

ATTACHMENT A

Treatment by Generator Request
T Plant Treatment TankI. Treatment by Generator for Waste Tank 15-1, Building 221-T CanyonA. Generator Waste Description

Tank 15-1 receives mixed wastes (MW) generated during equipment decontamination activities at Building 221-T and the adjacent Building 2706-T. Equipment decontaminated at the two buildings include centrifuges, fuel casks, railroad equipment, buses and automobiles, agitators, process vessels, wrenches, piping and valves, instrumentation, road building machinery, and plant process equipment.

T Plant operators perform decontamination operations on equipment that is contaminated with alpha- and beta-gamma-emitting radionuclides. Depending on the equipment and nature of the contamination, the following decontamination methods can be used: steam cleaning; high-pressure water application; blasting with dry and wet abrasives; acid/base chemical immersion or spraying; electrocleaning in phosphoric/chromic acid baths; and occasional cleaning by hand using small amounts of solvents and detergents.

Liquid wastes generated during the decontamination processes are discharged to a 24-inch sewer line encased in concrete located below the 221-T canyon. The sewer line drains into several temporary holding tanks which are routed to Tank 15-1. Once sufficient volume has accumulated in Tank 15-1, the collected liquid wastes are treated. After treatment, the waste is transferred from Tank 15-1 via pipes to the double shell tank farms, a interim status storage facility, in the 200 West Area within the allowable 90 days.

The quantity of waste treated and the frequency of treatment in Tank 15-1 varies, depending on the pace of decontamination activities. Accumulated volumes may be treated on a frequency of from once per month up to four or more times per month. Treatment occurs on a batch basis, and on the average involves from 9,000 up to 13,000 gallons of waste liquid. Annual quantities of wastes handled in Tank 15-1 since 1982 have ranged between about 250,000 and 500,000 gallons.

The dangerous waste liquids treated in Tank 15-1 are comprised primarily of small amounts of decontamination chemicals in aqueous solutions. This information has been derived from process knowledge. These chemicals and their principal ingredients are:

Sodium hydroxide,
Citric acid,

Potassium permanganate,
Sodium carbonate,
Sodium nitrite,
Turco FAB 5589,
Turco 4512A and 4502 (Phosphoric acid),
Turco 4501A (Potassium hydroxide),
Turco 4306D (Sodium bisulfite),
Turco 4520 (Ammonium oxalate),
Turco 4518 and 4521 (Oxalic acid),
Rust remover.

Any one or more of these chemicals may be in Tank 15-1 at very dilute quantities during treatment. In addition, small amounts of oil, grease, and dirt are also likely to be present in the Tank 15-1 wastes at very low concentrations.

Wastes treated in Tank 15-1 are comprised primarily of slightly contaminated waste aqueous solutions. These waste aqueous solutions occasionally exceed the pH limits (2 and 12.5) for designation as corrosive dangerous wastes, thus they may be designated as D002.

The principal risk associated with the wastes in Tank 15-1 is the radioactive nature of the materials in the tank. Chemically, the contents of the tank present a risk primarily from corrosivity after treatment has occurred. Potential organic compounds are of such low concentration that even if the wastes should escape the tank, they would not pose a risk.

B. Waste Treatment Process Description

The purpose of the treatment conducted in Tank 15-1 is to make the liquid wastes generated during decontamination activities at the T Plant amenable for storage in the West Area Tank Farms. In general, the treatment involves the addition of sodium hydroxide and sodium nitrites to meet double-shell tank storage criteria. The caustic and nitrite additions are done to inhibit corrosion in transfer lines and double-shell tanks.

Tank 15-1 is located in Canyon Cell 15R in Building 221-T, in the 200 West Area of the Hanford Site. Cell 15R is a fully enclosed concrete cell that acts primarily as protection against radiation exposure, and consequently also provides secondary containment and collection in the event of losses from Tank 15-1. The only access allowed to cell 15R, which is almost always sealed while wastes are present, is by remote crane operations. People are never allowed to physically enter cell 15R when wastes are present. The concrete surrounding cell 15R ranges from six feet to nine feet in thickness. The cell is sloped to a corner drain that discharges to the 24-inch sewer drain. Thus, any losses from Tank 15-1 are immediately removed from the secondary containment (cell 15R) and then eventually returned to Tank 15-1 after the tank

level has been reduced or the tank has been repaired to prevent further overfills or leaks.

Tank 15-1 is a 14,000-gallon capacity stainless steel tank. The tank is oval-shaped, with a flat bottom and open top. Its approximate dimensions are 14 feet high by 15 feet wide by 20 feet long. A manometer dedicated to Tank 15-1 measures the level of liquids in the tank. Pipelines entering the tank allow for the addition and removal of wastes and materials.

When sufficient waste has accumulated in Tank 15-1, it is sampled and analyzed. Analyses are performed for parameters such as percent solids, pH, nitrite, sulfate, permanganate, phosphate, plutonium, and uranium. In addition, the volume of the waste is reconfirmed.

The waste is then chemically treated by addition of sodium nitrite to greater than 600 parts per million, and addition of sodium hydroxide caustic solution to adjust the pH to be greater than 12. These are the minimum acceptable criteria for liquid waste are stored at the 200 West Area Tank Farms. Typical quantities of sodium nitrite added to a waste batch are 100 to 200 pounds. Typical quantities of caustic added are 200 to 500 pounds.

Treatment processes in Tank 15-1 are monitored while they are conducted to detect possible disruptions or problems. After treatment, additional analyses of the treated wastes are performed to ensure that the treatment process was properly conducted and confirm that the West Area Tank Farms specifications have been met.

II. Comparison with State Treatment by Generator Criteria

The criteria established by Ecology in TIM No. 86-3, as presented in preamble of this attachment, were reviewed with respect to the Tank 15-1 treatment process. Following is a discussion of how the Tank 15-1 treatment process satisfies each of Ecology's criteria.

A. Inherent Risk of the Treatment Process.

The treatment process, addition of sodium nitrite and sodium hydroxide, is a low risk process. The principal issue of concern for treatment in Tank 15-1 is the potential for generation of gases and fumes during addition of sodium hydroxide solution to the wastes. All cells in Building 221-T are maintained at a slight negative pressure, so escape of gases from the cells to areas where workers are located cannot occur. The ventilation system removes any gases generated in cell 15R to a filtration system and exhaust stacks.

The treatment process occurs in a contained vessel and is managed in accordance with all applicable requirements and presents a low risk to public health and the environment.

B. Waste Toxicity.

Wastes treated in Tank 15-1 are dangerous primarily due to their radioactive nature. The waste mixtures are also corrosive and contain low concentrations of toxic and/or EP toxic constituents. These wastes have been treated to meet Tank Farm acceptance criteria. Acceptance of the waste by Tank Farms facilitates further treatment activities in the Grout Treatment Facility and/or the Hanford Waste Vitrification Plant which will immobilize the toxic constituents, therefore this criteria is met.

C. Risk and Probability of Release.

The principal avenues of release from Tank 15-1 would be to the air and secondary containment system in cell 15R. As discussed above, the air does not pose a risk because it is withdrawn and filtered prior to its exhaust to the atmosphere. A filter management system is in place to maintain filter efficiency and detect failures of the filter system.

Releases to the cell 15R containment system are returned to Tank 15-1 via the 24-inch sewer drain which is encased in concrete. Minimal potential exists for human or environmental contact with wastes in the cell 15R containment system or the sewer drain.

The design of the 221-T Canyon reduces the risk and probability of a release to the environment and therefore meets this criterion.

D. Relative Benefit to the Environment.

Treatment of the wastes accumulated in Tank 15-1 renders those wastes amenable for storage at the 200 West Area Tank Farms double shell tanks. If treatment was not performed, the wastes could not be stored in double shell tanks and other methods of storage would have to be considered. Alternate storage options do not exist at this time.

Treatment of the waste has an increased benefit to the environment by making the waste amenable for storage; therefore, this criterion is met.

III. Compliance with Generator Accumulation Requirements.

The following information presents the measures taken toward meeting the applicable generator accumulation requirements set forth in WAC 173-303-200(1) and ensuring compliance for the Tank 15-1 tank system and the treatment processes conducted in the tank.

General Requirements

A. Transfer of Dangerous Wastes to a Permitted Facility within Ninety Days of Generation, WAC 173-303-200(1)(a)

As discussed above in Section I.A., wastes that accumulate in Tank 15-1 are treated, at least monthly, and transferred immediately to the 200 West Area Tank Farms. Thus, wastes never accumulate in Tank 15-1 for more than ninety days after they are generated. Existing procedures will be modified to ensure this practice is performed.

B. Labeling, WAC 173-303-200(1)(d)

Personnel rarely have physical access to cell 15R or Tank 15-1 and never have physical access while wastes are present in the tank. The public never has access to cell 15R or Tank 15-1.

Activities and procedures at Building 221-T clearly recognize the contents of and hazards associated with Tank 15-1, and personnel are trained accordingly. Any labeling requirements under the federal Atomic Energy Act are currently satisfied.

Addition of hazardous waste and major risk labels to tanks is currently being evaluated. It may not be possible to place labels directly on tanks without excessive radiation exposure to personnel. However, the existing system for marking and labeling these units provides an equivalent level protection. In addition, warning signs will be placed on the entrances to the TSD units.

C. Personnel Training, WAC 173-303-330

A personnel training plan has been prepared and is being implemented. Dangerous waste on-the-job training (Course number 006H) and Generator Hazards Safety Course (Course Number 006G) are currently presented annually to each employee at Building 221-T. Training records for facility personnel are maintained and updated as needed. The training plan and training records are available at Building 221-T.

D. Preparedness and Prevention, WAC 173-303-340

Building 221-T has both an internal and an external telephone communication system. An alarm system can be used to notify personnel as well as emergency response teams in the event of an emergency. Fire extinguishers and spill control equipment are present throughout Building 221-T. Arrangements and agreements have been made with non-Hanford Site parties who might be expected to respond in the event of emergencies, and these arrangements are documented in Memorandums of Understanding.

E. Contingency Plan and Emergency Procedures, WAC 173-303-350

An overall Hanford Site emergency plan exists and addresses emergencies that may occur at the Hanford Site. In addition, a contingency plan (Appendix E of the 200 West Building Emergency

Plan) has been prepared for T Plant and is being upgraded to specifically include the Tank 15-1 tank system. The upgraded plan is scheduled for completion by 10/01/89. The Hanford Site emergency plan and the T Plant contingency plan are available and maintained at the Hanford Site. The T Plant contingency plan is amended as needed to ensure that it is kept current and accurate.

F. Emergencies, WAC 173-303-360

The appropriate procedures, as described in the Hanford Site emergency plan, and to be incorporated in the T Plant contingency plan, will be followed in the event of emergencies. Emergencies associated with the Tank 15-1 tank system that require implementation of the Hanford Site emergency plan or the T Plant contingency plan will be reported as soon as they are detected to appropriate state and/or local agencies who have response roles. In such cases, follow-up written reports will be submitted to Ecology within fifteen days after emergencies that require implementation of the emergency plan.

Emergencies that could threaten human health or the environment outside Building 221-T will be reported as soon as detected to Ecology and the National Response Center. In addition, reports of releases from Tank 15-1 will be submitted as described under section III.L., below.

Requirements for Tank Systems

G. Applicability, WAC 173-303-640(1)

The requirements of WAC 173-303-640 apply to the accumulation and treatment of dangerous wastes in tanks by generators; except that, WAC 173-303-640(8)(c) does not apply, and in lieu of WAC 173-303-640(5)(b)(iii) for uncovered tanks, a minimum freeboard of 2 feet must be maintained.

Tank 15-1, including its components, is an existing tank system as defined in WAC 173-303-040. Thus, the requirements of WAC 173-303-640 applicable only to new tank systems or components are not relevant to Tank 15-1.

WAC 173-303-640(2), assessment of existing tank system's integrity, requires that an assessment of the Tank 15-1 tank system be conducted by January 12, 1990.

WAC 173-303-640(4), containment and detection of releases, will not be applicable to the Tank 15-1 containment system until January 12, 1991.

H. Integrity Assessment, WAC 173-303-640(2)

A tank system integrity assessment will be performed, and will be certified by an independent, qualified, registered professional engineer. The assessment of the integrity of the Tank 15-1 tank

system will be based on existing structural, design, construction, materials, and other information. The schedule for performance a tank system integrity assessment will be determined as part of a concentrated effort to assess and attain compliance on the Hanford Site with WAC-173-303-640. In addition, schedules will be negotiated with regulatory agencies to meet Hanford Federal Facility Agreement and Consent Order M-22-00 by December 31, 1989.

To date, there is no evidence of integrity failure for the Tank 15-1 tank system. In addition, a secondary containment system is in place (see section III.I., below) in the event that leaks do develop.

I. Containment and Detection of Releases,
WAC 173-303-640(4)

As described in Section I.A., above, Tank 15-1 and most ancillary piping and connections to Tank 15-1 are protected with secondary containment. Cell 15R provides secondary containment for Tank 15-1. The containment and leak detection systems are currently being evaluated as part of the tank system assessment effort described in Section III.H.

J. General Operation, WAC 173-303-640(5)

Dangerous wastes and treatment reagents are not placed in Tank 15-1 if they could cause the tank to leak, rupture, or otherwise fail. Spillage and overflows are prevented by monitoring the tank levels during each operational shift.

Freeboard in the tank is maintained below two feet by inspections and readings from tank level indicators (i.e., the Tank 15-1 manometer). The level in the tank is never allowed to exceed 145 inches (12 feet) and, as stated in Section I.A., above, the tank is about 14 feet high. Labeling of Tank 15-1 has been addressed in section III.B., above. Tank 15-1 does not handle extremely hazardous waste that is toxic by inhalation. As previously discussed in Sections III.A. and C., treatment processes are operated to prevent the generation and release of emissions to the air.

K. Inspections, WAC 173-303-640(6) and 173-303-320(1), (2)(a), (b), and (d), and (3)

A written inspection plan and schedule for Building 221-T has been implemented. The inspection plan requires daily inspection of monitoring equipment and maintenance of an inspection log, with notations of observations and corrective actions, as needed. The inspection plan is also being upgraded to address additional inspection requirements specific to the 15-1 tank system and is scheduled to be complete by July 1989.

Due to the radioactive nature of the dangerous wastes treated in Tank 15-1, physical observation of some portions of the tank system during its operation exceeds regulatory limits for radiation

exposure. Further evaluation of alternate methods for meeting the intent of physical inspection requirement is being performed. A petition for rulemaking change to the physical inspection requirements will be submitted to the EPA and Ecology by September 30, 1989 in accordance with the Hanford Federal Facility Agreement and Consent Order milestone M-22-01.

L. Response to Releases, WAC 173-303-640(7)

When a leak or spill from Tank 15-1 is detected, the flow or addition of dangerous wastes and/or treatment reagents to the tank will be stopped. If necessary to prevent continued releases from Tank 15-1, the tank will be emptied to an upstream accumulation tank. The cause of the leak or spill will be determined. Appropriate measures will be taken to correct the cause of the leak or spill before Tank 15-1 is reintroduced to service. Releases to secondary containment systems are removed immediately by the cell 15R containment system and eventually rerouted to Tank 15-1. Any major repairs required as a result of a spill or leak from Tank 15-1 will be certified to Ecology by an independent, qualified, registered professional engineer.

If releases to the environment are detected as a result of a spill or leak from Tank 15-1, such releases will immediately be contained. Environmental releases, if they occur, will be removed and their impacts on the environment will be mitigated. Releases to the environment in excess of applicable Reportable Quantities (RQs), or 1 pound, whichever is less, will be reported to Ecology within 24 hours of detection. The National Response Center will be notified pursuant to 40 CFR Part 302. If a 24-hour report to Ecology is necessary, it will be followed up by a written report on the release from Tank 15-1.

M. Closure and Post-Closure Care, WAC 173-303-640(8)

At closure, dangerous wastes and contaminated equipment and structures (including underlying materials contaminated with dangerous wastes or dangerous waste constituents) will either be removed from Tank 15-1 and the surrounding area (cell 15R), decontaminated, or stabilized and closed as a landfill. Closure of Tank 15-1 and the surrounding area will be performed in a manner that will minimize the need for further maintenance; control, minimize, or eliminate post-closure releases that could threaten human health or the environment; achieve the removal and decontamination criteria of WAC 173-303-610(2)(b); and be consistent with the requirements of the Atomic Energy Act and ALARA goals.

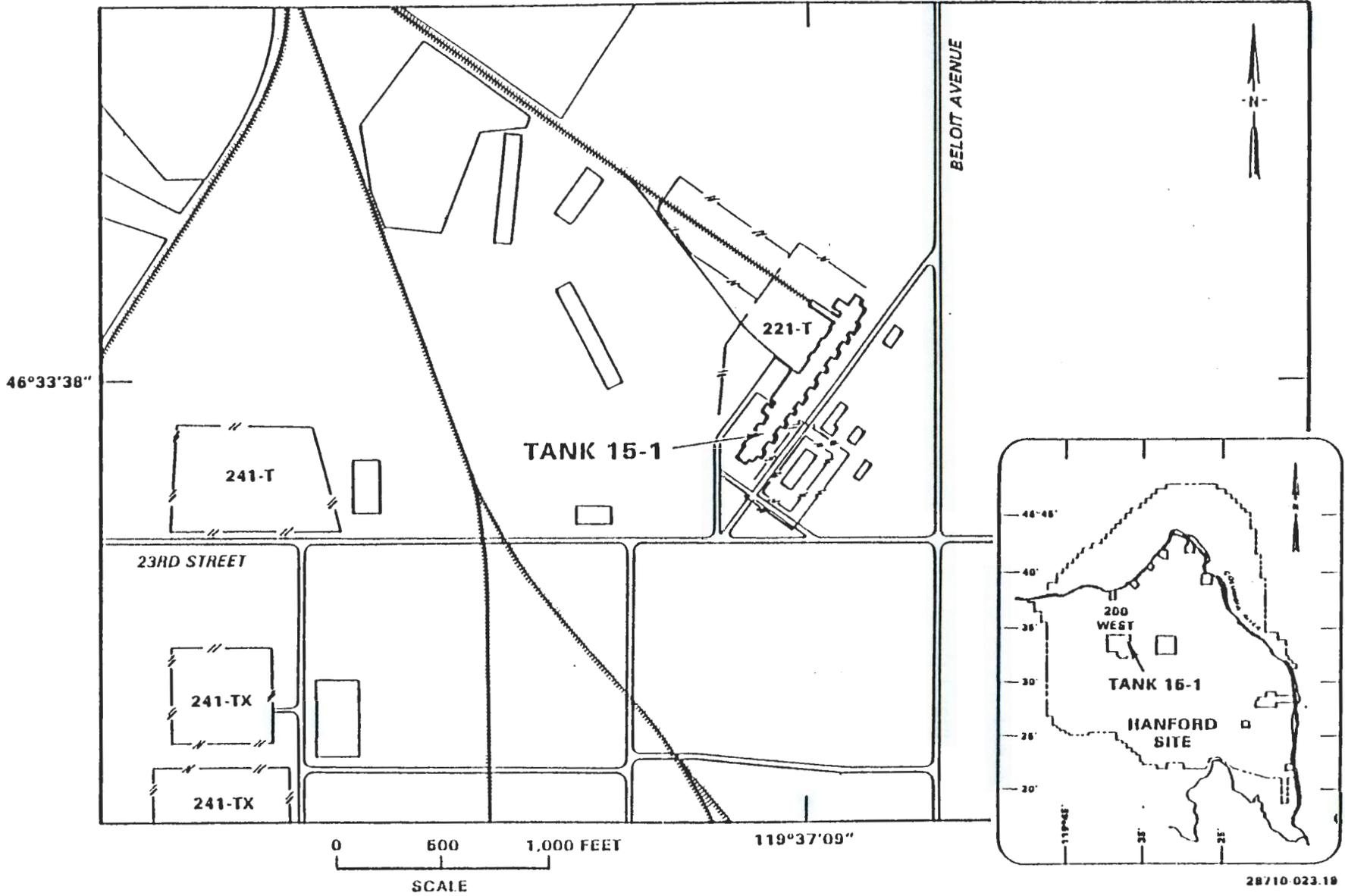
N. Special Requirements, WAC 173-303-640(9) and (10)

Tank 15-1 does not receive or handle ignitable or reactive dangerous wastes. Introduction of acids and caustic to the tank during treatment are done under controlled conditions designed to prevent hazards. The interior of Tank 15-1 is compatible with all dangerous wastes and treatment reagents managed in the tank.

221-T BUILDING TANK 15-1 SITE PLAN

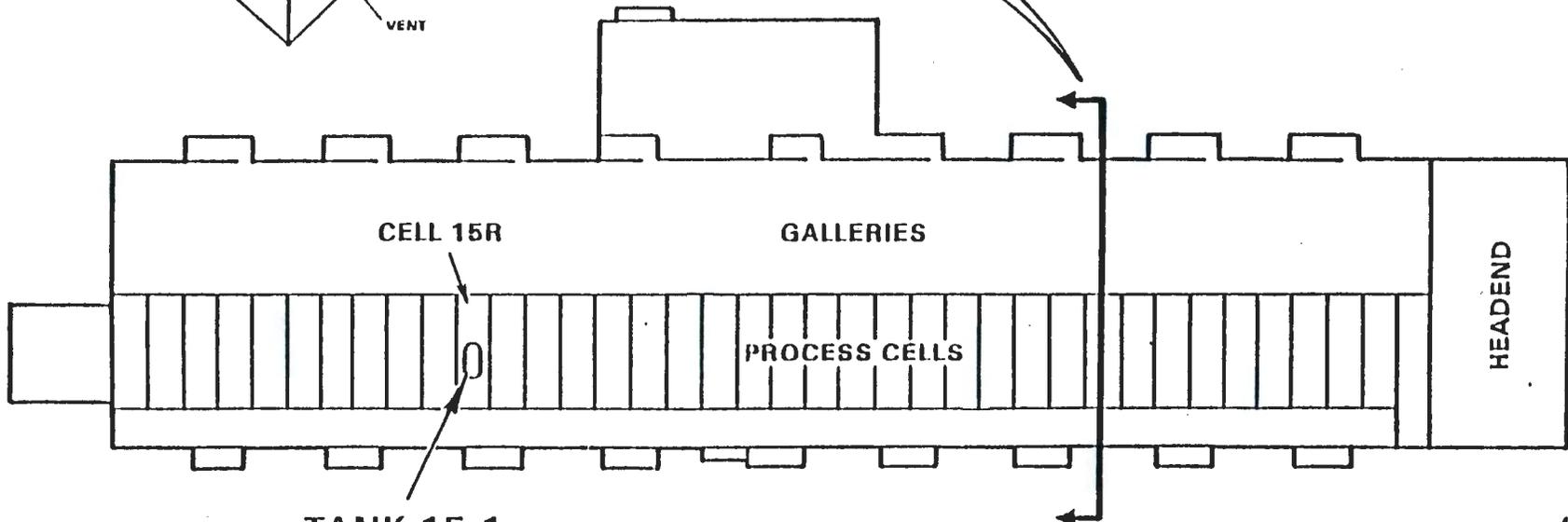
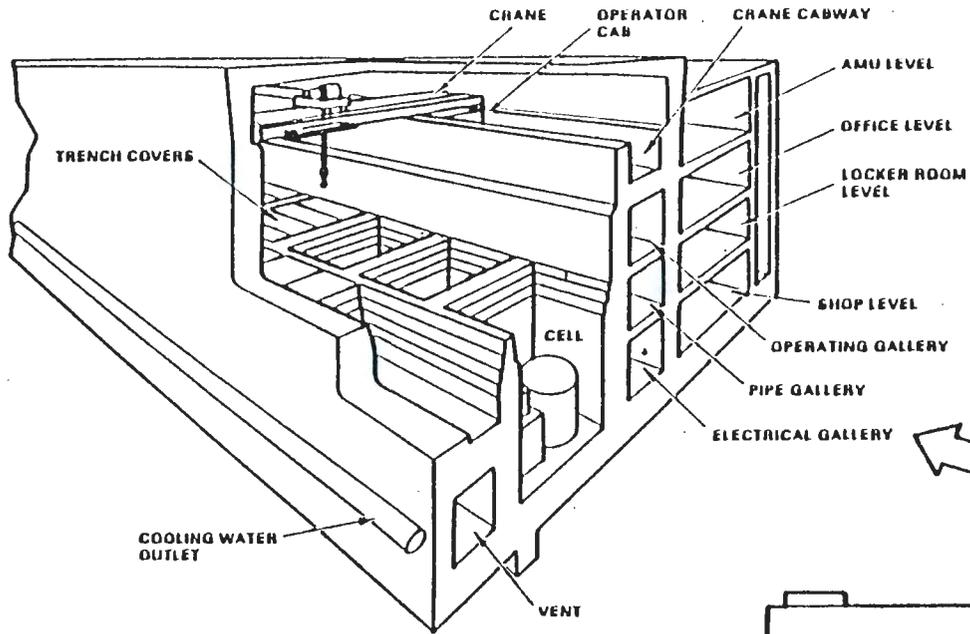
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T Plant Treatment Tank

BUILDING 221-T TANK 15-1 LOCATION

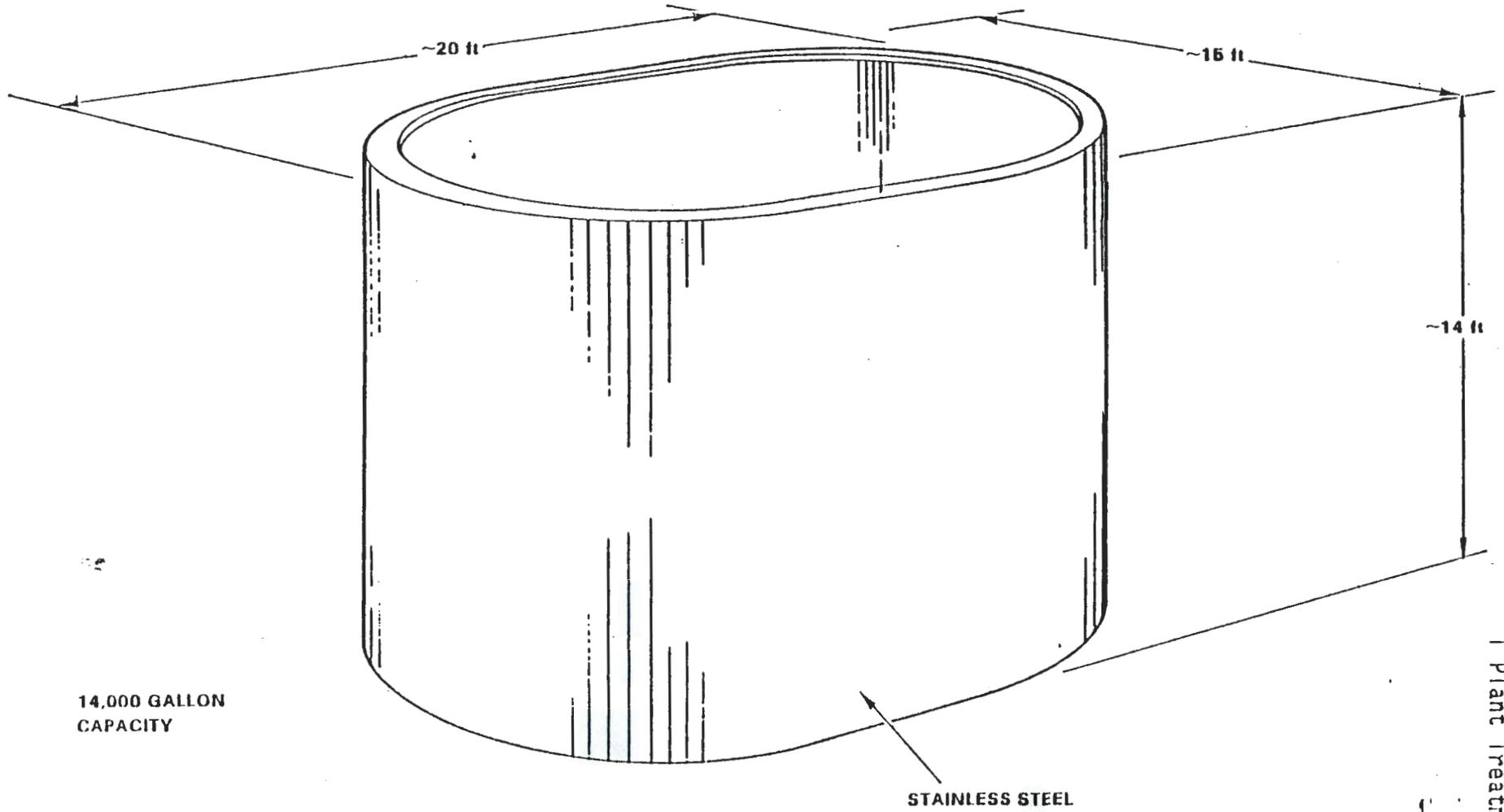


**TANK 15-1
(14,000 GALLON CAPACITY)**

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A-10

TANK 15-1



A-11

14,000 GALLON
CAPACITY

STAINLESS STEEL

28710-023.85

T Plant Treatment Tank