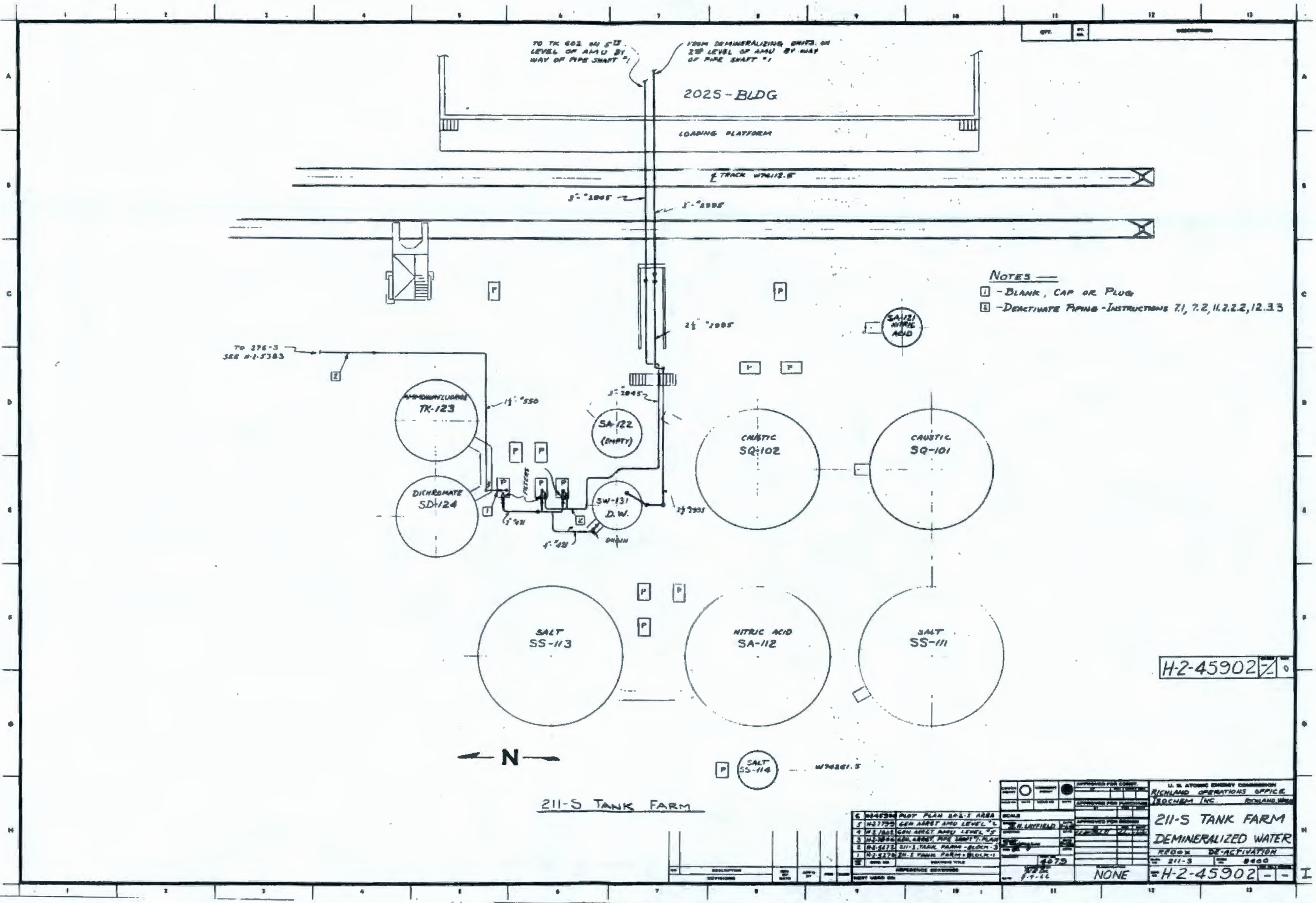
2. Marked copies of drawings showing deviations or changes to other drawings to accomplish Deactivation, will be delivered to Facilities Engineering Drafting for drawing revision.

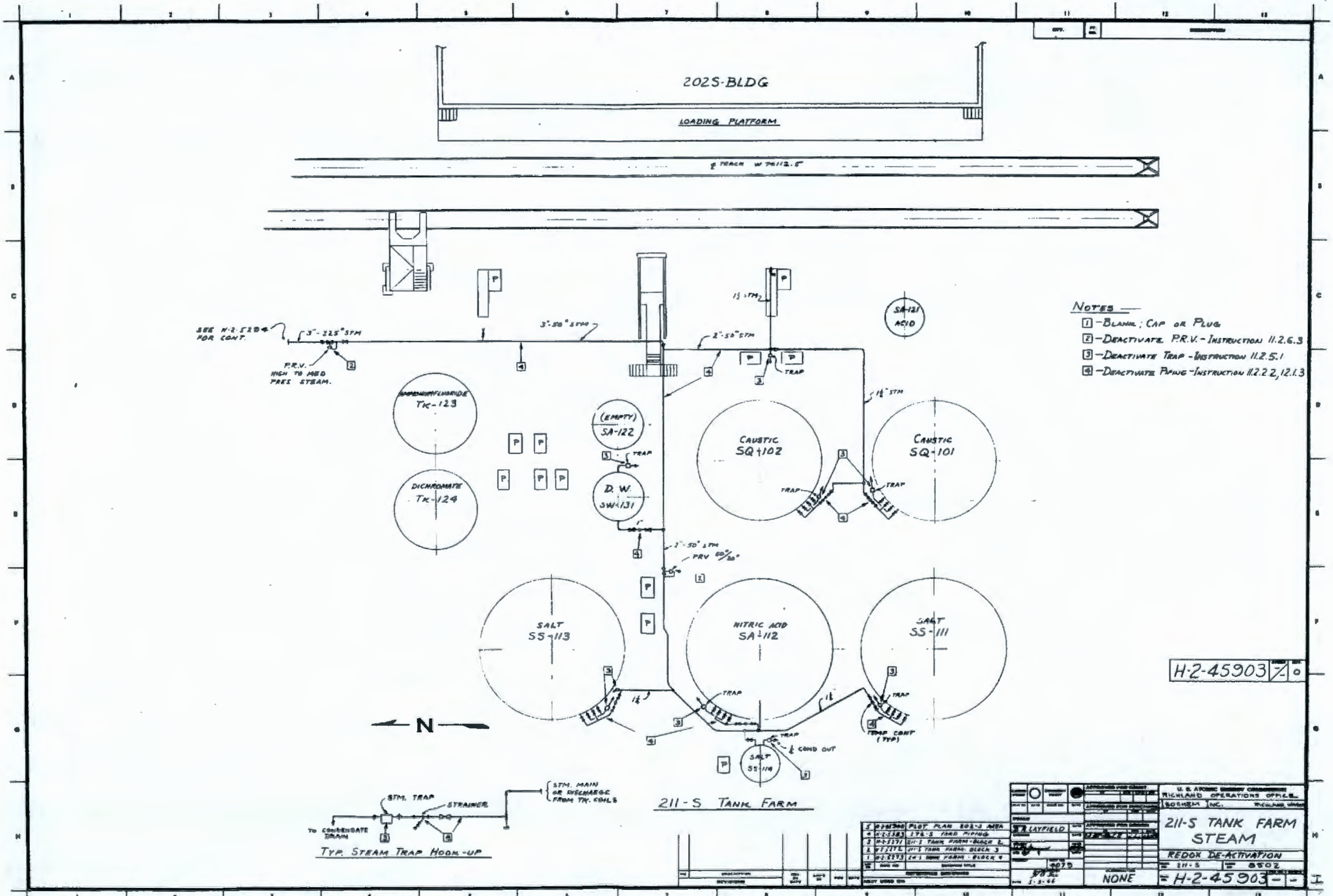
3. All drawings utilized in deactivation, will be revised at the completion of deactivation and marked "As Deactivated".



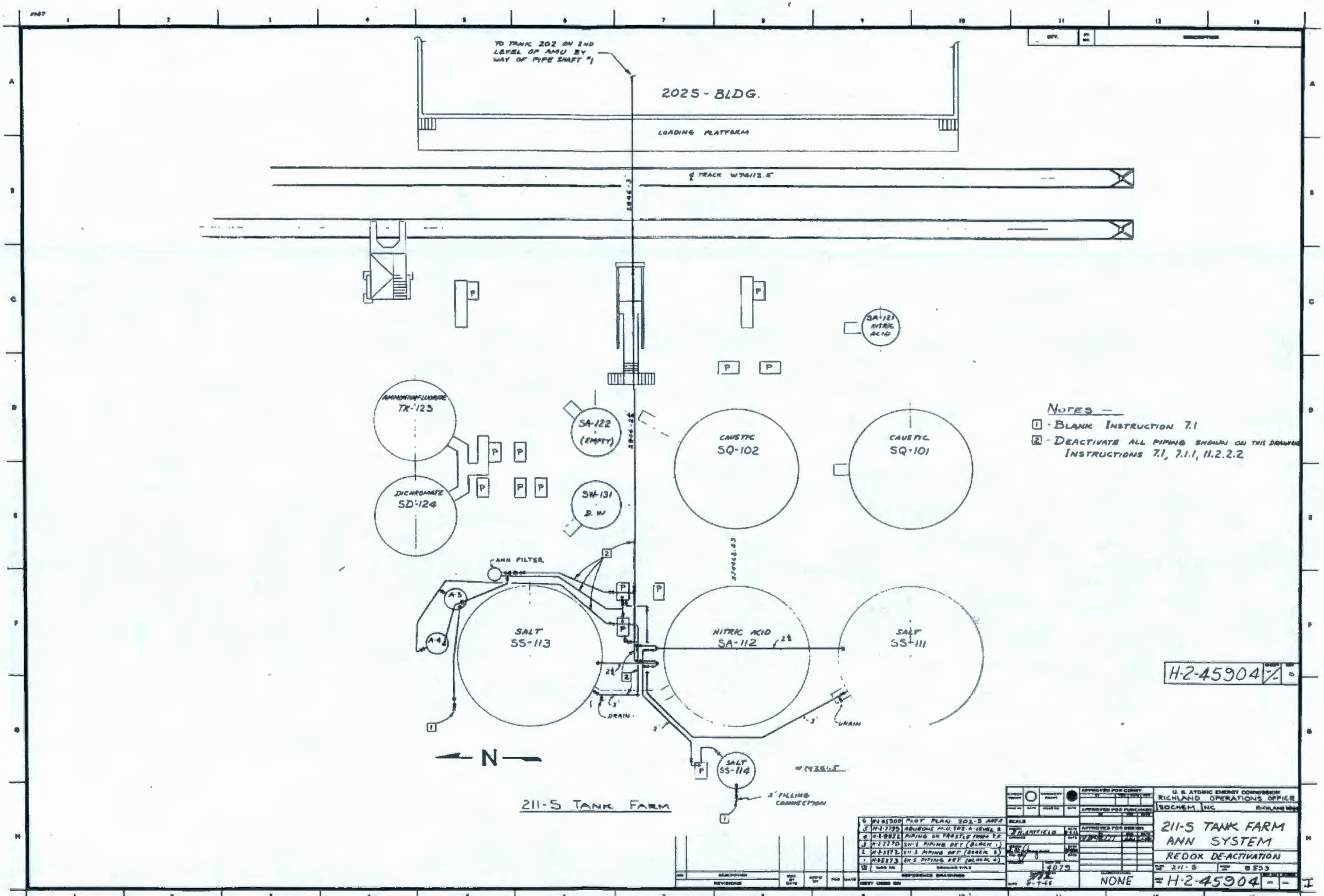
NOTES
1 DEACTIVATE INSTRUCTIONS
12 RAW WATER TIE-IN TO PROCESS SEWER H-2-45923
CANYON BLDG. 202-S
FILTER 291-S
233-S BLDG.
ORGANIC SOLVENT 276-S BLDG.
291-S STACK
CHEM. SEWER
PROCESS SEWER
SANITARY SEWER
RAW WATER
SANITARY WATER
NEW FENCING
CONDENSATE TO 216 CRIB
TO EXIST. EXCLUSION AREA FENCE
DECANTING OVERFLOW
PIPE BRIDGE
COMP. ROOM
STEAM
PROPANE GAS
WATER TK.
SCALE 1" = 30'
U. S. ATOMIC ENERGY COMMISSION
RICHLAND OPERATIONS OFFICE
PLOT PLAN
202-S VICINITY
REDOX DE-ACTIVATION
NONE
H-2-45900

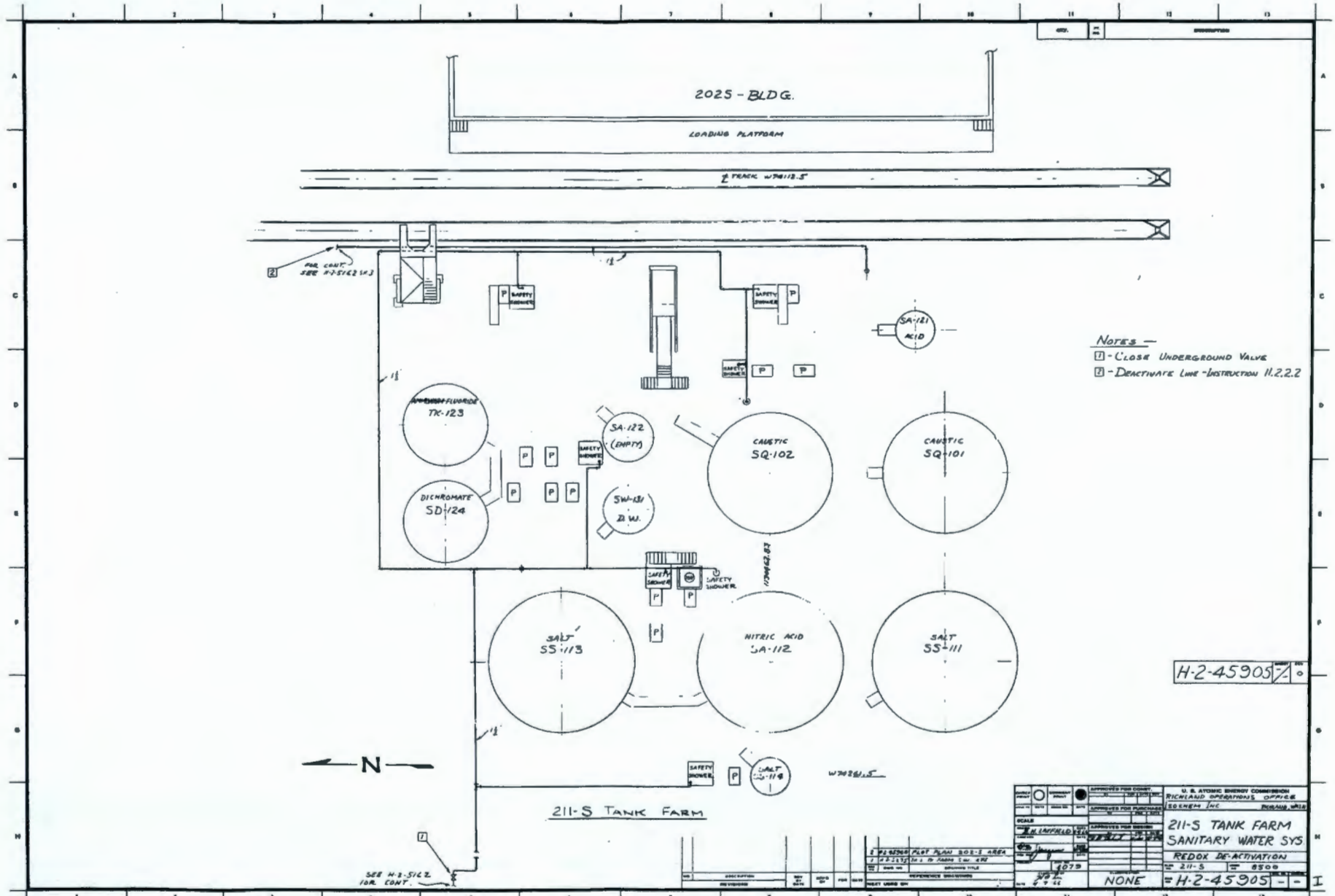

202S - BLDG.
TO TK 603 ON 5TH LEVEL OF AMU BY WAY OF PIPE SHAFT #1
TO TK 501 ON 5TH LEVEL OF AMU BY WAY OF PIPE SHAFT #1
TO TK 506 ON 5TH LEVEL OF AMU BY WAY OF PIPE SHAFT #1
LOADING PLATFORM
℄ TRACK W7#112.5
FROM SHOVEL FILLING PIPE
AMMONIUM FLUORIDE FILLING
DICHROMATE FILLING
FILTER
FILTERS
DRAIN
AMMONIUM FLUORIDE TK-123
DICHROMATE SD-124
SA-122 (EMPTY)
SW-131 D.W.
CAUSTIC SQ-102
CAUSTIC SQ-101
SA-121 NITRIC ACID
SALT SS-113
NITRIC ACID SA-112
SALT SS-111
SALT SS-114
ACID TRUCK 3" FILLING CONNECTION
RR. CAR UNLOADER
TO 276-S SEE H2-5383
N
211-S TANK FARM
NOTES —
1 - BLANK - INSTRUCTION 7.1
DEACTIVATE ALL PIPING SHOWN ON THIS DRAWING - INSTRUCTIONS 7.1, 11.2.2.2
H-2-45901
6 H-2-45900 PLOT PLAN 202-S AREA
5 H-2-7802 GEN ARRGT - AMU LEVEL 5
4 H-2-7806 GEN ARRGT - PIPE SHAFT #1
3 H-2-5272 211-S TK FARM - BLOCK 3
2 H-2-5271 211-S TK FARM - BLOCK 2
1 H-2-5270 211-S TK FARM - BLOCK 1
REFERENCE DRAWINGS
U. S. ATOMIC ENERGY COMMISSION
RICHLAND OPERATIONS OFFICE
ISOCHEM INC. RICHLAND WASH
211-S TANK FARM
NITRIC, CAUSTIC, DICHROMATE & AMMONIUM FLUORIDE
REDOX DE-ACTIVATION
211-S
8503
4079
4-7-66
NONE
H-2-45901


2025-BLDG
LOADING PLATFORM
NOTES —
1 - BLANK, CAP OR PLUG
2 - DEACTIVATE PIPING - INSTRUCTIONS 7.1, 7.2, 11.2.2.2, 12.3.3
AMMONIUMFLUORIDE TK-123
DICHROMATE SD-124
SA-122 (EMPTY)
SW-131 D.W.
CAUSTIC SQ-102
CAUSTIC SQ-101
SA-121 NITRIC ACID
SALT SS-113
NITRIC ACID SA-112
SALT SS-111
SALT SS-114
DRAIN
N
211-S TANK FARM
H-2-45902
U. S. ATOMIC ENERGY COMMISSION
RICHLAND OPERATIONS OFFICE
ISOCHEM INC RICHLAND, WASH.
211-S TANK FARM
DEMINERALIZED WATER
REDOX DE-ACTIVATION
211-S
NONE
H-2-45902



202S-BLDG
LOADING PLATFORM
SEE H-2-5294 FOR CONT.
3"-225# STM
P.R.V. HIGH TO MED PRES. STEAM.
3"-50# STM
2"-50# STM
1½" STM
TRAP
SA-121 ACID
TK-123
DICHROMATE TK-124
(EMPTY) SA-122
D.W. SW-131
2"-50# STM
PRV 50/30#
CAUSTIC SQ-102
CAUSTIC SQ-101
SALT SS-113
NITRIC ACID SA-112
SALT SS-111
SALT SS-114
½ COND OUT
TEMP CONT (TYP)
N
STM. TRAP
STRAINER
TO CONDENSATE DRAIN
STM. MAIN OR DISCHARGE FROM TK. COILS
TYP. STEAM TRAP HOOK-UP
211-S TANK FARM
NOTES —
1 – BLANK; CAP OR PLUG
2 – DEACTIVATE P.R.V. – INSTRUCTION 11.2.6.3
3 – DEACTIVATE TRAP – INSTRUCTION 11.2.5.1
4 – DEACTIVATE PIPING – INSTRUCTION 11.2.2.2, 12.1.3
H-2-45903
5 PLOT PLAN 202-S AREA
4 H-2-5383 276-S TANK PIPING
3 H-2-5271 211-S TANK FARM-BLOCK 2
2 H-2-5272 211-S TANK FARM-BLOCK 3
1 H-2-5273 211-S TANK FARM-BLOCK 4
LAYFIELD
U. S. ATOMIC ENERGY COMMISSION
RICHLAND OPERATIONS OFFICE
ISOCHEM INC.
211-S TANK FARM
STEAM
REDOX DE-ACTIVATION
211-S
8502
NONE
H-2-45903


TO TANK 202 ON 2ND LEVEL OF AMU BY WAY OF PIPE SHAFT #1
202S - BLDG.
LOADING PLATFORM
℄ TRACK W76112.5
SA-121 NITRIC ACID
AMMONIUM FLUORIDE TK-123
SA-122 (EMPTY)
CAUSTIC SQ-102
CAUSTIC SQ-101
DICHROMATE SD-124
SW-131 D.W.
ANN FILTER
A-3
A-4
SALT SS-113
NITRIC ACID SA-112
SALT SS-111
DRAIN
SALT SS-114
3" FILLING CONNECTION
N
211-S TANK FARM
NOTES –
1 - BLANK INSTRUCTION 7.1
2 - DEACTIVATE ALL PIPING SHOWN ON THIS DRAWING INSTRUCTIONS 7.1, 7.1.1, 11.2.2.2
H-2-45904
U. S. ATOMIC ENERGY COMMISSION RICHLAND OPERATIONS OFFICE
ISOCHEM INC
211-S TANK FARM ANN SYSTEM
REDOX DE-ACTIVATION
211-S
0533
NONE
H-2-45904
6 H-2-65300 PLOT PLAN 202-S AREA
5 H-2-2795 ABOVE M-U. 202-A-LEVEL 2
4 H-2-8032 PIPING ON TRESTLE FROM T.F.
3 H-2-3270 211-S PIPING DET (BLOCK 1)
2 H-2-3272 211-S PIPING DET (BLOCK 3)
1 H-2-3273 211-S PIPING DET (BLOCK 4)
REFERENCE DRAWINGS



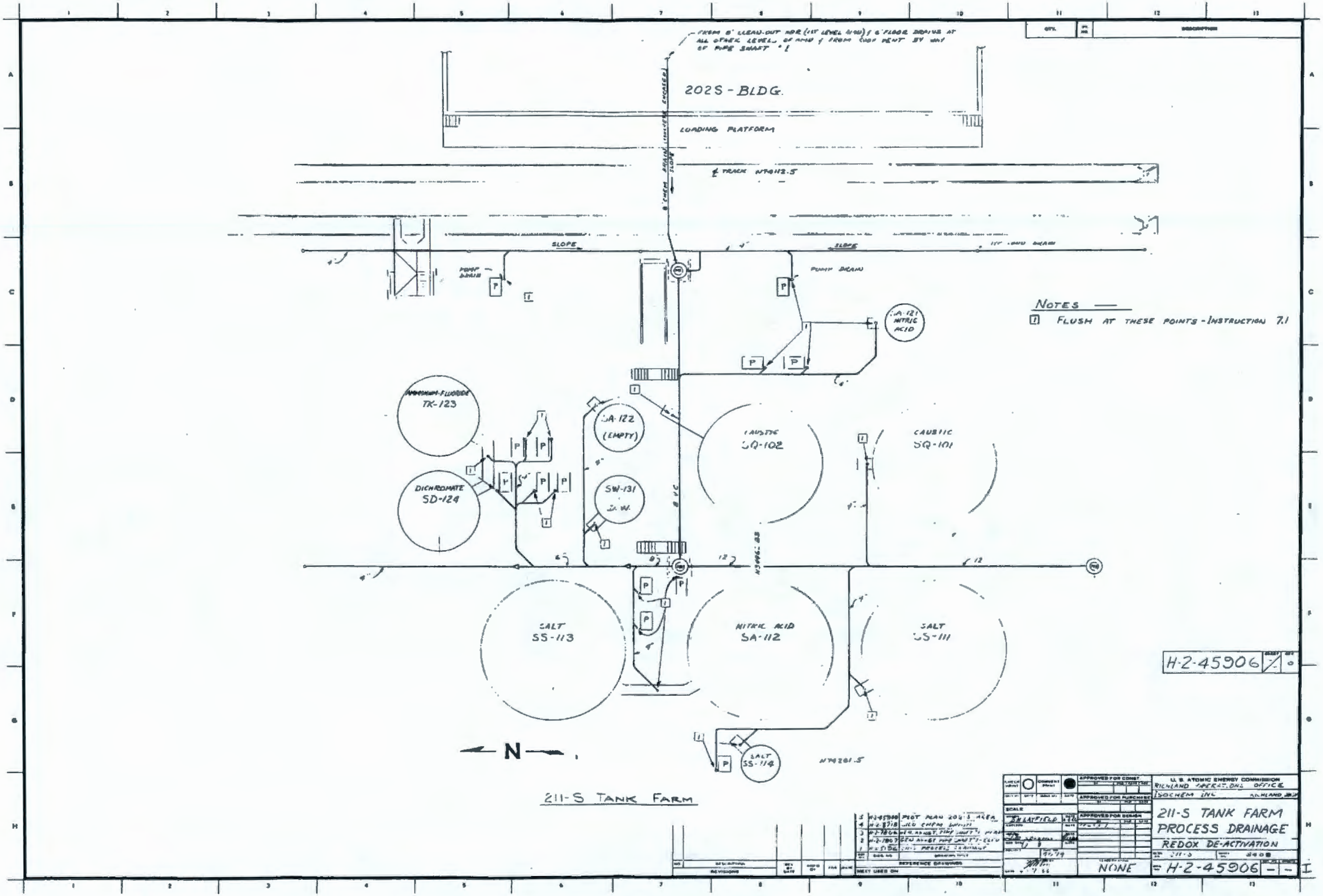
Notes —

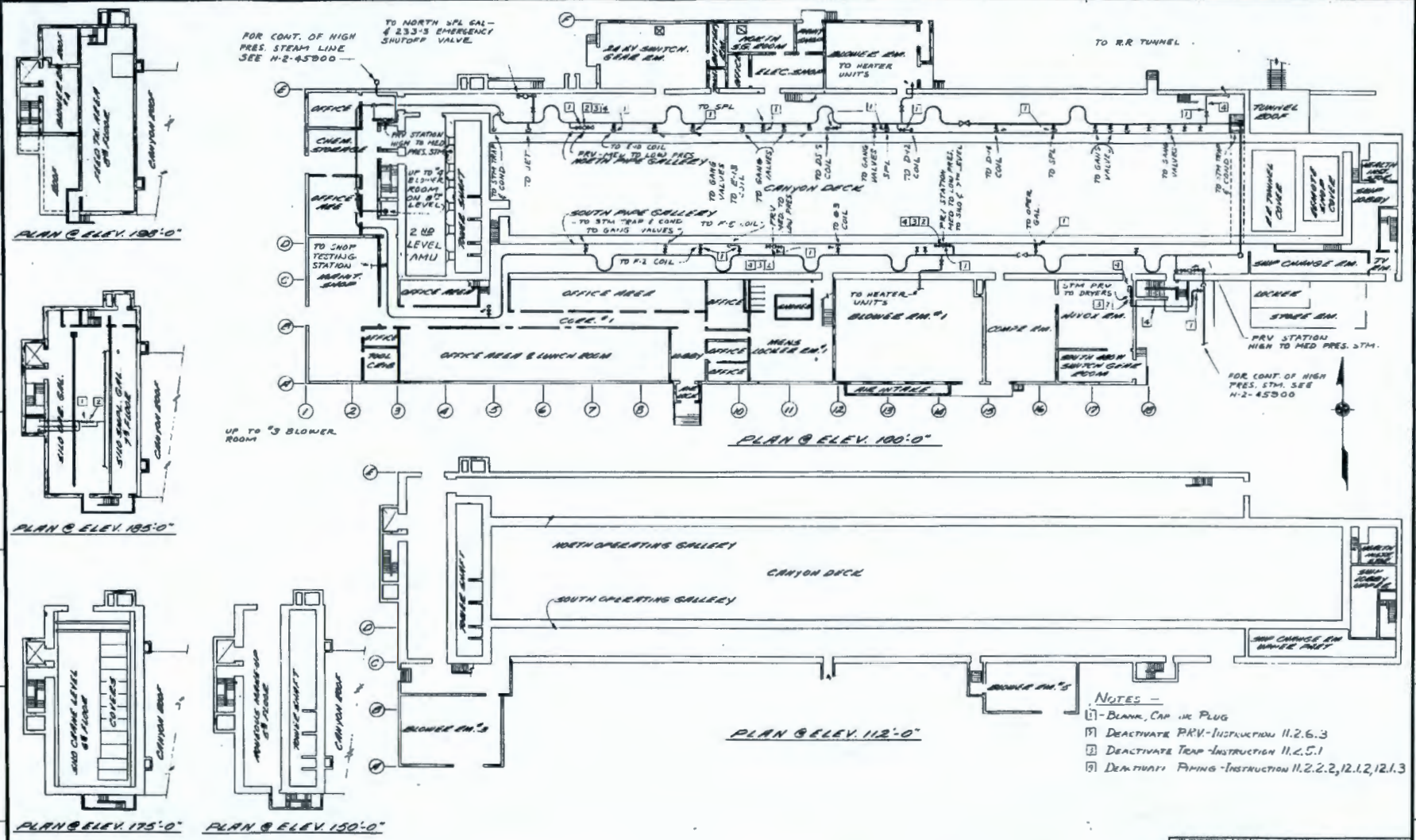
1 - CLOSE UNDERGROUND VALVE

2 - DEACTIVATE LINE - INSTRUCTION 11.2.2.2

H-2-45905 SHEET 1 REV 0

U. S. ATOMIC ENERGY COMMISSION RICHLAND OPERATIONS OFFICE	
200 AREA INC.	
211-S TANK FARM SANITARY WATER SYS REDOX DE-ACTIVATION	
211-S	8500
NONE	H-2-45905


202S - BLDG.
LOADING PLATFORM
SLOPE
PUMP DRAIN
NOTES —
1 FLUSH AT THESE POINTS - INSTRUCTION 7.1
SA-121 NITRIC ACID
TK-123
SA-122 (EMPTY)
CAUSTIC SQ-102
CAUSTIC SQ-101
DICHROMATE SD-124
SW-131
SALT SS-113
NITRIC ACID SA-112
SALT SS-111
SALT SS-114
N
211-S TANK FARM
H-2-45906
U. S. ATOMIC ENERGY COMMISSION
RICHLAND OPERATIONS OFFICE
ISOCHEM INC
211-S TANK FARM
PROCESS DRAINAGE
REDOX DE-ACTIVATION
SCALE NONE
H-2-45906



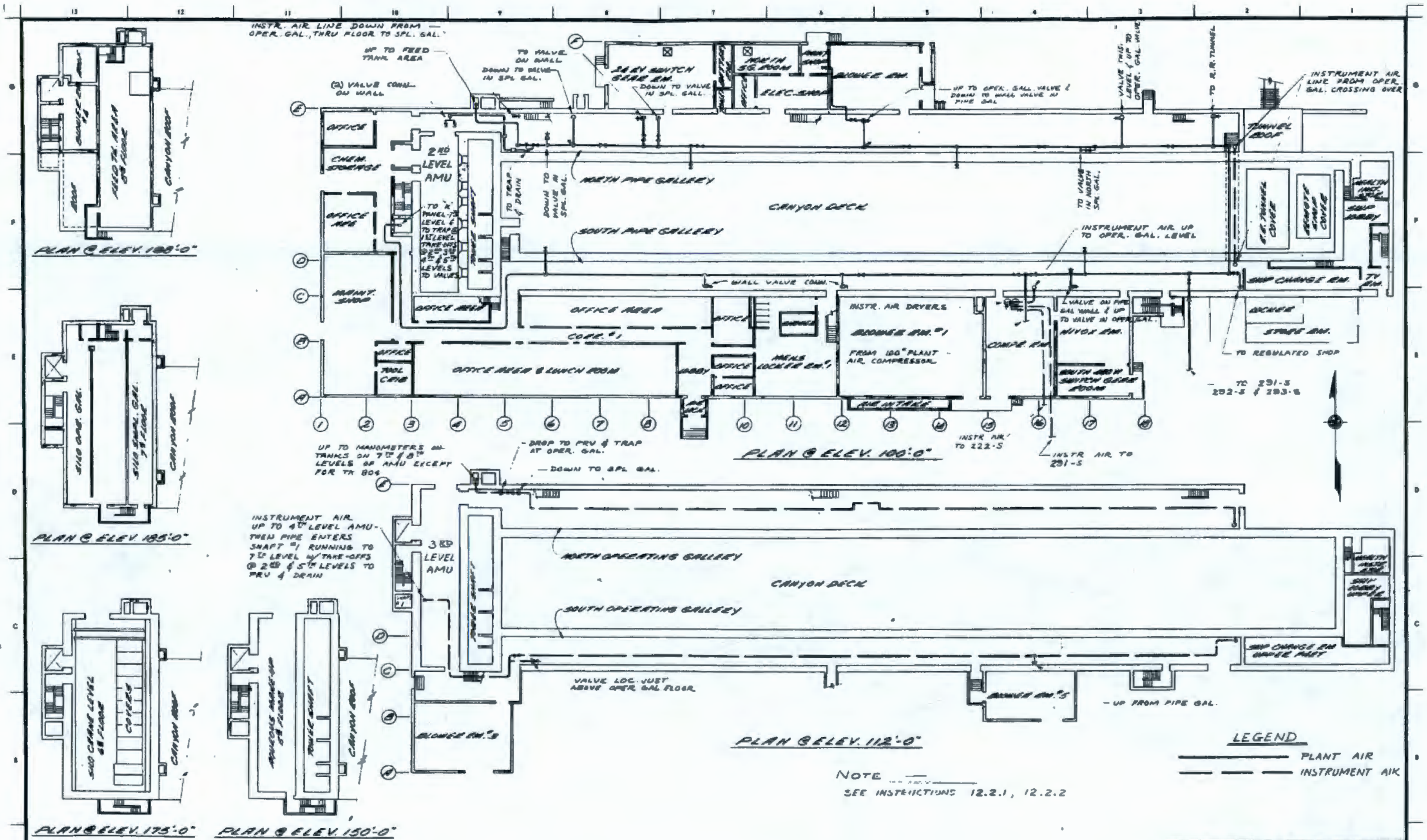
U. S. ATOMIC ENERGY COMMISSION
RICHLAND OPERATIONS OFFICE
ISOMETRIC

PIPING
STEAM SYSTEM

300 AREA DE-ACTIVATION

202-S 8501

H-2-45907



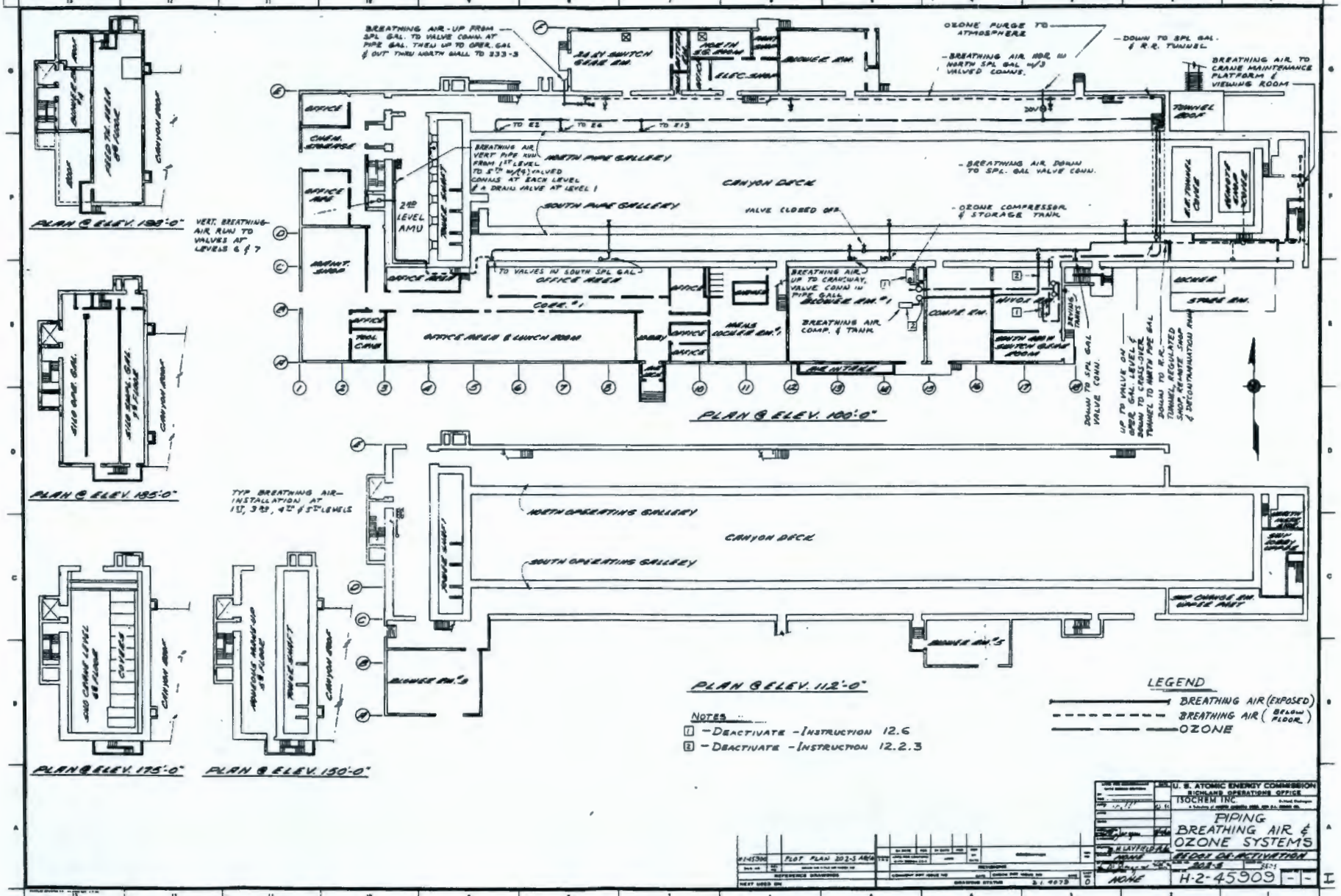
NOTE
SEE INSTRUCTIONS 12.2.1, 12.2.2

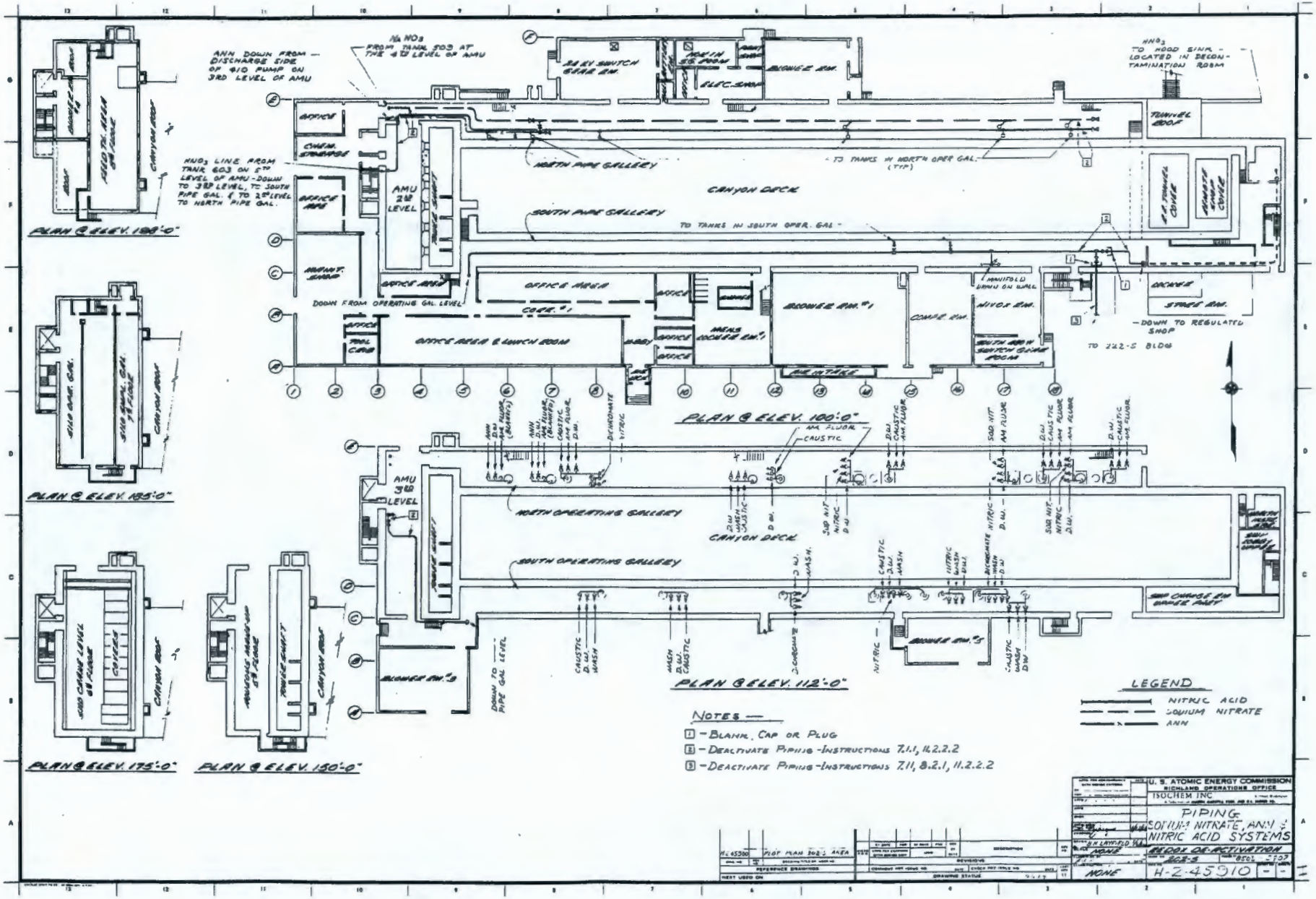
U. S. ATOMIC ENERGY COMMISSION
RICHLAND OPERATIONS OFFICE
ISOCHEM INC.

PIPING
INSTRUMENT AIR & PLANT AIR SYSTEMS
REDOX DE-ACTIVATION

202-S

H-2-45908


PLAN @ ELEV. 199'-0"
PLAN @ ELEV. 185'-0"
PLAN @ ELEV. 175'-0"
PLAN @ ELEV. 150'-0"
PLAN @ ELEV. 100'-0"
PLAN @ ELEV. 112'-0"
BREATHING AIR - UP FROM SPL GAL. TO VALVE CONN. AT PIPE GAL. THEN UP TO GREEN GAL & OUT THRU NORTH WALL TO 233-3
OZONE PURGE TO ATMOSPHERE
- DOWN TO SPL GAL & R.R. TUNNEL
BREATHING AIR TO CRANE MAINTENANCE PLATFORM & VIEWING ROOM
- BREATHING AIR DOWN TO SPL. GAL VALVE CONN.
- OZONE COMPRESSOR & STORAGE TANK
VALVE CLOSED OFF
VERT. BREATHING AIR RUN TO VALVES AT LEVELS 6 & 7
TYP BREATHING AIR INSTALLATION AT 1ST, 3RD, 4TH & 5TH LEVELS
NORTH PIPE GALLERY
SOUTH PIPE GALLERY
CANYON DECK
NORTH OPERATING GALLERY
SOUTH OPERATING GALLERY
OFFICE AREA & LUNCH ROOM
TO VALVES IN SOUTH SPL GAL
BREATHING AIR COMP. & TANK
LEGEND
BREATHING AIR (EXPOSED)
BREATHING AIR (BELOW FLOOR)
OZONE
NOTES
1 - DEACTIVATE - INSTRUCTION 12.6
2 - DEACTIVATE - INSTRUCTION 12.2.3
U. S. ATOMIC ENERGY COMMISSION
RICHLAND OPERATIONS OFFICE
ISOCHEM INC.
PIPING
BREATHING AIR & OZONE SYSTEMS
H-2-45909

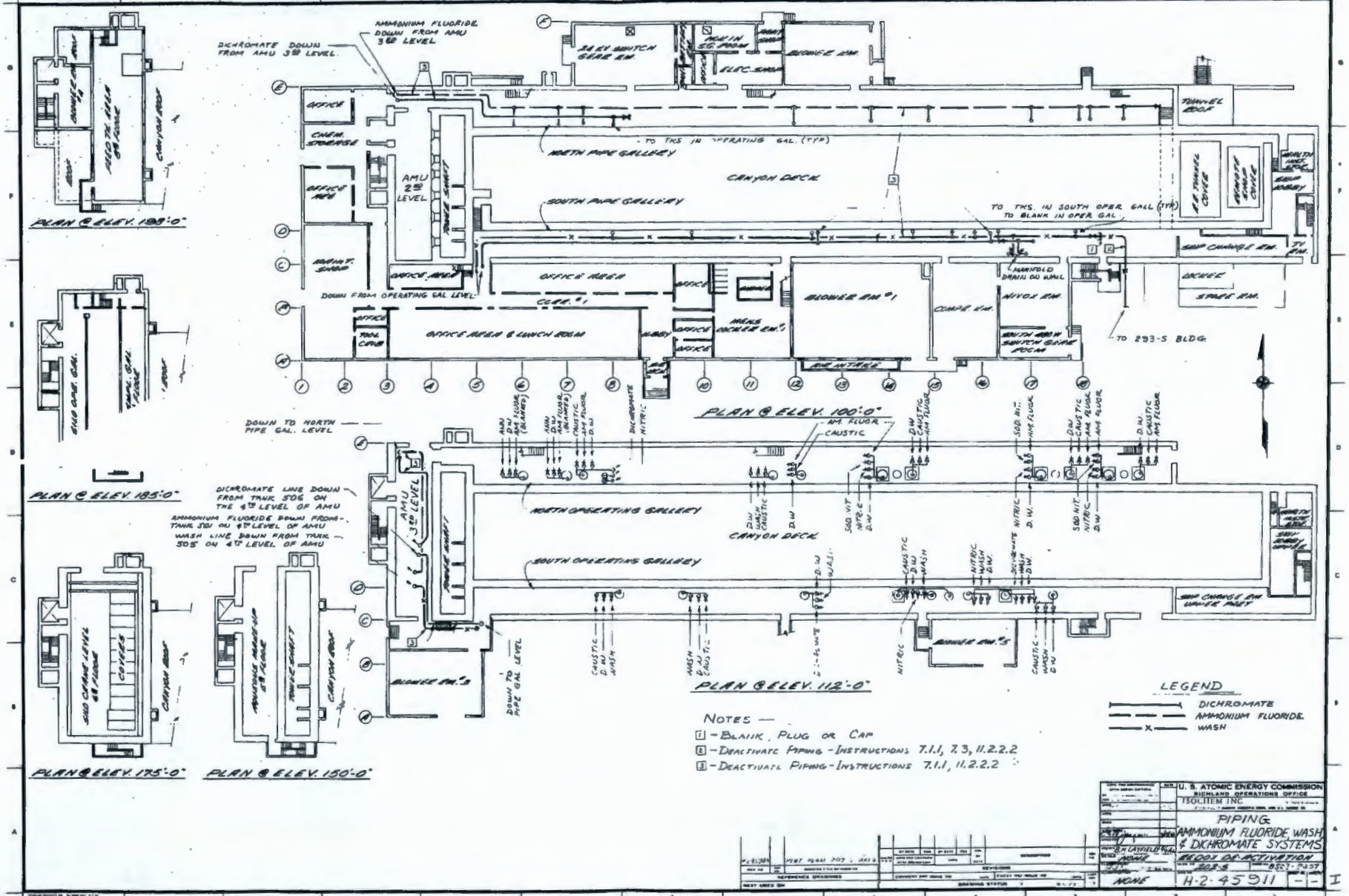


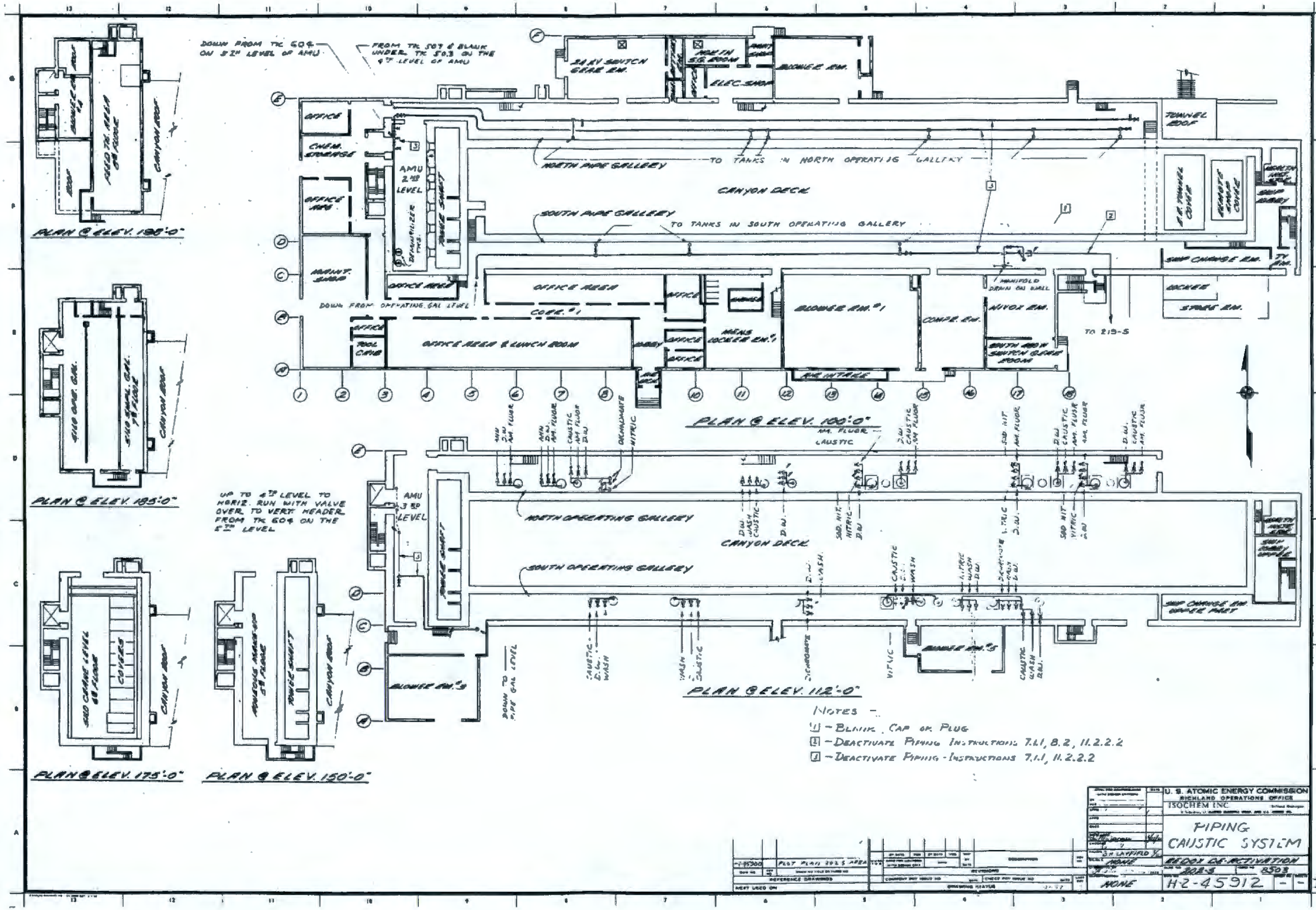
U. S. ATOMIC ENERGY COMMISSION
RICHLAND OPERATIONS OFFICE
ISOCHEM INC

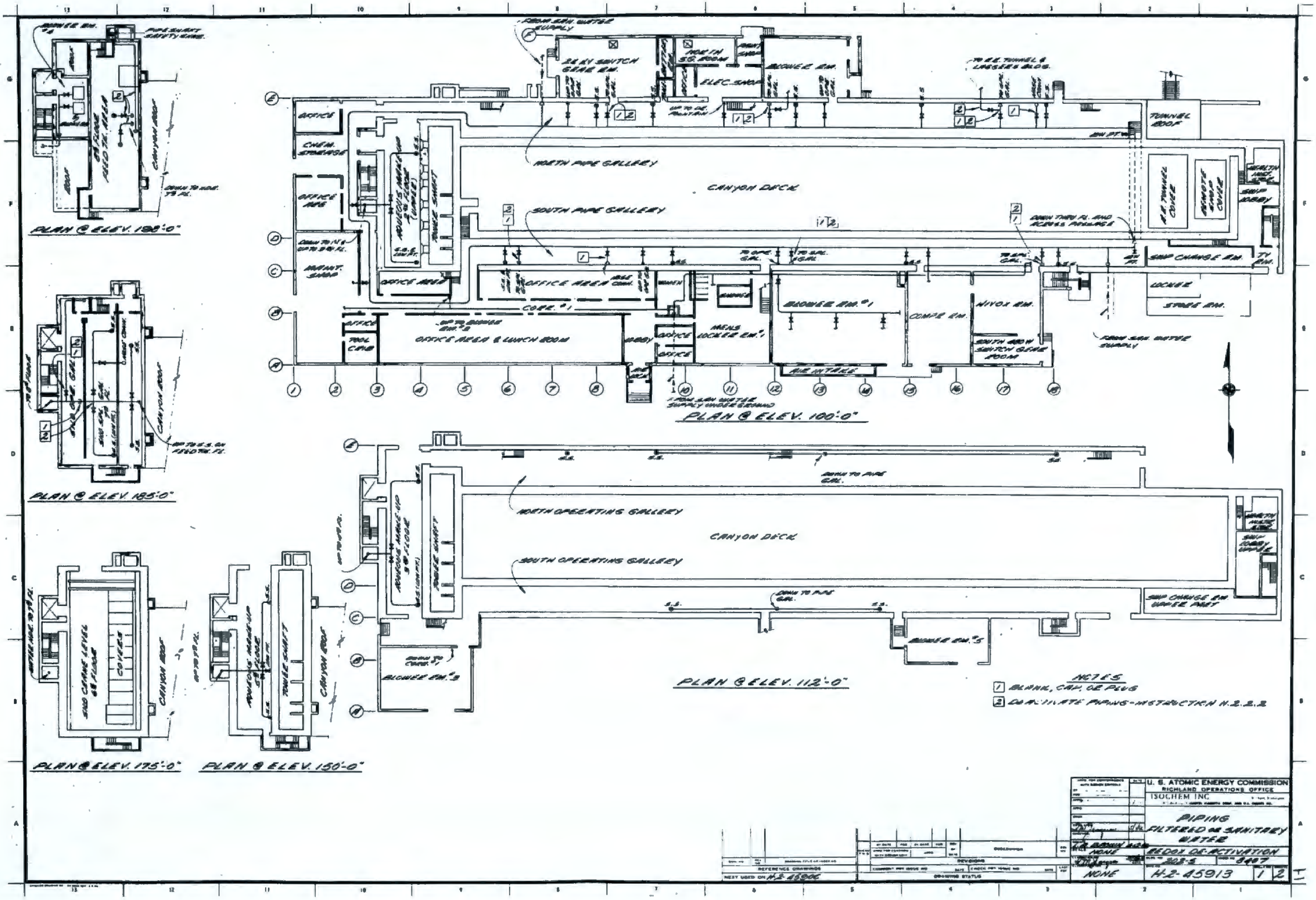
PIPING
SODIUM NITRATE, ANN & NITRIC ACID SYSTEMS
REPORT OF ACTIVATION

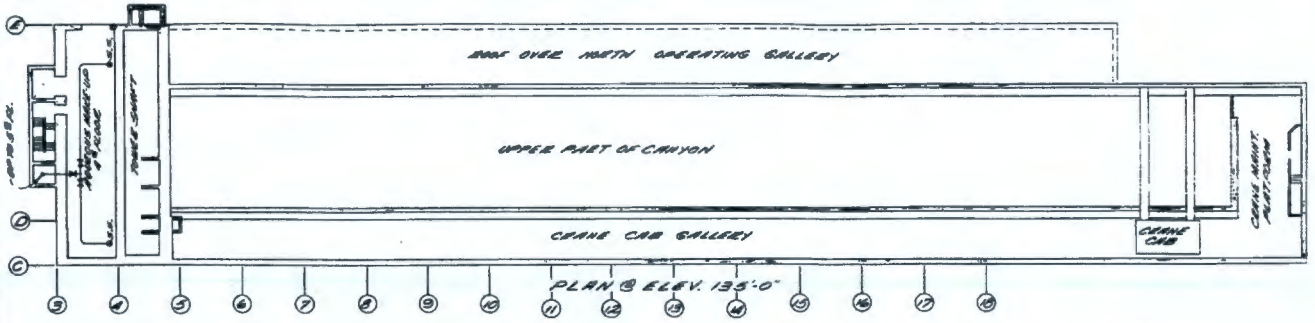
NONE

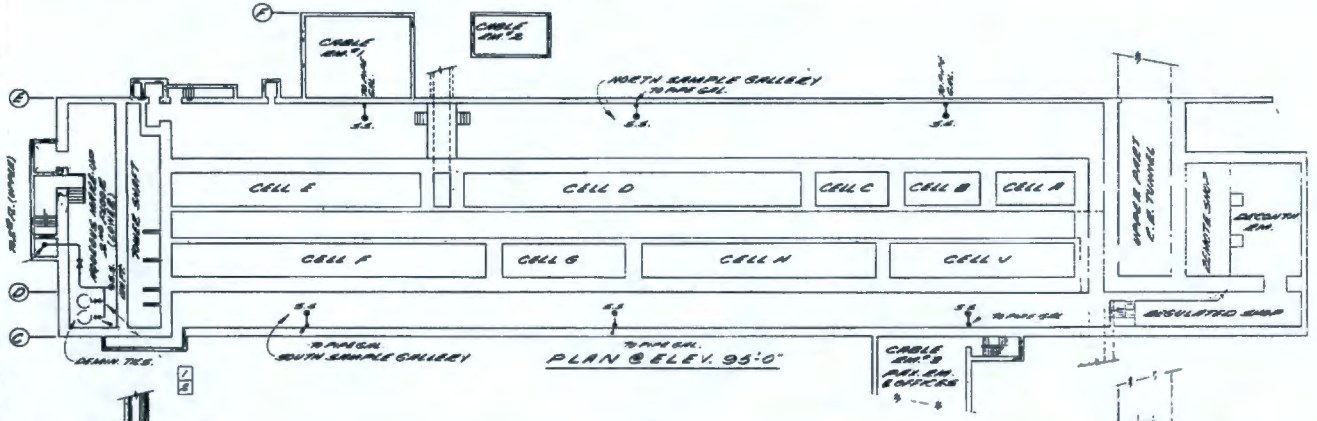
H-2-45910

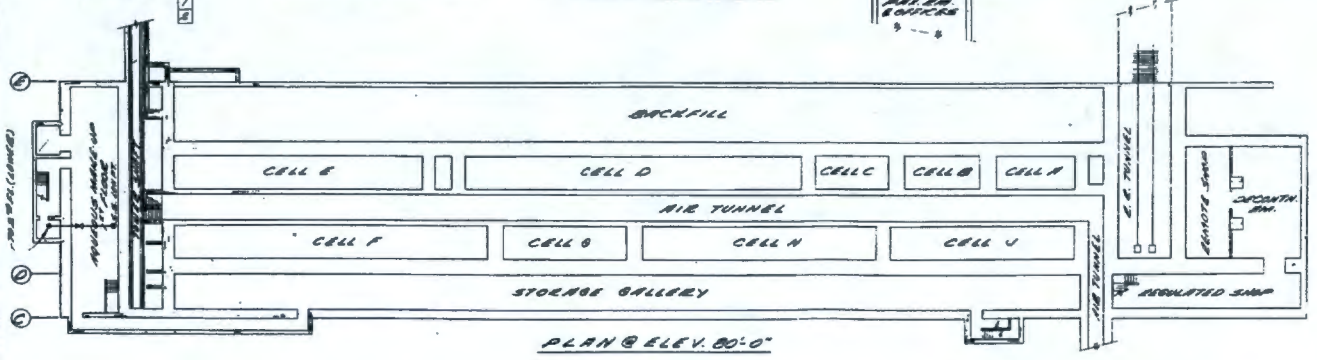

PLAN @ ELEV. 185'-0"
PLAN @ ELEV. 175'-0"
PLAN @ ELEV. 150'-0"
PLAN @ ELEV. 100'-0"
PLAN @ ELEV. 112'-0"
DICHROMATE DOWN FROM AMU 3RD LEVEL
AMMONIUM FLUORIDE DOWN FROM AMU 3RD LEVEL
TO TKS IN OPERATING GAL. (TYP)
TO TKS. IN SOUTH OPER GALL (TYP)
TO BLANK IN OPER GAL
NORTH PIPE GALLERY
CANYON DECK
SOUTH PIPE GALLERY
DOWN FROM OPERATING GAL LEVEL
MANIFOLD DRAIN ON WALL
TO 293-S BLDG.
DOWN TO NORTH PIPE GAL. LEVEL
DICHROMATE LINE DOWN FROM TANK 306 ON THE 4TH LEVEL OF AMU
AMMONIUM FLUORIDE DOWN FROM TANK 301 ON 4TH LEVEL OF AMU
WASH LINE DOWN FROM TANK 305 ON 4TH LEVEL OF AMU
NORTH OPERATING GALLERY
SOUTH OPERATING GALLERY
CANYON DECK
DOWN TO PIPE GAL LEVEL
LEGEND
DICHROMATE
AMMONIUM FLUORIDE
WASH
NOTES —
1 - BLANK, PLUG OR CAP
2 - DEACTIVATE PIPING - INSTRUCTIONS 7.1.1, 7.3, 11.2.2.2
3 - DEACTIVATE PIPING - INSTRUCTIONS 7.1.1, 11.2.2.2
U. S. ATOMIC ENERGY COMMISSION
RICHLAND OPERATIONS OFFICE
TSOLITEM INC.
PIPING
AMMONIUM FLUORIDE, WASH & DICHROMATE SYSTEMS
REQUEST OF ACTIVATION
NONE
H-2-45911


PLAN @ ELEV. 198'-0"
PLAN @ ELEV. 185'-0"
PLAN @ ELEV. 175'-0"
PLAN @ ELEV. 150'-0"
PLAN @ ELEV. 100'-0"
PLAN @ ELEV. 112'-0"
NORTH PIPE GALLERY
TO TANKS IN NORTH OPERATING GALLERY
CANYON DECK
SOUTH PIPE GALLERY
TO TANKS IN SOUTH OPERATING GALLERY
NORTH OPERATING GALLERY
SOUTH OPERATING GALLERY
AMU 2ND LEVEL
AMU 3RD LEVEL
TO 219-S
DOWN FROM TK 604 ON 5TH LEVEL OF AMU
FROM TK 507 & BLANK UNDER TK 503 ON THE 4TH LEVEL OF AMU
UP TO 4TH LEVEL TO HORIZ. RUN WITH VALVE OVER TO VERT. HEADER FROM TK 604 ON THE 5TH LEVEL
DOWN FROM OPERATING GAL LEVEL
DOWN TO PIPE GAL LEVEL
OFFICE AREA & LUNCH ROOM
BLOWER RM. #1
COMPR. RM.
NIVOX RM.
AIR INTAKE
MANIFOLD DOWN ON WALL
Notes -
1 - Blank, Cap or Plug
2 - Deactivate Piping Instructions 7.1.1, 8.2, 11.2.2.2
3 - Deactivate Piping - Instructions 7.1.1, 11.2.2.2
U. S. ATOMIC ENERGY COMMISSION
RICHLAND OPERATIONS OFFICE
ISOCHEM INC.
PIPING
CAUSTIC SYSTEM
REDOX DE-ACTIVATION
202-S
8503
H-2-45912
SCALE NONE


PLAN @ ELEV. 198'-0"
PLAN @ ELEV. 185'-0"
PLAN @ ELEV. 175'-0"
PLAN @ ELEV. 150'-0"
PLAN @ ELEV. 100'-0"
PLAN @ ELEV. 112'-0"
NORTH PIPE GALLERY
SOUTH PIPE GALLERY
CANYON DECK
NORTH OPERATING GALLERY
SOUTH OPERATING GALLERY
OFFICE
CHEM. STORAGE
OFFICE AREA
MAINT. SHOP
OFFICE AREA & LUNCH ROOM
TOOL CRIB
MENS LOCKER RM.
BLOWER RM. #1
COMPR. RM.
NIVOX RM.
SOUTH AREA SWITCH GEAR ROOM
AIR INTAKE
SWP CHANGE RM.
LOCKER
STORE RM.
TUNNEL ROOF
NORTH SG. ROOM
ELEC. SHOP
BLOWER RM.
CORR. #1
TOWER SHAFT
CANYON ROOF
BLOWER RM. #3
BLOWER RM. #5
NOTES
1 BLANK, CAP, OR PLUG
2 DEACTIVATE PIPING-INSTRUCTION H.2.2.2
U. S. ATOMIC ENERGY COMMISSION
RICHLAND OPERATIONS OFFICE
ISOCHEM INC
PIPING
FILTERED OR SANITARY WATER
REDOX DEACTIVATION
202-S
8407
NONE
H-2-45913
1
2
REFERENCE DRAWINGS
NEXT USED ON H-2-45906
REVISIONS
DRAWING STATUS





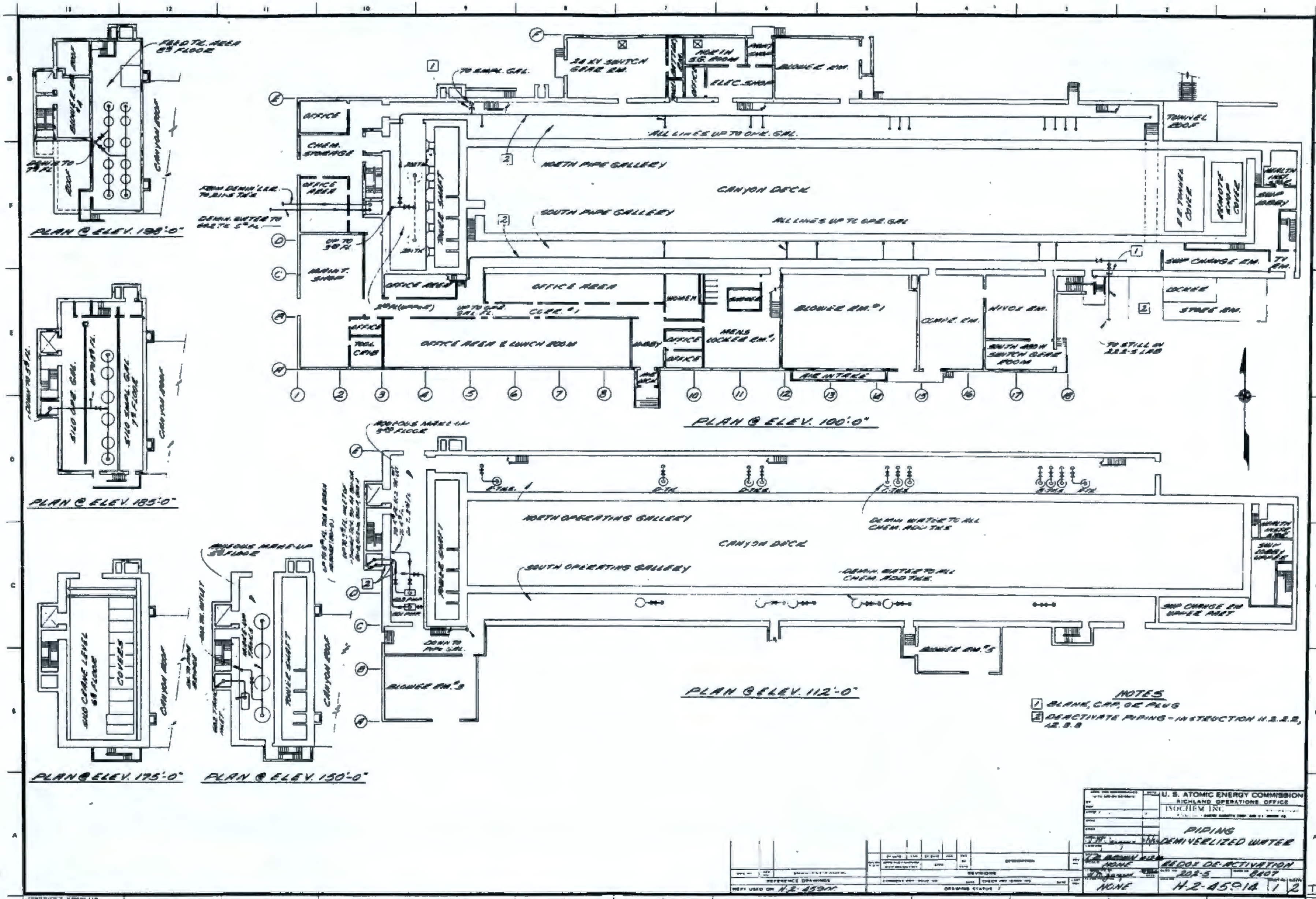


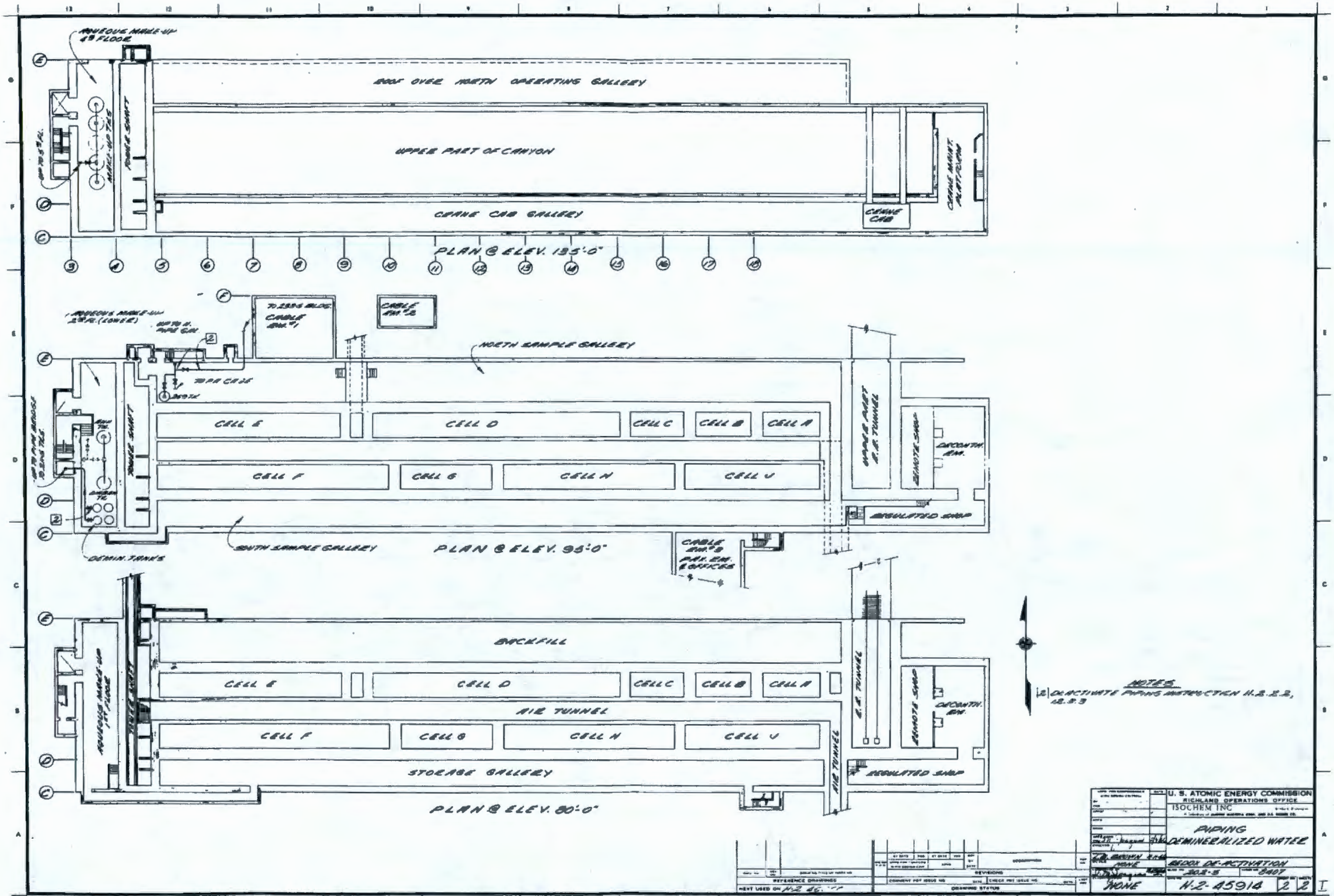
NOTES

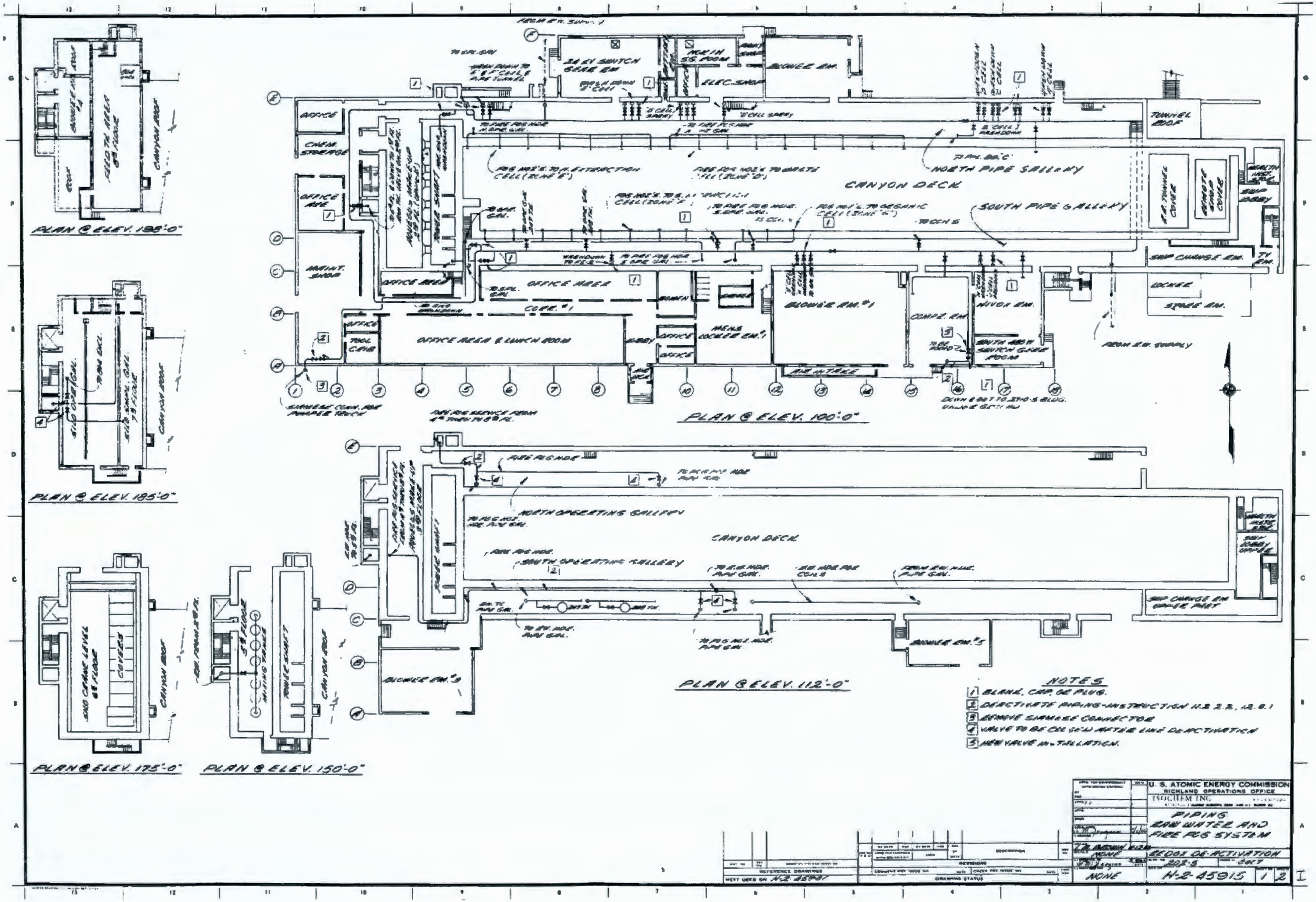
1. BLANK, CAP OR PLUG
2. DEACTIVATE PIPING - INSTRUCTION 11.2.2.2, 12.2.2, 7.1.1

U. S. ATOMIC ENERGY COMMISSION	
RICHLAND OPERATIONS OFFICE	
TSOCHEM INC.	
PIPING FILTERED OR SANITARY WATER	
BUILDING DE-ACTIVATION	
202-S	0907
H-2-45913	2 2

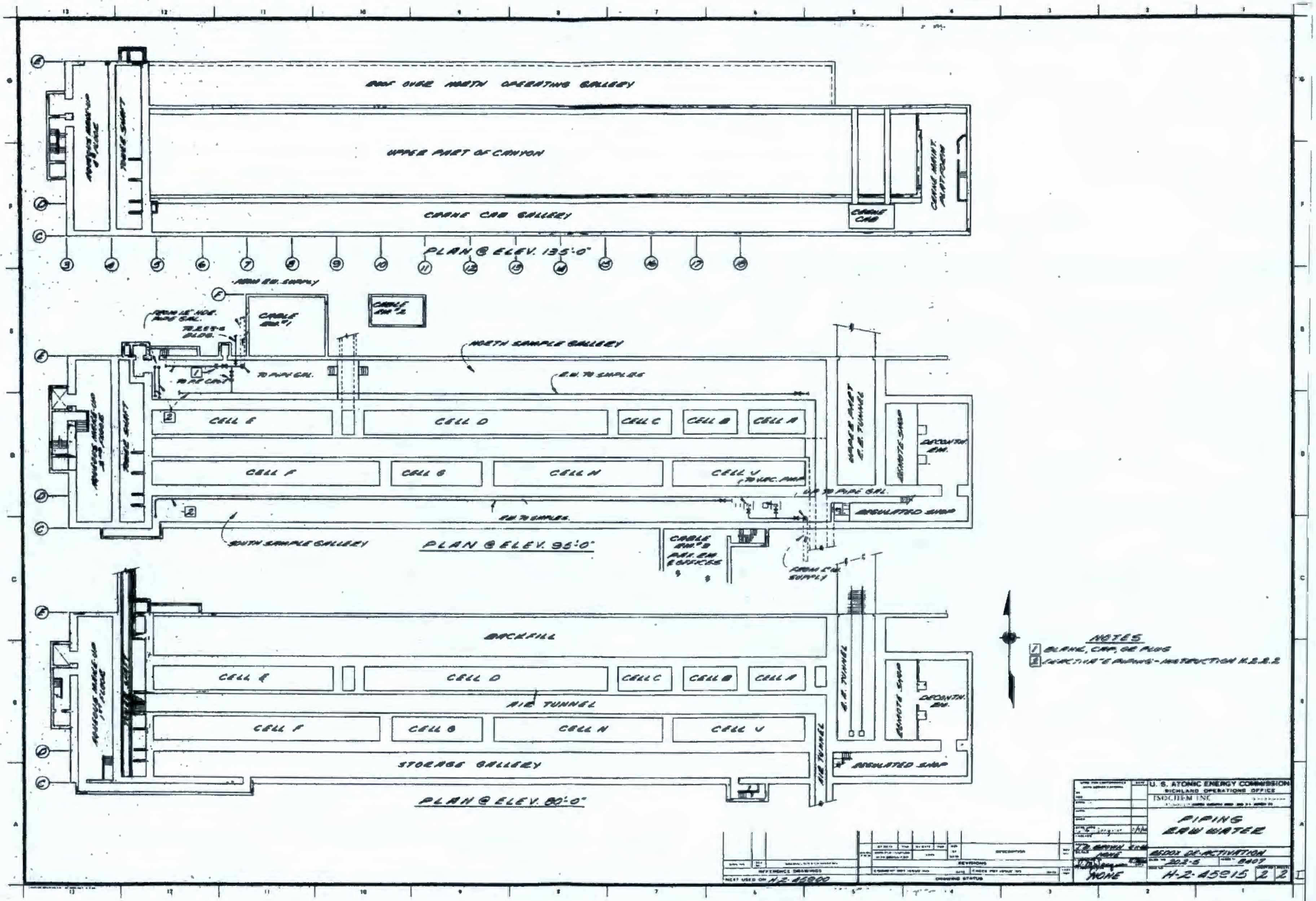
REFERENCE DRAWINGS
NEXT USED ON H-2-45900

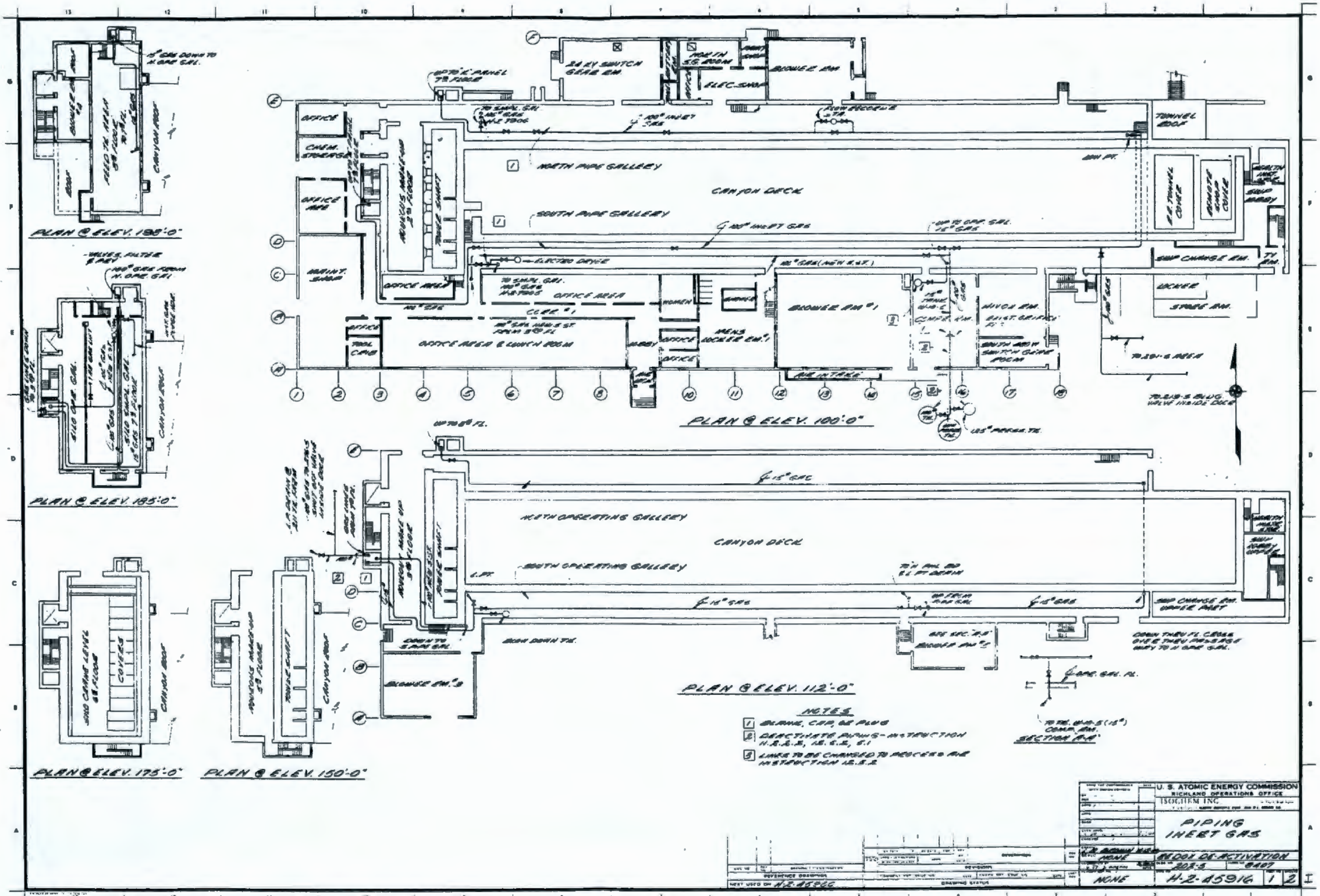

PLAN @ ELEV. 198'-0"
PLAN @ ELEV. 185'-0"
PLAN @ ELEV. 175'-0"
PLAN @ ELEV. 150'-0"
PLAN @ ELEV. 100'-0"
PLAN @ ELEV. 112'-0"
24 KV SWITCH GEAR RM.
ELEC. SHOP
BLOWER RM.
OFFICE
CHEM. STORAGE
OFFICE AREA
MAINT. SHOP
TOOL CRIB
OFFICE AREA & LUNCH ROOM
WOMEN
MENS LOCKER RM.
BLOWER RM. #1
COMPR. RM.
SOUTH REDOX SWITCH GEAR ROOM
AIR INTAKE
ALL LINES UP TO OPR. GAL.
NORTH PIPE GALLERY
CANYON DECK
SOUTH PIPE GALLERY
TOWER SHAFT
TUNNEL ROOF
REMOTE SHOP COVER
SHOP CHANGE RM.
TO STILL IN 222-S LAB
NORTH OPERATING GALLERY
SOUTH OPERATING GALLERY
DEMIN. WATER TO ALL CHEM. ADD TKS.
BLOWER RM. #5
BLOWER RM. #3
SILO CRANE LEVEL 6th FLOOR
COVERS
CANYON ROOF
NOTES
1 BLANK, CAP, OR PLUG
2 DEACTIVATE PIPING - INSTRUCTION 4.2.2.2, 12.3.8
U. S. ATOMIC ENERGY COMMISSION
RICHLAND OPERATIONS OFFICE
ISOCHEM INC.
PIPING
DEMINERALIZED WATER
REDOX DE-ACTIVATION
202-S
8407
NONE
H-2-45914
1
2
NEXT USED ON H-2-45900
REFERENCE DRAWINGS
REVISIONS
DRAWING STATUS

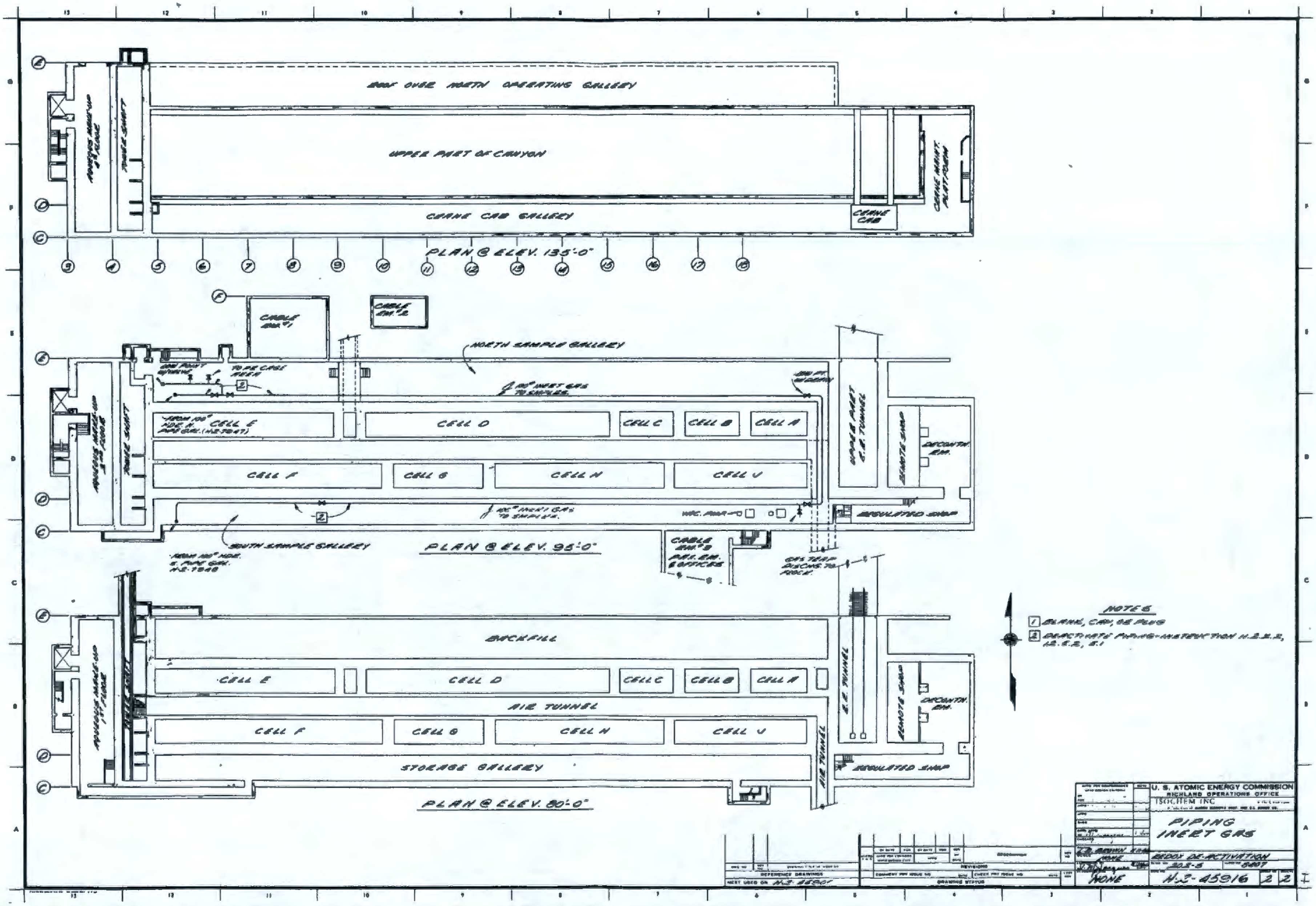

ROOF OVER NORTH OPERATING GALLERY
UPPER PART OF CANYON
CRANE CAB GALLERY
CRANE CAB
PLAN @ ELEV. 135'-0"
NORTH SAMPLE GALLERY
CELL E
CELL D
CELL C
CELL B
CELL A
CELL F
CELL G
CELL H
CELL J
REGULATED SHOP
SOUTH SAMPLE GALLERY
PLAN @ ELEV. 95'-0"
DEMIN. TANKS
BACKFILL
AIR TUNNEL
STORAGE GALLERY
PLAN @ ELEV. 80'-0"
NOTES
2 DEACTIVATE PIPING INSTRUCTION II.2.2.2, II.2.3
U. S. ATOMIC ENERGY COMMISSION
RICHLAND OPERATIONS OFFICE
ISOCHEM INC
PIPING
DEMINERALIZED WATER
REDOX DE-ACTIVATION
202-S
NONE
H-2-45914
2
2



PLAN @ ELEV. 100'-0"
PLAN @ ELEV. 112'-0"
PLAN @ ELEV. 150'-0"
PLAN @ ELEV. 175'-0"
PLAN @ ELEV. 185'-0"
PLAN @ ELEV. 198'-0"
CANYON DECK
NORTH PIPE GALLERY
SOUTH PIPE GALLERY
NORTH OPERATING GALLERY
SOUTH OPERATING GALLERY
OFFICE AREA & LUNCH ROOM
MAINT. SHOP
CHEM. STORAGE
BLOWER RM. #1
TUNNEL ROOF
NOTES
1 BLANK, CAP, OR PLUG.
2 DEACTIVATE PIPING-INSTRUCTION 11.2 2.2, 12.0.1
3 REMOVE SIAMESE CONNECTOR
4 VALVE TO BE CLOSED AFTER LINE DEACTIVATION
5 NEW VALVE INSTALLATION.
U. S. ATOMIC ENERGY COMMISSION
RICHLAND OPERATIONS OFFICE
ISOCHEM INC.
PIPING
RAW WATER AND
FIRE FOG SYSTEM
REDOX DE-ACTIVATION
202-S
NONE
H-2-45915
1
2
DRAWING STATUS
REVISIONS
REFERENCE DRAWINGS


ROOF OVER NORTH OPERATING GALLERY
UPPER PART OF CANYON
CRANE CAB GALLERY
CRANE CAB
PLAN @ ELEV. 135'-0"
CABLE RM. #1
CABLE RM. #2
NORTH SAMPLE GALLERY
TO PIPE GAL.
R.W. TO SAMPLES
CELL E
CELL D
CELL C
CELL B
CELL A
CELL F
CELL G
CELL H
CELL J
UPPER PART E.E. TUNNEL
REMOTE SHOP
DECONTN. RM.
UP TO PIPE GAL.
REGULATED SHOP
R.W. TO SAMPLES.
SOUTH SAMPLE GALLERY
PLAN @ ELEV. 95'-0"
FROM R.W. SUPPLY
BACKFILL
AIR TUNNEL
E.E. TUNNEL
STORAGE GALLERY
PLAN @ ELEV. 80'-0"
NOTES
1 BLANK, CAP, OR PLUG
U. S. ATOMIC ENERGY COMMISSION
RICHLAND OPERATIONS OFFICE
ISOCHEM INC
PIPING
RAW WATER
REDOX DE-ACTIVATION
202-S
8407
NONE
H-2-45815
2
2
H-2-45800


PLAN @ ELEV. 198'-0"
PLAN @ ELEV. 185'-0"
PLAN @ ELEV. 175'-0"
PLAN @ ELEV. 150'-0"
PLAN @ ELEV. 100'-0"
PLAN @ ELEV. 112'-0"
NORTH PIPE GALLERY
SOUTH PIPE GALLERY
CANYON DECK
NORTH OPERATING GALLERY
SOUTH OPERATING GALLERY
24 KV SWITCH GEAR RM.
BLOWER RM.
OFFICE
CHEM. STORAGE
OFFICE AREA
MAINT. SHOP
BLOWER RM. #1
MENS LOCKER RM. #1
OFFICE AREA & LUNCH ROOM
TUNNEL ROOF
SUMP CHANGE RM.
LOCKER
STORE RM.
AIR INTAKE
NOTES
1 BLANK, CAP, OR PLUG
2 DEACTIVATE PIPING - INSTRUCTION
3 LINES TO BE CHANGED TO PROCESS AIR
SECTION A-A
U. S. ATOMIC ENERGY COMMISSION
RICHLAND OPERATIONS OFFICE
ISOCHEM INC.
PIPING
INERT GAS
REDOX DE-ACTIVATION
202-S
8407
NONE
H-2-45916
1
2


ROOF OVER NORTH OPERATING GALLERY
UPPER PART OF CANYON
CRANE CAB GALLERY
CRANE CAB
PLAN @ ELEV. 135'-0"
CABLE RM. #1
CABLE RM. #2
NORTH SAMPLE GALLERY
CELL E
CELL D
CELL C
CELL B
CELL A
CELL F
CELL G
CELL H
CELL J
SOUTH SAMPLE GALLERY
REGULATED SHOP
PLAN @ ELEV. 95'-0"
BACKFILL
AIR TUNNEL
STORAGE GALLERY
PLAN @ ELEV. 80'-0"
NOTES
1 BLANK, CAP, OR PLUG
U. S. ATOMIC ENERGY COMMISSION
RICHLAND OPERATIONS OFFICE
ISOCHEM INC
PIPING
INERT GAS
REDOX DE-ACTIVATION
202-S
NONE
H-2-45916
2
2

19. STAND-BY

19.1 Stand-by Force

19.2 Maintenance

19.3 Operations

19.4 Surveillance

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 19.1	
	REVISION 2	PAGE 1 OF 1
SUBJECT: STAND-BY FORCE	LOCATION 202-S	
APPROVED BY: J. R. Cartmell	DATE June 8, 1967	

19.1 STAND-BY FORCE

INTRODUCTION: The Redox Plant will be maintained in a stand-by condition with a skeleton crew not to exceed the 13 employees included in the revised FY 1968 budget. The surveillance force will be adjusted as appropriate after a steady state condition has been verified.

SCHEDULE: The stand-by force will be established by July 1, 1967.

INSTRUCTION:

1. A seasoned Redox Supervisor will be assigned to direct stand-by activities.

2. Shift coverage will consist of a Power Operator and a Chemical Process Operator assigned to each of the A, B, C, and D shifts.

3. The day crew is to include one Process Crane Operator, one Power Operator, and two Chemical Process Operators.

4. Janitorial service is to be purchased.

5. Maintenance service is to be provided by Waste Management.

6. Radiation Monitoring service is to be provided by Technical Services.

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 19.2 REVISION 1 / PAGE 1 OF 4
SUBJECT: MAINTENANCE	LOCATION 202-S
APPROVED BY: J. R. Cartmell	DATE June 8, 1967

19.2 MAINTENANCE

INTRODUCTION: The Waste Management Section will provide the craft services as required to maintain the Redox Plant in stand-by, according to the established stand-by maintenance programs, and to effect needed repairs to maintain the facility in a safe condition. The Supervisor of the Redox Plant stand-by force will coordinate activities as necessary.

SCHEDULE:

The stand-by maintenance program is to be in effect beginning July 1, 1967.

INSTRUCTION:

1. Property will be controlled according to the Deactivation Property Management Program 4.15.

2. Spare canyon rotary equipment is to be maintained to assure stand-by operations. This is to be accomplished primarily by the repair of failed units by the T-Plant equipment reclamation operation coupled with the use of spare equipment and parts from the terminal inventory. Modifications of spare equipment are to be made as required to adapt available spares for replacement of failed units.

3. Action regarding failure of canyon vessels is to be decided on an individual basis.

4. The 293-S and 276-S facilities are to be inspected for evidence of deterioration once each quarter and appropriate action is to be initiated.

5. The Redox preventive maintenance program is to be modified and continued for active services and equipment. Preventive maintenance cards for deactivated systems and equipment are to be labeled and left in place in the kardex system.

6. Assure that all F series work orders for the Redox Plant have been canceled. Purchase services on an individual work order basis until it is determined that an F order is justified.

19.2 MAINTENANCE (Continued)

7. The Redox 291 process ventilation exhaust stack and the sanitary water high tank are to be inspected periodically as scheduled by Facility Engineering.

8. The cathodic protection system is to be maintained.

9. Portable tool and equipment inspections shall continue to be inspected according to CPD Accident Prevention Standard No. 4.

10. The 60 ton canyon and the Silo cranes will remain in service and the established preventive maintenance inspection program will continue for the equipment.

11. Inspect and repair as necessary all outside steam tracer lines and traps each September.

12. Install a new CWS filter on the 60 ton crane each June and December.

13. Change the "dust-stopper" fiber glass filter on the 60 ton crane the last Friday of each month.

14. Test the 233-S fire alarm system in April and September.

15. Perform a ventilation balance of the 233-S and 202-S Buildings once each month.

16. Make console operability test each time the 10 ton silo crane is operated.

17. Perform an alarm test by addition of water to the 205-S and 204-S sumps on a monthly basis.

18. Perform a sand filter air flow measurement and clean and calibrate the sand filter D/P instrumentation.

19. Flush the 291-S stack quarterly in September, December, March and June.

20. Inspect the UNH export line for leaks and operation of the electric heating cables on a monthly basis.

21. Check performance of limit switches on the 60 ton crane hooks and wrenches prior to scheduled canyon cell inspection.

19.2 MAINTENANCE (Continued)

22. Facility Engineering is to continue all 222-S Building and the following Third Party Inspections:

Equipment	PC. No.	Location
Hot Water Tank (Steam)	W-1-S	202-S (#3 Blower Room)
Service Air Aftercooler	W-2-S	202-S (Comp. Room) (Aftercooler)
Instrument Air Receiver	W-3-S	202-S
Service Air Separator	W-4-S	202-S Aftercooler
Service Air Receiver	W-5-S	202-S
Process Air Tank Filter	W-6-S	202-S
Process Air Tank Filter	W-7-S	202-S
Instrument Air Dryer	W-8-S	202-S
Instrument Air Dryer	W-9-S	202-S
Instrument Air Filter	W-12-S	202-S (Comp. Room)
Instrument Air Filter	W-13-S	202-S (Comp. Room)
Propane Storage Tank	W-34-S	2726 (Field)
Propane Storage Tank	W-35-S	2726 (Field)
Freight Elevatory (Montgomery)		202-S

23. Facility Engineering is to cancel Third Party Inspections on the following equipment:

Equipment	PC. No.	Location
Humidified Gas Receiver	W-10-S	202-S (Comp. Room)
Inert Gas Humidifier	W-11-S	202-S (Comp. Room)
Inert Gas Receiver (Hi-pressure)	W-16-S	202-S

19.2 MAINTENANCE (Continued)

Equipment	PC No.	Location
Inert Gas Receiver (Stand-by)	W-17-S	202-S
Fresh Air Tank #1 (Blower Room)	W-18-S	202-S
Inert Gas Filter	W-19-S	202-S (Comp. Room)
Inert Gas Filter	W-20-S	202-S (Comp. Room)
Ozonator Air Dryer	W-21-S	202-S (Comp. Room)
Ozonator Air Dryer	W-22-S	202-S (Comp. Room)
Oriad Inert Gas Dryer	W-23-S	(Comp. Room)
Oriad Inert Gas Dryer	W-24-S	(Comp. Room)
Inert Gas Filter	W-25-S	(North Pipe Gal.)
Inert Gas Filter	W-26-S	(South Pipe Gal.)
Hot Water Tank	W-27-S	233-S
Hot Water Tank	W-36-S	202-S (North Pipe Gal.)
Hot Water Tank	W-37-S	202-S (7th Level)
Ozone Receiver	W-38-S	202-S (#1 Blower Room)
Inert Gas Filter	W-45-S	202-S (Comp. Room)
Sample Elevatory (Electric)		202-S

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 19.3 REVISION 1 / PAGE 1 OF 5
SUBJECT: OPERATIONS	LOCATION Canyon and Silo
APPROVED BY: C B Foster C. B. Foster	DATE November 10, 1966

19.3 OPERATIONS

INTRODUCTION: In accordance with requirements outlined in Program 4.3, Stand-by Status - Canyon and Silo, periodic water transfers are scheduled to be routed through the cell vessels and the extraction batteries.

INSTRUCTION:

During alternate weeks of the stand-by period sanitary water transfer operations will be conducted on a batch basis through Silo and Canyon vessels to maintain steam jets, rotating equipment, piping and the vessels in a functional condition. A total of 40 hours, scheduled Monday through Friday of the day shift, should provide ample time to complete a full cycle through the entire process system to ultimate discard to the S-5-6 crib via D-2 vessels. Water volumes prescribed in detailed procedures are to be restricted to levels suitable for agitator operation and pump pickup for transfer or recirculation.

The following outline shows schematically the routine order, approximate water volumes, and transfer routes.

REDOX PLANT DEACTIVATION

INSTRUCTION

INSTRUCTION NO.	
19,3...	
REVISION: New	PAGE: 2 OF 5

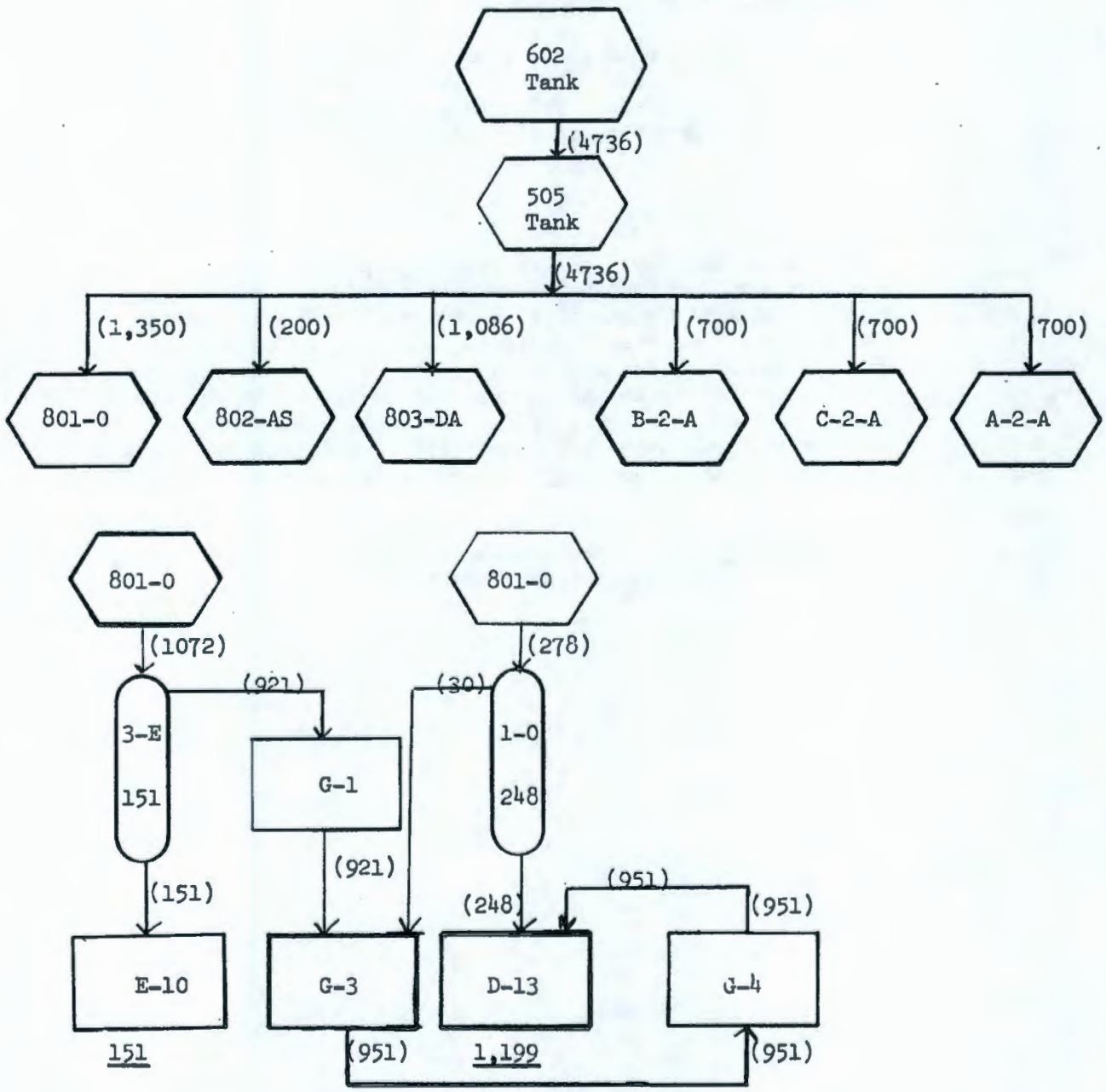
SUBJECT: STANDBY - WATER FLOW DIAGRAM

LOCATION: Canyon and Silo

APPROVED BY: C. B. Foster

DATE: November 10,1966

2,636 Gallons - First Draw
2,100 Gallons - Second Draw



REDOX PLANT DEACTIVATION

INSTRUCTION

INSTRUCTION NO. 19.3

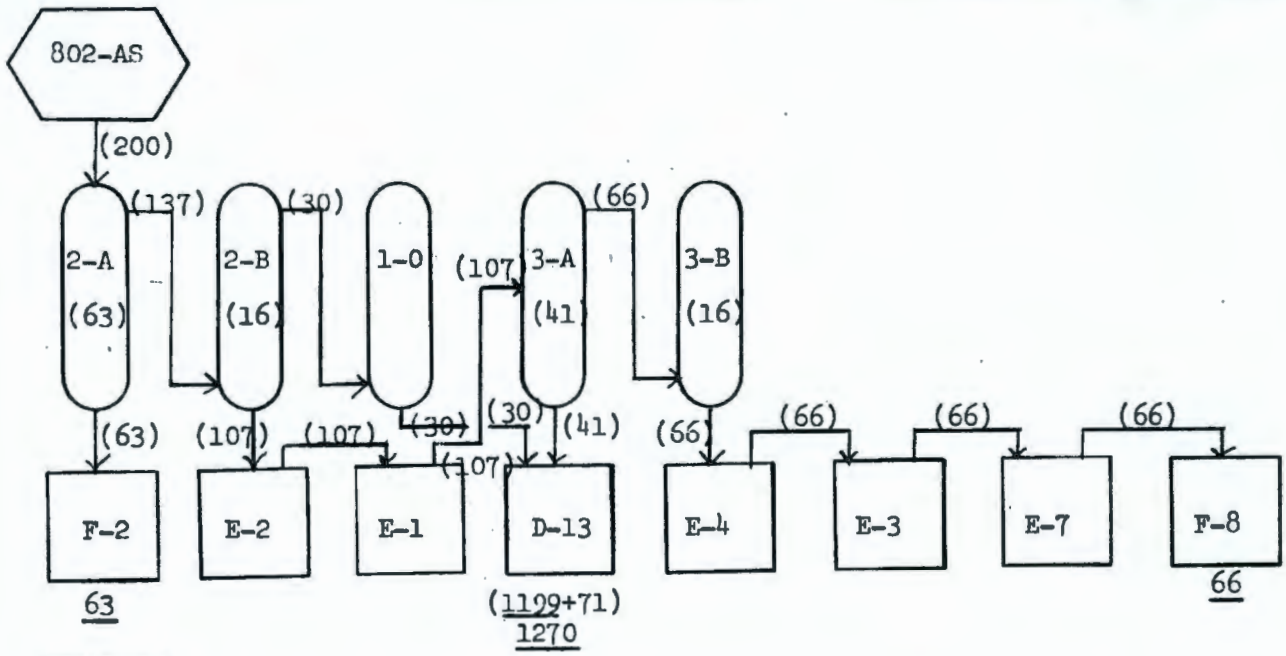
REVISION New

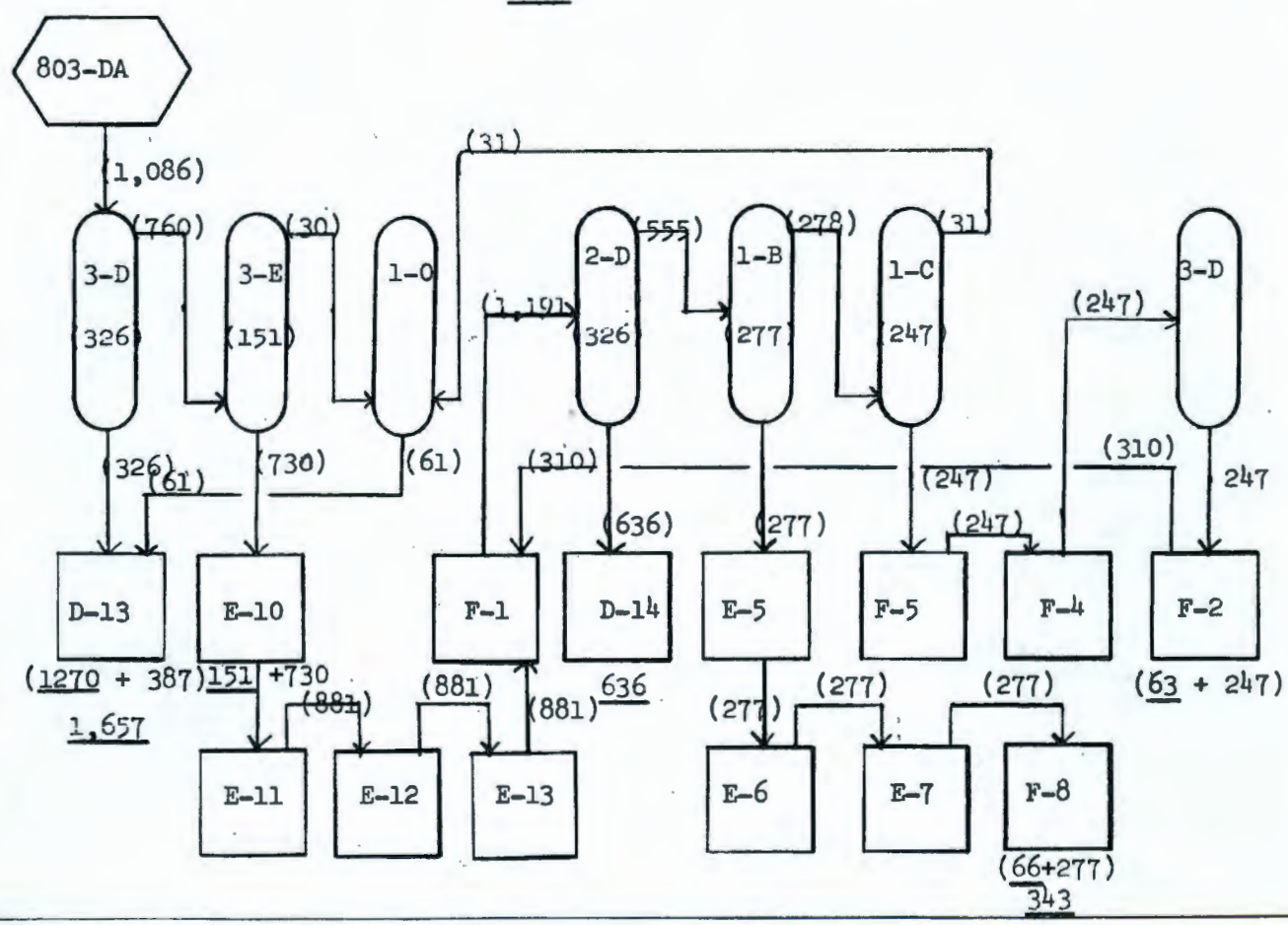
SUBJECT: STAND-BY WATER FLOW DIAGRAM

LOCATION Canyon and Silo

APPROVED BY: C B Foster C. B. Foster

DATE November 11, 1966





REDOX PLANT DEACTIVATION
INSTRUCTION

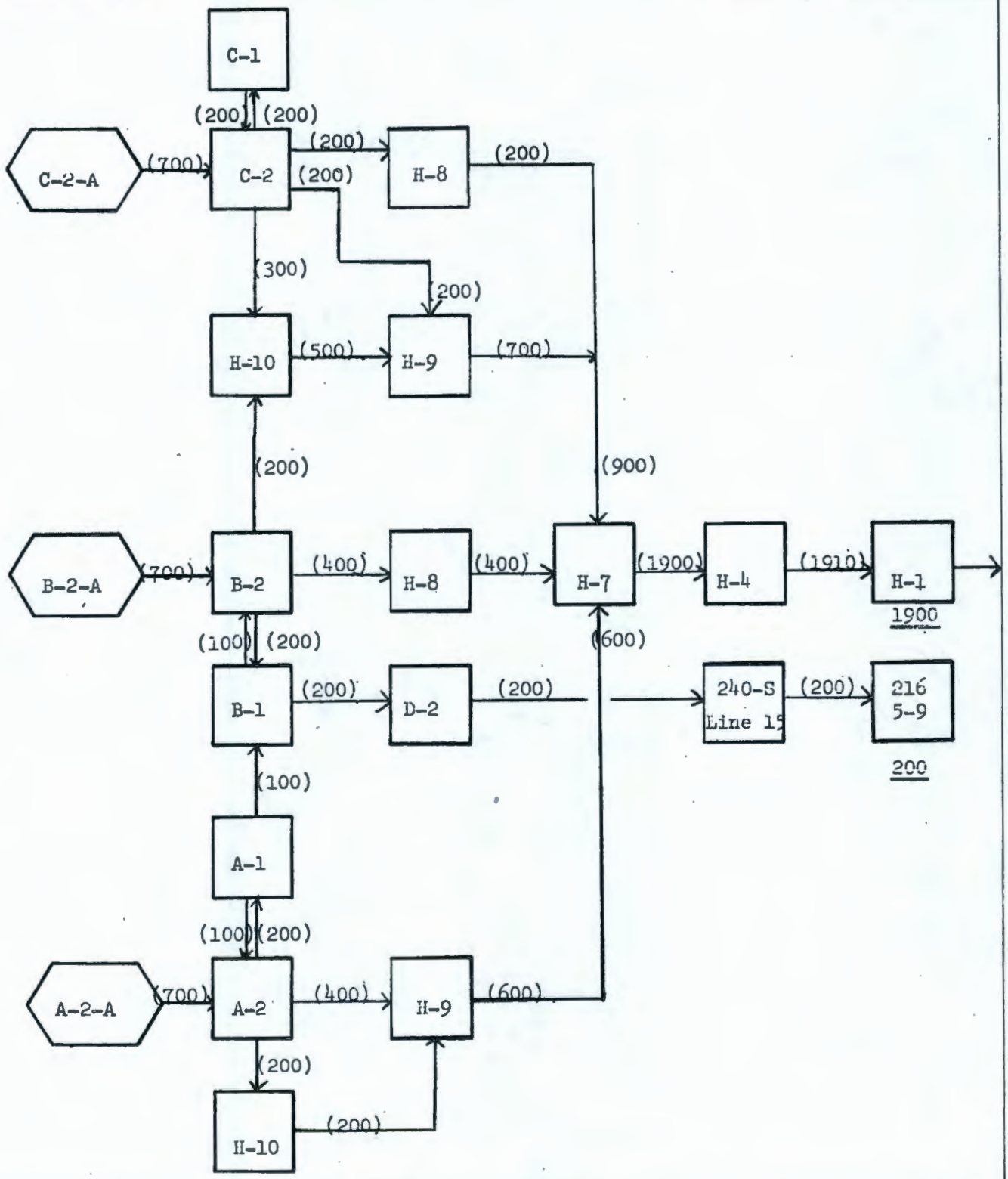
INSTRUCTION NO. 19.3.1
REVISION New
PAGE 4 OF 5

SUBJECT: STAND-BY WATER FLUSH DIAGRAM

LOCATION Canyon and Silo

APPROVED BY: CBFoster C. B. Foster

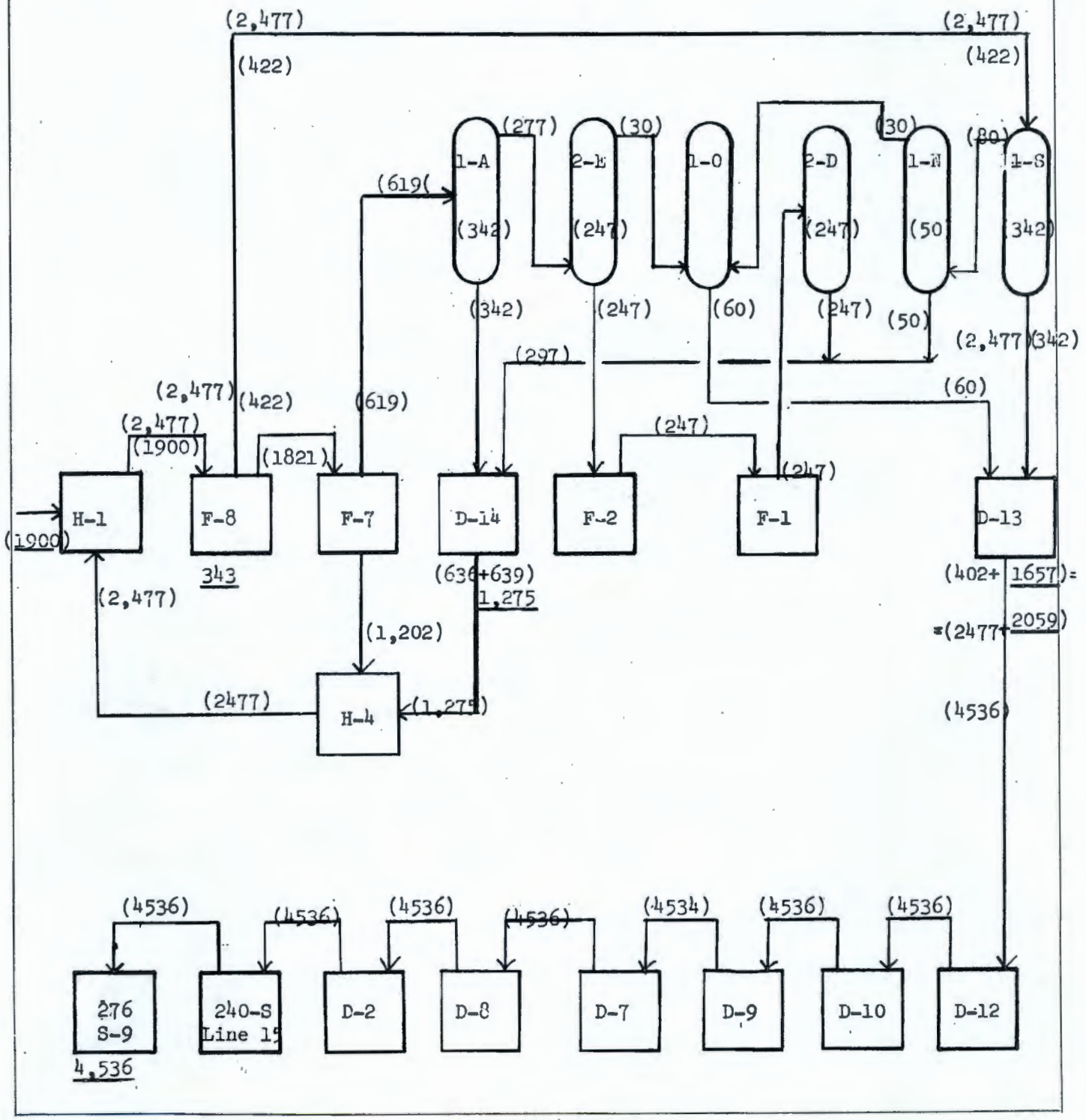
DATE November 11,1966



REDOX PLANT DEACTIVATION

INSTRUCTION

INSTRUCTION NO.	19,3...
REVISION	New
PAGE	5 OF 5
SUBJECT:	STAND-BY WATER FLUSH DIAGRAM
LOCATION	Canyon and Silo
APPROVED BY:	C. B. Foster
DATE	November 11, 1966



REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 19.4	
	REVISION New	PAGE 1 OF 4
SUBJECT: SURVEILLANCE	LOCATION General	
APPROVED BY: C. B. Foster	DATE June 1, 1966	

19.4 SURVEILLANCE

INTRODUCTION: Deactivation of Redox will establish conditions to preclude a preventable catastrophic event which would jeopardize the safety of personnel, the environs and future operability of the plant. Surveillance is required to assure that any unfavorable condition or trend is promptly recognized and evaluated so that appropriate action can be initiated. The degree of surveillance will be examined on a continuous basis and modified as steady state conditions are verified.

SCHEDULE: Detailed Procedures, forms and methods of communication are to be established and placed in effect on July 1, 1967.

INSTRUCTION:

1. Fire inspections are to be performed as required by Accident Prevention Standard No. 6.
2. The standard 291-S electric fan, steam turbine, and sand filter inspections are to be performed once a shift.
3. Canyon cells are to be opened and inspected for water accumulation once a week.
4. Shift inspection by operations is to include canyon sump manometer readings.
5. The UNH area is to be inspected daily on the 8-4 shift.
6. Outside grounds are to be inspected daily for:
   a) Underground pipe failure as evidenced by ground recess or cave-in and surface water.
   b) Flood conditions which might cause structural inundation or overflow into electrical manholes. Inspect french drain and road culverts.
   c) Accumulation of tumble weeds and other combustibles.
   d) Deterioration of fences, walkways, stairs and hand railings, roads, building roof flashing, stacks and ventilators, electrical cable and conductors, piping systems, posts, poles, signs and markers.
   e) Any condition which does not meet safety and security requirements.
7. Surveillance of the open pond - Redox swamp will be performed by the Waste Management Operation and Battelle Northwest.
8. Federal Support Services are to continue fire and security surveillance.

19.4 SURVEILLANCE (Continued)

SCHEDULE								RADIATION AUDITS
MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	WEEKLY	MONTHLY	QUARTERLY	INSTRUCTION: Radiation Monitoring audits are to be performed as scheduled. Revisions will be made as steady state conditions are verified.
X		X		X				9. The area will be audited for radiation, contamination and atmospheric releases by the following plan:
	X							a) Perform a G.M. instrument traverse survey of common traffic areas throughout operating and pipe galleries, service areas and SWP lobby. Smear survey if high background is measured.
			X					b) Change the air sampler filters of the 291-S stack, 233-SA stack, north and south pipe and operating galleries, office area, SWP lobby, silo operating gallery, canyon crane cab, old PR cage, and 233-S change room. Count removed filters for Alpha, B and G and record results.
			X					c) Smear survey the sample gallery floors and survey smears with a GM and a Poppy.
			X					d) Perform a CP instrument traverse survey of the pipe, operating and sample galleries.
					X			e) Survey selected 202-S sample gallery hoods with CP and Poppy instruments.
					X			f) Smear E section of operating and pipe galleries and monitor smears with a Poppy.
					X			g) Smear survey common traffic floor area of all service areas and monitor smears with GM and Poppy instruments.
					X			h) Smear survey lunch room tables and monitor with air counter.
					X			i) Spot survey tools and equipment in non-regulated shops by both smears and direct readings with GM and Poppy instruments.

19.4 SURVEILLANCE (Continued)

SCHEDULE								RADIATION AUDITS
MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	WEEKLY	MONTHLY	QUARTERLY	INSTRUCTION: Radiation Monitoring audits are to be performed as scheduled. Revisions will be made as steady state conditions are verified.
					X			j) Smear survey radiation standards source storage.
					X			k) Perform a GM traverse survey of all galleries - survey around piping and instrument lines. Smear as required.
					X			l) Perform Poppy survey of piping and instrument lines in E section of operating and pipe galleries.
					X			m) Perform a direct GM and a smear survey of the floor in the SWP lobby, change room and Regulated shop, monitor smears with GM and Poppy Instruments.
					X			n) Spot survey tools and equipment in the regulated tool room and shop by both smears and direct readings with GM and Poppy instruments.
					X			o) Smear survey the crane maintenance platform stairwell, crane maintenance platform, crane viewing room, crane cab airlock and floor and controls in the crane cab (60T). Monitor smears with GM and Poppy instruments.
					X			p) Perform a CP instrument dose rate traverse of the crane maintenance platform and 60T crane bridge.
					X			q) Measure dose rate 2 feet from each 60T crane hood and wrench with a CP instrument.
					X			r) Monitor AMU and Silo levels with smears and measure smears with GM and Poppy instruments.
					X			s) Perform a CP survey around all silo lights and windows of the column enclosure.
					X			t) Perform a GM instrument traverse in the silo operating gallery area. Smear survey if required.

REDOX PLANT DEACTIVATION
INSTRUCTION

INSTRUCTION NO.	
19.4	
REVISION: New	PAGE: 4 OF 4
LOCATION: General	
DATE: June 1, 1966	

SUBJECT: SURVEILLANCE

APPROVED BY: C. B. Foster

19.4 SURVEILLANCE (Continued)

SCHEDULE								RADIATION AUDITS
MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	WEEKLY	MONTHLY	QUARTERLY	INSTRUCTION: Radiation Monitoring audits are to be performed as scheduled. Revisions will be made as steady state conditions are verified.
						X		u) Perform CP dose rate survey at the door and top of the 804 tank enclosure; and the silo sample gallery.
							X	v) Perform a GM meter survey of all outside hard surface walkways and boundaries of regulated zones.
							X	w) Perform a T PC probe of the NE, NW, SW, and SE quadrants of the 291-S sand filter.

ISO-1108

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 20.0	
	REVISION New	PAGE 1 OF 4
SUBJECT: COMPLETION REPORT	LOCATION General	
APPROVED BY: C. B. Foster	DATE June 1, 1966	

20.0 COMPLETION REPORT

INTRODUCTION: A Report is to be prepared when work required by a designated Instruction and any associated Detail Procedure is completed.

The Report is to be a brief summary of the work performed, significant results, observations regarding terminal conditions and specific deficiencies that would require action for reactivation of the plant.

The Manager of Redox Deactivation will assure the Reports are properly processed and distributed for insertion in Section 20.0 of the Manuals.

INSTRUCTION:

Completion Reports will be prepared for the following Instructions:

INSTRUCTION NO.	SUBJECT
5.1.1	Vessels and Piping
5.1.2	Pipe Trench
5.1.3	Wind Tunnel
5.1.4	Silo and Cells
5.2.1	Vessels and Piping
5.2.2	Column Carrier
5.2.3	Canyon Deck
5.2.4	Cells and Equipment
6.1.2	Greenhouse
6.1.3	Loadout Hood
6.2.1	Vessels and Piping - Process
6.2.2	Greenhouse
6.2.3	Loadout Hood
6.2.4	Loadout Room
6.2.5	Can Storage Room
6.2.6	Viewing Room
6.2.7	Viewing Room Stairwells
6.2.8	Viewing Room Airlocks
6.2.9	Pipe Gallery
6.3	Heat and Ventilation
6.4	Utilities

ISO-1108

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 20.0	
	REVISION New	PAGE 2 OF 4
SUBJECT: COMPLETION REPORT	LOCATION General	
APPROVED BY: C. B. Foster	DATE June 1, 1966	

20.0 COMPLETION REPORT (Continued)

INSTRUCTION NO.	SUBJECT
6.5	Equipment
6.6	Operating Gallery
6.7	Change Room
6.8	Storage Building
7.1	General Bulk Storage 211-S
7.1.1	Makeup and Distribution
7.2	Organic Systems 276-S and 202-S
7.3	Nitric Acid Recovery and Distribution 293-S and 202-S
7.4	Tank Farm Sodium Nitrate
7.5	Propane Storage and Distribution 2726-S, 222-S, 2710-S
8.1.5	Demineralized Water
8.1.6	Inert Gas
8.2.1	Nitric Acid
8.2.2	Sodium Hydroxide
8.3	Aqueous Effluent
9.1.1	Flushing
9.1.2	Silica Gel 205-S
9.1.3	Instrumentation
9.1.4	Transport Systems
10.1.1	Open Pond
10.1.2	Cribs
10.1.3	Diversion Boxes
10.1.4	Tank Farms
10.2.1	Canyon and Silo
10.2.2	233-S

ISO-1108

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 20.0	
	REVISION New	PAGE 3 OF 4
SUBJECT: COMPLETION REPORT	LOCATION General	
APPROVED BY: C. B. Foster	DATE June 1, 1966	

20.0 COMPLETION REPORT (Continued)

INSTRUCTION NO.	SUBJECT
11.1.6.1	Poppies
11.1.6.2	Hand Held Portable Instruments
11.1.6.3	Hand and Shoe Counters
11.2.1	Remote Cranes
12.1.1	High Pressure Steam
12.1.2	Medium Pressure Steam
12.1.3	Low Pressure Steam
12.2.1	Process Air
12.2.2	Instrument Air
12.2.3	Breathing Air
12.3.1	Raw Water
12.3.2	Sanitary Water
12.3.3	Demineralized Water
12.5.1	Propane Receiving, Storage and Distribution
12.5.2	Inert Gas Generation and Distribution
12.6	Ozone Generation and Distribution
12.7.2	Public Telephones
12.7.3	Intercom (Teletalk)
12.7.4	TV
12.7.5	Data Transmission
14.0	Galleries
15.1	Craneways
15.2	Crane Maintenance Platform
15.3	Remote Shop, Regulated Shop, Decontamination Room
15.4	Railroad Tunnel and Railroad Cut
16.1	Storage Gallery
16.2	SWP Lobby and Change Room
16.3	Ladies Lounge
16.4	Restrooms
16.5	Offices
16.6	Dispatchers Office

ISO-1108

REDOX PLANT DEACTIVATION INSTRUCTION	INSTRUCTION NO. 20.0	
	REVISION New	PAGE 4 OF 4
SUBJECT: COMPLETION REPORT	LOCATION General	
APPROVED BY: C. B. Foster	DATE June 1, 1966	

20.0 COMPLETION REPORT (Continued)

INSTRUCTION NO.	SUBJECT
16.7.1	Mechanical Shop
16.7.2	Electrical Shop
16.7.3	Instrument Shop
16.7.4	Paint Shop
16.7.5	Laggers Shack
16.8	AMU Levels
18.0	Drawings

ISO-1108

REDOX PLANT DEACTIVATION COMPLETION REPORT	INSTRUCTION NO. 5 DETAIL PROCEDURE NO. 5
SUBJECT: TERMINAL PROCESSING	PAGE 1 OF 2
PREPARED BY J. R. Cartmell	October 25, 1967

Section 5 of the Redox Deactivation Manual gave instructions and detailed procedures for the period extending from the last scheduled charge of production-type fuel through final processing of products recovered in the extensive flushing of vessels, piping and equipment enclosures. In the original schedules it had been intended to continue normal processing through year-end, 1966. This schedule was revised to terminate regular production on 11-17-66, in favor of separate campaign processing of PRTR and PWR metals, the latter to include decontamination for cask loadout of the Am-Cm fractions. Separation of the various products, flushing of process vessels and sludge removal operations were conducted simultaneously where compatible with the end result desired, and to the extent permitted by equipment flexibility. The following is the schedule obtained through the product recovery period. Separate Completion Reports for the individual sections of Terminal Processing work are included under specific instruction numbers:

Completion Schedule

Final Production Charge	11-17-66
Final PRTR Charge	11-22-66
Final PWR Charge	12-01-66
U-Pu Inventory Depletion	12-29-66
First Neptunium Loadout	1-15-67
57% Nitric Acid Flush Completed	1-22-67
Vessel Sludge Removals Completed	1-29-67
U-Pu Terminal Processing Completed	3-05-67
Am-Cm Cask Loadout	3-15-67
Second Neptunium Loadout	4-14-67
57% Nitric Acid Flush Completed	4-16-67

Product recoveries obtained in the final 57% nitric acid flush, in addition to the recovery data tabulated from all previous flushing operations, including vessel sludge dissolutions, were used as a basis for request to rescind provisions of Section 6 "Critical Mass Hazards Control Specifications" - RL-SEP-315. Formal concurrence by signatories of RL-SEP-315:

ISO-1108

REDOX PLANT DEACTIVATION
COMPLETION REPORT

	INSTRUCTION NO. 5
	DETAIL PROCEDURE NO. 5
SUBJECT: TERMINAL PROCESSING (Continued)	PAGE 2 OF 2
PREPARED BY J. R. Cartmell	October 25, 1967

H. C. Rathvon

G. R. Kiel

R. E. Tomlinson

R. W. McCullugh

was given on 4-21-67 to permit start of the second phase of Terminal Processing - decontamination flushing - to proceed on that date.

ISO-1108

REDOX PLANT DEACTIVATION
COMPLETION REPORT

INSTRUCTION NO. 5.1.1
DETAIL PROCEDURE NO. 5.1.1.1D
PAGE 1 OF 2

SUBJECT: FINAL 57% NITRIC ACID FLUSH THROUGH REDOX LINES AND VESSELS

PREPARED BY J. R. Cartmell

April 16, 1967

Detailed Procedure 5.1.1.1D represents the final acid flush of process vessels and piping following the termination of all processing including sludge removals from vessels listed in Procedure 5.1.1.3D. The flush was completed without the exceptions noted in the initial 57% nitric acid flush, conducted at the start of terminal processing and reported by M. C. Jacobs under the January 31, 1967 date.

Due to sampling and/or analytical problems that developed in connection with the 2D column, F-2 and F-1 vessel flushes, chemical assays received from F-1 samples were not corroborated by D-9 analysis. As a result the 2D column drain flush was repeated three times. The F-1 assays (subsequently) were determined to be in error.

Summary of plutonium accumulation data shown below was basis of the request to rescind provisions of RL-SEP-315:

Source	Grams Pu
1B, E-5, E-6, E-7	7
2D Overflow	5
1C, F-5, F-4	1
2D Drain, F-2, F-1	474*
2AW	0
3AW	0
2B, E-2, E-1	1
3B, E-4, E-3	0
Total Measured in D-14	(300)
Total Measured in D-9	378

*F-1 is obviously in error and should be about 350.

Repeat of 2D, F-2, F-1 Flush:

ISO-1108

REDOX PLANT DEACTIVATION
COMPLETION REPORT

INSTRUCTION NO. 5.1.1
DETAIL PROCEDURE NO. 5.1.1.1D
PAGE 2 OF 2

SUBJECT: FINAL 57% NITRIC ACID FLUSH THROUGH REDOX LINES AND VESSELS (Continued)

PREPARED BY J. R. Cartmell

April 16, 1967

Source	Grams Pu
Measured in F-1	54
Measured in D-14	17
Measured in D-9	19
Previous in D-9	378
TOTAL in D-9	397*

*Material in D-9 discarded.

ISO-1108

REDOX PLANT DEACTIVATION
COMPLETION REPORT

INSTRUCTION NO. 5.1.4
DETAIL PROCEDURE NO.

SUBJECT: TERMINAL PROCESSING

PAGE 1 OF 1

PREPARED BY J. R. Cartmell

June 28, 1967

COMPLETION:

A. Silo

The final water flush of the silo shaft was confined to use of the floor washdown spray system on February 9, 1967. It was decided to forego the use of a special wand shown on page 3 of Instruction 5.1.4. This flush water was processed through D-cell for combination with other flush solutions subsequently prepared for terminal processing of product to recovery.

Decontamination flushing of the column carrier, silo shafts, and column exteriors were completed by use of a spray wand and high pressure pump at a later date. See Completion Report 5.2.1 for result of the flush.

B. Canyon Cells

Cell flushes were completed as instructed except that D-1 samples were voided in the interest of expediting flushing operations.

ISO-1108

REDOX PLANT DEACTIVATION **COMPLETION REPORT**	INSTRUCTION NO. 5.2.1 through 5.2.4 DETAIL PROCEDURE NO. 5.2.1.1D
SUBJECT: DECONTAMINATION FLUSHES FOR REDOX VESSELS AND PIPING, COLUMN CARRIER, CANYON DECK, CELLS AND EQUIPMENT.	PAGE 1 OF 2
PREPARED BY J. R. Cartmell	June 5, 1967

I. COMPLETION:

Detailed Procedure number 5.2.1.1D and Instruction numbers 5.2.2, 5.2.3, and 5.2.4 were completed on May 31, 1967, without exceptions.

II. OBSERVATIONS:

A. The decontamination flushes consumed 7,423 pounds of potassium permanganate in a 1 1/2% solution and 8,000 pounds of oxalic acid in a 2 1/2% solution.

B. Installed Beckman instruments failed to give internal or external radiation readings for the cells. Page 2 gives the results of canyon deck radiation surveys.

III. SUMMARY:

A summary of decontamination flush product pick-up is tabulated below:

A. Vessels and Piping

	U(lbs)	Pu(gms)	Np(gms)
Alkaline Permanganate Flush No. 1	168	182	34
Alkaline Permanganate Flush No. 2	29	46	13
TOTAL PICKUP	197	228	47

B. Decks and Cells

	U(lbs)	Pu(gms)	Np(gms)
TOTAL PICKUP	189	153	42

C. Column Carrier and Silo Shaft

	U(lbs)	Pu(gms)	Np(gms)
TOTAL PICKUP*	40	22	7

*Included flush of A and B Cells.

SUBJECT: DECONTAMINATION FLUSHES FOR REDOX VESSELS AND PIPING, COLUMN CARRIER, CANYON DECK, CELLS AND EQUIPMENT.

PREPARED BY J. R. Cartmell

June 5, 1967

CANYON RADIATION SURVEY RESULTS

All Readings Rads/Hr at 3 Feet

A CELL

10	2	5
3.1	3.8	.8
1.3	1.4	5
.7	.8	1.5
6	8	6
1.5	1.3	1.1
1.5	2.0	1.5
1.3	1.3	.9

15 × .5 = 3.0

2.8

B CELL

4	3	4
×	1.9	×
.9	2.0	5
.6	2.5	2.7
5	5	8
×	3.6	×
1.2	4.3	16
1.2	1.2	10

8

1.2
1.2 2.6 4.0

C CELL

12	10	10
2.0	4.0	3.9
1.6	1.5	5.0
1.2	1.0	3.7
20	25	15
4.0	5.0	4.0
3.5	2.0	1.6
2.6	1.8	1.2

100
12
2.0 18 2.0

D CELL

>500	>500	80	50	15	10	8.0	7.0	8.0	8.0	9.0	12	11
15	22	10	1.3	.8	2.6	20	1.9	1.5	1.6	2.3	3.0	2.0
6.0	30	4.5	1.0	.5	1.5	2.0	2.2	1.5	1.1	1.2	1.2	1.3
			1.0	.4	1.5	1.5	1.1	.8	.8	.8	.7	1.8
500	500	500	50	20	20	15	18	20	20	23	20	10
2.5	4.0	50	1.8	2.5	4.5	3.2	3.7	2.3	3.0	8.0	X	X
9.0	22	10	1.2	1.3	2.9	3.2	3.2	2.5	2.4	18	2.8	1.2
			1.2	.8	1.5	1.8	2.0	1.9	1.5	2.5	.5	1.4

>500 100 50 45 35 20 50 60 70 50 25 12 10
>500 16 6 6.0 X 2.8 7 9 6 7 8 X X
23 20 4 1.5 2.3 2.7 10 10 5 9 25 5 1.4

E CELL

10	5	10	20	40	60	80	250
1.4	.6	.7	1.8	9.0	5.0	7.0	6.0
1.0	3.8	8.0	2.2	7.0	1.2	.5	1.7
.7	2.2	2.5	1.4	3.0	.5	.4	1.5
10	10	12	25	30	40	>500	>500
2.0	1.8	2.1	8.0	6.0	2.5	3.6	11
1.0	2.0	4.5	2.2	1.7	1.3	1.0	3.0
1.5	2.1	3.2	1.6	1.5	1.5	1.4	2.3

10 15 20 20 30 50 100 >500
2.5 3.5 9 4 2 1.5 2.5 11
2.8 5.0 10 2.5 1.2 1.0 4.8 7

F CELL

10	15	35	50	35	40	150	400	300	300	100
2.0	2.2	7.5	15	5.0	3	6.4	2.7	8.0	8.0	5.5
3.2	2.0	3.8	3.0	3.2	3.3	2.3	1.8	2.6	2.0	3.2
1.4	1.2	3.8	2.0	1.8	2.7	1.5	1.0	.8	2.0	3.0
5	8.0	10	30	40	30	70	120	120	150	150
2.4	2.3	1.0	15	6.0	4.3	1.4	2.4	2.4	3.1	2.8
4.0	2.0	3.7	2.8	2.7	5.0	2.0	1.8	1.4	1.3	7.0
4.0	10	1.8	1.5	2.0	5.0	1.1	.7	.7	1.2	4.0

G CELL

100	120	50	30	35
8.0	17	5.0	1.6	2.7
3.4	2.3	2.3	1.2	1.3
2.0	2.0	1.4	1.1	1.1
150	150	60	80	50
6.0	12	9.0	1.4	2.0
4.5	2.8	1.1	.9	1.1
3.0	1.5	1.0	.8	.9

H CELL

100	220	100	25	12	9	10	15	20
19	20	5.0	5.0	1.5	1.0	1.1	1.6	2.0
9.0	16	2.5	9.0	2.7	1.0	1.2	1.5	1.5
3.0	10	1.5	5.0	2.0	.6	.8	.7	1.2
70	150	50	20	10	8.0	10	10	8.0
36	23	3.7	3.3	.7	.6	.9	.8	.75
8.0	20	1.7	3.2	3.1	.7	.7	.5	.9
1.5	10	1.5	1.6	1.6	.4	.32	.3	.9

J CELL

10	17	15	18	20	18	5
.85	.9	.9	1.3	1.6	1.2	1.1
1.0	2.3	6.0	3.5	1.0	1.3	1.3
.9	1.0	3.5	3.0	.7	1.0	.8
10	25	30	25	50	20	20
.4	.6	.8	1.5	1.7	.6	.5
.40	2.3	3.2	3.6	.43	.33	.35
.31	1.5	3.0	2.4	.29	.24	.20

ISO-1108

ISO-1108

REDOX PLANT DEACTIVATION
COMPLETION REPORT

INSTRUCTION NO. *See Below

DETAIL PROCEDURE NO.

SUBJECT: TERMINAL PROCESSING - 233-S

PAGE 1 OF 1

PREPARED BY J. R. Cartmell

June 5, 1966

*OPERATIONS - Instruction No's. 6.1.1 · 6.2.1
6.1.2 6.2.2
6.1.3 6.2.3

Following completion of the final 57% nitric acid flush through 233-S concentration and loadout equipment, which was routed to the waste section for subsequent discard in terminal waste batches, the decontamination flushes external to the vessels were completed as specified. Only very nominal product accumulation was experienced in the internal flush since it followed the second neptunium campaign which had been preceded by and followed with copious flushing associated with that loadout of neptunium.

Decontamination flushes of greenhouse and loadout hood external to vessels and piping were completed as specified in the instruction without exception. These flushes were restricted to use of 10% nitric acid followed by water.

The loadout hood was contact decontaminated to levels considered reasonable by R.M. Standards prior to sealing all cracks and openings and installing the high efficiency filter in one of the hood glove ports.

Decontamination of Sections external to the greenhouse and hood were reduced to non-smearable status for painting. See other Section 6 - Completion Reports for areas recoated.

ISO-1108

REDOX PLANT DEACTIVATION
COMPLETION REPORT

INSTRUCTION NO. See Below

DETAIL PROCEDURE NO. See Below

SUBJECT: 233-S (VARIOUS SECTIONS)

PAGE 1 OF 2

PREPARED BY S. W. Douglas, R. L. Hibbard & J. R. Cartmell

June 9, 1967

In the interest of brevity and to consolidate the paper work involved the following Completion Reports have been combined. They represent the efforts of Mechanical, Instrument and Operations forces who certify that work specified in the procedures was completed without exception unless otherwise noted:

Instruction

6.2.4	Instruments deactivated as per 11.1.3.3 and 11.1.6.1. S. W. Douglas.
6.2.4	Load out room walls spray painted with 33 Amercoat. Floors of room brush painted. R. L. Hibbard.
6.2.4	Operations - Instruction completed without exception. J. R. Cartmell.
6.2.5	Instrument deactivated as per Instruction 11.1.6. S. W. Douglas.
6.2.5	Operations - Instruction completed without exception. J. R. Cartmell.
6.2.6	Viewing room walls and grating painted with 133 Amercoat. Airless spray gun used. R. L. Hibbard.
6.2.6	Operations - Instruction completed without exception. J. R. Cartmell.
6.2.7	Stairwell spray painted with 33 Amercoat. R. L. Hibbard.
6.2.7	Operations - Instruction completed without exception. J. R. Cartmell.
6.2.8	Operations - Instruction completed without exception. J. R. Cartmell.
6.2.9	Lower section of pipe gallery walls were spray painted with 33 Amercoat. The floor was brush coated. R. L. Hibbard.
6.2.9	Instruction completed without exception. J. R. Cartmell.
6.3	Heat and Vent Instruction for 233-S completed without exception. J. R. Cartmell.

ISO-1108

REDOX PLANT DEACTIVATION
COMPLETION REPORT

	INSTRUCTION NO. See Below
	DETAIL PROCEDURE NO. See Below
SUBJECT: 233-S (VARIOUS SECTIONS) (Continued)	PAGE 2 OF 2
PREPARED BY S. W. Douglas, R. L. Hibbard & J. R. Cartmell	June 9, 1967

6.4 Instrument Instruction for 233-S utilities completed without exception. S. W. Douglas.

6.4 Operations - Instruction for 233-S utilities completed without exception. J. R. Cartmell.

6.5 Instrument Instruction for 233-S equipment completed without exception. S. W. Douglas.

6.5 Operations Instruction for 233-S equipment completed without exception. J. R. Cartmell.

6.6 Instrument Instruction for 233-S Operating gallery completed without exception as per Instruction 11.1.6. S. W. Douglas.

6.6 Operations Instruction for 233-S Operating gallery completed without exception. J. R. Cartmell.

6.7 Operations Instruction for 233-S Change room completed without exception. J. R. Cartmell.

6.8 Operations Instruction for 233-S Storage building completed without exception. J. R. Cartmell.

ISO-1108

REDOX PLANT DEACTIVATION
COMPLETION REPORT

INSTRUCTION NO. 7.1
DETAIL PROCEDURE NO.

SUBJECT: GENERAL BULK STORAGE 211-S

PAGE 1 OF 1

PREPARED BY J. R. Cartmell

June 9, 1967

Storage Vessels:

TK.123 - Ammonium Fluoride 36, 125 lbs. 100%.

TK.112 - Nitric Acid 957, 456 lbs. 100%.

These two chemicals are being held in inventory for transfer to Purex at a later date.

All remaining storage vessels for:

Nitric Acid

Caustic Soda

ANN

Sodium Dichromate

Demineralized Water

have been emptied and flushed clean. They are being held in stand-by condition as per procedure without exceptions.

ISO-1108

REDOX PLANT DEACTIVATION
COMPLETION REPORT

INSTRUCTION NO. 7.1.1
DETAIL PROCEDURE NO.

SUBJECT: MAKE UP AND DISTRIBUTION - OPERATIONS - INSTRUMENTS

PAGE 1 OF 1

PREPARED BY S. W. Douglas and J.R . Cartmell

June 9, 1967

All AMU and 8th level head tank vessels were deactivated as per the Instruction. Piping revisions to supply raw water for stand-by flushing operations were completed as prescribed in Section XIX.

ISO-1108

REDOX PLANT DEACTIVATION
COMPLETION REPORT

INSTRUCTION NO. 7.2
DETAIL PROCEDURE NO.

SUBJECT: ORGANIC SYSTEMS 276-S AND 202-S
ELECTRICAL, MECHANICAL, INSTRUMENTS, AND OPERATIONS

PAGE 1 OF 1

PREPARED BY R. L. Hibbard, S. W. Douglas & J. R. Cartmell JRC

June 9, 1967

All provisions of procedure 7.2 were complied with except that storage of spent organic is being maintained in U.G.S. tanks 141-142, pending receipt of a method for disposal. The void space in each vessel has been filled with water to preclude vapor formation within the vessels.

See Appendix Section for radiation and contamination status of 276-S process section.

ISO-1108

REDOX PLANT DEACTIVATION COMPLETION REPORT	INSTRUCTION NO. 7.3 DETAIL PROCEDURE NO. 7.3.D
SUBJECT: 293-S NITRIC ACID RECOVERY AND STORAGE ~~OPERATIONS - MECHANICAL - ELECTRICAL~~	PAGE 1 of 1
PREPARED BY M. C. Jacobs and R. L. Hibbard	March 7, 1967

I. COMPLETION

Operations work was completed without exception as per procedure 7.3.D.

Pump motor disconnects for Tk-3, T3-1, T3-2 were pulled at motor control center as per Instruction 11.2.3.2.

Item 12 of Instruction 7.3 was found impractical to follow. The alternate of drilling holes in two traps was done to provide drainage. The traps were tagged accordingly.

II. OBSERVATIONS

The C-Dissolver Absorber by-pass valve failed to close when operated from C-Section in the north operating gallery. Repairs were not made, but the information has been noted on the deactivation tag affixed to controller. The valve remains in open position.

ISO-1108

REDOX PLANT DEACTIVATION
COMPLETION REPORT

INSTRUCTION NO. 7.4
DETAIL PROCEDURE NO.

SUBJECT: TANK FARM SODIUM NITRATE

PAGE 1 OF 1

PREPARED BY J. R. Cartmell jrc

June 20, 1967

Provisions of Instruction 7.4 were completed as planned with the exception that the transfer lines from SX farm had plugged with salt several months prior to Redox shutdown, and as of the above date had not been cleared. Subsequent to this time Waste Management forces were successful in clearing the lines from 240-S-151 diversion box back to 105-SX.

ISO-1108

REDOX PLANT DEACTIVATION
COMPLETION REPORT

INSTRUCTION NO. 7.5

DETAIL PROCEDURE NO.

SUBJECT: PROPANE STORAGE AND DISTRIBUTION

PAGE 1 OF 1

PREPARED BY MECHANICAL - OPERATIONS
R. L. Hibbard and J. R. Cartmell

May 15, 1967

The Instruction was completed as specified and without exception.

ISO-1108

REDOX PLANT DEACTIVATION
COMPLETION REPORT

INSTRUCTION NO. 8.1
DETAIL PROCEDURE NO. 8.15 - 8.16

SUBJECT: UTILITIES - 222-S, 202-S (MECHANICAL - OPERATIONS)

PAGE 1 OF 1

PREPARED BY R. L. Hibbard and J. R. Cartmell JRC

March 9, 1967

Supply of demineralized water to the Laboratory was discontinued as per Instruction 8.15. Raw water is now being fed to the 222-S Still.

After all hexone had been displaced and flushed from process vessels, 804 Head-Tank and the 0-1, 0-2, and 0-3 tanks at 276-S, inert gas supply to the 100 and 25 psi header and distribution systems were converted to process air.

ISO-1108

REDOX PLANT DEACTIVATION
COMPLETION REPORT

INSTRUCTION NO. 8.2.1 - 8.2.2
DETAIL PROCEDURE NO. 11.2.2.2
PAGE 1 OF 1

SUBJECT: CHEMICALS TO 222-S - NITRIC ACID, SODIUM HYDROXIDE

PREPARED BY R. L. Hibbard and J. R. Cartmell

May 25, 1967

Completed deactivation of nitric acid, and caustic lines to the 222-S building. Completed caustic and nitric cut-in of new installation from pumps that were installed by Construction Forces.

ISO-1108

REDOX PLANT DEACTIVATION
COMPLETION REPORT

INSTRUCTION NO. 8.3
DETAIL PROCEDURE NO.

SUBJECT: RADIOACTIVE WASTE DISPOSAL 222-S

PAGE 1 OF 1

PREPARED BY J. R. Cartmell JRC

May 25, 1967

Revisions were completed to 219-S vault by J. A. Jones forces to permit direct neutralization of 222-S Laboratory waste.

The jumpers required for by-pass of D-8 Waste Neutralizer vessel in the Redox waste cell has been fabricated, but not installed since Waste Management is continuing to utilize waste concentration facilities for 202-S Building.

ISO-1108

REDOX PLANT DEACTIVATION
COMPLETION REPORT

INSTRUCTION NO. 9.1.1 through 9.1.5
DETAIL PROCEDURE NO.

SUBJECT: UNH STORAGE - 205-205 BUILDINGS

PAGE 1 OF 1

PREPARED BY MECHANICAL, INSTRUMENTS, OPERATIONS
R. L. Hibbard, S. W. Douglas, J. R. Cartmell

June 20, 1967

All Instructions in Section 9 were completed without exception.

The security fence has been erected and the 204-205 facilities transferred to Purex and Waste Management dual responsibility. The latter organization came into the picture on July 1 in connection with handling of aqueous wastes from Battelle Northwest.

ISO-1108

REDOX PLANT DEACTIVATION
COMPLETION REPORT

	INSTRUCTION NO. 10
	DETAIL PROCEDURE NO.
SUBJECT: EFFLUENT SYSTEMS	PAGE 1 OF 1
PREPARED BY J. R. Cartmell	June 30, 1967

The following Instructions were completed without exception:

10.1.1	Open Pond
10.1.2	Cribs
10.1.3	Diversion Boxes
10.1.4	Tank Farms
10.2.1	Canyon and Silo
10.2.2	233-S

ISO-1108

REDOX PLANT DEACTIVATION
COMPLETION REPORT

INSTRUCTION NO. 11
DETAIL PROCEDURE NO.

SUBJECT: EQUIPMENT

PAGE 1 OF 1

PREPARED BY J. R. Cartmell

June 30, 1967

The Instructions covering equipment in:

11.1.6.1
11.1.6.2
11.1.6.3
11.2.1

were completed without exception. General instructions followed with respect to all equipment precluded D-Section where waste concentration operations are continuing. The waste cell functions previously conducted from K-Panel in the Silo Operating Gallery has been transferred back to D-Board. Instruments required for operation were moved from K-Panel.

The canyon crane was decontaminated to the lowest levels measured in many years. Request to paint the crane for preservative purpose has been requested. See Appendix for radiation levels measured after completion of the decontamination effort.

ISO-1108

REDOX PLANT DEACTIVATION COMPLETION REPORT	INSTRUCTION NO. 12 DETAIL PROCEDURE NO.
SUBJECT: UTILITIES	PAGE 1 OF 1
PREPARED BY J. R. Cartmell, R. L. Hibbard, S. W. Douglas	June 30, 1967

Services in 202-S and associated buildings were deactivated in accordance with the following Instructions with the few exceptions required for D-cell continued operation:

12.1.1	High Pressure Steam
12.1.2	Medium Pressure Steam
12.1.3	Low Pressure Steam
12.2.1	Process Air
12.2.2	Instrument Air
12.2.3	Breathing Air
12.3.1	Raw Water
12.3.2	Sanitary Water
12.3.3	Demineralized Water
12.5.1	Propane Receiving and Distribution
*12.5.2	Inert Gas Generation and Distribution
12.6	Ozone
12.7.2	Public Telephones
12.7.3	Intercom
**12.7.4	TV
12.7.5	Data Transmission

*The inert gas compressor low pressure tank cut off limit switches have been adjusted so that contacts are closed in order to permit stand-by operation of the generators. If the service is reactivated the contacts must be opened before the compressors are started up. The equipment has been tagged to call out this fact.

**The canyon TV camera snd TV receivers have been retained for service.

ISO-1108

REDOX PLANT DEACTIVATION **COMPLETION REPORT**	INSTRUCTION NO. 14.0 DETAIL PROCEDURE NO.
SUBJECT: GALLERIES	PAGE 1 OF 1
PREPARED BY S. W. Douglas, R. L. Hibbard, J. R. Cartmell	June 30, 1967

Deactivation Instruction 14.0 was completed with the following exceptions:

1. All instrumentation and services associated with D-Board Operation including the vent systems.

2. Retention of D-9 sampling capability.

3. Retention of D-2 to crib route.

4. Did not install 222-S to 241 by-pass jumper.

ISO-1108

REDOX PLANT DEACTIVATION COMPLETION REPORT	INSTRUCTION NO. 15 DETAIL PROCEDURE NO.
SUBJECT: REGULATED AREAS	PAGE 1 OF 1
PREPARED BY J. R. Cartmell	June 30, 1967

Instructions 15.1 through 15.4 were completed as specified. See Appendix for a review of final radiation and contamination status.

ISO-1108

REDOX PLANT DEACTIVATION **COMPLETION REPORT**	INSTRUCTION NO. 16 DETAIL PROCEDURE NO.
SUBJECT: SERVICE AREAS - OPERATIONS - ALL CRAFTS	PAGE 1 OF 1
PREPARED BY J. R. Cartmell	June 30, 1967

All Deactivation Instructions covered in Section 16.1 through 16.8 were completed except for the following:

16.3 Ladies Lounge continues in service.

16.4 All restrooms continue in service.

16.7.1 -
16.7.5 All maintenance facilities continue in service. The Shops are being used as a Waste Management tank farm maintenance crew base.

ISO-1108

REDOX PLANT DEACTIVATION
COMPLETION REPORT

INSTRUCTION NO.

DETAIL PROCEDURE NO.

SUBJECT: DEACTIVATION SURVEY

PAGE 1 OF 8

PREPARED BY J. R. Cartmell and R. C. Herald

SURVEY RESULTS

BLDG. OR AREA	RADIATION LEVELS - CONTAMINATION LEVELS
291-S Area	
Exhaust Fan Housing	200 mR/hr at C (Internal Contamination)
Exhaust Fan Housing Base and Concrete Fan	35W.O. 8 W.C. at C 100,000 c/m smears
291-S Bldg. Lines and Floor	To continue in present status
291-S Stack - Side	To continue in present status
291-S Stack Shack	To continue in present status
291-S 50' Stack Sample Rm. and Stairway	Smears 6000 c/m ∠ 1 mR/hr at F
Sample Room	Smears 6000 c/m
Lines and Floor in Sample Room	Smears 500 c/m Direct 6000 c/m
292-S Bldg.	
Pipe and Lines (Ground Floor)	Direct 1000 c/m Smears 400 c/m
Entrance to Bottom Level	Direct ∠ 1 mR/hr Smears 400 c/m
293-S Bldg.	
Valve Pit Room (Walls)	Smears 200 c/m ∠ 500 d/m
Lines, Valves and Floor	Smears 600 c/m ∠ 500 d/m
Stairwell and Sampling Area	Smears 200 c/m ∠ 500 d/m
Absorber Room	
Absorber and Floor	Smears 200 c/m ∠ 500 d/m
Absorber	∠ 6 mR/hr at C
Scrubber	∠ 6 mR/hr
Scrubber and Floor	Smears 200 c/m ∠ 500 d/m
Sample Area and Instrument Area-Ground Level	∠ 6 mR/hr at C Smears 500 c/m ∠ 500 d/m
Underground Tanks Area 291-S	∠ 6 mR/hr through concrete covers
291-S Fallout Area	Low level B-G contamination over ground area (General) Washed into soil
Sand Filter (202-S	To remain in active status
Sand Filter Shack	To remain in active status

Symbol	Identification
W.O.	Window open with a C.P. Survey Instrument - Beta-Gamma Reading.
W.C.	Window closed with a C.P. Survey Instrument - Gamma reading only in mR/hr.
At C	At contact
At F	At field
N.S.	Non-smearable
15/5	Means 15 W.O. 5 W.C. with a C.P.
SOP	Step-Off Pad
D.R.	Dose Rate
d/m	Counts per minute measured with a G.M. Instrument for Beta-Gamma,
d/m	Disintegrations per minute used for alpha contamination as measured with Poppy or Juno Instrument.

If no distance is indicated, readings are at contact.

ISO-1108

REDOX PLANT DEACTIVATION
COMPLETION REPORT

INSTRUCTION NO.

DETAIL PROCEDURE NO.

SUBJECT: DEACTIVATION SURVEY

PREPARED BY J. R. Cartmell and R. C. Herald

BLDG. OR AREA	SURVEY RESULTS RADIATION LEVELS - CONTAMINATION LEVELS
204-205 Area	
204 Pit Floor	< 6 mR/hr at C To 3000 c/m smears - 500 d/m smears
Tops and Sides (Tanks)	To 40 mR/hr at C - Smears 35,000 c/m and 1,000 d/m
Catwalk	10 mR/hr at F
204 Pump Pit Floor, lines and pump	< 6 mR/hr at C - 2000 c/m smears 500 d/m smears
205 Bldg.	
Lines and Tanks	< 6 mR/hr at C < 200 c/m smears < 500 d/m smears
Sample Room	6 mR/hr at C < 200 c/m smears < 500 d/m smears
151-152 Tanks	
Tanks, piping floor	To 80 W.O. - 25 W.C. Smears 6,000 c/m < 500 d/m
276-S	
(Outside) Wall Instrument Lines and Pipe on East Side of Bldg.	220 W.O. 40 W.C. Smears 3500 c/m
Operating Gallery	
Process Side	
Bottom Level	To 150 W.O. and 100 W.C. at F
All lines - Floor	< 1 mR/hr at C < 100 c/m < 500 d/m smears
Floor and Drain	1000 W.O. 500 W.C. at 1" Smears 50,000 c/m
Sides of Tanks and lines	To 500 mR/hr at C Smears 1500 c/m < 500 d/m
Tops of tanks and pumps	25 mR/hr at C Smears 1500 c/m < 500 d/m
233-S	
Entrance air lock, instrument Rm. Change room, blower room, Rest room, and Operating Gallery	Direct Smears < 100 c/m < 500 d/m
Pipe Gallery Wall, floor pipes and Lines	6 mR/hr at C - General Smears 5,000 d/m after painting
Pipe Gallery airlock	500 d/m smears

ISO-1108

REDOX PLANT DEACTIVATION
COMPLETION REPORT

INSTRUCTION NO.

DETAIL PROCEDURE NO.

SUBJECT: DEACTIVATION SURVEY

PREPARED BY J. R. Cartmell and R. C. Herald

SURVEY RESULTS

BLDG. OR AREA	RADIATION LEVELS - CONTAMINATION LEVELS
Electrical switch gear station East of 233-S	Contaminated on external surfaces to 1000 d/m direct
All conduit and other lines outside and inside 233-S	Contaminated internally
233-S	
Can storage rooms and loading dock	$\angle$ 1 mR/hr $\angle$ 500 d/m smears
Loadout room Hooks, scales, Hoods Side and Front - Walls, ceiling, top of hoods, monorail Ports of Loadhood	 Smears $\angle$ 500 d/m
233-S Viewing Room Stairwell Stairs, floor, walls, ledges	 Smears 5000 d/m - after painting
Viewing Room - 4th level Grating, Walls, Beams Window Ledges	 Smears 5000 d/m - after painting
3rd Level Viewing Room Grating, Walls, Beams, Window ledges	 10,000 d/m smearable - after painting
2nd Level - Grating, Walls Beams, Window Ledges	 50,000 d/m smearable - after painting
1st Level - Grating, Walls, Beams, Window Ledges	 5,000 d/m smearable - after painting
233-S Greenhouse	2400 W.O. 800 W.C. at Plastic Window
202-S	
S Sample Gallery - General Sample Port Ledges	Max. 200 W.O. - 100 W.C. at 6" Generally $\angle$ 20,000 c/m smears - Max. $\angle$ 100,000 c/m
Floor Area	Smears 10,000 c/m
F Sample Ports	To 40,000 d/m direct 5000 d/m smears
North Sample Gallery A thru D Sect. Sample Ports (Inside)	 Max. 80 W.O. 20 W.C. at 6"

ISO-1108

REDOX PLANT DEACTIVATION
COMPLETION REPORT

INSTRUCTION NO.

DETAIL PROCEDURE NO.

SUBJECT: DEACTIVATION SURVEY

PAGE 4 OF 8

PREPARED BY J. R. Cartmell and R. C. Herald

BLDG. OR AREA	SURVEY RESULTS RADIATION LEVELS - CONTAMINATION LEVELS
E Section - Ports (Inside Sample Boxes)	Max. 200 W.O. - 200 W.C. at 6"
Port Ledges	Smears to > 40,000 d/m
Floor Area	
A through D	300 c/m Smears
E Section	2000 d/m Smears
Remote Shop	
Walls	Direct and Smear 500 W.O. - 100 W.C. at C
Floor	500 W.O. at 6" and 50 W.O. - 10 W.C. at C on smears
Decontamination Room	
Decontamination Hood	30,000 c/m Smears 10,000 d/m Smears
Gloved Box and All Stored Equipment	4,000 c/m
Floor	15000 c/m Smears
Regulated Shop - All Tools, Equipment and Machinery	∠6 mrads/hr ∠100 c/m ∠500 d/m Smears
202-S	
Pipe and Operating Galleries Including Offices in S.O.G.	
North Pipe Gallery	Walkway smearable ∠100 c/m ∠500 d/m D Section roped off. Smears 700 c/m to 1500 c/m
Floors, Equipment, Tools, etc. of Lunch Room, Offices, H-vox Room, Compressor Room, Main Floor Corridor, Electric Shop, Instrument Shop, Maintenance Shop - Change Room	Good - All ∠100 c/m ∠500 d/m Direct and Smearable
Blower Rooms	Good
Area outside Blowers - Area inside Units	
Main Elevator	
Pit Area, Top of Elevator and cables	Good - All ∠200 c/m ∠500 d/m Direct and Smears
Elevator Inside	Direct and Smears
Sample Elevator	To 10,000 c/m direct 400 c/m smears
Silo Operating and Pipe Gallery	
Panel Board, Instrument Lines	∠200 c/m ∠500 d/m
Floor and Desk	Direct and Smears
Silo Sample Gallery	
Outside Areas of Sample Ports Floor and Lines	Smears 1000 c/m - 1000 d/m -(300 W.C. at C direct)

ISO-1108

REDOX PLANT DEACTIVATION
COMPLETION REPORT

INSTRUCTION NO.

DETAIL PROCEDURE NO.

SUBJECT: DEACTIVATION SURVEY

PREPARED BY J. R. Cartmell and R. C. Herald

BLDG. OR AREA	SURVEY RESULTS RADIATION LEVELS - CONTAMINATION LEVELS
Inside Sample Ports Silo S.G. Airlock	Very hot ≥40,000 d/m smearable Smears <200 c/m - <500 d/m
6th Level Crane Way (Silo Crane) Floor (not over columns)	150 W.O. 50 W.C. at C Smears 100 W.O. at C
Cell Covers	150 W.O. 150 W.C. at C Smears 150 W.O. at C
6th Level Crane - Except for Wrenches, Cables, Hooks & Auxillary Eqpt.	Smears 90 W.O. at C
Silo Stairwell Steps-Landings, etc.	<1mR/hr at F <200 c/m <500 d/m Smears
202-S	
Fire Escape West Entrance to 60 Ton Craneway	Good - <6mR/hr at door <200 c/m <500 d/m
Fire Escape in General	Direct and Smears
Roof Areas Canyon Roof	Good - <5 mR/hr at 22" through roof Smears <200 c/m - 500 d/m - Direct Smears
Other Roof Areas South side of 202S	Good - 200 c/m < 500 d/m Smears
Roof Areas over NO.O.G. Electric Shop, Switch Gear Room, and North Entrance to Sample Gallery	Good - <200 c/m <500 d/m Smears
233-S	
Roof Area	Good - <200 c/m <500 d/m Smears
Column Carrier Pit Top of Pit Ground Area	 Good - 100 mR/hr thru metal plate over pit 16' deep Good - Smears <100 c/m <500 d/m
202-S	
Engineering Offices Off to Stairwell to Storage Gallery and Switch Gear Cable Rooms - and 2	 <200 c/m <500 d/m Smears
Chemical Sewer Check Station S.W. Corner of 211 Area Sample Riser	 To remain in active status
Storage Gallery (PAX Rm.) Floor and Wall General	<1 mR/hr at F Smears 4000 c/m Spots on floor to 200 W.O. 100 W.C. at C Wall and Floor Smears <200 c/m <500 d/m
Tunnel to 1st AMU	<200 c/m <500 d/m Smears

ISO-1108

REDOX PLANT DEACTIVATION
COMPLETION REPORT

INSTRUCTION NO.

DETAIL PROCEDURE NO.

SUBJECT: DEACTIVATION SURVEY

PREPARED BY J. R. Cartmell and R. C. Herald

BLDG. OR AREA	SURVEY RESULTS RADIATION LEVELS - CONTAMINATION LEVELS
AMU Levels - 1,2,3,4,5	1st level light ports to 60,000 c/m direct 6,000 c/m smears
Tools, Floors and Walls Silo lights - Ports	1st level floor near leak - 30,000 c/m Smears <100 c/m <500 d/m 2nd level window smears to 800 c/m 40,000 c/m direct 3rd level - OK 4th level near light port 15 W.O. 5 W.C. at C N.S. 5th level leak from 6th level through ceiling to 10,000 c/m - Tanks and floor smears 800 c/m
804 Enclosure	
Tank (top)	<5mR/hr at C
Floor (sides)	15/5 at C - Smears 1,000 c/m
Pumps	Smears 1000 c/m
Lines	to 1000/200 at 1" Smears >100,000 c/m 500 d/m
804 level in general Floor - lines and etc.	Good shape - <200 c/m <500 d/m smearable
All exhaust fans and stacks From 202-S other than 291-S stack	<6 mR/hr at C <200 c/m <500 d/m smearable
RR Tunnel	
Floor	4000 W.O. 1000 W.C. at 2" near drain line Floor smears 35 W.O. 10 W.C. at C
Walls	100 W.O. 50 W.C. at 1" Smears 30/5 at C Rails smear 5 W.O. at C
Floor Drain	Smears floor drain 120/20 at C
RR Cut	Several spots in cut to 100,000 c/m
Cask car decontamination station	Several spots to 8,000 c/m
CMP	
Floors, Walls, Equipment	Smears 10 W.O. 5 W.C. 2000 d/m D.R. to cross CMP - 50 mRads/hr at F Readings 100 W.O. 30 W.C. at F Crane in Barn
Craneway	1000 W.O. 800 W.C. at 22"
60 Ton Crane	
Auxiliary units other than hooks, cables and wrenches	1500/1000 at 6"
Hooks	5000/3000 at 1"
Cables - Wrenches	5000/3000 at 1"

ISO-1108

REDOX PLANT DEACTIVATION
COMPLETION REPORT

INSTRUCTION NO.

DETAIL PROCEDURE NO.

SUBJECT: DEACTIVATION SURVEY

PREPARED BY J. R. Cartmell and R. C. Herald

BLDG. OR AREA	SURVEY RESULTS RADIATION LEVELS - CONTAMINATION LEVELS
Underside of Crane Rails, Beams, Optics Festoons-Cables	200/100 at C
Light Reflectors	1500/1000 at 6"
Light Shields Top of Catwalk	East 300/200 at 6" West 1000/500 at 6"
Rails	1500/1000 6"
Motors	1000/1000 6"
Wheel Areas	1500/1000 6"
Top of Trolley Flat Surfaces, Cables,	1500/400 at 6"
Motors	1000/1000 at 6"
Crane Cab - Filter Units	No cleaning - still very hot
Air conditioner Filter	No cleaning - still very hot
Air conditioner condenser Fans	No cleaning - still very hot
Top of Penthouse	No survey at this time
Penthouse (inside) and Floor	No survey at this time
60 Ton Crane (Cab)	
Cab on Inside	Direct 300-800 c/m Smear = Background
Cab Airlock Floor and SOP	Smear 5,000 c/m
Walls	Smear 600 c/m
CMP	Smear of deck = 10/5 at C and 2000 d/m
Viewing Room	(Crane in Barn) 5/5/F Smear 500 c/m 800 d/m
Undressing airlock	Smear 500 c/m
Stairwell-Steps, landings, Rails	Smear = Background 200-300 c/m $\angle$500 d/m Smearable
202-S	
SWP Change Room	Through tile on floor @west end direct 9,000 c/m
Floor	Smear $\angle$100 c/m $\angle$500 c/m
Walls	Smear $\angle$100 c/m $\angle$500 c/m
Duct Work and Pipes	Background 200 - 1,000 c/m
Store Room	$\angle$200 c/m $\angle$500 d/m
SWP Lobby	$\angle$200 c/m $\angle$500 d/m
Floor	Background 400-600 c/m
Sample Gallery and Stepoff Area	Smear $\angle$200 c/m $\angle$500 d/m
SWP Decontamination Room - Floor	Smears $\angle$200 c/m

ISO-1108

REDOX PLANT DEACTIVATION
COMPLETION REPORT

INSTRUCTION NO.

DETAIL PROCEDURE NO.

SUBJECT: DEACTIVATION SURVEY

PAGE 8 OF 8

PREPARED BY J. R. Cartmell and R. C. Herald

SURVEY RESULTS

BLDG. OR AREA	RADIATION LEVELS - CONTAMINATION LEVELS
Decontamination Sink	Direct 10,000 c/m Smear 1500 c/m ∠ 500 d/m
RM Skin Decontamination Room, Floor, shower, sink, cabinets and etc.	All ∠ 200 c/m ∠ 500 d/m smearable
Hot Tool Room	
Floor	∠ 200 c/m ∠ 500 d/m smearable
Tools	∠ 2000 c/m ∠ 1,000 d/m direct ∠ 1000 c/m ∠ 500 d/m smears
Hot Laundry Storage Floors and Walls	All ∠ 200 c/m ∠ 500 d/m direct and smearable