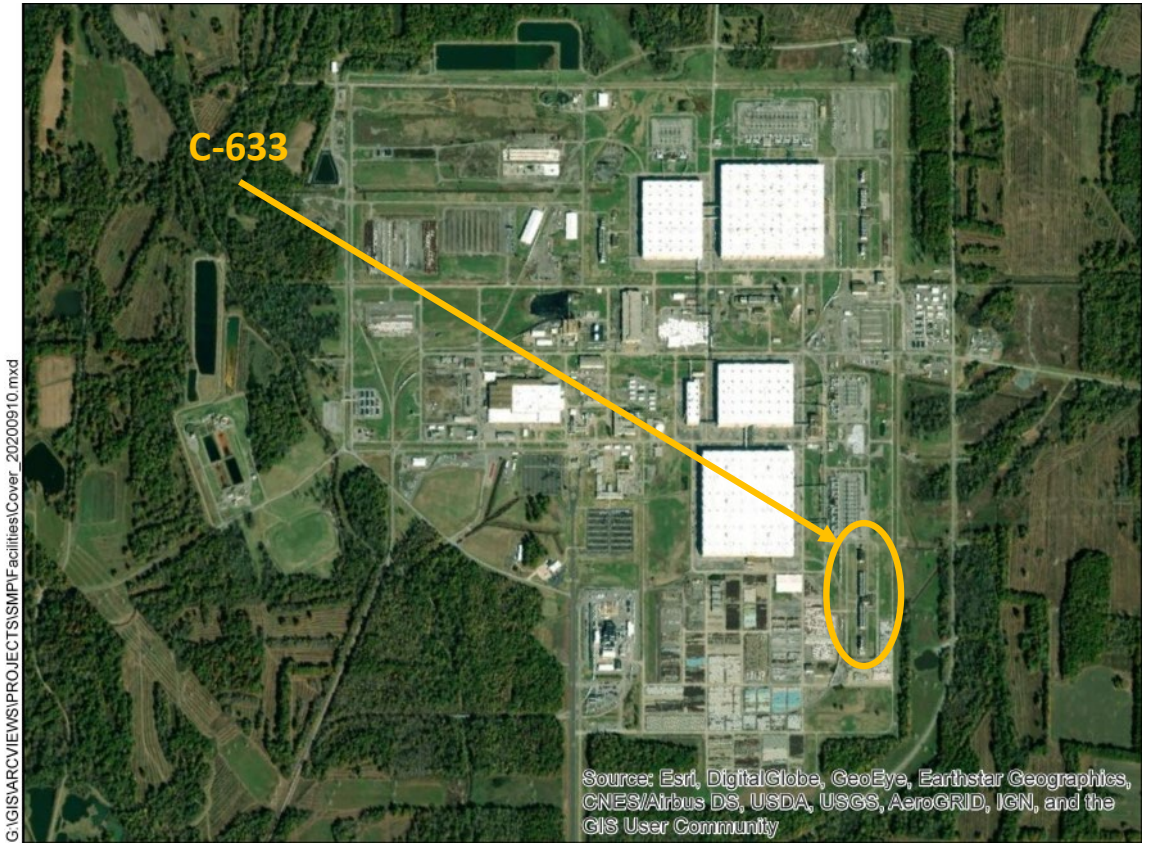
C-633 Pumphouse and Cooling Tower (Solid Waste Management Unit 87)



Facility Overview Briefing

April 4, 2023

Reflects consultation with EPA and Kentucky in accordance with the Site Management Plan that occurred on April 3, 2023, and includes incorporation of comments from those discussions.

Purpose

- The C-633 Pumphouse and Cooling Tower is discussed in Appendix 4 of the Site Management Plan (SMP) and is designated as Solid Waste Management Unit (SWMU) 87.

- The C-633 Pumphouse and Cooling Tower (SWMU 87) is a candidate for future demolition and disposal, contingent upon funding priorities.

- The current SMP strategy includes the removal of the C-633 Pumphouse and Cooling Tower (SWMU 87) facilities as part of the Facility D&D Operable Unit (OU) and evaluation of underlying soils and slabs as part of the Soils and Slabs OU.

- This presentation is intended to serve as clarification of which C-633 Pumphouse and Cooling Tower facilities are associated with SWMU 87 and to document DOE's consultation with EPA and Kentucky for demolition and disposal of the aboveground structures outside of the FFA/CERCLA process.

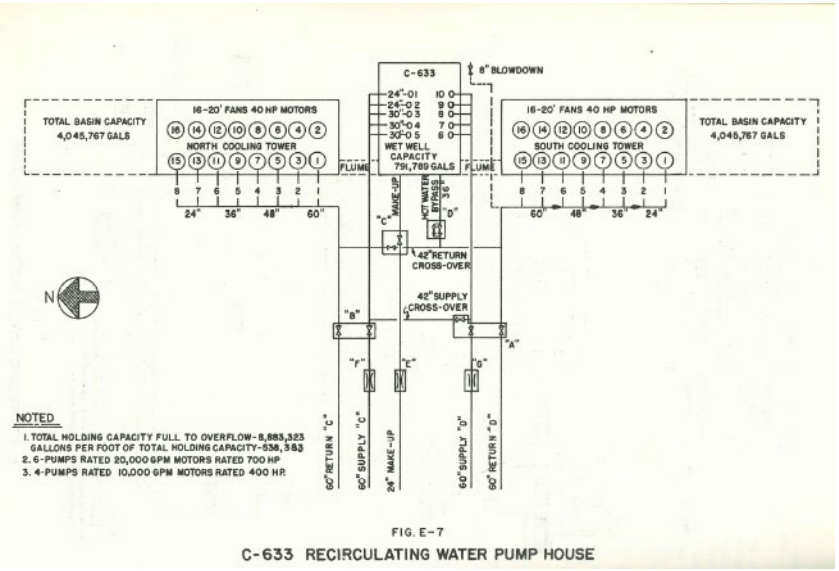
C-633 Cooling Tower Photo: 10/2022

Construction History

- The C-633 Pumphouse and Cooling Tower (SWMU 87) is located within the Paducah Site security fence, southeast of the C-333 process building.
- Construction of the C-633 Pumphouse and Cooling Tower began in 1952/1953; with additional facilities added in 1976/1977, and 1981.
- The C-633 Pumphouse and Cooling Tower is one of four similar sets of facilities designed to support the process buildings (C-331, C-333, C-335, and C-337).
  - The C-633 Pumphouse and Cooling Tower supported the C-333 process building.
- In addition to the process buildings, the four cooling tower and pumphouse facilities also supported additional plant facilities (e.g., switchyards).
  - The C-633 Pumphouse and Cooling Tower did not support C-533 Switchyard; no synchronous condensers are present at C-533.
  - Crossover exists between the C-631 system and the C-633 system through C-333 headers R17/S18.
- The cooling tower and pumphouse facilities were, often referred to as "recirculating cooling water (RCW) plants"
  - Designed to continuously pump cooling water through the process and auxiliary building heat exchangers associated with the gaseous diffusion process.

Construction History

- RCW Cycle:
  - Cooled water was pumped from the pump house through underground supply headers to the process building and into heat exchanger units where the water temperature rose as the water absorbed heat from the process equipment. Heated water was then returned through underground return mains (gravity feed) to the cooling towers where the heated water was distributed through various sections of the cooling tower and released via evaporation. The cooled water was then collected into the cooling tower basin where it flowed by gravity via a flume into the wet well located underneath the pump house.
    - Cooled water from the pump house was also pumped through underground supply headers to the synchronous condensers located in the switchyard; where the water was heated and then returned through underground return mains (gravity feed) to the cooling towers
  - Approximately 500 million gallons per day (MGD) of water was recirculated through the four cooling tower and pumphouse facilities with nearly 8-25 MGD of water loss to evaporation each day depending on the plant load or power level.

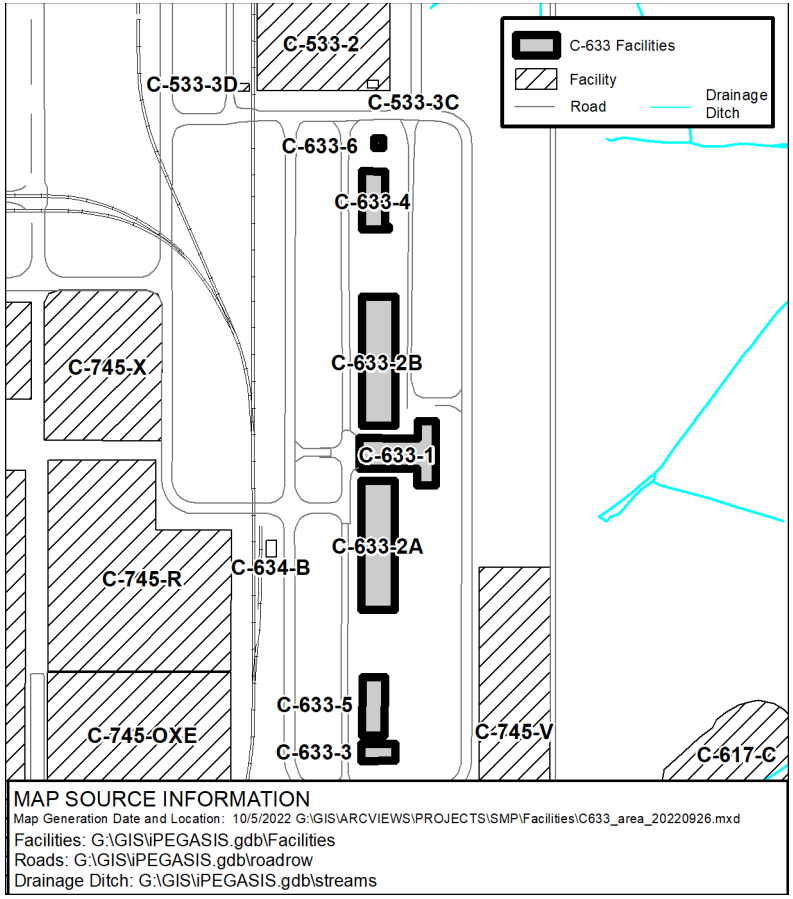


C-633 Cooling Tower Diagram: 7/1962

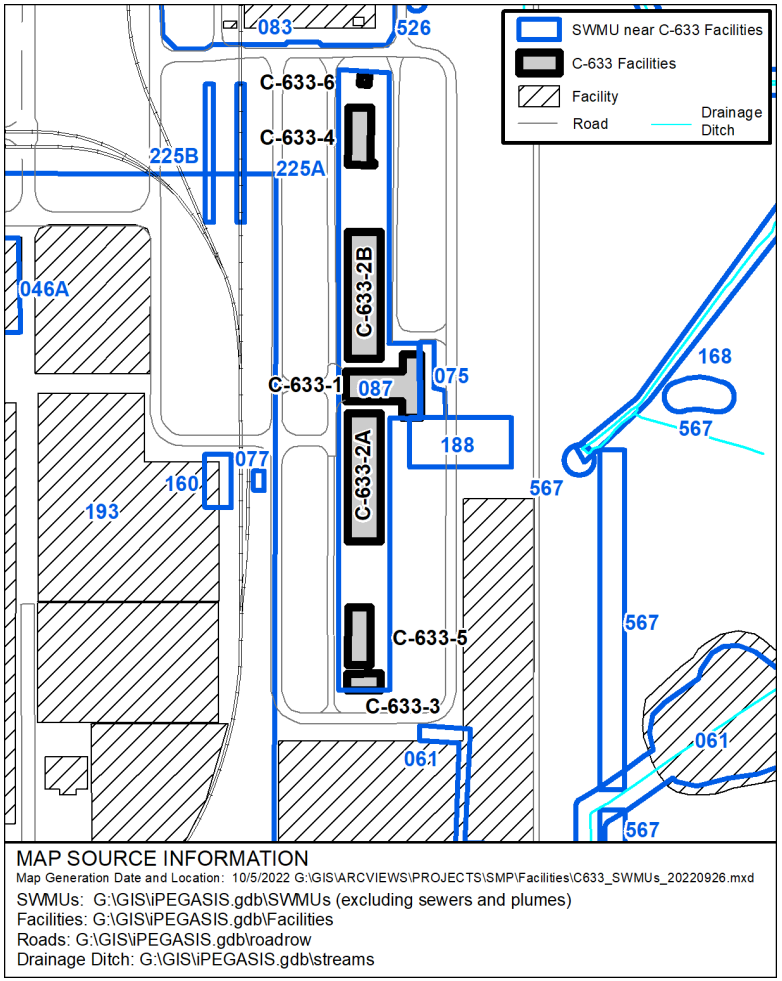
- Each pumphouse and cooling tower contained the following.
  - Pump house
  - Main cooling tower(s)
  - Blending pump house
  - Blending cooling towers
  - Other support buildings

Construction History

- The C-633 Pumphouse and Cooling Tower is made up of multiple facilities generically referred to as the C-633 Cooling Tower.
  - C-633-1 Pump House and Piping
  - C-633-2A Cooling Tower (South)
  - C-633-2B Cooling Tower (North)
  - C-633-3 Blending Pump House
  - C-633-4 Blending Cooling Tower (North)
  - C-633-5 Blending Cooling Tower (South)
  - C-633-6 Sand Filter Building
- The total area for all the main structures associated with C-633 Cooling Tower is approximately 55,660 ft^2; with construction details, operational history, and current status for each facility discussed in subsequent slides.



Environmental Impacts (Solid Waste Management Units)



- The current SAR (SWMU 87) for the C-633 Pumphouse and Cooling Tower does not identify the specific facilities that are included in SWMU 87.

SWMU No.	Facility Name	Current Status
46 A	C-746-Q Hazardous and Low-Level Mixed Waste Storage Facility (includes C-746-Q1)	Permitted Facility
61	C-375-E5 Effluent Ditch (KPDES 013)	Surface Water OU
75	C-633 PCB Spill Site	Soils and Slabs OU
77	C-634-B Sulfuric Acid Storage Tank (slab and underlying soils)	Soils OU; Soils and Slabs OU
83	C-533 Switchyard (slab and underlying soils)	Soils and Slabs OU; Facility D&D OU
87	C-633 Pumphouse and Cooling Tower (slab and underlying soils)	Soils and Slabs OU; Facility D&D OU
102 B*	Plant Storm Sewer associated with C-333-A, C-337-A, C-340, C-535, and C-537	Surface Water OU
160	C-745 Cylinder Yard Spoils (PCB Soils)	Soils OU
168	KPDES Outfall Ditch 012	Surface Water OU
188	C-633 Septic System	No Further Action; KDWM 10/20/1993
193	McGraw Construction Facilities (Southside Cylinder Yards)	DUF_6 Footprint Underlying
225 A	OS-14	Soils OU
225 B	Contaminated Soil Area near C-533-1 DMSA OS-14	Soils OU
526	Internal Plant Drainage Ditches (includes KPDES 016)	Surface Water OU
567	Soil Pile K013 near Outfall 013, West of Little Bayou Creek	Soils OU

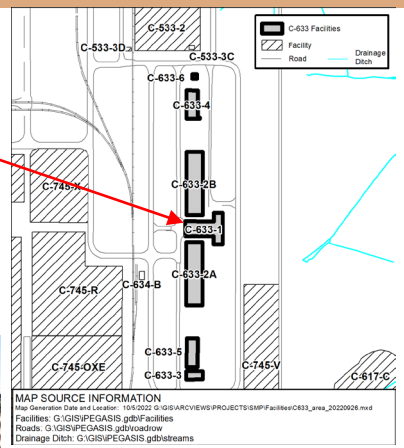
* Not shown on map.

C-633-1 Pump House and Piping

C-633-1 Pump House and Piping

C-633-1 Pump House and Piping - Construction History

- C-633-1 Pump House and Piping facility is one of seven facilities located in SWMU 87.
- The facility was constructed in 1952/1953.
- C-633-1 is composed of three main structures (center structure, east wing, and west wing) on poured concrete foundations that vary from 6 to 21 inches in thickness.
  - The center structure is a single level, high-bay steel frame building with a built-up flat roof and exterior transite walls.
    - Garage-like structure with a roll-up door and pedestrian entrance.
    - Houses RCW pumps.
    - Wet well runs beneath the concrete floor.
    - External to the center structure is a wet well overflow/blowdown vault.
  - The east wing is a one-story concrete block building attached to the east side of the center structure.
    - East wing contains electrical switchgear room, battery room, restroom/shower/change area.
    - External to the east wing is a separate exterior concrete block wall with attached electrical transformers.
  - The west wing is a one-story concrete block building attached to the west side of the center structure.
    - West wing served as a chemical feed area with a loading dock/area.
    - Contains an acid room, Calgon room (e.g., chemical feed room), and a chlorine room with safety shower and eye wash station.
    - A mixing flume that connects the two influent flumes from the C-633-2A and C-633-2B cooling towers runs beneath the floor and is connected to the wet well.
    - Contained a laboratory bench area with sink (no longer present); drained to wet well.



C-633-1 - Pump House West Wing View

C-633-1 - Pump House Center Structure

Wet Well Overflow/Blowdown Vault

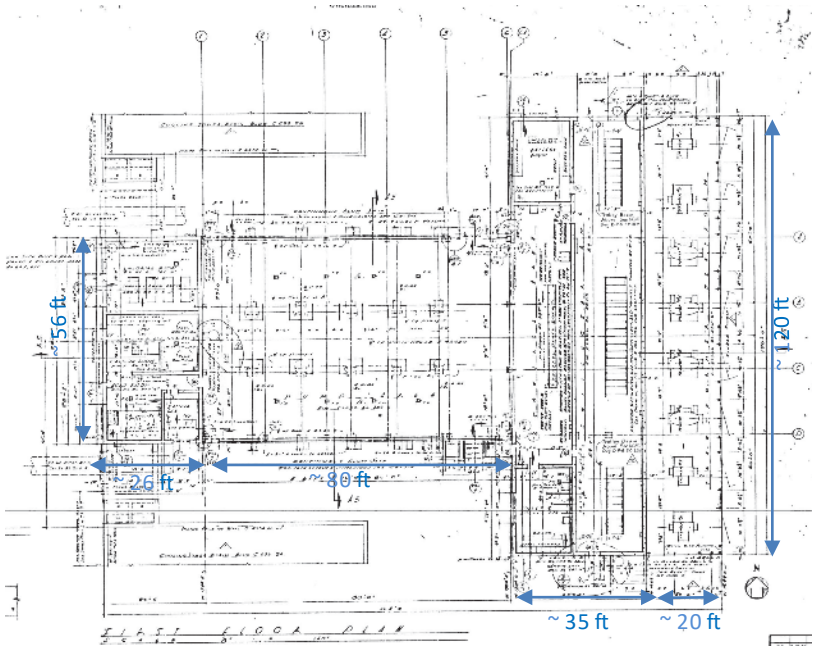
C-633-1 - Pump House East Wing View

External Electrical Transformers

C-633-1 Facility Photos: 10/2022

C-633-1 Pump House and Piping - Construction History

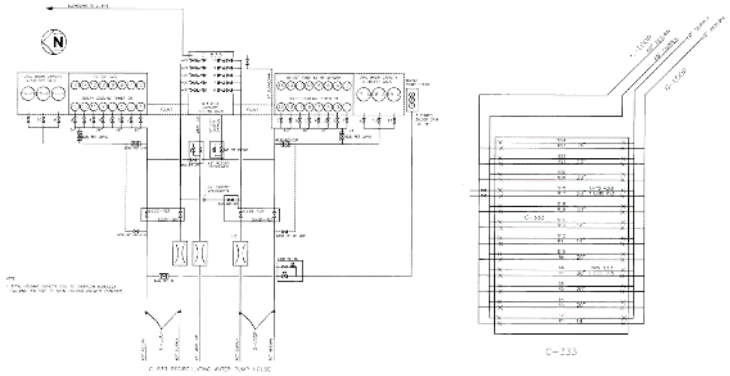
- The C-633-1 facility is approximately 12,536 ft^2 (includes external section that houses the transformers).
  - The center structure is approximately 4,480 ft^2; measuring ~80 ft x ~56 ft.
    - Wet well beneath the entire center structure measuring ~27 ft deep (~ 791,789 gal capacity) with an external wet well overflow/blowdown vault measuring ~5 ft x ~18 ft located at a depth of ~6-7 ft.
    - Eight floor drains; four drain to the sanitary sewer system and four drain into the overflow pit and back into the wet well.
    - Two pressure relief valves located along the bottom of the wet well floor.
  - The east wing is approximately 4,200 ft^2; measuring ~35 ft x ~120 ft.
    - Multiple floor drains associated with battery room and restroom/shower/change area, that drain to the sanitary sewer system.
    - External to the east wing structure is an additional outside concrete area approximately 2,400 ft^2; measuring ~20 ft x ~120 ft that houses eleven electrical transformers.
  - The west wing is approximately 1,456 ft^2; measuring ~26 ft x ~56 ft.
    - Contains an mixing flume area measuring approximately ~26 ft x ~56 ft x ~9 ft located at a depth of ~20 ft that runs beneath the entire west wing (connects to the wet well located beneath the center structure).
      - Two influent flumes measuring ~ 14 ft x ~23 ft x ~9 ft each located at a depth of ~20 ft enter the mixing flume from the C-633-2A and C-633-2B cooling towers.
    - Four floor drains and a laboratory sink (no longer present) that drain into the wet well.



Floor Plan View: Excerpt from Engineering Drawing C-633-1 G2-2-A, dated 1959

C-633-1 Pump House and Piping - Operational History

- C-633-1 was originally built and operated as a pump house from its construction in 1952/1953 to 2013.
  - Pumped RCW from the wet well located beneath the pump house through 60-inch underground supply headers to the C-333 process building.
  - Utilized 4 – 36-inch and 6 – 48-inch multi-stage deep well turbine pumps with 400 and 700 hp motors capable of 10,000 gallons per minute (gpm) and 20,000 pgm pumping rate, respectively.
    - The pumps, motors, and associated valves have been upgraded and/or replaced as needed to support operations.
  - Chlorine, sulfuric acid, and corrosion inhibitors were routinely fed into the RCW system via the wet well located beneath C-633-1.
    - Chorine was fed to control the growth of algae and other microbiological organisms.
    - Sulfuric acid was fed to control the pH or hydrogen ion concentration (Note: Soda ash was occasionally used on a non-routine basis for pH correction.)
    - Corrosion inhibitors were fed to help maintain piping and equipment integrity.
      (Note: For a brief period, prior to 1962, corrosion inhibitors also were dissolved in 500-gal stainless steel tanks; pumped into the plant water line at C-611, and introduced into the RCW system with make-up water.)



Excerpts from M5E-Z66150-E01, Rev 2

C-633-1 - Center Structure Pumps

Wet Well
(located beneath the concrete)

C-633-1 Facility Photos: 10/2022

C-633-1 Pump House and Piping - Operational History

- Corrosion of the piping and heat exchanger units became a reoccurring problem within two years of cooling tower startup.
  - 1952 -1956 – a polyphosphate inhibitor (e.g., Calgon), focused on steel corrosion, was introduced into the RCW system.
    - Within two years severe pitting of the copper condenser tubes had progressed to complete penetration of the tube wall resulting in the loss of Freon-114 into the RCW.
  - 1956 – the RCW system was switched over to a polyphosphate-chromate inhibitor (dianodic inhibitor) effective against both steel and copper corrosion, but prone to fouling.
  - 1957 – an A-line cooling program was initiated to clean the condenser tube bundles; at this time the RCW system was switched to a zinc dianodic inhibitor (Orocol 155-Z), a polyphosphate-chromate inhibitor that contained about half the phosphate content and added zinc.
  - 1962 – further testing of the corrosion inhibitors was conducted in a pilot plant corrosion test loop in C-633; resulting in change to Betz Orocol TL, a polyphosphate-chromate inhibitor, which was used until the RCW system was converted to a phosphate system.
  - 1992/1993 – the RCW system (one cooling tower at a time) was converted from a chromate system to a phosphate system. [Note: In 1996 and 2000/2001 the RCW system was adjusted based on vendor product changes/updates (use of dispersant to help with the calcium phosphate depositing/scaling)].

C-633-1 - West Wing Calgon Room (Corrosion Inhibitor Feed Area)

C-633-1 - West Wing Chlorine Feed Header

C-633-1 – West Wing Sulfuric Acid Dock

C-633-1 - West Wing Sulfuric Acid Storage and Feed Area

C-633-1 Facility Photos: 10/2022

C-633-1 Pump House and Piping - Operational History

- In 1969, concrete walls were installed in between each of the transformers located outside of the west wing of C-633-1.
  - Walls were installed for fire protection.

- USEC leased the facility in the early 1990s and continued to use C-633-1 as a pump house until enrichment operations ceased at C-333 in 2013.

- In 1990, various polychlorinated biphenyl (PCB) spills associated with the transformers occurred; all areas were addressed.
  - September:
    - 9/18 – Drain valve leak (3PH5); >500 ppm
    - 9/22 – Transformer leak (3PH5); 8 ppm
    - 9/24 – Leak on pad/gravel; 7.5 ppm
  - October:
    - 10/12 – PCB containment dike found to be leaking rainwater with detectable PCBs; dike pumped and area cleaned up.
      - In 1991, the site was decontaminated prior to sealing the dike.
    - 10/21 – Back flange leak (3PH6B); 3 ppm
    - 10/21 – Back flange leak ((3PH7); 18 ppm

- In 1992, approximately one quart of oil leaked from a drum onto the floor within the pump house; oil was cleaned up.

- In 2008, there was a small PCB leak located at transformer 3PH4B; < 50 ppm.

C-633-1 - East Wing External Transformers

C-633-1 - East Wing Interior Switchgear Room

C-633-1 Facility Photos: 10/2022

C-633-1 Pump House and Piping - Operational History

- In 2009, there were two PCB events; both < 50 ppm.
  - Spill occurred southeast of the C-633 cooling towers when a transformer was being moved; resulted in an 8 ft X 9 ft area of soil that was removed.
  - Small leak at secondary buswork associated with 3PH4A.

- In 2013, C-633-1 was shutdown, along with its associated cooling towers (main cooling towers and blending towers).
  - Subsequent RCW leaks from pumps and associated lines occurred with some impact to the pad and surrounding drainage ditches.
  - The wet well and mixing flume were not drained and remained full of water. (Note: Draining has not occurred in order to prevent hydrostatic pressure changes that could cause collapse or floating of the subsurface structure.)

- In 2013, a leak associated with the pump for the General Electric (GE) Betz Dianodic DN 2250 (mild steel corrosion inhibitor) chemical tank was discovered in the chemical feed room.
  - Approximately 10-15 gallons of material was lost.
  - Area was cleaned and corrective action put in place with GE equipment to modify connections to prevent future leaks.

- C-633-1 transitioned from USEC to DOE in 2014.

- In 2015, there was a small PCB leak located associated with transformer 3PH3; sample indicated a PCB value of 8.1 ppm.

C-633-1 - Center Wing
No. 1 RCW Pump and Discharge Lines

C-633-1 West Wing
Betz Chemical Feed Tank

C-633-1 Facility Photos: 10/2022

C-633-1 Pump House and Piping - Operational History

- In November 2017, solid waste exceeding Toxicity Characteristic Leaching Procedure (TCLP) limits for chromium, mercury, and lead was discovered in the bottom of the diked areas located within the cooling tower pump houses.
  - Waste was associated with the chemical tanks that contained corrosion inhibitors (including sulfuric acid).
  - Waste included crusty residues, sludges, liquids or a combination thereof.
  - Waste was removed and disposed in 2018.

C-633-1 West Wing
Diked Area Beneath Corrosion Inhibitor Tanks

C-633-1 West Wing
Diked Area Beneath Corrosion Inhibitor Tanks

C-633-1 West Wing
Sulfuric Acid Pig and Tanks Location

C-633-1 Facility Photos: 10/2022

C-633-1 Pump House and Piping - Current Status

- C-633-1 is shutdown; the transformers no longer supply power to any facilities.

- Walkdown inspection conducted in October 2022 and employee interviews confirmed no unusual conditions.
  - Center Structure:
    - Houses RCW pumps.
    - Cement corrugated siding (transite).
    - Both asbestos-containing materials (ACM) and lead-based paints are known to be present.
    - Wet well runs beneath the concrete floor; chlorine, sulfuric acid, and corrosion inhibitors (including chromate) were routinely fed into the RCW system via the wet well (wet well remains full of water).
    - External to the center structure is a wet well overflow/blowdown vault.
    - Eight floor drains are present; four drain to the sanitary sewer system and four drain into the overflow pit and back into the wet well.
    - Not used for radiological storage; the center structure of the facility does not contain any radiological postings.
    - No generator staging area (GSA) or satellite accumulation area (SAA).
    - Minor oil staining around several of the RCW pumps.
    - Chromated water leaks have occurred within the center structure of the facility.
    - Minor oil spill in 1992 from a drum (see slide 12).
    - No known chemical spills except for the above noted chromated water leaks and oil spill.

C-633-1 - Center Structure No. 9 RCW Pump

C-633-1 - Center Structure No. 9 RCW Base/Open to Wet Well

C-633-1 - Center Structure High Pressure Air Tank

C-633-1 - Center Structure Control Panel

C-633-1 - Center Structure Steam Supply Station

C-633-1 - Center Structure Pump Oil Stain

C-633-1 - Center Structure Typical Floor Drain (damaged around edge)

C-633-1 Facility Photos: 10/2022

C-633-1 Pump House and Piping - Current Status

- Walkdown inspection conducted in October 2022 and employee interviews confirmed no unusual conditions (Continued).
  - East Wing:
    - Houses electrical switchgear room, battery room, and restroom/shower/change area.
    - Multiple floor drains associated with battery room and restroom/shower/change area.
    - 125-volt lead calcium batteries (60 cells) used for relay protection (no longer present).
    - Eleven transformers (five – 480 V and six - 4160 V) with associated electrical switchgear; all have been air-gapped.
      - Nine of the eleven have been drained; 3PH1 and 3PH2 are newer transformers that contain oil so that they can be utilized as spare transformers should the need arise.
      - Six of the eleven transformer tanks are non-PCB (3PH1, 3PH2, 3PH5, 3PH6B, 3PH8, 3PH9); the five remaining transformer tanks contain PCBs < 50 ppm (3PH3, 3PH4A, 3PH4B, 3PH6A, 3PH7).
      - Multiple PCB spills have occurred (see slides 12 and 13).
      - Note: Transformers have been upgraded and replaced over the years.
    - Not used for radiological storage; the east wing of the facility does not contain any radiological postings.
    - No GSA or SAA.
    - Both ACM and lead-based paints are known to be present.

C-633-1 - East Wing
Transformer Sprinkler System

C-633-1 – East Wing
Switchgear Room – Looking North

C-633-1 – East Wing
Battery Charger

C-633-1 - East Wing
Sanitary Water Supply

C-633-1 - East Wing
Restroom/shower/change area

C-633-1 – East Wing
Change House Locker Area

C-633-1 Facility Photos: 10/2022

C-633-1 Pump House and Piping - Current Status

- Walkdown inspection conducted in October 2022 and employee interviews confirmed no unusual conditions (Continued).
  - West Wing:
    - Houses chemical feed area which is divided into three main sections: acid room (with loading dock), Calgon room, and a chlorine room.
    - Loading dock/area housed sulfuric acid pigs/day tanks.
    - Calgon room housed tanks of corrosion inhibitors; area within the dike contained solid waste exceeding TCLP limits for chromium, mercury, and lead that have been removed.
      - GE Betz Dianodic DN2250 (mild steel corrosion inhibitor) chemical tank leak in 2013 (see slide 13).
    - Chlorine room housed chlorine tanks.
    - Four floor drains are present; drain to wet well.
    - Laboratory bench area with sink (no longer present) and drain; drain to wet well.
    - Contains a mixing flume located beneath the concrete (mixing flume remains full of water).
    - Manhole located in north west corner of chlorine room.
    - Both ACM and lead-based paints are known to be present.
    - No GSAs or SAAs.
    - Not used for radiological storage; the west structure of the facility does not contain any radiological postings.
    - No known chemical spills except for the above noted Betz chemical tank leak in 2013 (see slide 13).

C-633-1 - West Wing
Calgon Area

C-633-1 - West Wing
Chlorine Monitor Cooler

C-633-1 - West Wing
Chlorine Fan Exhaust Duct and Metering

C-633-1 - West Wing
Sulfuric Acid Storage and Feed Area

C-633-1 - West Wing
Chlorine Room Floor Drain

C-633-1 -West Wing
Chlorine Room
Manhole Cover

C-633-1 - West Wing
Safety Shower

C-633-1 Facility Photos: 10/2022 and 1/2023

C-633-1 Pump House and Piping – Environmental Impacts

- No information to indicate a release or threatened release of a hazardous substance that would require a CERCLA evaluation for a potential response action for demolition of the aboveground structure to protect future public health or welfare or the environment.
  - C-633-1 has exclusively operated as a pump house that pumped RCW from the wet well located beneath the pump house through 60-inch underground supply headers to the C-333 process building from its construction in 1952/1953 to 2013.
  - Building materials used for construction could contain lead-based paints, ACM, and PCB-containing materials [e.g., C-633-1 has cement corrugated siding (transite), PCB transformers].
  - Building debris generated from demolition of the aboveground structures can be properly managed using standard demolition and waste management practices.

- Process knowledge and employee interviews indicate that the historical construction and system processes at C-633-1 involved equipment and chemicals that could have the potential to pose a release threat to the concrete pad and underlying soils. (See slide 6 for SWMU 87 details.)
  - Chromated water leaks have occurred; making the slab, underlying soils and surrounding area suspect for potential chromium contamination.
  - A wet well (currently full of water) runs beneath the concrete floor where chlorine, sulfuric acid, and corrosion inhibitors (including chromate) were routinely fed into the RCW system via the wet well.
    - Two pressure relief valves located along the bottom of the wet well floor.
  - An mixing flume (currently full of water) runs beneath the concrete floor where floor drains from the chlorine room, Calgon room, and acid room drained into the wet well.
  - Transformers located on the east side of the building contain PCBs; making the slab, underlying soils, and surrounding area suspect for potential PCB contamination.
  - Solid waste exceeding TCLP limits for chromium, mercury, and lead was discovered in the diked area located within the cooling tower pump house (waste was removed and disposed in 2018).

C-633-1 Pump House and Piping - Conclusion and Recommendations

- Walkdown inspection of the facility, employee interviews, and other reviewed historical information did not identify any unusual conditions that would pose a potential threat of environmental release during future demolition of the aboveground structure.
  - Deactivation will include removal of any accessible loose items being stored and certain equipment (e.g., pumps, motors, valves, electrical transformers and switchgear, etc.) (to the extent practicable) prior to demolition.
  - Any floor drains (along with the wet well, mixing flume, wet well overflow/blowdown vault, manholes, and supply/return lines) will be delineated, documented, and isolated prior to demolition.
  - An evaluation will be made to determine if any measures may be appropriate to stabilize and/or isolate the basement (or portions thereof) from the main floor prior to demolition. [Note: Measures other than mechanical isolation (one example of a measure other than mechanical isolation would be the addition of flowable fill) will require additional consultation with EPA and Kentucky.]
  - Water from the wet well and mixing flume will be evaluated for removal and proper disposal as part of deactivation and/or predemolition activities. (Note: Because the wet well and mixing flume are part of the underlying slab and soils that constitutes the SWMU, a SWMU notification, along with a SAR revision, will be performed documenting removal and disposal of the water associated with deactivation and/or predemolition activities.)

- Pending completion of deactivation and availability of funding, proceeding with demolition and disposal of the C-633-1 facility (aboveground structure) outside of the FFA/CERCLA process, contingent upon the fact that no additional changes have occurred that would affect the CERCLA determination of the facility prior to demolition, is recommended.

- All applicable laws, regulations, and DOE procedures/protocols will be followed to ensure the demolition and disposal of the aboveground structure occurs in a safe, compliant manner, including conducting any additional radiological characterization through confirmation radiological surveys (as necessary) to support demolition and waste disposition.

C-633-1 Pump House and Piping - Conclusion and Recommendations

- Based on the construction and historical use at C-633-1, demolition and disposal of the aboveground structure for C-633-1 is recommended to be conducted outside of the FFA/CERCLA process.

- As part of the demolition of the aboveground structure, the appropriate best management practices (BMPs) will be evaluated and implemented (as needed) to prevent/minimize the pooling and/or migration of storm water that may come into contact with any contamination that may exist on the pad/subsurface structure(s). For example, the following BMPs will be implemented as necessary:
  - Radiological surveying will occur following demolition.
  - Decontamination and/or application of fixatives and/or barriers to contaminated surfaces above regulatory posting limits.
  - Isolation measures and other types of barriers to minimize and/or control runoff/pooling of contaminated storm water [e.g., seal inlets to drains/sumps/subsurface structure(s)].

- Removal of the C-633-1 facility from the Facility D&D OU will be documented in the appropriate annual SMP revision.

- Based on the construction and historical use at C-633-1, it is recommended that the underlying slab and soils undergo further CERCLA evaluation as part of Soils and Slabs OU as currently identified in Appendix 4 of the SMP.
  - The SAR for SWMU 87 will be updated to clarify that the C-633-1 underlying slab and soils constitutes the SWMU and will undergo a remedial field investigation as part of the Soils and Slabs OU.
  - Consideration will be given to coordinate the timing for issuance and finalization of a revised SAR for SWMU 87 that includes updated information on C-633-1 prior to removal of the aboveground structure.

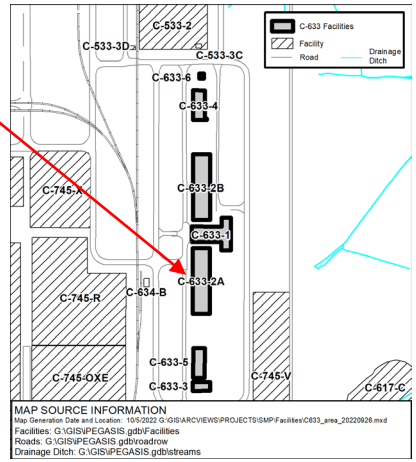
C-633-2A (South) Cooling Tower

C-633-2A (South) Cooling Tower

C-633-2A (South) Cooling Tower - Construction History

- C-633-2A Cooling Tower facility is one of seven facilities located in SWMU 87.
- The facility was originally constructed in 1952/1953.
- The facility is a wood frame structure (originally approximately 48 ft tall) resting on a 2-ft thick poured concrete pier-type foundation; a deck roof with railing and fan shrouds; and exterior walls of corrugated panels.
  - Often referred to as a "main cooling tower."
  - Supports 8 pairs of back-to-back cooling tower cells; total of 16 cooling tower cells. Each cell operates independently of the other cells.
    - Each cell has a fan and driving motor; total of 16 fans/driving.
    - Fans are enclosed by protective shrouds.
    - One riser serves each pair of back-to-back cells; total of 8 risers.
    - The tower contains a water distribution system (including lateral flush lines), cold water fill (system of baffles), and mist eliminators.
    - Piping and sprinklers for fire protection throughout.
  - Cools RCW and returns it to the below grade collection basin.
    - Footprint of the basin is larger than the aboveground footprint of the cooling tower; extending an additional 248 ft south of the cooling tower (this section has a concrete slab top).
    - Basin is open and visible.
    - Influent flume located on the north west corner (exterior to the basin).
    - Ten pressure relief valves located along the bottom of basin floor.

C-633-2A Main Cooling Tower (South)



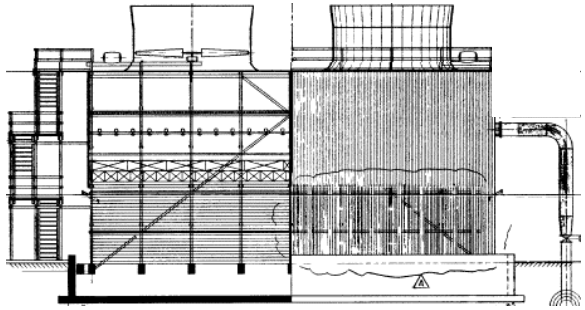
C-633-2A Cooling Tower – West Side

C-633-2A Facility Photo: 10/2022

C-633-2A (South) Cooling Tower - Construction History

- C-633-2A Cooling Tower facility (Continued)
  - Houses the beginning of an influent flume.
    - Influent flume exits the north west corner of the basin of the cooling tower; connecting the cooling tower basin to the mixing well located in C-633-1 pump house.
  - West side infrastructure.
    - Eight water riser pipes; connect into the below grade piping system.
    - Two external concrete buildings; house the fire sprinkler system.
    - Twenty vaults are located within the footprint of the two main cooling towers with nine supporting C-633-2A (See slide 25 for details).
  - East side infrastructure.
    - Two exterior wood staircases; one located on the south end and one located on the north end.
    - Lateral flush lines and connections.
    - Power supplies.
  - Roof infrastructure.
    - Wood decking with railing that extends the circumference of the tower.
    - Support fans enclosed with protective shrouds.

Historical Photo of Cooling Tower Roof Deck and Shrouds



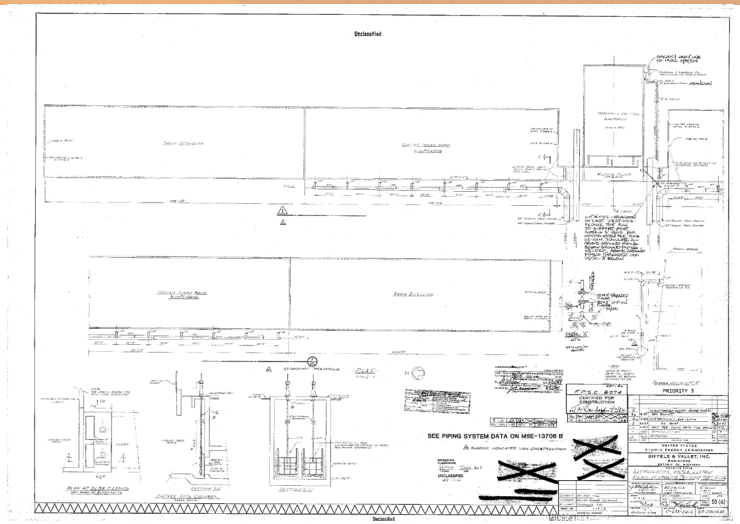
Internal Cooling Tower Components
Excerpt from Engineering Drawing HUC3403-001-01

C-633-2A Cooling Tower East Side

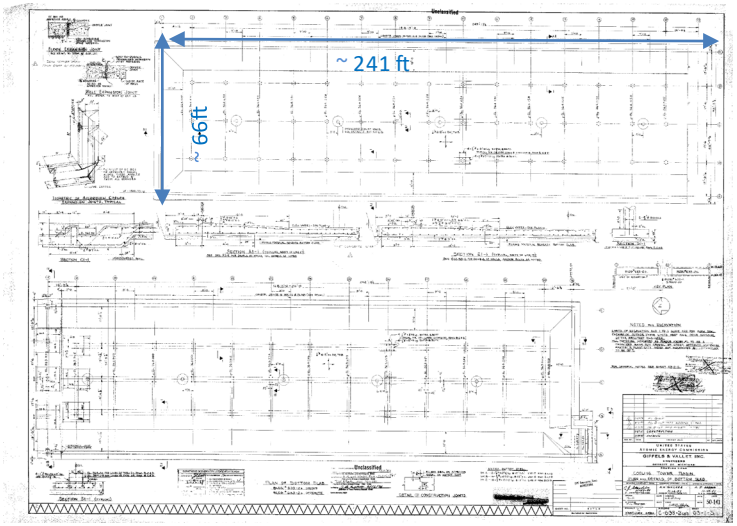
C-633-2A Facility Photo: 10/2022

C-633-2A (South) Cooling Tower - Construction History

- The C-633-2A facility (aboveground structure) is approximately 15,906 ft^2; measuring ~66 ft x ~241 ft.
  - Collection basin (underground) measuring ~66 ft x ~489 ft x ~15 ft.
    - Footprint is larger than the aboveground footprint of the C-633-2A cooling tower; extending an additional 248 ft south of the C-633-2A cooling tower (this section has a concrete slab top).
  - Influent flume exiting the basin measuring ~14 ft x ~23 ft x ~9 ft located to a depth of ~20 ft.
    - Runs underground from the cooling tower basin to the C-633-1 pump house mixing flume, which in turn enters into the wet well.
  - Two external concrete buildings measuring ~6 ft 8 inches x ~10 ft 8 inches x ~9 ft.
    - Houses the fire sprinkler system.
    - Located within footprint of main cooling tower.



Excerpt of Engineering Drawing of C-633-2A & 2B Layout; G3-2000M, dated 1951



Excerpt of Engineering Drawing of C-633-2A & 2B Layout; G3-1-S, dated 1951

C-633-2A (South) Cooling Tower - Construction History

- The C-633-2A facility is approximately 15,906 ft^2. (Continued)
  - Twenty vaults are located within the footprint of the two main cooling towers with nine supporting C-633-2A.
    1. D-Loop Return to Blending Tower Crossover
       a. Located within footprint of main cooling tower; installed as part of blending towers in 1975/1976.
    2. D-Loop Return to Blending Tower
       a. Located within footprint of main cooling tower; installed as part of blending towers in 1975/1976.
    3. Hot Water Bypass
    4. D-Loop Supply Crossover/D-Loop Supply/D-loop Return
    5. D-Loop Supply Venturi
    6. D-Loop Return Bypass to Blending Tower
       a. Located within footprint of main cooling tower; installed as part of blending towers in 1975/1976.
    7. D-Loop Return to Blending Pump House
       a. Located within footprint of main cooling tower; installed as part of blending towers in 1975/1976.
    8. Flume/Sluice Gate
       a. Housed influent flume (connects to mixing flume in C-633-1).
       b. Housed two flume sluice gates.
    9. High Pressure Fire Water Valve
  - Note: Historically these types of vaults have been known to contain sump pumps; therefore, it is assumed that there has been drainage to the surrounding soils during past operations.

D-Loop Return to Blending Tower Crossover Vault

D-Loop Return to Blending Tower Vault

Hot Water Bypass Vault

D-Loop Supply Crossover/D-Loop Supply/D-Loop Return Vault

D-Loop Supply Venturi Vault

D-Loop Return Bypass to Blending Tower Vault

D-Loop Return to Blending Pump House Vault

Flume/Sluice Gate Vault

High Pressure Fire Water Valve Vault

C-633-2A Facility Photos: 10/2022 and 12/2022

C-633-2A (South) Cooling Tower - Operational History

- C-633-2A was originally built and operated as a cooling tower from its construction in 1952/1953.
  - Heated RCW from the C-333 process building was distributed through various sections of the cooling tower and released via evaporation; cooled RCW was then collected into the cooling tower basin where it then flowed by gravity via an influent flume into the mixing flume and wet well located underneath the C-633-1 pump house.
  - Tower was demolished down to the basin and rebuilt in the 1988-1990 timeframe.

- Brown rot fungi growth quickly became a problem for the cooling towers.
  - In 1958, a program was initiated to combat fungus deterioration.
  - Replaced infected wood with new pressure treated redwood.
    - Cooling tower structural members, fill, mist eliminators, outer wall, cell partitions, and deck were originally constructed of California redwood.
  - Treated remaining wood with fungicide solutions (most susceptible areas only).
  - All cell plenum chambers, tower deck, outer sidewalls, and tower tops were treated periodically with one of two types of fungicide solutions:
    - Sodium pentachlorophenate.
    - Double diffusion method – first spraying with a solution of zinc sulphate and arsenic acid followed by a second spraying with a solution of sodium bichromate.
  - Fungicide treatment was discontinued in 1987.

C-633-2A Cooling Tower – South Side

C-633-2A Cooling Tower – Interior View

C-633-2A Facility Photos: 10/2022

C-633-2A (South) Cooling Tower - Operational History

- In 1972, the main cooling towers underwent restoration.
  - Restoration was limited; engineering drawings indicate that certain structural members were only removed if necessary. (Note: Mechanical repairs to motors, gear boxes, etc., also occurred over the years of operation.)
- Between 1975 – 1977 firewater/sprinkler systems were upgraded.
- In 1978, new wind baffling was installed.
- In 1979, a cooling tower drift study was conducted to determine the impact of chromium dispersion from the cooling towers.
  - Vegetation survey provided evidence of long-term transport and disposition of chromium to terrestrial ecosystem components.
    - Decrease in concentration with distance; most disposition is confined to DOE property.
  - Chromium deposited by drift to soils or lost to soils from vegetation does not accumulate significantly beyond 200 meters from the towers.
    - Soil chromium is the less soluble and less biologically active oxidation state (Cr+3).
- In 1981, RCW sprinkler alarms were installed.

C-633-2A Sprinkler System - External View

C-633-2A Sprinkler System - Internal View

C-633-2A Facility Photos: 10/2022

C-633-2A (South) Cooling Tower - Operational History

- In 1988-1990, the main cooling tower was replaced down to the basin.
  - A construction permit was not put in place for rebuilding of the C-633-2A cooling tower.
  - Due to potential chromium emissions, KY issued a notice of violation (ASER 1989).
  - A permit was developed and issued; violation was withdrawn.
  - While the overall footprint of the cooling tower remained the same, the height of the new cooling tower was reduced from approximately 48 ft to approximately 30 ft.

Historical photo of main cooling tower replacement project
(Photo of C-633 Main Cooling Tower)

- USEC leased the facility in the early 1990s and continued to use C-633-2A as a cooling tower until enrichment operations ceased at C-333.

- In 1990, a 60-inch underground RCW supply line was discovered to be leaking, allowing chromated water to seep into the storm drain system (ASER 1990).
  - Elevated Cr^{+6} levels of 0.61 mg/L were detected at KPDES outfall K012.
  - Upstream a pool containing approximately 2000 gal of water was discovered containing 7.6 mg/L Cr^{+6}.
  - Flow at K012 was contained and water was pumped and transferred back to the cooling tower basins.
  - Leak was repaired; no KPDES Agreed Order limits were violated as a result of the leak.

C-633-2A Cooling Tower – North East Corner

C-633-2A Facility Photo: 10/2022

C-633-2A (South) Cooling Tower - Operational History

- In 1991, an estimated 1600 ft^2 of asbestos siding was blown off the side of the C-633 cooling tower as a result of high winds (ASER 1991).
  - Not considered to be friable; heavy rains prevented the possibility of any airborne fiber release.

- In 1995, approximately 500 ft^2 of asbestos/cement siding was blown off the side of the C-633 cooling tower as a result of high winds. (Note: Report somewhat unclear concerning which cooling tower was impacted.)
  - Approximately 50% asbestos; causing a release of 680 lb of friable asbestos.
  - CERCLA RQ for friable asbestos was 1 lb.

- In 2013, C-633-2A was shutdown, along with its associated pump house and blending towers.

- C-633-2A transitioned from USEC to DOE in 2014.

C-633-2A Cooling Tower
South Side Structural Damage

C-633-2A – Southwest Corner
Structural Damage

C-633-2A Cooling Tower
Loose Fallen Structural Panels

C-633-2A Facility Photos: 10/2022

C-633-2A (South) Cooling Tower - Current Status

- Walkdown inspection conducted in October 2022 and employee interviews confirmed no unusual conditions.
  - Both ACM (e.g., transite siding) and lead-based paints are known to be present.
  - Basin located beneath the cooling tower contains ten pressure release valves.
  - Houses an influent flume that remains full of water and exits at the bottom of the basin of the cooling tower; north west corner.
    - Chlorine, sulfuric acid, and corrosion inhibitors (including chromate) were routinely fed into the RCW system via the C-633-1 wet well and would be present in the basin.
  - Nine vaults located within the footprint of the C-633-2A cooling tower; some contain sump pumps.
  - Two external concrete buildings; house the fire sprinkler system.
  - Not used for radiological storage; no radiological postings are present.
  - No GSA or SAA.
  - Historical use of sodium pentachlorophenate; zinc sulphate; arsenic acid; and sodium bichromate for fungicide treatment of wood.
  - Historical chromated water leaks have occurred and were immediately addressed.
  - No known chemical spills except for chromated water leaks.

C-633-2A – Riser No. 8 with Bypass

C-633-2A – Southwest Corner Structural Damage

C-633-2A - Flush Line Connections

C-633-2A – North End (Sluice Gates)

C-633-2A –Riser No. 7 with Hot Water Line to Fire House Heaters

C-633-2A –Light Switch Panel to Tower and Fire Houses

C-633-2A Facility Photos: 10/2022

C-633-2A (South) Cooling Tower - Environmental Impacts

- No information to indicate a release or threatened release of a hazardous substance that would require a CERCLA evaluation for a potential response action for demolition of the aboveground structure to protect future public health or welfare or the environment.
  - C-633-2A has exclusively operated as the main cooling tower; cooling heated RCW from the C-333 process building from its construction in 1952/1953 to 2013.
  - Building materials used for construction could contain lead-based paints and ACM (e.g., corrugated transite siding).
    - Because the cooling tower was completely rebuilt (wood removed down to basin) in the 1988/1990 timeframe, chemicals used for fungicide treatment prior to 1987 are no longer a concern for the existing wood.
    - In 1992/1993, the RCW system was converted from a chromate system to a phosphate system.
  - Building debris generated from demolition of the aboveground structures can be properly managed using standard demolition and waste management practices.

- Process knowledge and employee interviews indicate that the historical construction and system processes at C-633-2A involved equipment and chemicals that could have the potential to pose a release threat to the basin and associated vaults and underlying soils (including the surrounding area associated with the basin/vaults). (See slide 6 for SWMU 87 details.)
  - Chromated water releases and airborne dispersion of chromium have occurred; making the underlying soils and surrounding area suspect for potential chromium contamination.
  - Historical fungicide treatment of wood; making the underlying soils suspect for potential contamination.
  - Ten pressure release valves are located along the bottom of the basin floor.
  - Basin (currently full of water) is connected to the C-633-1 pump house via an influent flume (currently full of water).
    - Chlorine, sulfuric acid, and corrosion inhibitors (including chromate) were routinely fed into the RCW system via the C-633-1 wet well and would be present in the basin (Note: Soda ash was occasionally used on a non-routine basis for pH correction).
  - Nine vaults located within the footprint of the cooling tower. Historically these types of vaults have been known to contain sump pumps; therefore, it is assumed that there has been drainage to the surrounding soils during past operations.

C-633-2A (South) Cooling Tower - Conclusion and Recommendations

- Walkdown inspection of the facility, employee interviews, and other reviewed historical information did not identify any unusual conditions that would pose a potential threat of environmental release during future demolition of the aboveground structure.
  - Deactivation will include removal of any accessible loose items being stored and certain equipment (e.g., risers, fans, fan motors, and shrouds, etc.) (to the extent practicable) prior to demolition.
  - Any floor drains (along with the vaults, sumps, influent flume, and supply/return lines) will be delineated, documented, and isolated prior to demolition.
  - An evaluation will be made to determine if any measures may be appropriate to stabilize and/or isolate the basin (or portions thereof) from the main floor of the cooling tower prior to demolition. [Note: Measures other than mechanical isolation (one example of a measure other than mechanical isolation would be the addition of flowable fill) will require additional consultation with EPA and Kentucky.]
  - Water from the basin and influent flume will be evaluated for removal and proper disposal as part of deactivation and/or predemolition activities. (Note: Because the basin and influent flume are part of the underlying slab and soils that constitutes the SWMU, a SWMU notification, along with a SAR revision, will be performed documenting removal and disposal of the water associated with deactivation and/or predemolition activities.)

- Pending completion of deactivation and availability of funding, proceeding with demolition and disposal of the C-633-2A facility (aboveground structure) outside of the FFA/CERCLA process, contingent upon the fact that no additional changes have occurred that would affect the CERCLA determination of the facility prior to demolition, is recommended.

- All applicable laws, regulations, and DOE procedures/protocols will be followed to ensure the demolition and disposal of the aboveground structure occurs in a safe, compliant manner, including conducting any additional radiological characterization through confirmation radiological surveys (as necessary) to support demolition and waste disposition.

C-633-2A (South) Cooling Tower - Conclusion and Recommendations

- Based on the construction and historical use at C-633-2A, demolition and disposal of the aboveground structure for C-633-2A is recommended to be conducted outside of the FFA/CERCLA process.

- As part of the demolition of the aboveground structure, the appropriate BMPs will be evaluated and implemented (as needed) to prevent/minimize the pooling and/or migration of storm water that may come into contact with any contamination that may exist on the pad/subsurface structure(s). For example, the following BMPs will be implemented as necessary:
  - Radiological surveying will occur following demolition.
  - Decontamination and/or application of fixatives and/or barriers to contaminated surfaces above regulatory posting limits.
  - Isolation measures and other types of barriers to minimize and/or control runoff/pooling of contaminated storm water [e.g., seal inlets to drains/sumps/subsurface structure(s)].

- Removal of the C-633-2A facility from the Facility D&D OU will be documented in the appropriate annual SMP revision.

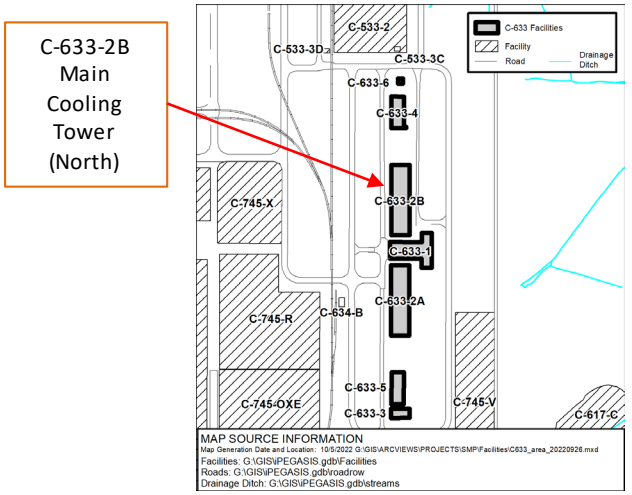
- Based on the construction and historical use at C-633-2A, it is recommended that the underlying slab and soils (including surrounding soils within the C-633-2A footprint) undergo further CERCLA evaluation as part of Soils and Slabs OU as currently identified in Appendix 4 of the SMP.
  - The SAR for SWMU 87 will be updated to clarify that the C-633-2A underlying slab and soils (including surrounding soils within the C-633-2A footprint) constitutes the SWMU and will undergo a remedial field investigation as part of the Soils and Slabs OU.
  - Consideration will be given to coordinate the timing for issuance and finalization of a revised SAR for SWMU 87 that includes updated information on C-633-2A prior to removal of the aboveground structure.

C-633-2B (North) Cooling Tower

C-633-2B (North) Cooling Tower

C-633-2B (North) Cooling Tower - Construction History

- C-633-2B Cooling Tower facility is one of seven facilities located in SWMU 87.
- The facility was originally constructed in 1952/1953.
- The facility is a wood frame structure (originally approximately 48 ft tall) resting on a 2-ft thick poured concrete pier-type foundation; a deck roof with railing and fan shrouds; and exterior walls of corrugated panels.
  - Often referred to as the "main cooling tower."
  - Supports 8 pairs of back-to-back cooling tower cells; total of 16 cooling tower cells. Each cell operates independently of the other cells.
    - Each cell has a fan and driving motor; total of 16 fans/driving.
    - Fans are enclosed by protective shrouds.
    - One riser serves each pair of back-to-back cells; total of 8 risers.
    - The tower contains a water distribution system (including lateral flush lines), cold water fill (system of baffles), and mist eliminators.
    - Piping and sprinklers for fire protection throughout.
  - Cools RCW and returns it to the below grade collection basin.
    - Footprint of the basin is larger than the aboveground footprint of the cooling tower; extending an additional 248 ft north of the cooling tower (this section has a concrete slab top).
    - Basin is open and visible.
    - Influent flume located on the south west corner (exterior of basin).
    - Ten pressure relief valves located along the bottom of basin floor.



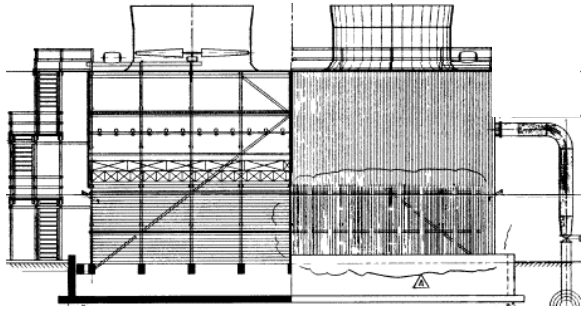
C-633-2B Cooling Tower – East Side

C-633-2B Facility Photo: 10/2022

C-633-2B (North) Cooling Tower - Construction History

- C-633-2B Cooling Tower facility (Continued)
  - Houses the beginning of an influent flume.
    - Influent flume exits the south west corner of the basin of the cooling tower; connecting the cooling tower basin to the mixing well located in C-633-1 pump house.
  - West side infrastructure.
    - Eight water riser pipes; connect into the below grade piping system.
    - Two external concrete buildings; house the fire sprinkler system.
    - Twenty vaults are located within the footprint of the two main cooling towers with eleven supporting C-633-2B (See slide 38 for details).
  - East side infrastructure.
    - Two exterior wood staircases; one located on the south end and one located on the north end.
    - Lateral flush lines and connections.
    - Power supplies.
  - Roof infrastructure.
    - Wood decking with railing that extends the circumference of the tower.
    - Support fans enclosed with protective shrouds.

Historical Photo of Cooling Tower Roof Deck and Shrouds



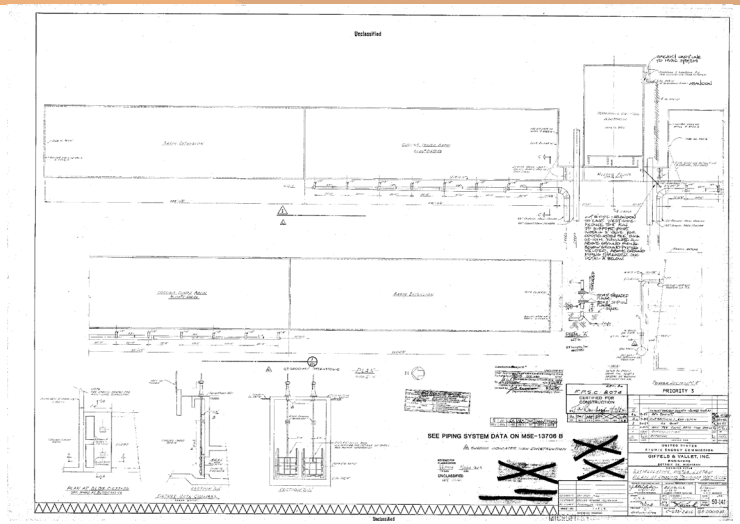
Internal Cooling Tower Components
Excerpt from Engineering Drawing HUC3403-001-01

C-633-2B Cooling Tower West Side

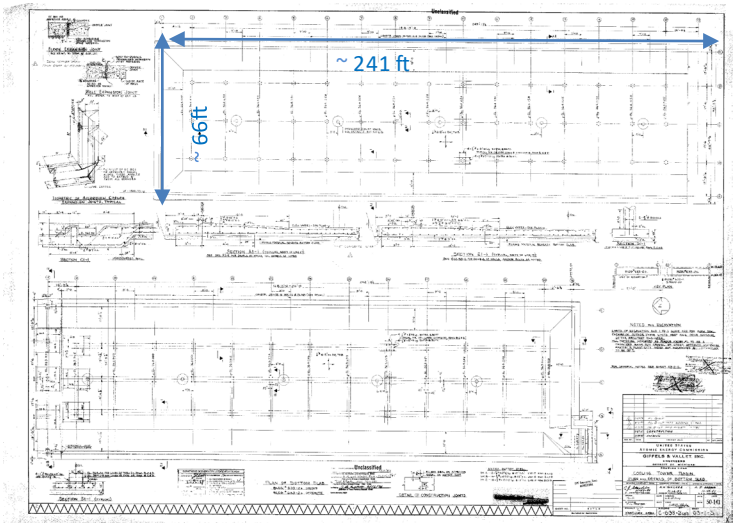
C-633-2B Facility Photo: 1/2023

C-633-2B (North) Cooling Tower - Construction History

- The C-633-2B facility (aboveground structure) is approximately 15,906 ft^2; measuring ~66 ft x ~241 ft.
  - Collection basin (underground) measuring ~66 ft x ~489 ft x ~15 ft.
    - Footprint is larger than the aboveground footprint of the C-633-2B cooling tower; extending an additional 248 ft north of the C-633-2B cooling tower (this section has a concrete slab top).
  - Influent flume exiting the basin measuring ~14 ft x ~23 ft x ~9 ft located to a depth of ~20 ft.
    - Runs underground from the cooling tower basin to the C-633-1 pump house mixing flume, which in turn enters into the wet well.
  - Two external concrete buildings measuring ~6 ft 8 inches x ~10 ft 8 inches x ~9 ft.
    - Houses the fire sprinkler system.
    - Located within footprint of main cooling tower.



Excerpt of Engineering Drawing of C-633-2A & 2B Layout; G3-2000M, dated 1951



Excerpt of Engineering Drawing of C-633-2A & 2B Layout; G3-1-S, dated 1951

C-633-2B (North) Cooling Tower - Construction History

- The C-633-2B facility is approximately 15,906 ft^2. (Continued)
  - Twenty vaults are located within the footprint of the two main cooling towers with eleven supporting C-633-2B.
    1. C-Loop Return to Blending Tower Crossover
       a. Located within footprint of main cooling tower; installed as part of blending towers in 1975/1976.
    2. C-Loop Return to Blending Tower
       a. Located within footprint of main cooling tower; installed as part of blending towers in 1975/1976.
    3. C-Loop Return Crossover
    4. C-Loop Return/C-Loop Supply
    5. C-Loop Supply Venturi
    6. C-Loop Makeup Venturi
    7. C-Loop Return Bypass to Blending Tower
       a. Located within footprint of main cooling tower; installed as part of blending towers in 1975/1976.
    8. C-Loop Return to Blending Pump House
       a. Located within footprint of main cooling tower; installed as part of blending towers in 1975/1976.
    9. Flume/Sluice Gate
       a. Housed influent flume (connects to mixing flume in C-633-1).
       b. Housed two flume sluice gates.
    10. High Pressure Fire Water Valve
    11. Plant Water Valves (Makeup Water)
  - Note: Historically these types of vaults have been known to contain sump pumps; therefore, it is assumed that there has been drainage to the surrounding soils during past operations.

C-Loop Return Blending Tower Crossover Vault

C-Loop Return to Blending Tower Vault

C-Loop Return Crossover Vault

C-Loop Return/C-Loop Supply Vault

C-Loop Supply Venturi Vault

C-Loop Makeup Venturi Vault

C-Loop Return Bypass to Blending Tower Vault

C-Loop Return to Blending Pump House Vault

Flume/Sluice Gate Vault

High Pressure Fire Water Valve Vault

Plant Water Valves (Makeup Water) Vault

C-633-2B Facility Photos: 10/2022 and 12/2022

C-633-2B (North) Cooling Tower - Operational History

- C-633-2B was originally built and operated as a cooling tower from its construction in 1952/1953.
  - Heated RCW from the C-333 process building was distributed through various sections of the cooling tower and released via evaporation; cooled RCW was then collected into the cooling tower basin where it then flowed by gravity via an influent flume into the mixing flume and wet well located underneath the C-633-1 pump house.
  - Tower was demolished down to the basin and rebuilt in the 1988-1990 timeframe.

- Brown rot fungi growth quickly became a problem for the cooling towers.
  - In 1958, a program was initiated to combat fungus deterioration.
  - Replaced infected wood with new pressure treated redwood.
    - Cooling tower structural members, fill, mist eliminators, outer wall, cell partitions, and deck were originally constructed of California redwood.
  - Treated remaining wood with fungicide solutions (most susceptible areas only).
  - All cell plenum chambers, tower deck, outer sidewalls, and tower tops were treated periodically with one of two types of fungicide solutions:
    - Sodium pentachlorophenate.
    - Double diffusion method – first spraying with a solution of zinc sulphate and arsenic acid followed by a second spraying with a solution of sodium bichromate.
  - Fungicide treatment was discontinued in 1987.

C-633-2B Cooling Tower – North Side

C-633-2B Cooling Tower – Interior View

C-633-2B Facility Photos: 10/2022

C-633-2B (North) Cooling Tower - Operational History

- In 1972, the main cooling towers underwent restoration.
  - Restoration was limited; engineering drawings indicate that certain structural members were only removed if necessary. (Note: Mechanical repairs to motors, gear boxes, etc., also occurred over the years of operation.)
- Between 1975 – 1977 firewater/sprinkler systems were upgraded.
- In 1978, new wind baffling was installed.
- In 1979, a cooling tower drift study was conducted to determine the impact of chromium dispersion from the cooling towers.
  - Vegetation survey provided evidence of long-term transport and disposition of chromium to terrestrial ecosystem components.
    - Decrease in concentration with distance; most disposition is confined to DOE property.
  - Chromium deposited by drift to soils or lost to soils from vegetation does not accumulate significantly beyond 200 meters from the towers.
    - Soil chromium is the less soluble and less biologically active oxidation state (Cr+3).
- In 1981, RCW sprinkler alarms were installed.

C-633-2B Sprinkler System - External View

C-633-2B Sprinkler System - Internal View

C-633-2B Facility Photos: 10/2022

C-633-2B (North) Cooling Tower - Operational History

- In 1988-1990, the main cooling tower was replaced down to the basin.
  - While the overall footprint of the cooling tower remained the same, the height of the new cooling tower was reduced from approximately 49 ft to approximately 30 ft.

- USEC leased the facility in the early 1990s and continued to use C-633-2B as a cooling tower until enrichment operations ceased at C-333.

- In 1995, approximately 500 ft^2 of asbestos/cement siding was blown of the side of the C-633 cooling tower as a result of high winds. (Note: Report somewhat unclear concerning which cooling tower was impacted.)
  - Approximately 50% asbestos; causing a release of 680 lb of friable asbestos.
  - CERCLA RQ for friable asbestos was 1 lb.

- In 2013, C-633-2B was shutdown, along with its associated pump house and blending towers.

- C-633-2B transitioned from USEC to DOE in 2014.

Historical photo of main cooling tower replacement project
(Photo of C-633 Main Cooling Tower)

C-633-2B Cooling Tower – South East Side

C-633-2B Facility Photo: 10/2022

C-633-2B (North) Cooling Tower - Current Status

- Walkdown inspection conducted in October 2022 and employee interviews confirmed no unusual conditions.
  - Both ACM (e.g., transite siding) and lead-based paints are known to be present.
  - Basin located beneath the cooling tower contains ten pressure release valves.
  - Houses an influent flume that remains full of water and exits at the bottom of the basin of the cooling tower; south west corner.
    - Chlorine, sulfuric acid, and corrosion inhibitors (including chromate) were routinely fed into the RCW system via the C-633-1 wet well and would be present in the basin.
  - Eleven vaults located within the footprint of the C-633-2B cooling tower; some contain sump pumps.
  - Two external concrete buildings; house the fire sprinkler system.
  - Not used for radiological storage; no radiological postings are present.
  - No GSA or SAA.
  - Historical use of sodium pentachlorophenate; zinc sulphate; arsenic acid; and sodium bichromate for fungicide treatment of wood.
  - Historical chromated water leaks have occurred and were immediately addressed.
  - No known chemical spills except for chromated water leaks.

C-633-2B– Riser No. 1 and Bypass

C-633-2B - Lateral Flush Line Connections

C-633-2B –Corrosion Testing Area

C-633-2B – Interior Structural Damage

C-633-2B - Bypass

C-633-2B –Interior and Exterior Structural Damage

C-633-2B Facility Photos: 10/2022

C-633-2B (North) Cooling Tower - Environmental Impacts

- No information to indicate a release or threatened release of a hazardous substance that would require a CERCLA evaluation for a potential response action for demolition of the aboveground structure to protect future public health or welfare or the environment.
  - C-633-2B has exclusively operated as the main cooling tower; cooling heated RCW from the C-333 process building from its construction in 1952/1953 to 2013.
  - Building materials used for construction could contain lead-based paints and ACM (e.g., corrugated transite siding).
    - Because the cooling tower was completely rebuilt (wood removed down to basin) in the 1988/1990 timeframe, chemicals used for fungicide treatment prior to 1987 are no longer a concern for the existing wood.
    - In 1992/1993, the RCW system was converted from a chromate system to a phosphate system.
  - Building debris generated from demolition of the aboveground structures can be properly managed using standard demolition and waste management practices.

- Process knowledge and employee interviews indicate that the historical construction and system processes at C-633-2B involved equipment and chemicals that could have the potential to pose a release threat to the basin and associated vaults and underlying soils (including the surrounding area associated with the basin/vaults). (See slide 6 for SWMU 87 details.)
  - Chromated water releases and airborne dispersion of chromium have occurred; making the underlying soils and surrounding area suspect for potential chromium contamination.
  - Historical fungicide treatment of wood; making the underlying soils suspect for potential contamination.
  - Ten pressure release valves are located along the bottom of the basin floor.
  - Basin (currently full of water) is connected to the C-633-1 pump house via an influent flume (currently full of water).
    - Chlorine, sulfuric acid, and corrosion inhibitors (including chromate) were routinely fed into the RCW system via the C-633-1 wet well and would be present in the basin (Note: Soda ash was occasionally used on a non-routine basis for pH correction).
  - Eleven vaults located within the footprint of the cooling tower. Historically these types of vaults have been known to contain sump pumps; therefore, it is assumed that there has been drainage to the surrounding soils during past operations.

C-633-2B (North) Cooling Tower - Conclusion and Recommendations

- Walkdown inspection of the facility, employee interviews, and other reviewed historical information did not identify any unusual conditions that would pose a potential threat of environmental release during future demolition of the aboveground structure.
  - Deactivation will include removal of any accessible loose items being stored and certain equipment (e.g., risers, fans, fan motors, and shrouds, etc.) (to the extent practicable) prior to demolition.
  - Any floor drains (along with the vaults, sumps, influent flume, and supply/return lines) will be delineated, documented, and isolated prior to demolition.
  - An evaluation will be made to determine if any measures may be appropriate to stabilize and/or isolate the basin (or portions thereof) from the main floor of the cooling tower prior to demolition. [Note: Measures other than mechanical isolation (one example of a measure other than mechanical isolation would be the addition of flowable fill) will require additional consultation with EPA and Kentucky.]
  - Water from the basin and influent flume will be evaluated for removal and proper disposal as part of deactivation and/or predemolition activities. (Note: Because the basin and influent flume are part of the underlying slab and soils that constitutes the SWMU, a SWMU notification, along with a SAR revision, will be performed documenting removal and disposal of the water associated with deactivation and/or predemolition activities.)

- Pending completion of deactivation and availability of funding, proceeding with demolition and disposal of the C-633-2B facility (aboveground structure) outside of the FFA/CERCLA process, contingent upon the fact that no additional changes have occurred that would affect the CERCLA determination of the facility prior to demolition, is recommended.

- All applicable laws, regulations, and DOE procedures/protocols will be followed to ensure the demolition and disposal of the aboveground structure occurs in a safe, compliant manner, including conducting any additional radiological characterization through confirmation radiological surveys (as necessary) to support demolition and waste disposition.

C-633-2B (North) Cooling Tower - Conclusion and Recommendations

- Based on the construction and historical use at C-633-2B, demolition and disposal of the aboveground structure for C-633-2B is recommended to be conducted outside of the FFA/CERCLA process.

- As part of the demolition of the aboveground structure, the appropriate BMPs will be evaluated and implemented (as needed) to prevent/minimize the pooling and/or migration of storm water that may come into contact with any contamination that may exist on the pad/subsurface structure(s). For example, the following BMPs will be implemented as necessary:
  - Radiological surveying will occur following demolition.
  - Decontamination and/or application of fixatives and/or barriers to contaminated surfaces above regulatory posting limits.
  - Isolation measures and other types of barriers to minimize and/or control runoff/pooling of contaminated storm water [e.g., seal inlets to drains/sumps/subsurface structure(s)].

- Removal of the C-633-2B facility from the Facility D&D OU will be documented in the appropriate annual SMP revision.

- Based on the construction and historical use at C-633-2B, it is recommended that the underlying slab and soils (including surrounding soils within the C-633-2B footprint) undergo further CERCLA evaluation as part of Soils and Slabs OU as currently identified in Appendix 4 of the SMP.
  - The SAR for SWMU 87 will be updated to clarify that the C-633-2B underlying slab and soils (including surrounding soils within the C-633-2B footprint) constitutes the SWMU and will undergo a remedial field investigation as part of the Soils and Slabs OU.
  - Consideration will be given to coordinate the timing for issuance and finalization of a revised SAR for SWMU 87 that includes updated information on C-633-2B prior to removal of the aboveground structure.

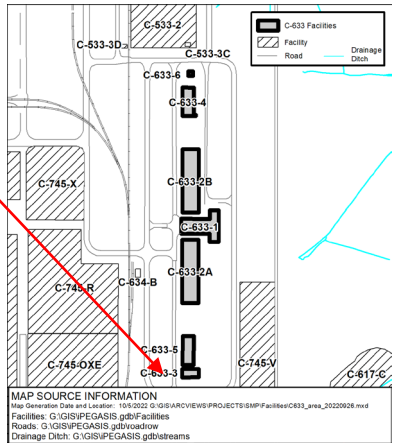
C-633-3 Blending Pump House

C-633-3 Blending Pump House

C-633-3 Blending Pump House - Construction History

- C-633-3 Blending Pump House facility is one of seven facilities located in SWMU 87.
- The facility was constructed in 1976/1977.
- The facility is a one-story steel framed building with a slanted shed roof and exterior corrugated panels on a poured concrete foundation that varies in thickness from ~6 inches to ~4 ft (reinforced under the pumps).
  - Garage-like structure with two pedestrian doorways located on the east and west side of the facility.
  - South side of the facility houses three manually operable louver panels and three high bay removable panels.
  - Houses three blending pumps.
  - Three large water pipes located on the north side of the facility are connected to the C-633-2A cooling tower basin.
- The entire facility is approximately 1,984 ft^2.
  - Measuring ~32 ft x ~62 ft.
    - Six 3-inch floor drains that drain back into the C-633-2A main cooling tower basin.

C-633-3 Blending Pump House



C-633-3 – Blending Pump House West Side

C-633-3 – Blending Pump House South Side

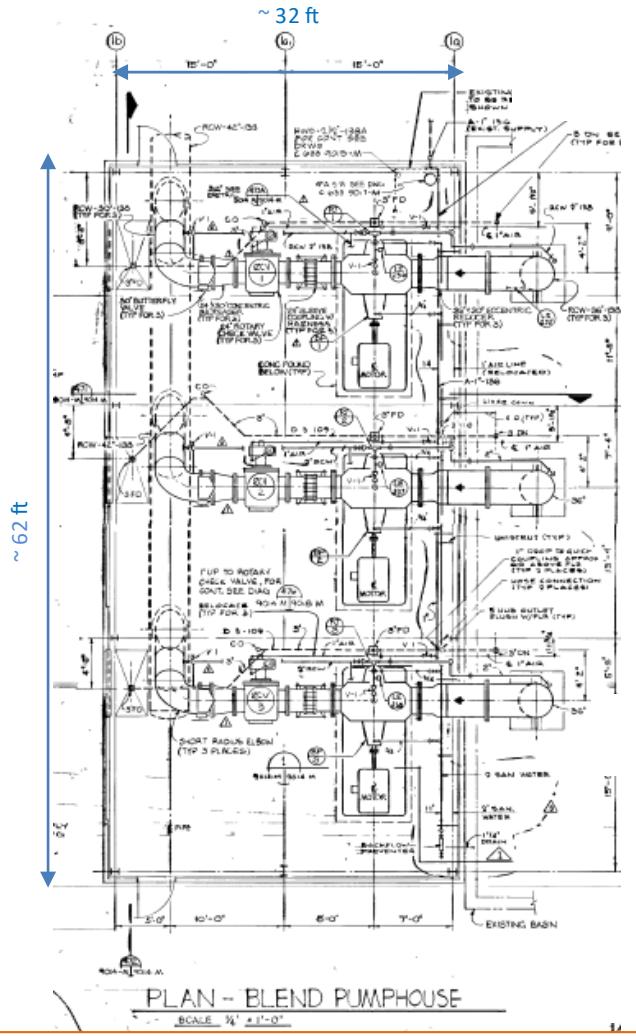
C-633-3 – Blending Pump House North Side

C-633-3 Facility Photos: 10/2022

C-633-3 Blending Pump House - Operational History

- Blending pump houses, along with the blending towers, were constructed as part of the 1970s Cascade Improvement Program and Cascade Uprating Program (CIP/CUP) in anticipation that the increase in enrichment capacity would result in an increase in process temperatures that would require additional cooling capability.
  - Blending pump houses were designed to decrease the temperature of RCW prior to entering into the main cooling tower. (Note: RCW temperatures in excess of 150°F could damage the cooling tower fill material.)
  - Cooled water from the cooling tower basin could be pumped (if needed) through the blending pump house where the cooled water could be "blended" with heated RCW in the return header before the water flowed over the cooling tower for further cooling.

- C-633-3 was originally designed and built as a blending pump house in 1976/1977; however, while brought on-line and tested to ensure proper operation, C-633-3 remained in standby and was never used.
  - The fill material temperature limits were never compromised.



Excerpt of Engineering Drawing from C-633-9014-M, Rev 3; dated 1975

C-633-3 Blending Pump House - Operational History

- USEC leased the facility in the early 1990s and continued to maintain C-633-3 as a blending pump house until enrichment operations ceased at C-333.
  - C-633-3 was routinely inspected and serviced.
  - C-633-3 was retested (late 1980s/early 1990s) to ensure that the system was still in operational order.
- In 2013, C-633-3 was shutdown, along with its associated cooling towers (main cooling tower and blending towers).
- C-633-3 transitioned from USEC to DOE in 2014.
- C-633-3 is no longer operational.

C-633-3 - Pump Discharge Lines

C-633-3 - Skid Frame with Blend Motor and Pump

C-633-3 - Pump Suction Lines Exterior View

C-633-3 - Pump Suction Line Interior View

C-633-3 Facility Photos: 10/2022

C-633-3 Blending Pump House - Current Status

- Walkdown inspection conducted in October 2022 and employee interviews confirmed no unusual conditions.
  - ❑ Houses three blending pumps.
  - ❑ Both ACM (e.g., corrugated transite siding) and lead-based paints are known to be present.
  - ❑ Six 3-inch floor drains are present.
    - All drain back into the C-633-2A cooling tower basin.
  - ❑ Not used for radiological storage; no radiological postings are present.
  - ❑ No GSA or SAA.
  - ❑ Minor oil staining around the blending pumps.
  - ❑ Damage to building insulation.
  - ❑ No known chemical spills.

    Note: Corrosion inhibitors (including chromate) were routinely fed into the RCW system and would have been present if leaks occurred during startup testing and periodic retesting.

C-633-3 - Floor Drain

C-633-3 - Floor Drain

C-633-3 - Fire Sprinkler System

C-633-3 – Damaged Insulation

C-633-3 – Electrical Panels

C-633-3 – Steam Heater

C-633-3 Facility Photos: 10/2022

C-633-3 Blending Pump House - Environmental Impacts

- No information to indicate a release or threatened release of a hazardous substance that would require a CERCLA evaluation for a potential response action for demolition of the aboveground structure to protect future public health or welfare or the environment.
  - C-633-3 was originally designed and built as a blending pump house in 1976/1977 and was tested to ensure proper operations; C-633-3 remained in standby and has never been used from its construction in 1976/1977 to 2013 and was placed into shutdown in 2013.
  - Building materials used for construction could contain lead-based paints and ACM (e.g., corrugated transite siding).
  - Building debris generated from demolition of the aboveground structures can be properly managed using standard demolition and waste management practices.

- Process knowledge and employee interviews indicate that outside of the testing of the operational status at C-633-3, the system remained in standby, was placed into shutdown in 2013, and there is no history or records of chemical spills that would pose an environmental release threat. (See slide 6 for SWMU 87 details.)
  - C-633-3 is located within the footprint of the C-633 Cooling Tower.
  - C-633-3 is connected to part of the RCW system which contained chromated water.
  - Six 3-inch floor drains are located along the slab of the facility that drain back into the C-633-2A cooling tower basin.

C-633-3 Blending Pump House - Conclusion and Recommendations

- Walkdown inspection of the facility, employee interviews, and other reviewed historical information did not identify any unusual conditions that would pose a potential threat of environmental release during future demolition of the aboveground structure.
  - Deactivation will include removal of any accessible loose items being stored and certain equipment (e.g., blend pumps and motors, etc.) (to the extent practicable) prior to demolition.
  - Any floor drains (including the six identified floor drains) will be delineated, documented, and isolated prior to demolition.
- Pending completion of deactivation and availability of funding, proceeding with demolition and disposal of the C-633-3 facility (aboveground structure) outside of the FFA/CERCLA process, contingent upon the fact that no additional changes have occurred that would affect the CERCLA determination of the facility prior to demolition, is recommended.
- All applicable laws, regulations, and DOE procedures/protocols will be followed to ensure the demolition and disposal of the aboveground structure occurs in a safe, compliant manner, including conducting any additional radiological characterization through confirmation radiological surveys (as necessary) to support demolition and waste disposition.

C-633-3 Blending Pump House - Conclusion and Recommendations

- Based on the construction and historical use at C-633-3, demolition and disposal of the aboveground structure for C-633-3 is recommended to be conducted outside of the FFA/CERCLA process.

- As part of the demolition of the aboveground structure, the appropriate BMPs will be evaluated and implemented (as needed) to prevent/minimize the pooling and/or migration of storm water that may come into contact with any contamination that may exist on the pad/subsurface structure(s). For example, the following BMPs will be implemented as necessary:
  - Radiological surveying will occur following demolition.
  - Decontamination and/or application of fixatives and/or barriers to contaminated surfaces above regulatory posting limits.
  - Isolation measures and other types of barriers to minimize and/or control runoff/pooling of contaminated storm water [e.g., seal inlets to drains/sumps/subsurface structure(s)].

- Removal of the C-633-3 facility from the Facility D&D OU will be documented in the appropriate annual SMP revision.

- While there is no history or records of chemical spills that would pose an environmental release threat at C-633-3, based on its construction and association with the C-633 Cooling Tower footprint, it is recommended that the underlying slab and soils undergo further CERCLA evaluation as part of Soils and Slabs OU as currently identified in Appendix 4 of the SMP.
  - The SAR for SWMU 87 will be updated to clarify that the C-633-3 underlying slab and soils constitutes the SWMU and will undergo a remedial field investigation as part of the Soils and Slabs OU.
  - Consideration will be given to coordinate the timing for issuance and finalization of a revised SAR for SWMU 87 that includes updated information on C-633-3 prior to removal of the aboveground structure.

C-633-4 Blending Cooling Tower (North)

C-633-4 Blending Cooling Tower (North)

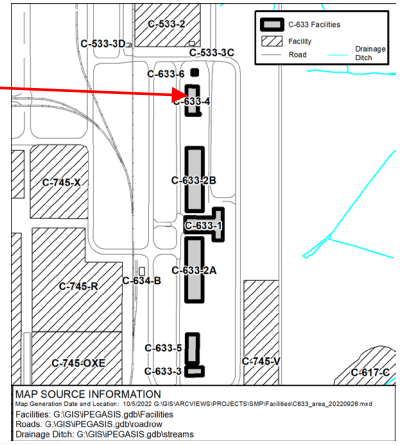
C-633-4 Blending Cooling Tower (North) - Construction History

- C-633-4 Blending Cooling Tower (North) facility is one of seven facilities located in SWMU 87.

- The facility was constructed in 1976/1977.

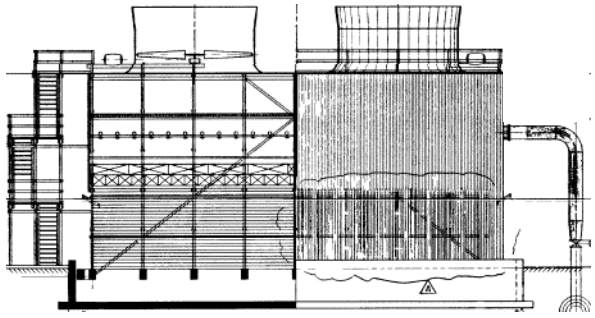
- The facility is a wood frame structure (approximately 35 ft tall) resting on an 8-inch thick poured concrete slab; a deck roof with railing and fan shrouds; and exterior walls of corrugated panels.
  - Often referred to as one of the "CUP towers."
  - Supports three cooling tower cells.
    - Each cell has a fan and driving motor; total of 3 fans/driving motors.
    - Fans are enclosed by protective shrouds (no longer present as a result of storm damage).
    - One riser serves each cooling tower cell; total of 3 risers.
    - The tower contains a water distribution system (including lateral flush lines), cold water fill (system of baffles), and mist eliminators.
    - Piping and sprinklers for fire protection throughout.
  - Cools RCW and returns it to the below grade collection basin.
    - Footprint of the basin is larger than the aboveground footprint of the cooling tower; extending approximately 381 ft south of C-633-4.
    - C-633-4 sits on top of a concrete slab with the basin running underneath the slab; as a result the basin is not open or visible.
    - Approximately 48 – 9-inch diameter holes are drilled into the slab allowing cooled RCW water to fall into the basin below.

C-633-4 Blending Cooling Tower (North)



C-633-4 Blending Cooling Tower – West Side

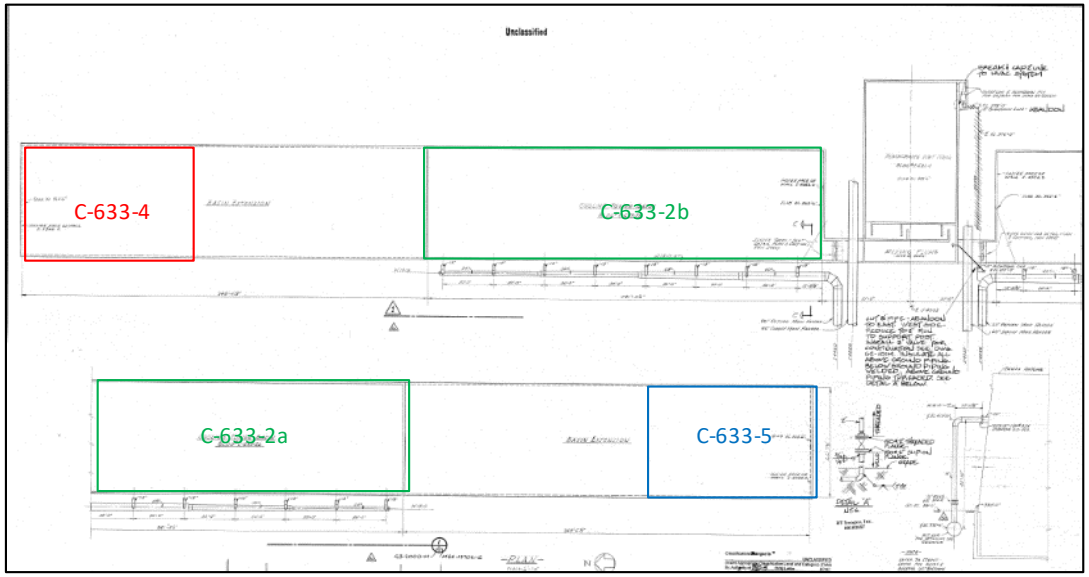
C-633-4 Facility Photo: 10/2022



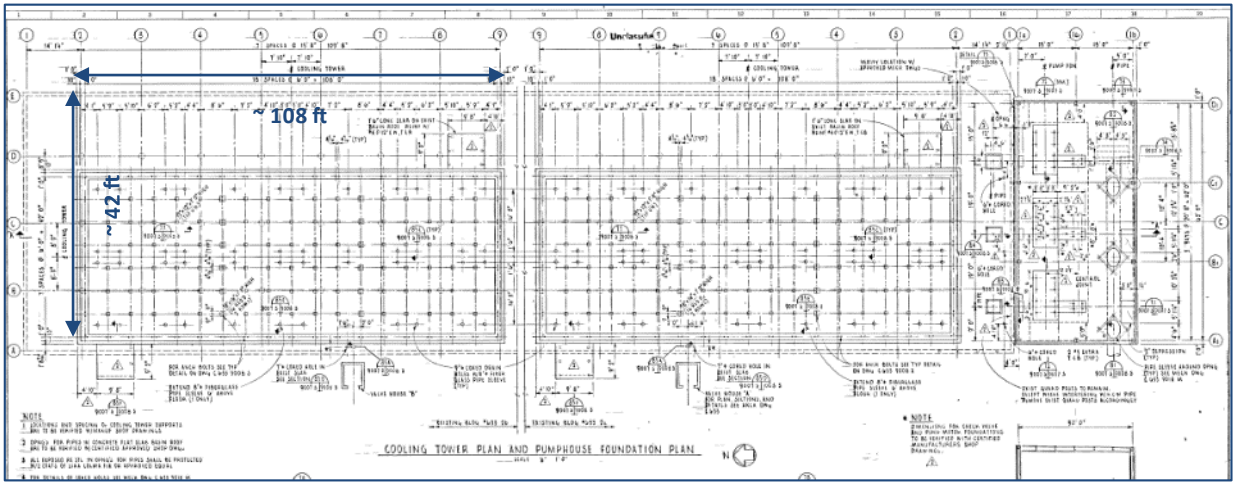
Internal Cooling Tower Components
Excerpt from Engineering Drawing HUC3403-001-01

C-633-4 Blending Cooling Tower (North) - Construction History

- C-633-4 Blending Cooling Tower (North) facility. (Continued)
  - West side infrastructure.
    - One exterior wood staircase; located on the north west end.
    - Three riser pipes; connect to the below grade piping system.
    - One external concrete building; houses the fire sprinkler system.
  - East side infrastructure.
    - One exterior wood staircase; located on the south east end.
    - Electrical power supply to fans.
    - Flush line connection points.
  - Roof infrastructure.
    - Wood decking with railing that extends the circumference of the tower.
    - Support fans that are enclosed with protective shrouds. (Note: protective shrouds are no longer present as a result of storm damage.)



Excerpt of Engineering Drawing of C-633-2A&B Layout; G3-2000M, dated 1951



Excerpt of Engineering Drawing of C-633 Blending Towers and Blending Tower Pump House Foundation Plan; C-633-9007-S, dated 1975

C-633-4 Blending Cooling Tower (North) - Construction History

- C-633-4 facility (aboveground structure) is approximately 4,536 ft^2; measuring ~ 42 ft x ~ 108 ft.
  - Collection basin (underground) measuring ~66 ft x ~489 ft x ~15 ft.
    - This basin is the larger basin footprint that runs underneath the C-633-2B Cooling Tower. (Note: The portion of the basin under the C-633-2B cooling tower contains the influent flume that connects the C-633-2B cooling tower basin to the C-633-1 pump house.)
  - One external concrete building measuring ~6 ft 8 inches x ~6 ft 8 inches x ~9 ft.
    - Houses the fire sprinkler system.
    - Located within footprint of the blending cooling tower.
  - Four vaults support C-633-4.
    - While installed and associated with the C-633-4 blending tower, these vaults are located within footprint of the C-633-2B main cooling tower.
      - C-Loop Return Blending Tower Crossover vault.
      - C-Loop Return to Blending Tower vault.
      - C-Loop Return Bypass to Blending Tower vault.
      - C-Loop Return to Blending Pump House vault.

9-inch Diameter Holes to Basin (Allows cooled RCW water to fall into the basin below)

C-633-4 Top of Basin Slab

C-633-4 Fire Sprinkler System

C-Loop Return Blending Tower Crossover Vault

C-Loop Return to Blending Tower Vault

C-Loop Return Bypass to Blending Tower Vault

C-Loop Return to Blending Pump House Vault

C-633-4 Facility Photos: 10/2022 and 12/2022

C-633-4 Blending Cooling Tower (North) - Operational History

- Blending cooling towers, along with blending pump houses, were constructed as part of the 1970s CIP/CUP in anticipation that the increase in enrichment capacity would result in an increase in process temperatures that would require additional cooling capacity.
  - Blending cooling towers were designed similar to the main cooling tower and provided additional cooling capacity.

- C-633-4 was originally built and operated as a blending cooling tower from its construction in 1976/1977 to 2013.
  - Often referred to as one of the "CUP cooling towers."
  - Heated RCW from the C-333 process building was distributed through various sections of the blending cooling tower and released via evaporation; cooled RCW was then collected into the cooling tower basin where it then flowed by gravity via an influent flume and into a mixing flume and wet well located underneath the C-633-1 pump house.

C-633-4 Blending Cooling Tower – East Side

C-633-4 Blending Cooling Tower – West Side

C-633-4 Facility Photos: 10/2022

C-633-4 Blending Cooling Tower (North) - Operational History

- Brown rot fungi growth was a problem for the blending cooling towers even though they were constructed with treated redwood.
  - All cell plenum chambers, tower deck, outer sidewalls, and tower tops were treated periodically with one of two types of fungicide solutions:
    - Sodium pentachlorophenate.
    - Double diffusion method – first spraying with a solution of zinc sulphate and arsenic acid followed by a second spraying with a solution of sodium bichromate.
  - Fungicide treatment was discontinued in 1987.

C-633-4 East Side – Flush Line Connection Point

- In 1979, a cooling tower drift study was conducted to determine the impact of chromium disposition from the cooling towers.
  - Vegetation survey provided evidence of long-term transport and disposition of chromium to terrestrial ecosystem components.
    - Decrease in concentration with distance; most disposition is confined to DOE property.
  - Chromium deposited by drift to soils or lost to soils from vegetation does not accumulate significantly beyond 200 meters from the towers.
    - Soil chromium is the less soluble and less biologically active oxidation state (Cr+3).

C-633-4 West Side – Riser No. 11

C-633-4 Facility Photos: 10/2022

C-633-4 Blending Cooling Tower (North) - Operational History

- In 1981, RCW sprinkler alarms were installed.
- USEC leased the facility in the early 1990s and continued to use C-633-4 as a blending cooling tower until enrichment operations ceased at C-333.
- From 2008-2010 the CUP cooling towers underwent refurbishment.
  - Refurbishment included the replacement of selected structure and decking materials. (Note: Mechanical repairs to motors, gear boxes, etc., also occurred over the years of operation.)
- In 2013, C-633-4 was shutdown, along with its associated pump house.
  - The basin and influent flume have not been drained and remain full of water; draining has not occurred in order to prevent hydrostatic pressure changes that could cause collapse or floating of the subsurface structure.
- In 2013, a tornado caused damage to C-633-4.
  - The large fiberglass shrouds were blown off along with some transite and sheet metal panels.
- C-633-4 transitioned from USEC to DOE in 2014.

C-633-4 South East Corner Stairs

C-633-4 – East Side- Basin Roof

C-633-4 – North Side (Structural Damage)

C-633-4 – North Side (Structural Top Damage – Missing Shrouds)

C-633-4 Facility Photos: 10/2022

C-633-4 Blending Cooling Tower (North) - Current Status

- Walkdown inspection conducted in October 2022 and employee interviews confirmed no unusual conditions.
  - Both ACM (e.g., transite siding) and lead-based paints are known to be present.
  - Historical use of sodium pentachlorophenate; zinc sulphate; arsenic acid; and sodium bichromate for fungicide treatment of wood.
  - One external concrete building; houses the fire sprinkler system.
  - Not used for radiological storage; no radiological postings present.
  - No GSA or SAA.
  - Basin located beneath the C-633-4 blending cooling tower is associated with the C-633-2B cooling tower basin (basin remains full of water).
    - Contains ten pressure release valves.
    - Houses an influent flume that exits at the bottom of the basin of the cooling tower (influent flume remains full of water).
    - Chlorine, sulfuric acid, and corrosion inhibitors (including chromate) were routinely fed into the RCW system via the C-633-1 wet well and would be present in the basin.
    - Historical chromated water leaks have occurred.
  - No known chemical spills except for those associated with the basin (e.g., chromated water leaks).
  - Four vaults associated with C-633-4 (C-Loop Return) are located within the footprint of the main cooling tower.

C-633-4 – Riser #9 and Manhole Cover

C-633-4 – Structural Frame

C-633-4 Electric Conduit and Cooling Tower Siding

C-633-4 Sprinkler (Disassembled)

C-633-4 – Fire Protection Connection Point

C-633-4 – Former Temporary Containment Area

C-633-4 Facility Photos: 10/2022

C-633-4 Blending Cooling Tower (North) - Environmental Impacts

- No information to indicate a release or threatened release of a hazardous substance that would require a CERCLA evaluation for a potential response action for demolition of the aboveground structure to protect future public health or welfare or the environment.
  - C-633-4 was exclusively operated as a blending cooling tower; cooling heated RCW from the C-333 process building from its construction in 1976/1977 to 2013.
  - Building materials used for construction could contain lead-based paints and ACM (e.g., corrugated transite siding).
    - Because the C-633-4 blending cooling tower was not completely refurbished; chemicals used for fungicide treatment in 1987 may still be of concern.
    - In 1992/1993, the RCW system was converted from a chromate system to a phosphate system.
  - Building debris generated from demolition of the aboveground structures can be properly managed using standard demolition and waste management practices.

- Process knowledge and employee interviews indicate that the historical construction and system processes at C-633-4 involved equipment and chemicals that could have the potential to pose a release threat to the basin and underlying soils (including the surrounding area associated with the basin/vaults). (See slide 6 for SWMU 87 details.)
  - Chromated water releases and airborne dispersion of chromium have occurred; making the underlying soils and surrounding area suspect for potential chromium contamination.
  - Historical fungicide treatment of wood; making the underlying soils suspect for potential contamination.
  - Ten pressure release valves are located along the bottom of the basin floor.
  - Basin (currently full of water) is connected to the C-633-1 pump house via an influent flume (currently full of water).
    - Chlorine, sulfuric acid, and corrosion inhibitors (including chromate) were routinely fed into the RCW system via the C-633-1 wet well and would be present in the basin.
  - Four of the eleven vaults located within the footprint of the C-633-2B main cooling tower are associated with C-633-4. Historically these types of vaults have been known to contain sump pumps; therefore, it is assumed that there has been drainage to the surrounding soils during past operations.

C-633-4 Blending Cooling Tower (North) - Conclusion and Recommendations

- Walkdown inspection of the facility, employee interviews, and other reviewed historical information did not identify any unusual conditions that would pose a potential threat of environmental release during future demolition of the aboveground structure.
  - Deactivation will include removal of any accessible loose items being stored and certain equipment (e.g., risers, fans, fan motors, and shrouds, etc.) (to the extent practicable) prior to demolition.
  - Any floor drains will be delineated, documented, and isolated prior to demolition.
  - An evaluation will be made to determine if any measures may be appropriate to stabilize and/or isolate the basin (or portions thereof) from the main floor of the cooling tower prior to demolition. [Note: Measures other than mechanical isolation (one example of a measure other than mechanical isolation would be the addition of flowable fill) will require additional consultation with EPA and Kentucky.]
  - Water from the basin and influent flume will be evaluated for removal and proper disposal as part of deactivation and/or predemolition activities. (Note: Because the basin and influent flume are part of the underlying slab and soils that constitutes the SWMU, a SWMU notification, along with a SAR revision, will be performed documenting removal and disposal of the water associated with deactivation and/or predemolition activities.)

- Pending completion of deactivation and availability of funding, proceeding with demolition and disposal of the C-633-4 facility (aboveground structure) outside of the FFA/CERCLA process, contingent upon the fact that no additional changes have occurred that would affect the CERCLA determination of the facility prior to demolition, is recommended.

- All applicable laws, regulations, and DOE procedures/protocols will be followed to ensure the demolition and disposal of the aboveground structure occurs in a safe, compliant manner, including conducting any additional radiological characterization through confirmation radiological surveys (as necessary) to support demolition and waste disposition.

C-633-4 Blending Cooling Tower (North) - Conclusion and Recommendations

- Based on the construction and historical use at C-633-4, demolition and disposal of the aboveground structure for C-633-4 is recommended to be conducted outside of the FFA/CERCLA process.

- As part of the demolition of the aboveground structure, the appropriate BMPs will be evaluated and implemented (as needed) to prevent/minimize the pooling and/or migration of storm water that may come into contact with any contamination that may exist on the pad/subsurface structure(s). For example, the following BMPs will be implemented as necessary:
  - Radiological surveying will occur following demolition.
  - Decontamination and/or application of fixatives and/or barriers to contaminated surfaces above regulatory posting limits.
  - Isolation measures and other types of barriers to minimize and/or control runoff/pooling of contaminated storm water [e.g., seal inlets to drains/sumps/subsurface structure(s)].

- Removal of the C-633-4 facility from the Facility D&D OU will be documented in the appropriate annual SMP revision.

- Based on the construction and historical use at C-633-4, it is recommended that the underlying slab and soils (including surrounding soils within the C-633-4 footprint) undergo further CERCLA evaluation as part of Soils and Slabs OU as currently identified in Appendix 4 of the SMP.
  - The SAR for SWMU 87 will be updated to clarify that the C-633-4 underlying slab and soils (including surrounding soils within the C-633-4 footprint) constitutes the SWMU will undergo a remedial field investigation as part of the Soils and Slabs OU.
  - Consideration will be given to coordinate the timing for issuance and finalization of a revised SAR for SWMU 87 that includes updated information on C-633-5 prior to removal of the aboveground structure.

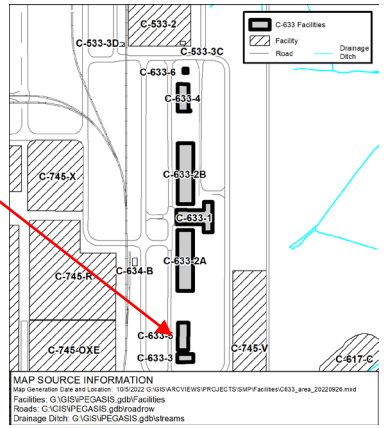
C-633-5 Blending Cooling Tower (South)

C-633-5 Blending Cooling Tower (South)

C-633-5 Blending Cooling Tower (South) - Construction History

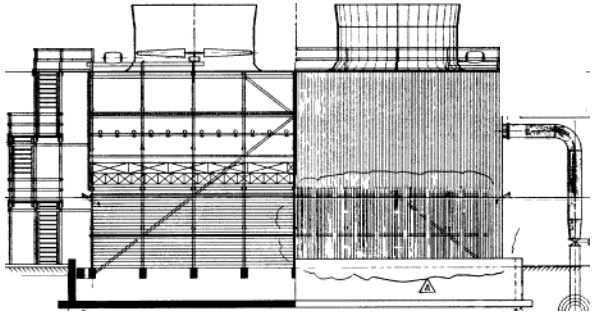
- C-633-5 Blending Cooling Tower (South) facility is one of seven facilities located in SWMU 87.
- The facility was constructed in 1976/1977.
- The facility is a wood frame structure (approximately 32 ft tall) resting on a 8-inch thick poured concrete slab; a deck roof with railing and fan shrouds; and exterior walls of corrugated panels.
  - Often referred to as one of the "CUP towers."
  - Supports three cooling tower cells.
    - Each cell has a fan and driving motor; total of 3 fans/driving motors.
    - Fans are enclosed by protective shrouds.
    - One riser serves each cooling tower cell; total of 3 risers.
    - The tower contains a water distribution system (including lateral flush lines), cold water fill (system of baffles), and mist eliminators.
    - Piping and sprinklers for fire protection throughout.
  - Cools RCW and returns it to the below grade collection basin.
    - Footprint of the basin is larger than the aboveground footprint of the blending cooling tower; extending approximately 381 ft north of C-633-5.
    - C-633-5 sits on top of a concrete slab with the basin running underneath the slab; as a result the basin is not open or visible.
    - Approximately 48– 9-inch diameter holes are drilled into the slab allowing cooled RCW water to fall into the basin below.

C-633-5 Blending Cooling Tower (South)



C-633-5 Blending Cooling Tower – West Side

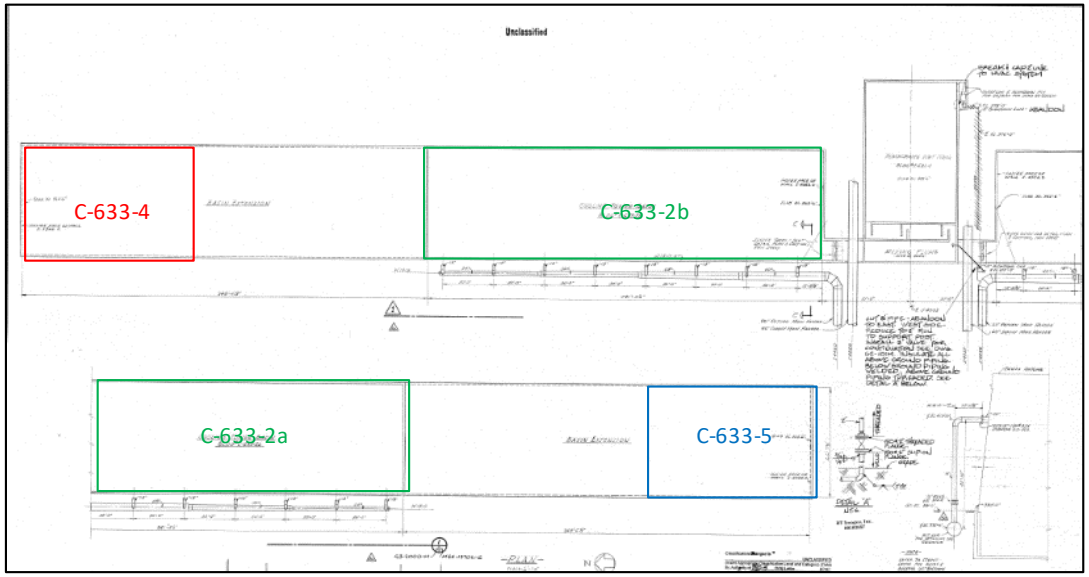
C-633-5 Facility Photos: 10/2022



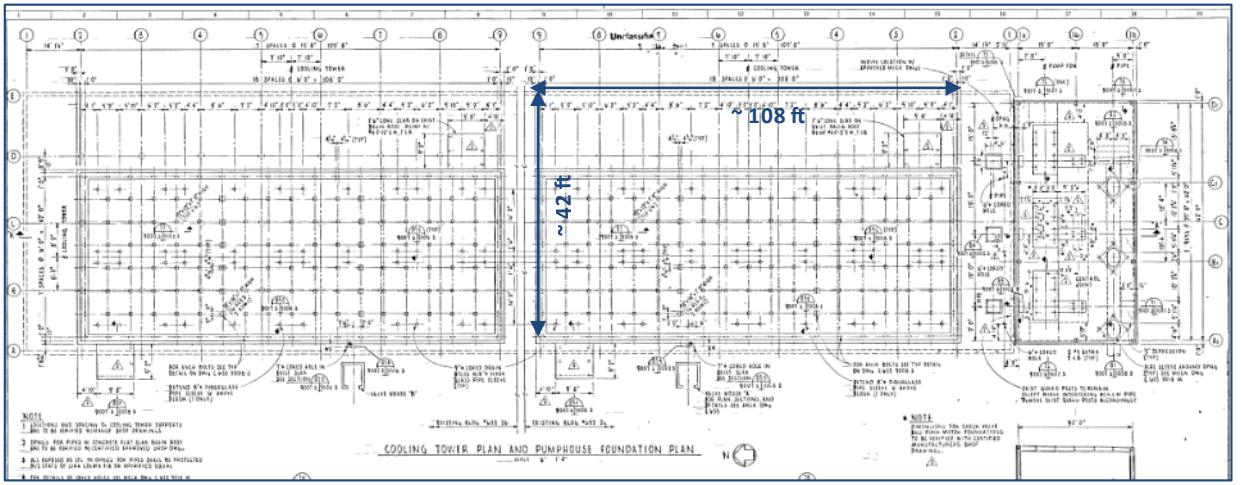
Internal Cooling Tower Components Excerpt from Engineering Drawing HUC3403-001-01

C-633-5 Blending Cooling Tower (South) - Construction History

- The facility is a wood frame structure… (Continued)
  - West side infrastructure.
    - One exterior wood staircase; located on the north west end.
    - Three riser pipes; connect to the below grade piping system.
    - One external concrete building; houses the fire sprinkler system.
  - East side infrastructure.
    - One exterior wood staircase; located on the south east end.
    - Electrical power supply to fans.
    - Flush line connection points.
  - Roof infrastructure.
    - Wood decking with railing that extends the circumference of the tower.
    - Support fans that are enclosed with protective shrouds.



Excerpt of Engineering Drawing of C-633-2A&B Layout; G3-2000M, dated 1951



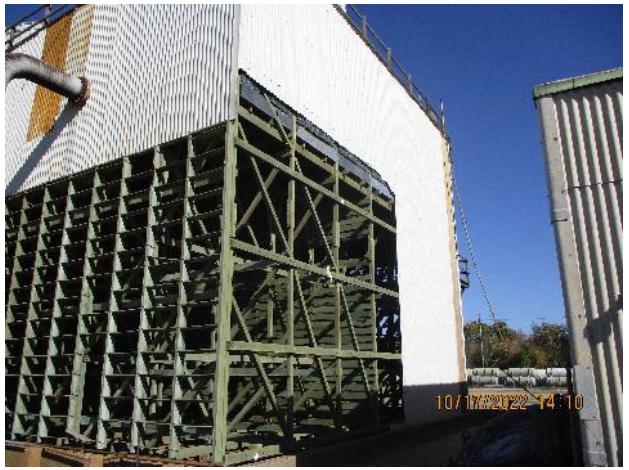
Excerpt of Engineering Drawing of C-633 Blending Towers and Blending Tower Pump House Foundation Plan; C-633-9007-S, dated 1975

C-633-5 Blending Cooling Tower (South) - Operational History

- Blending cooling towers, along with blending pump houses, were constructed as part of the 1970s CIP/CUP in anticipation that the increase in enrichment capacity would result in an increase in process temperatures that would require additional cooling capability.
  - Blending cooling towers were designed similar to the main cooling tower and provided additional cooling capacity.

- C-633-5 was originally built and operated as a blending cooling tower from its construction in 1976/1977 to 2013.
  - Often referred to as one of the "CUP cooling towers."
  - Heated RCW from the C-333 process building was distributed through various sections of the blending cooling tower and released via evaporation; cooled RCW was then collected into the cooling tower basin where it then flowed by gravity via an influent flume and into the mixing flume and wet well located underneath the C-633-1 pump house.

C-633-5 Blending Cooling Tower – North Side



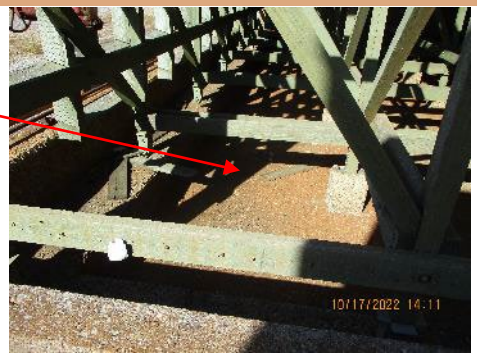
C-633-5 Blending Cooling Tower - South Side

C-633-5 Facility Photos: 10/2022

C-633-5 Blending Cooling Tower (South) - Construction History

- C-633-5 facility (aboveground structure) is approximately 4,536 ft^2; measuring ~42 ft x ~108 ft.
  - Collection basin measuring ~66 ft x ~489 ft x ~15 ft.
    - This basin is the larger basin footprint that runs underneath the C-633-2B Cooling Tower. (Note: The portion of the basin under the C-633-2B cooling tower contains the influent flume that connects the C-633-2B cooling tower basin to the C-633-1 pump house.)
  - One external concrete building measuring ~6 ft 8 inches x ~6 ft 8 inches x ~9 ft.
    - Houses the fire sprinkler system.
    - Located within footprint of the blending cooling tower.
  - Four vaults support C-633-5.
    - While installed and associated with the C-633-5 blending tower, these vaults are located within footprint of the C-633-2A main cooling tower.
      - D-Loop Return Blending Tower Crossover vault.
      - D-Loop Return to Blending Tower vault.
      - D-Loop Return Bypass to Blending Tower vault.
      - D-Loop Return to Blending Pump House vault.

9-inch Diameter Holes to Basin (Allows cooled RCW water to fall into the basin below)



C-633-5 - Top of Basin Slab

C-633-5 - Fire Sprinkler System

D-Loop Return to Blending Tower Crossover Vault

D-Loop Return to Blending Tower Vault

D-Loop Return Bypass to Blending Tower Vault

D-Loop Return to Blending Pump House Vault

C-633-6 Facility Photos: 10/2002 and 12/2022

C-633-5 Blending Cooling Tower (South) - Operational History

- Brown rot fungi growth was a problem for the blending cooling towers even though they were constructed with treated redwood.
  - All cell plenum chambers, tower deck, outer sidewalls, and tower tops were treated periodically with one of two types of fungicide solutions:
    - Sodium pentachlorophenate.
    - Double diffusion method – first spraying with a solution of zinc sulphate and arsenic acid followed by a second spraying with a solution of sodium bichromate.
  - Fungicide treatment was discontinued in 1987.

C-633-5 – East Side

- In 1979, a cooling tower drift study was conducted to determine the impact of chromium dispersion from the cooling towers.
  - Vegetation survey provided evidence of long-term transport and disposition of chromium to terrestrial ecosystem components.
    - Decrease in concentration with distance; most disposition is confined to DOE property.
  - Chromium deposited by drift to soils or lost to soils from vegetation does not accumulate significantly beyond 200 meters from the towers
    - Soil chromium is the less soluble and less biologically active oxidation state (Cr+3).

C-633-5 – West Side

C-633-5 Facility Photos: 10/2022

C-633-5 Blending Cooling Tower (South) - Operational History

- In 1981, RCW sprinkler alarms were installed.
- USEC leased the facility in the early 1990s and continued to use C-633-5 as a blending cooling tower until enrichment operations ceased at C-333.
- In 1992, a 4-inch fiberglass distribution lateral pipe disconnected from the 20-inch header line; approximately 25,000 gal of RCW containing 8-9 ppm Cr^{+6} leaked to the surrounding area. (ASER 1992).
  - The line was valved out; key discharge areas were sandbagged and plugged.
  - The amount of chromium released was calculated to be approximately 1.8 lb; less than the reportable quantity.
  - The majority of the spill was recover by Chemical Operations personnel.
- From 2008-2010 the CUP cooling towers underwent refurbishment.
  - Refurbishment included the replacement of selected structure and decking materials. (Note: Mechanical repairs to motors, gear boxes, etc., also occurred over the years of operation.)
- In 2013, C-633-5 was shutdown, along with its associated pump house.
  - The basin and influent flume have not been drained and remain full of water; draining has not occurred in order to prevent hydrostatic pressure changes that could cause collapse or floating of the subsurface structure.
- C-633-5 transitioned from USEC to DOE in 2014.

C-633-5 – West Side and No. 9 Riser

C-633-5 – West Side Riser with Bypass

C-633-5 Facility Photos: 10/2022

C-633-5 Blending Cooling Tower (South) - Current Status

- Walkdown inspection conducted in October 2022 and employee interviews confirmed no unusual conditions.
  - Both ACM (e.g., transite siding) and lead-based paints are known to be present.
  - Historical use of sodium pentachlorophenate; zinc sulphate; arsenic acid; and sodium bichromate for fungicide treatment of wood.
  - One external concrete building; houses the fire sprinkler system.
  - Not used for radiological storage; no radiological postings present.
  - No GSA or SAA.
  - Basin located beneath the C-633-5 blending cooling tower is associated with the C-633-2A cooling tower basin (basin remains full of water).
    - Contains ten pressure release valves.
    - Houses an influent flume that exits at the bottom of the basin of the cooling tower (influent full remains full of water).
    - Chlorine, sulfuric acid, and corrosion inhibitors (including chromate) were routinely fed into the RCW system via the C-633-1 wet well and would be present in the basin.
    - Historical chromated water leaks have occurred.
  - No known chemical spills except for those associated with the basin (e.g., chromated water leaks).
  - Four vaults associated with C-633-5 (D-Loop Return) are located within the footprint of the main cooling tower.

C-633-5 – Structural Frame

C-633-5 – Flush Line Connection Point

C-633-5 – East Stairway and Basin Roof

C-633-5 – Sprinkler

C-633-5 Facility Photos: 10/2022

C-633-5 Blending Cooling Tower (South) - Environmental Impacts

- No information to indicate a release or threatened release of a hazardous substance that would require a CERCLA evaluation for a potential response action for demolition of the aboveground structure to protect future public health or welfare or the environment.
  - C-633-5 was exclusively operated as a blending cooling tower; cooling heated RCW from the C-333 process building from its construction in 1976/1977 to 2013.
  - Building materials used for construction could contain lead-based paints and ACM (e.g., corrugated transite siding).
    - Because the C-633-5 blending cooling tower was not completely refurbished; chemicals used for fungicide treatment through 1987 may be of concern.
    - In 1992/1993, the RCW system was converted from a chromate system to a phosphate system.
  - Building debris generated from demolition of the aboveground structures can be properly managed using standard demolition and waste management practices.

- Process knowledge and employee interviews indicate that the historical construction and system processes at C-633-5 involved equipment and chemicals that could have the potential to pose a release threat to the basin and underlying soils (including the surrounding area associated with the basin/vaults). (See slide 6 for SWMU 87 details.)
  - Chromated water releases and airborne dispersion of chromium have occurred; making the underlying soils and surrounding area suspect for potential chromium contamination.
  - Historical fungicide treatment of wood; making the underlying soils suspect for potential contamination.
  - Ten pressure release valves are located along the bottom of the basin floor.
  - Basin (currently full of water) is connected to the C-633-1 pump house via an influent flume (currently full of water).
    - Chlorine, sulfuric acid, and corrosion inhibitors (including chromate) were routinely fed into the RCW system via the C-633-1 wet well and would be present in the basin.
  - Four of the nine vaults located within the footprint of the C-633-2A main cooling tower are associated with C-633-5. Historically these types of vaults have been known to contain sump pumps; therefore, it is assumed that there has been drainage to the surrounding soils during past operations.

C-633-5 Blending Cooling Tower (South) - Conclusion and Recommendations

- Walkdown inspection of the facility, employee interviews, and other reviewed historical information did not identify any unusual conditions that would pose a potential threat of environmental release during future demolition of the aboveground structure.
  - Deactivation will include removal of any accessible loose items being stored and certain equipment (e.g., risers, fans, fan motors, and shrouds, etc.) (to the extent practicable) prior to demolition.
  - Any floor drains will be delineated, documented, and isolated prior to demolition.
  - An evaluation will be made to determine if any measures may be appropriate to stabilize and/or isolate the basin (or portions thereof) from the main floor of the cooling tower prior to demolition. [Note: Measures other than mechanical isolation (one example of a measure other than mechanical isolation would be the addition of flowable fill) will require additional consultation with EPA and Kentucky.]
  - Water from the basin and influent flume will be evaluated for removal and proper disposal as part of deactivation and/or predemolition activities. (Note: Because the basin and influent flume are part of the underlying slab and soils that constitutes the SWMU, a SWMU notification, along with a SAR revision, will be performed documenting removal and disposal of the water associated with deactivation and/or predemolition activities.)

- Pending completion of deactivation and availability of funding, proceeding with demolition and disposal of the C-633-5 facility (aboveground structure) outside of the FFA/CERCLA process, contingent upon the fact that no additional changes have occurred that would affect the CERCLA determination of the facility prior to demolition, is recommended.

- All applicable laws, regulations, and DOE procedures/protocols will be followed to ensure the demolition and disposal of the aboveground structure occurs in a safe, compliant manner, including conducting any additional radiological characterization through confirmation radiological surveys (as necessary) to support demolition and waste disposition.

C-633-5 Blending Cooling Tower (South) - Conclusion and Recommendations

- Based on the construction and historical use at C-633-5, demolition and disposal of the aboveground structure for C-633-5 is recommended to be conducted outside of the FFA/CERCLA process.

- As part of the demolition of the aboveground structure, the appropriate BMPs will be evaluated and implemented (as needed) to prevent/minimize the pooling and/or migration of storm water that may come into contact with any contamination that may exist on the pad/subsurface structure(s). For example, the following BMPs will be implemented as necessary:
  - Radiological surveying will occur following demolition.
  - Decontamination and/or application of fixatives and/or barriers to contaminated surfaces above regulatory posting limits.
  - Isolation measures and other types of barriers to minimize and/or control runoff/pooling of contaminated storm water [e.g., seal inlets to drains/sumps/subsurface structure(s)].

- Removal of the C-633-5 facility from the Facility D&D OU will be documented in the appropriate annual SMP revision.

- Based on the construction and historical use at C-633-5, it is recommended that the underlying slab and soils (including surrounding soils within the C-633-5 footprint) undergo further CERCLA evaluation as part of Soils and Slabs OU as currently identified in Appendix 4 of the SMP.
  - The SAR for SWMU 87 will be updated to clarify that the C-633-5 underlying slab and soils (including surrounding soils within the C-633-5 footprint) constitutes the SWMU and will undergo a remedial field investigation as part of the Soils and Slabs OU.
  - Consideration will be given to coordinate the timing for issuance and finalization of a revised SAR for SWMU 87 that includes updated information on C-633-5 prior to removal of the aboveground structure.

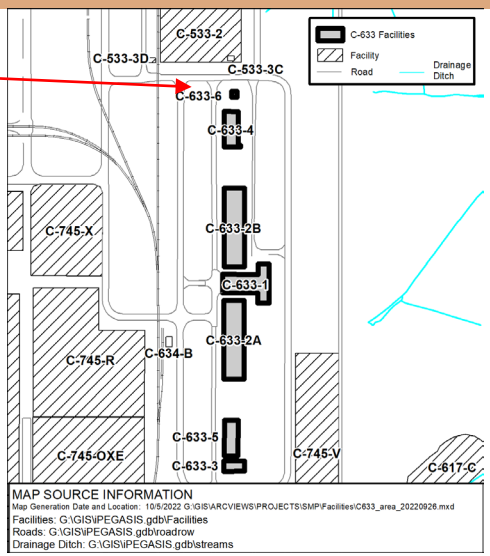
C-633-6 Sand Filter Building

C-633-6 Sand Filter Building

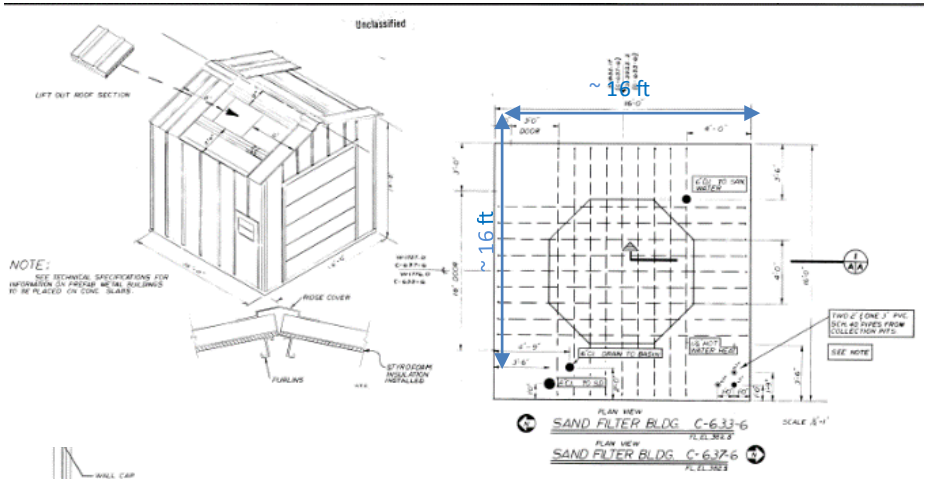
C-633-6 Sand Filter Building - Construction History

- C-633-6 Sand Filter building is one of seven facilities located in SWMU 87.
- The facility was constructed in 1981.
- The facility is a single-story, prefabricated metal building on a 6-inch poured concrete slab.
  - Gable roof with a 4 ft removable roof insert.
  - East side pedestrian door; north side garage bay roll-up door.
  - Houses a Permutit® sand filter tank, fabri-basket filter system, and system piping.
    - Permutit® sand filter tank (measuring ~ 8' dia. X ~ 11'6") is located on a 6-inch hexagon shaped concrete platform that sits on the 6-inch concrete building slab (sits on a total 12 inches of concrete).
    - Fabri-basket filter system is a wall mounted system located on the east wall.
- The entire facility is approximately 256 ft^2 measuring ~16 ft x ~16 ft x ~14 ft.
  - Three pipe enclosed drains are present.
    - Two drain back to C-633-2B basin: filtered water and RCW.
    - One drains into the storm sewer; backwash water.

C-633-6 Sand Filter Building



C-633-6 – Sand Filter Building North Side

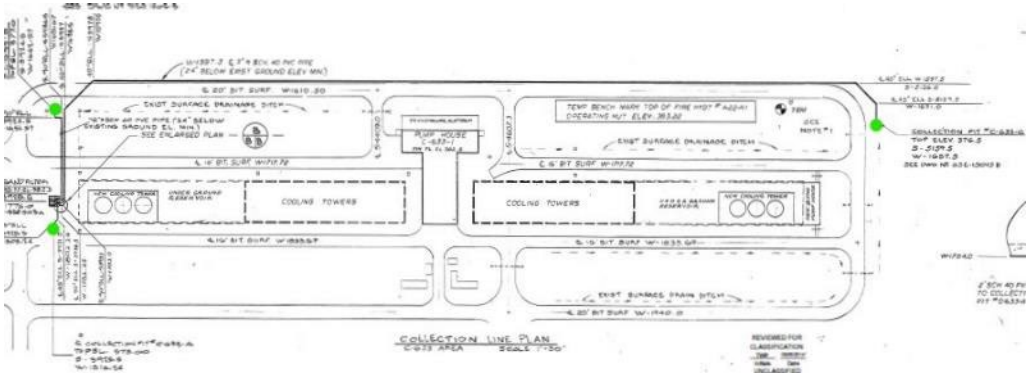


Floor Plan View: Excerpt from Engineering Drawing S5E 15015-A_0001_0000_U-021471, dated 1980

C-633-6 Facility Photo: 10/2022

C-633-6 Sand Filter Building - Construction History

- C-633-6 was originally designed and operated as a sand filter building; supporting the filtering of water [wind carried mist (e.g., windage) and surface water runoff] surrounding the cooling towers prior to returning it back to the C-633 cooling tower basin.
  - Three concrete collection basins (C-633-A, C-633-B, and C-633-C) with sump pumps located on the north and south ends of the cooling tower footprint collected and piped water to C-633-6.
  - C-633-6 is heated with hot RCW that is supplied from the process building to fin tube heaters located along the facility walls.
  - Sanitary water is supplied to the facility and used to backwash the Permutit® sand filter tank.
- USEC leased the facility in the early 1990s and continued to use C-633-6 as a sand filter building.



Excerpt from Engineering Drawing C5E 15015-B, dated 1980

C-633-A – Collection Basin

C-633-B – Collection Basin

C-633-C – Collection Basin

C-633-6 Facility Photos: 10/2022 and 11/2022

C-633-6 Sand Filter Building - Construction History

- In 2013, C-633-6 was shutdown, along with its associated cooling towers (main cooling tower and blending towers).
- C-633-6 transitioned from USEC to DOE in 2014.
- In 2016, C-633-6 was no longer in service and electricity and water were isolated.
  - Permutit® sand filter tank was drained.
  - Sanitary water line was capped at both the incoming line and floor locations.

C-633-6 – Fabri-Basket Filter System

C-633-6 – Permutit® Sand Filter Tank

C-633-6 – Inlets from Windage Collection Sumps

C-633-6 – RCW Line for Fin Heating - Drain Line to C-633-2B Basin

C-633-6 – Drain Lines to Storm Sewer and C-633-2B Basin

C-633-6 Facility Photos: 10/2022 and 11/2022

C-633-6 Sand Filter Building - Current Status

- Walkdown inspection conducted in October and November 2022 and employee interviews confirmed no unusual conditions.
  - ❑ Houses a Permutit® sand filter tank; drained and air-gapped.
  - ❑ Houses a wall mounted fabri-basket filter system.
  - ❑ No known ACM.
  - ❑ Lead-based paints are suspected to be present.
  - ❑ Three pipe enclosed drains are present.
    - One drain for filtered water; drains back into the C-633-2B basin.
    - One drain for RCW water; drains back into the C-633-2B basin.
    - One drain for backwash water; drains into the storm sewer.
  - ❑ Not used for radiological storage; no radiological postings are present.
  - ❑ No GSA or SAA.
  - ❑ Visible signs of historical water leaks and Permutit® sand filter tank corrosion.
  - ❑ Contains some loose piping and wiring.
  - ❑ No known chemical spills.

C-633-6 - Permutit® Sand Filter Tank Drain

C-633-6 - Permutit® Sand Filter Tank (Corrosion Damage)

C-633-6 -Permutit® Sand Filter Tank (Backwash Rotation Indicator)

C-633-6 – Piping System (West Wall)

C-633-6 – Sanitary Water Line (Capped)

C-633-6 -Sanitary Water Line (Capped at Floor)

C-633-6 Facility Photos: 10/2022 and 11/2022

C-633-6 Sand Filter Building – Environmental Impacts

- No information to indicate a release or threatened release of a hazardous substance that would require a CERCLA evaluation for a potential response action for demolition of the structure (aboveground and subgrade) to protect future public health or welfare or the environment.

- C-633-6 has exclusively operated as a sand filter building that supported the filtering of water [wind carried mist (e.g., windage) and surface water runoff] surrounding the cooling towers prior to returning it back to the C-633-2B cooling tower basin from its construction in 1981 to 2016.
  - Building materials used for construction could contain lead-based paints.
  - Building debris generated from demolition of the structure (aboveground and subgrade) can be properly managed using standard demolition and waste management practices.

- Process knowledge and employee interviews indicate that the historical construction and system processes at C-633-6 involved equipment and chemicals that could have the potential to pose a release threat to the concrete pad and underlying soils. (See slide 6 for SWMU 87 details.)
  - C-633-6 is located within the footprint of the C-633 Cooling Tower.
  - C-633-6 filtered windage water and storm water runoff associated with the C-633 cooling towers that contained chromated water; making the slab, underlying soils, and surrounding area suspect for potential chromium contamination.
  - C-633-6 was connected to part of the RCW system (heating purposes) which contained chromated water.
  - Piped enclosed drains are located along the slab of the facility that drain into the C-633-2B cooling tower basin and the storm sewer.

C-633-6 Sand Filter Building - Conclusion and Recommendations

- Walkdown inspection of the facility, employee interviews, and other reviewed historical information did not identify any unusual conditions that would pose a potential threat of environmental release during future demolition of the structure (aboveground and subgrade).
  - Deactivation will include removal of any accessible loose items being stored and certain equipment (e.g., HPFWS pumps and motors, electrical control panels, etc.) (to the extent practicable) prior to demolition.
  - Any floor drains (including the three pipe enclosed drains) will be delineated, documented, and isolated prior to demolition.
  - An evaluation will be made to determine if any measures may be appropriate to stabilize and/or isolate the subgrade structure (or portions thereof) prior to demolition.

- Pending completion of deactivation and availability of funding, proceeding with demolition and disposal of the C-633-6 facility (aboveground structure) outside of the FFA/CERCLA process, contingent upon the fact that no additional changes have occurred that would affect the CERCLA determination of the facility prior to demolition, is recommended.

- All applicable laws, regulations, and DOE procedures/protocols will be followed to ensure the demolition and disposal of the aboveground structure occurs in a safe, compliant manner, including conducting any additional radiological characterization through confirmation radiological surveys (as necessary) to support demolition and waste disposition.

C-633-6 Sand Filter Building - Conclusion and Recommendations

- Based on the construction and historical use at C-633-6, demolition and disposal of the aboveground structure for C-633-6 is recommended to be conducted outside of the FFA/CERCLA process.

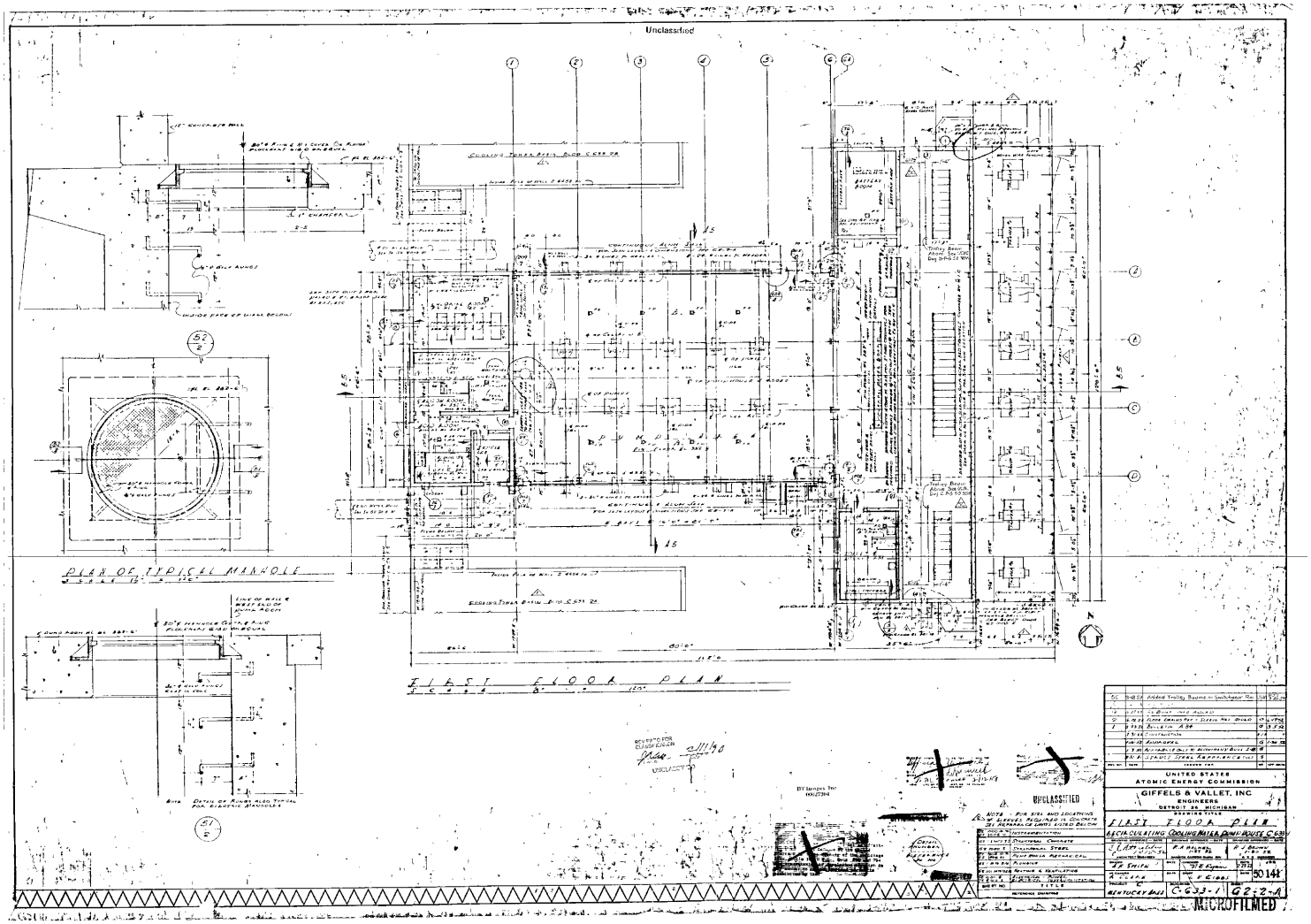
- As part of the demolition of the aboveground structure, the appropriate BMPs will be evaluated and implemented (as needed) to prevent/minimize the pooling and/or migration of storm water that may come into contact with any contamination that may exist on the pad/subsurface structure(s). For example, the following BMPs will be implemented as necessary:
  - Radiological surveying will occur following demolition.
  - Decontamination and/or application of fixatives and/or barriers to contaminated surfaces above regulatory posting limits.
  - Isolation measures and other types of barriers to minimize and/or control runoff/pooling of contaminated storm water [e.g., seal inlets to drains/sumps/subsurface structure(s)].

- Removal of the C-633-6 facility from the Facility D&D OU will be documented in the appropriate annual SMP revision.

- Based on the construction and historical use at C-633-6, it is recommended that the underlying and soils undergo further CERCLA evaluation as part of Soils and Slabs OU as currently identified in Appendix 4 of the SMP.
  - The SAR for SWMU 87 will be updated to clarify that the C-633-6 underlying slab (e.g., floor of subgrade structure) and soils constitutes the SWMU and will undergo a remedial field investigation as part of the Soils and Slabs OU.
  - Consideration will be given to coordinate the timing for issuance and finalization of a revised SAR for SWMU 87 that includes updated information on C-633-6 prior to removal of the structure.

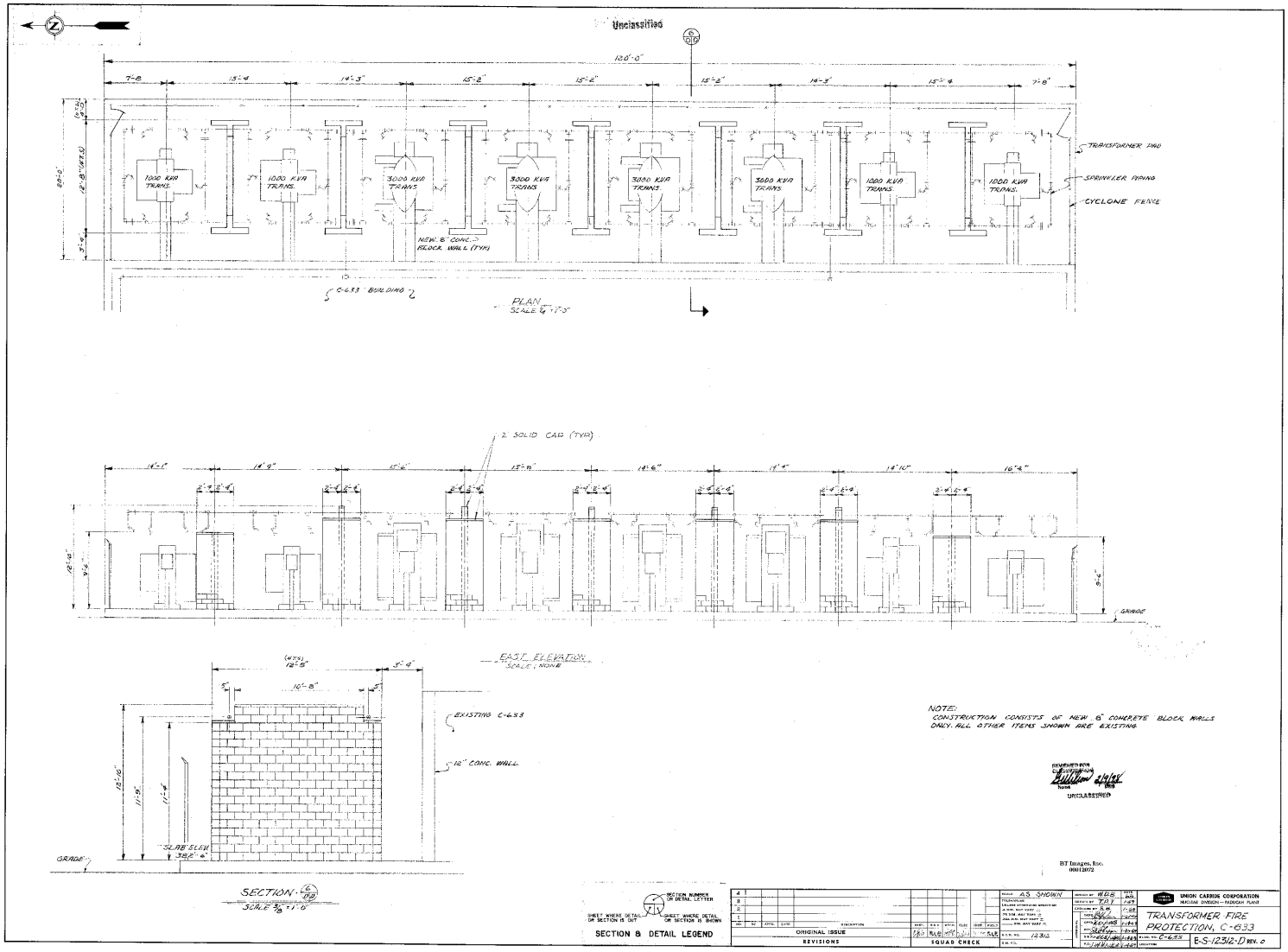
BACKUP INFORMATION

C-633-1 Engineering Drawings

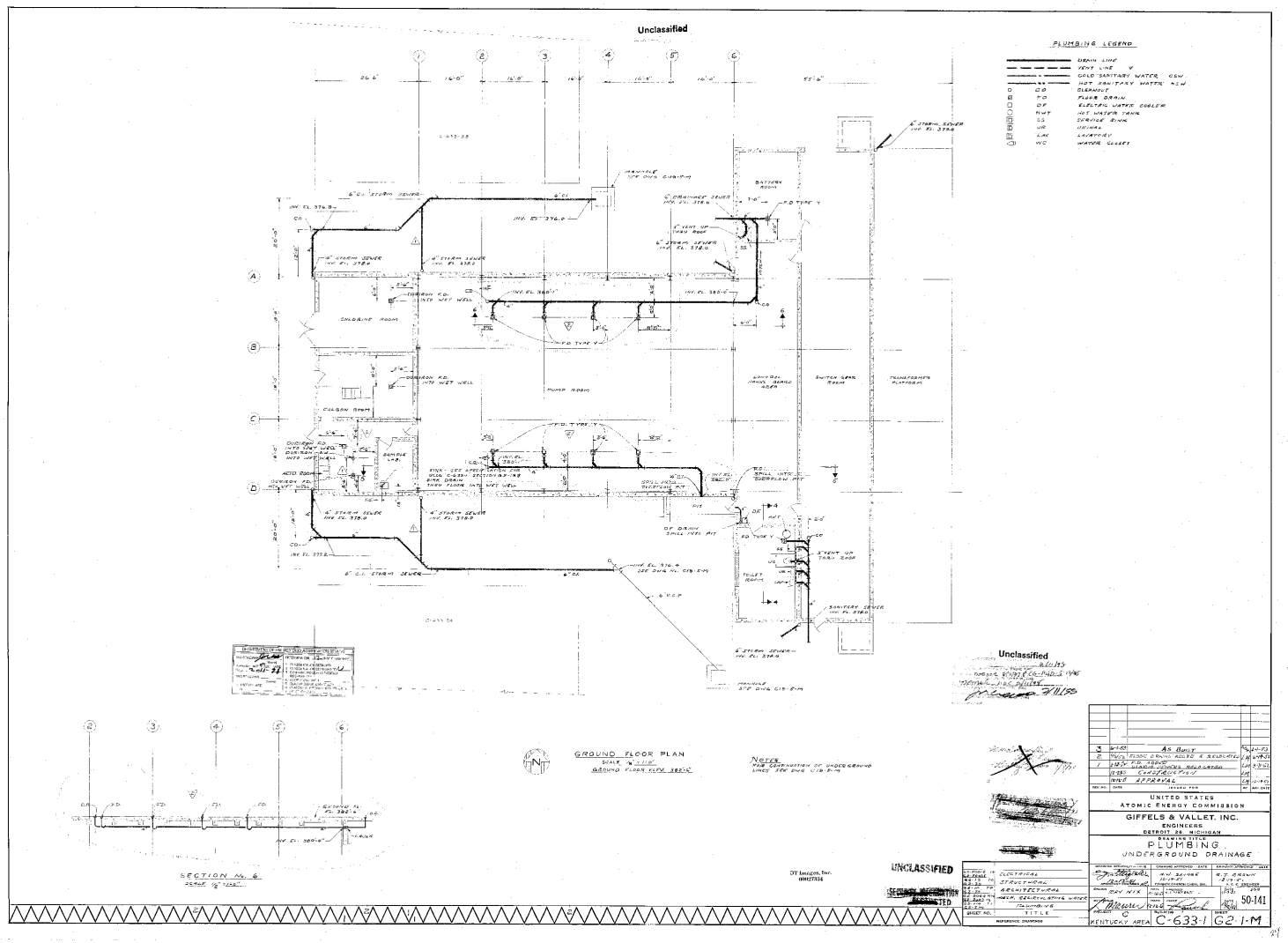


C-633-1; G2-2-A

C-633-1 Engineering Drawings

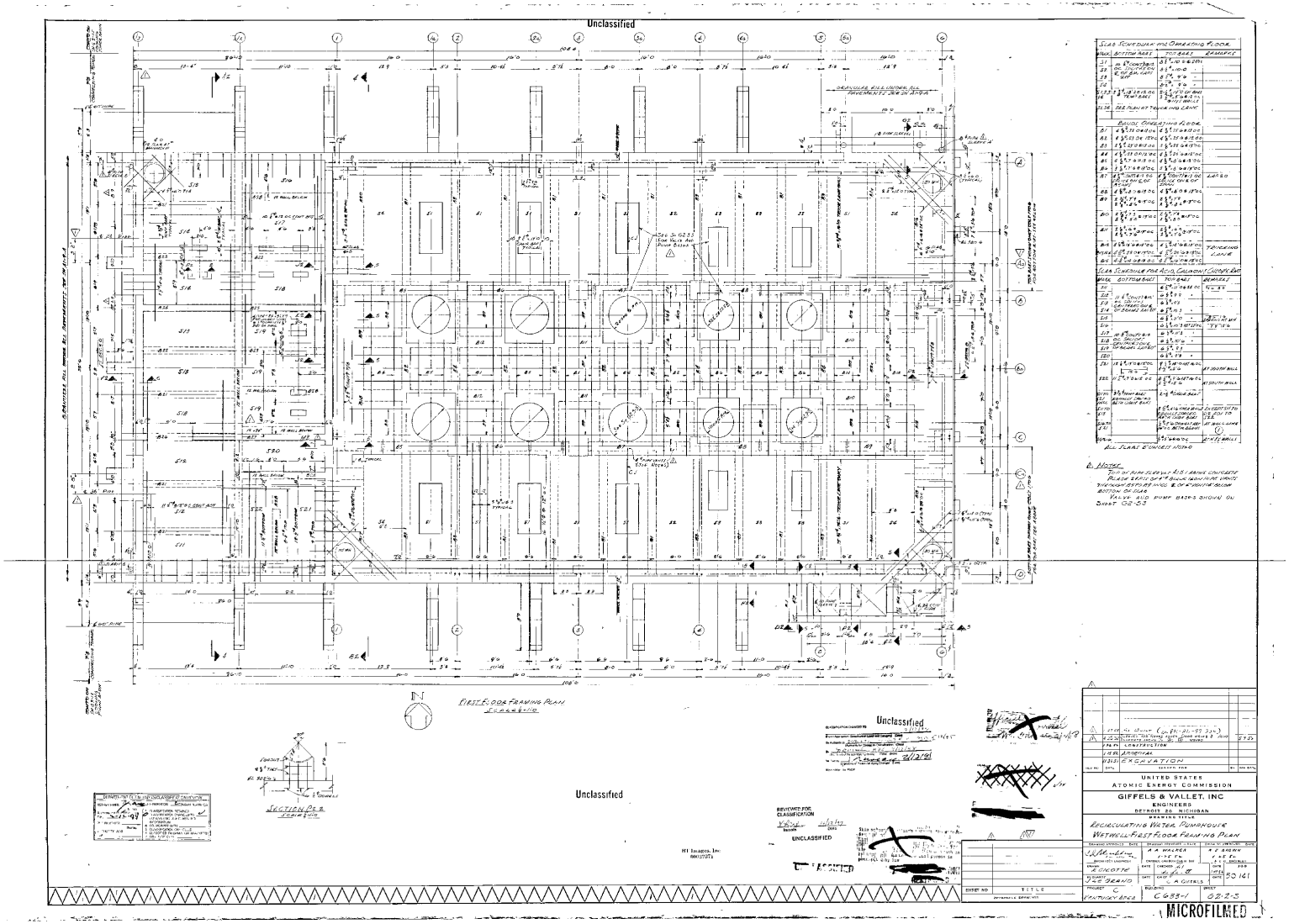


C-633-1 Engineering Drawings



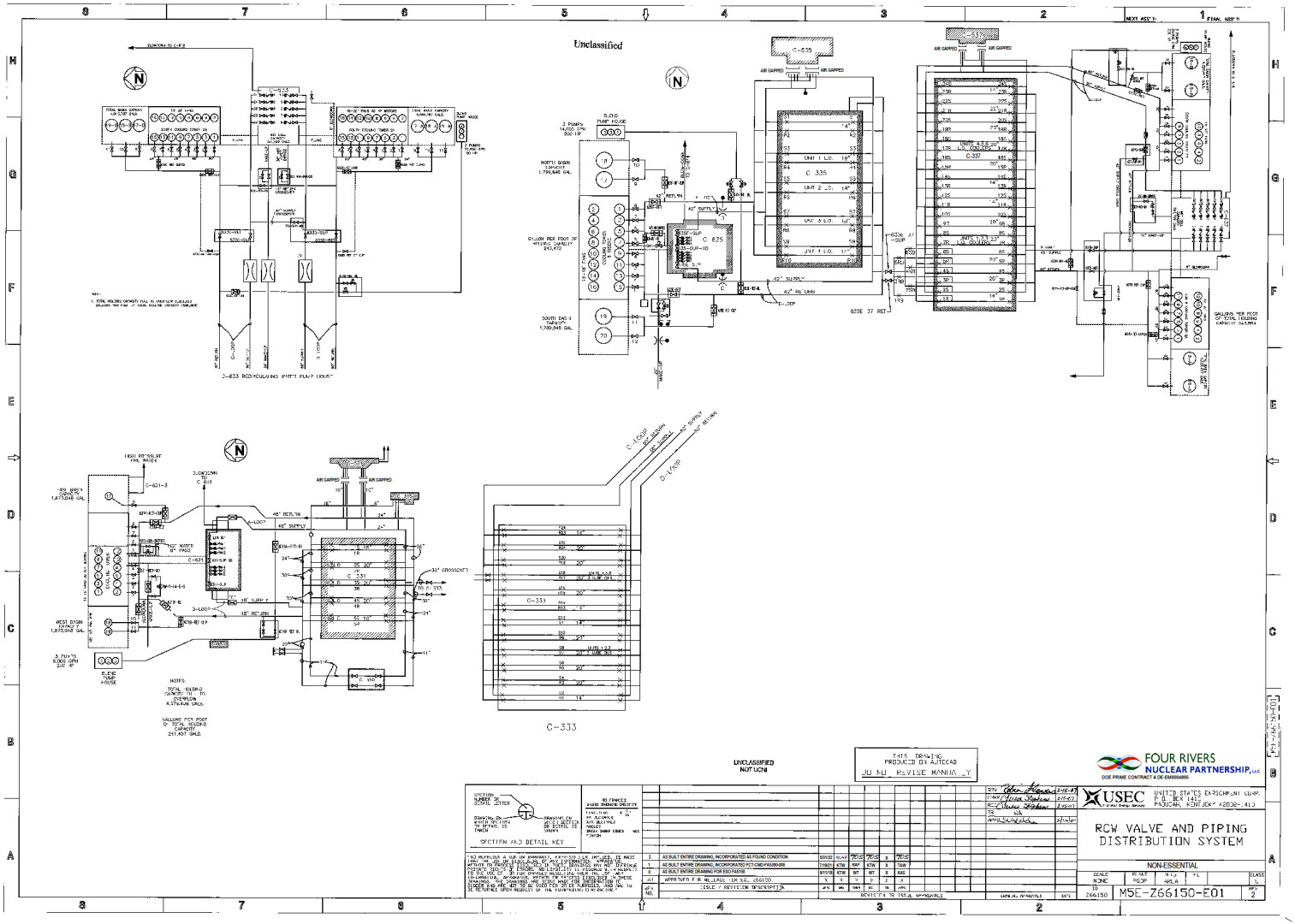
C-633-1, G2-1-M

C-633-1 Engineering Drawings



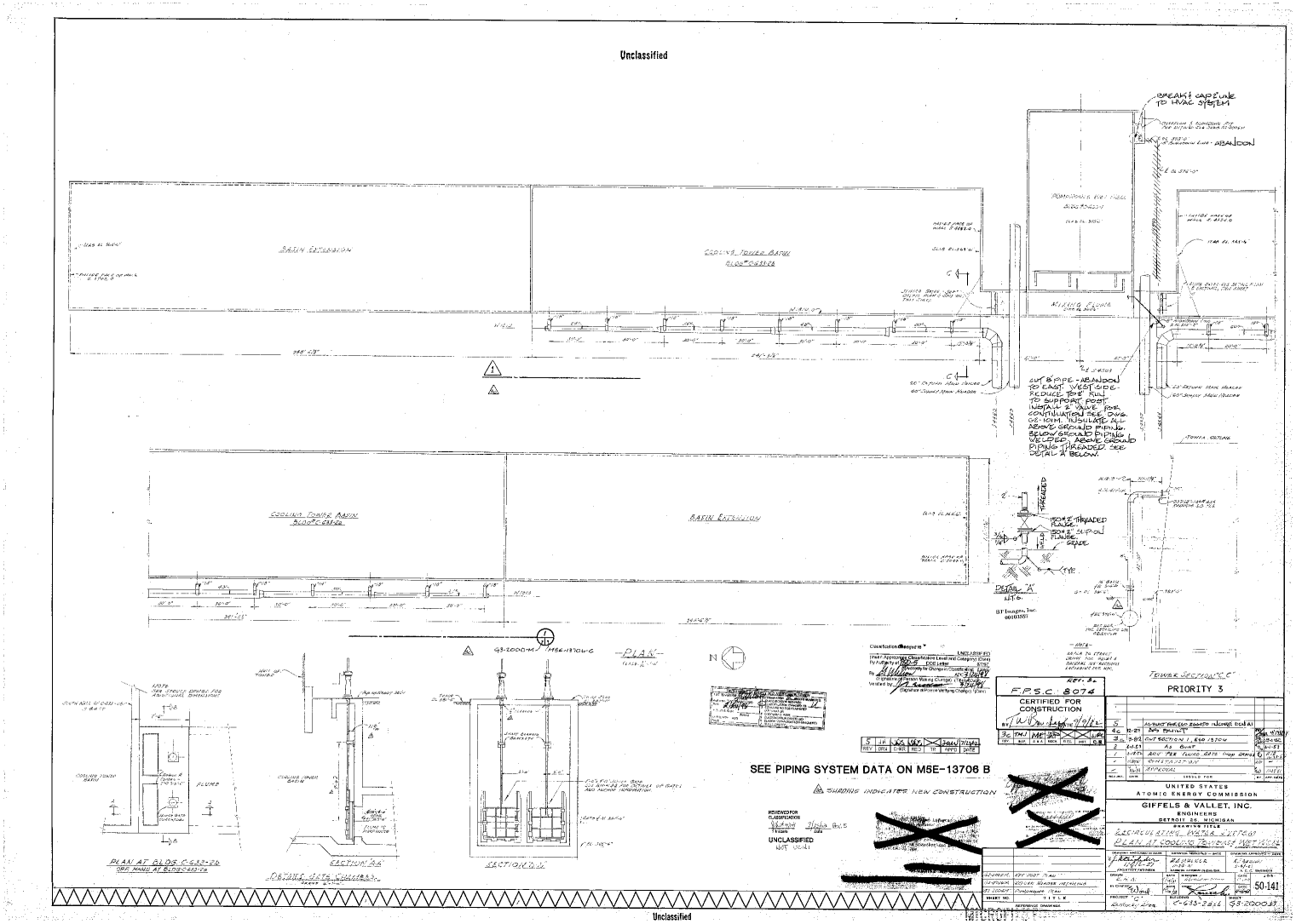
C-633-1; G2-2-S

C-633-1 Engineering Drawings



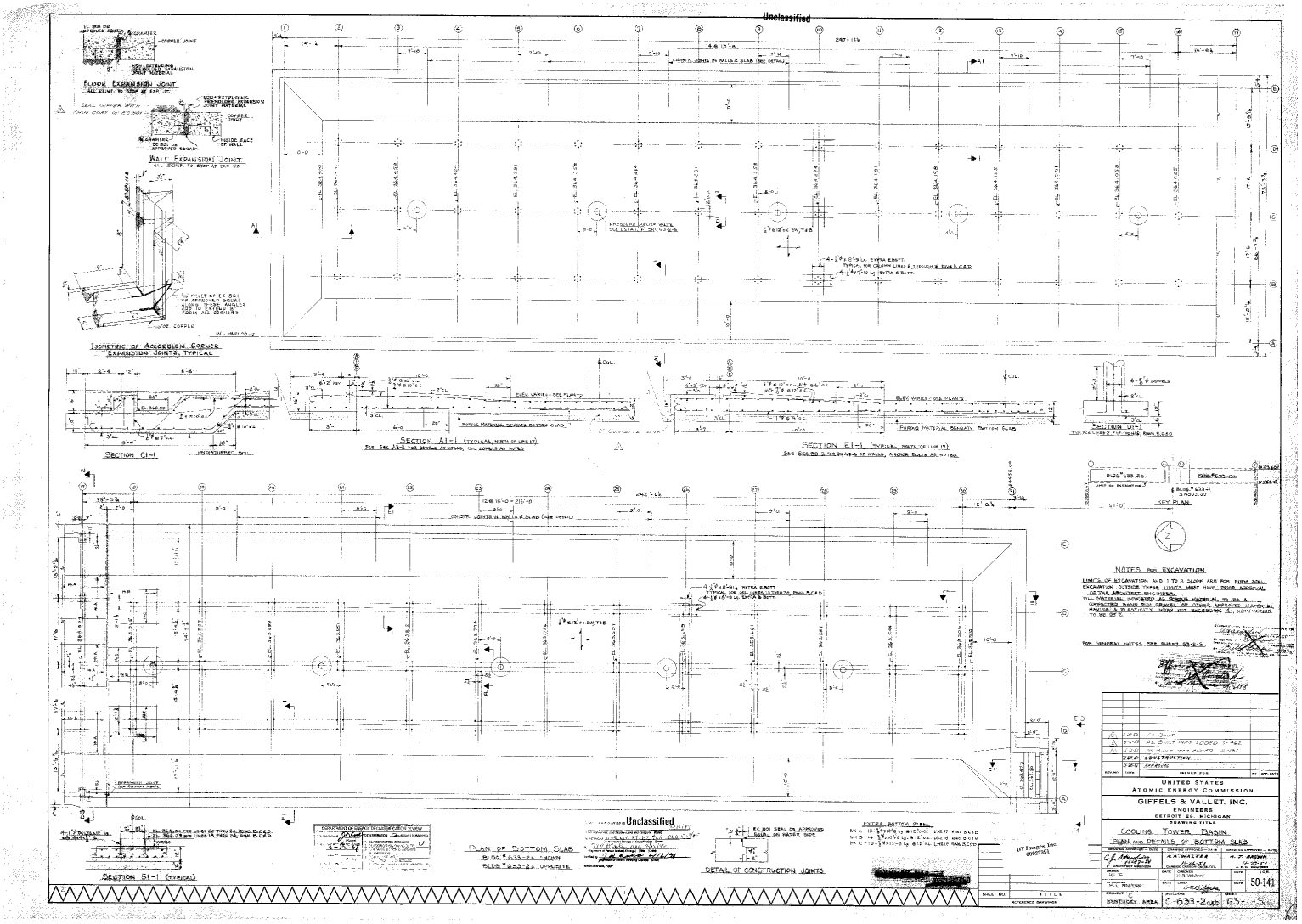
M5E-Z66150-E01, Rev 2

C-633-2A and C-633-2B Engineering Drawings



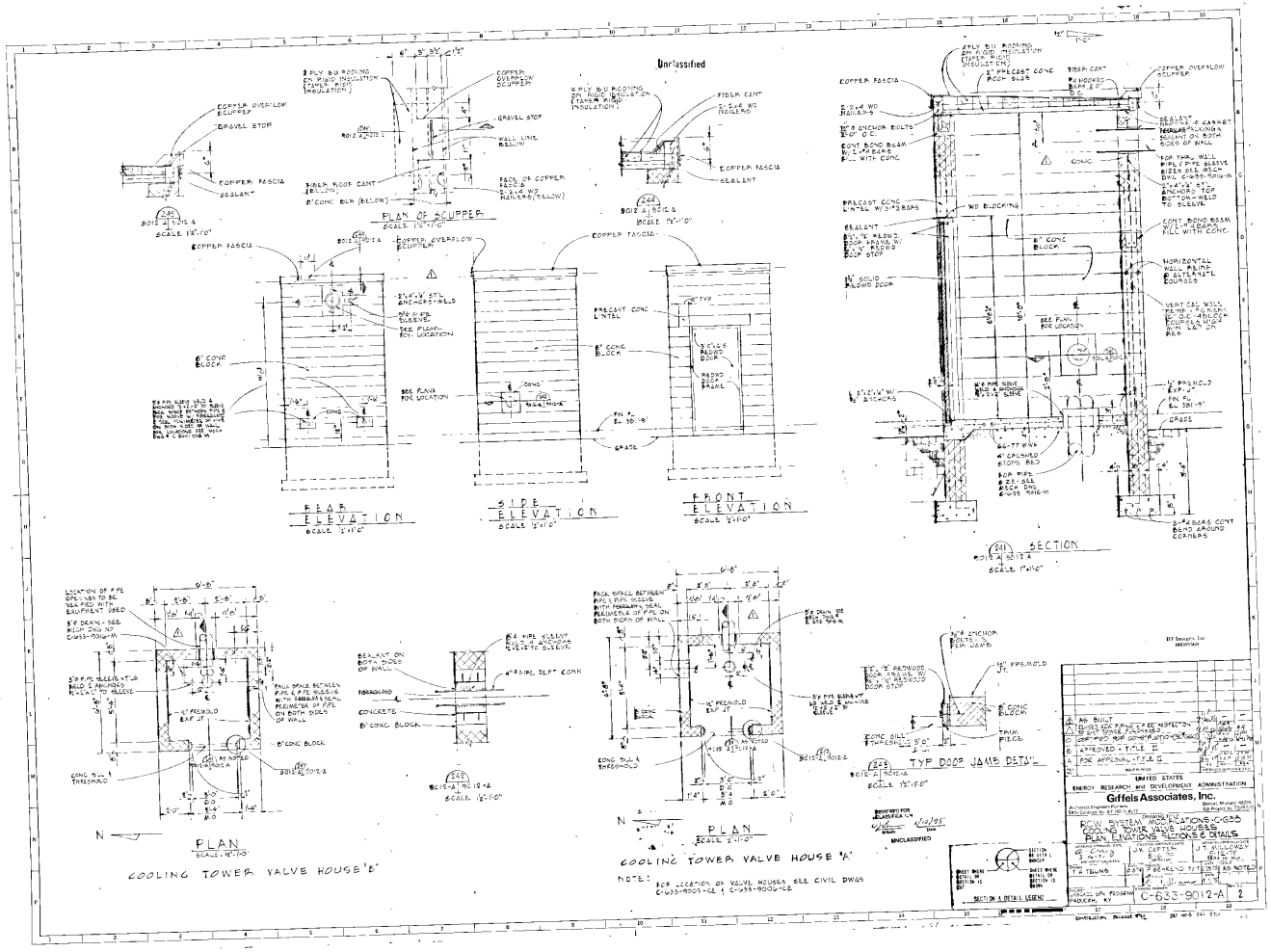
C-633-2A & B; G3-2000-M

C-633-2A and C-633-2B Engineering Drawings



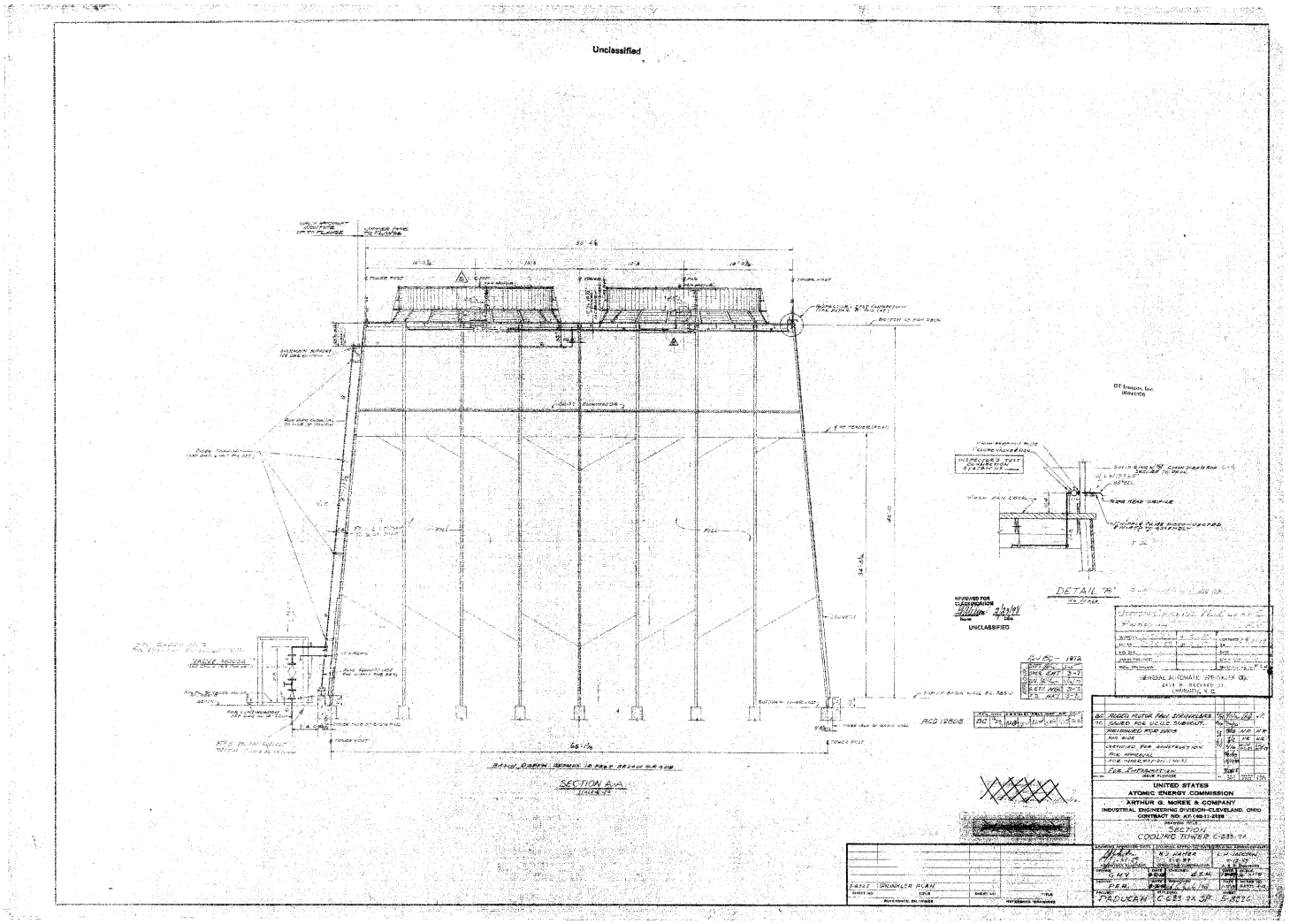
C-633-2A&b; G3-1-S

C-633-2A and C-633-2B Engineering Drawings



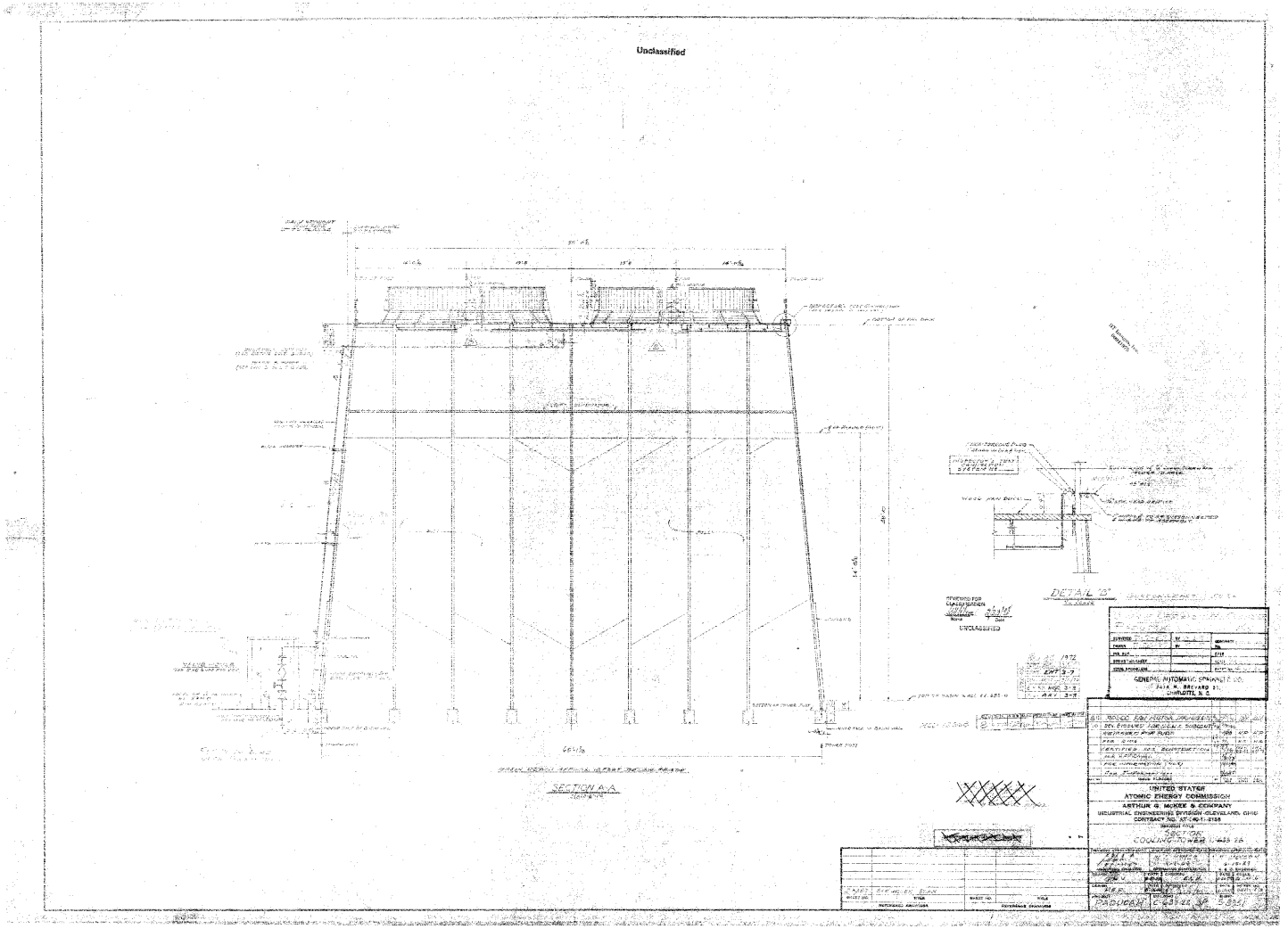
C-633-9012-A; Rev 2

C-633-2A and C-633-2B Engineering Drawings



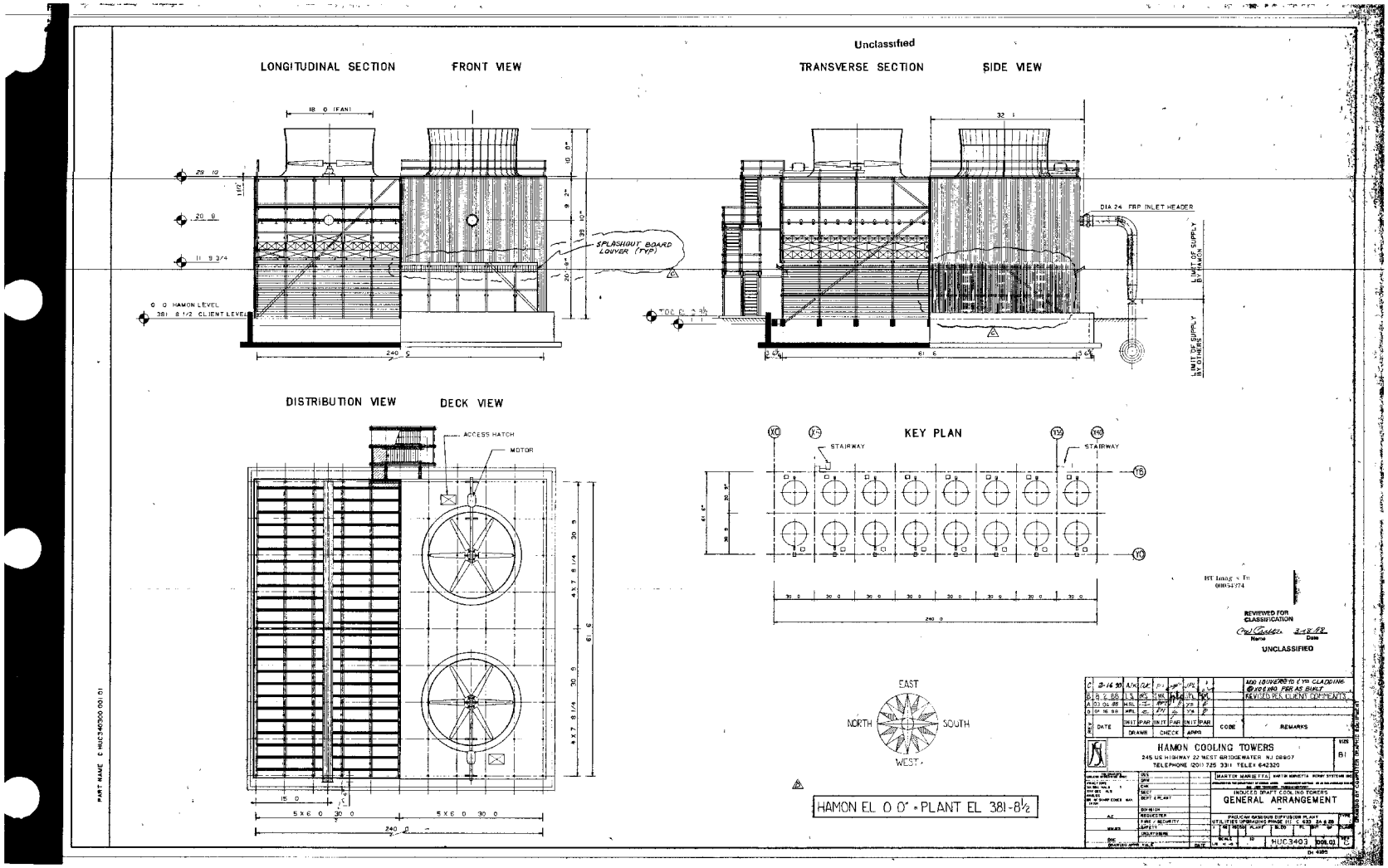
C-633-2A SP 5-8326

C-633-2A and C-633-2B Engineering Drawings

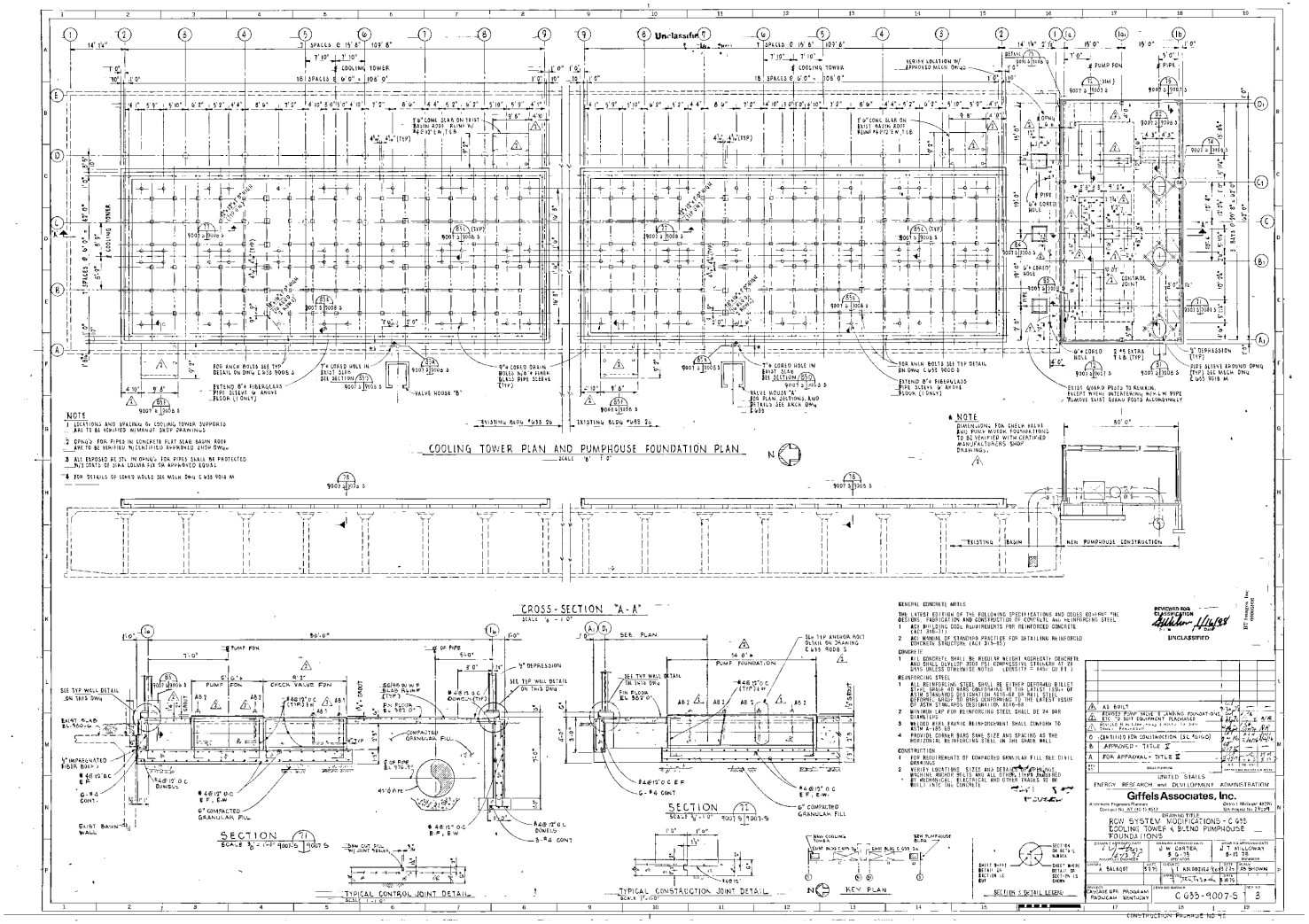


C-633-2B SP 5-8351

C-633-2A and C-633-2B Engineering Drawings

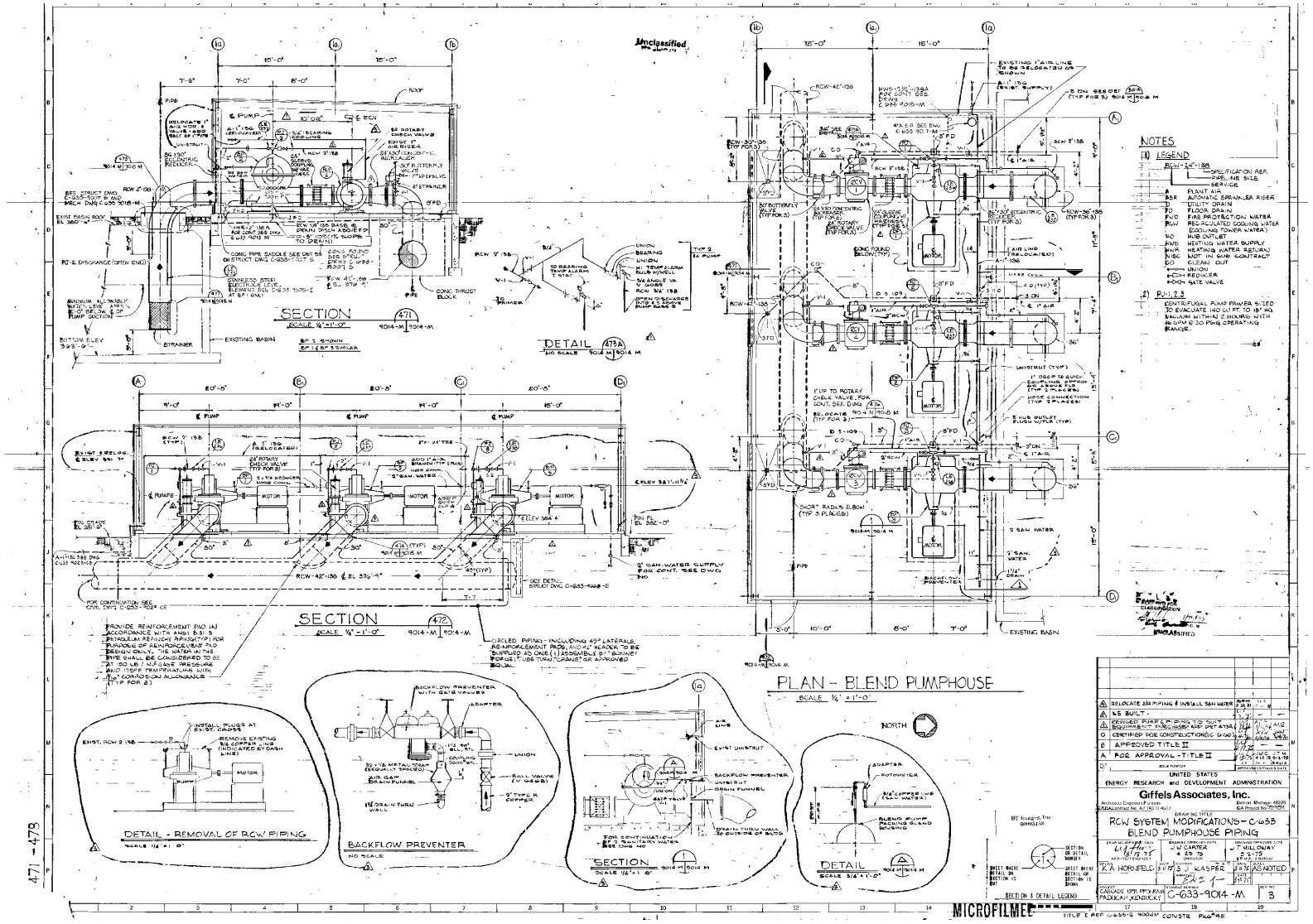


C-633-3 Engineering Drawings



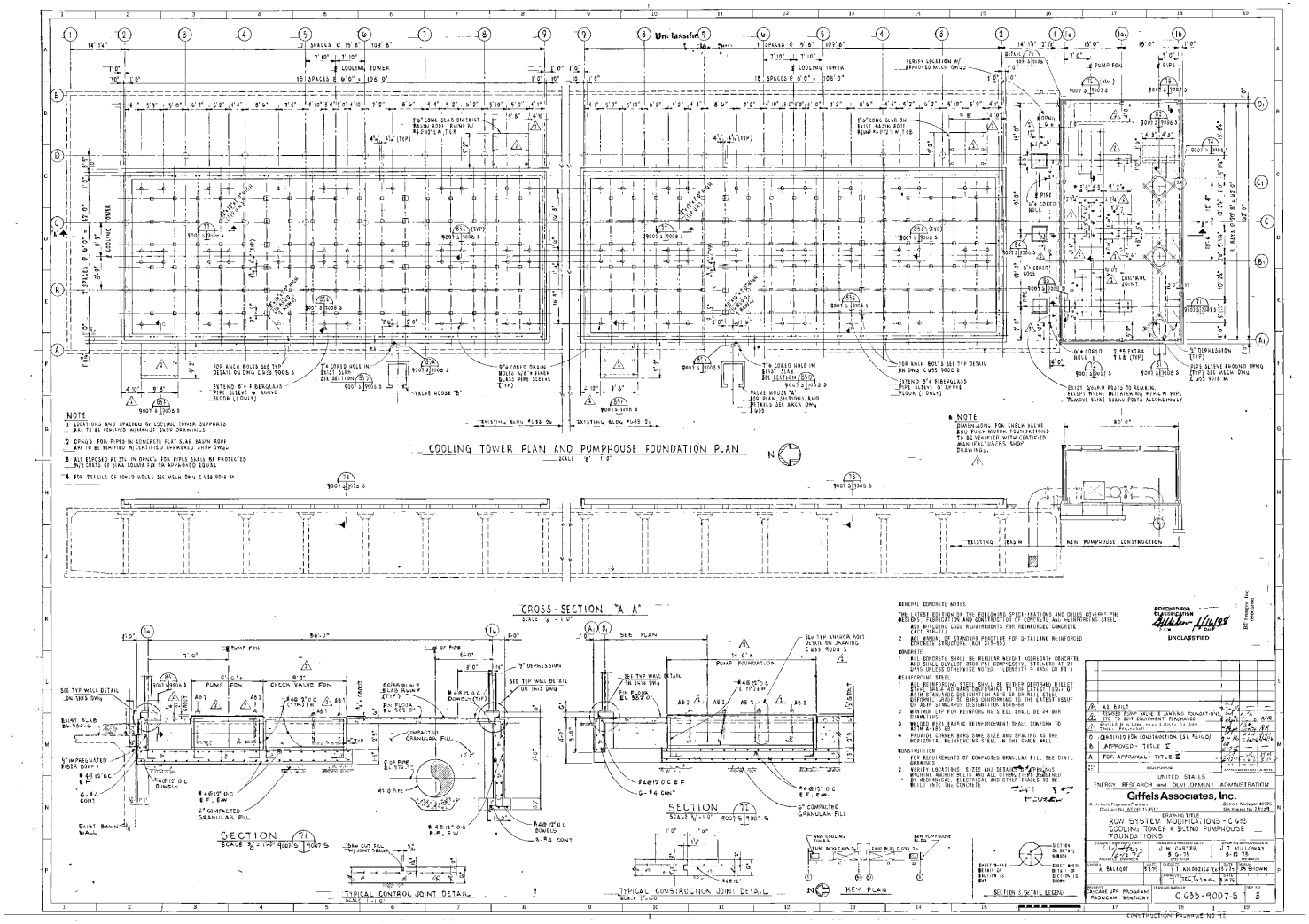
C-633-9007-S, Rev 3

C-633-3 Engineering Drawings

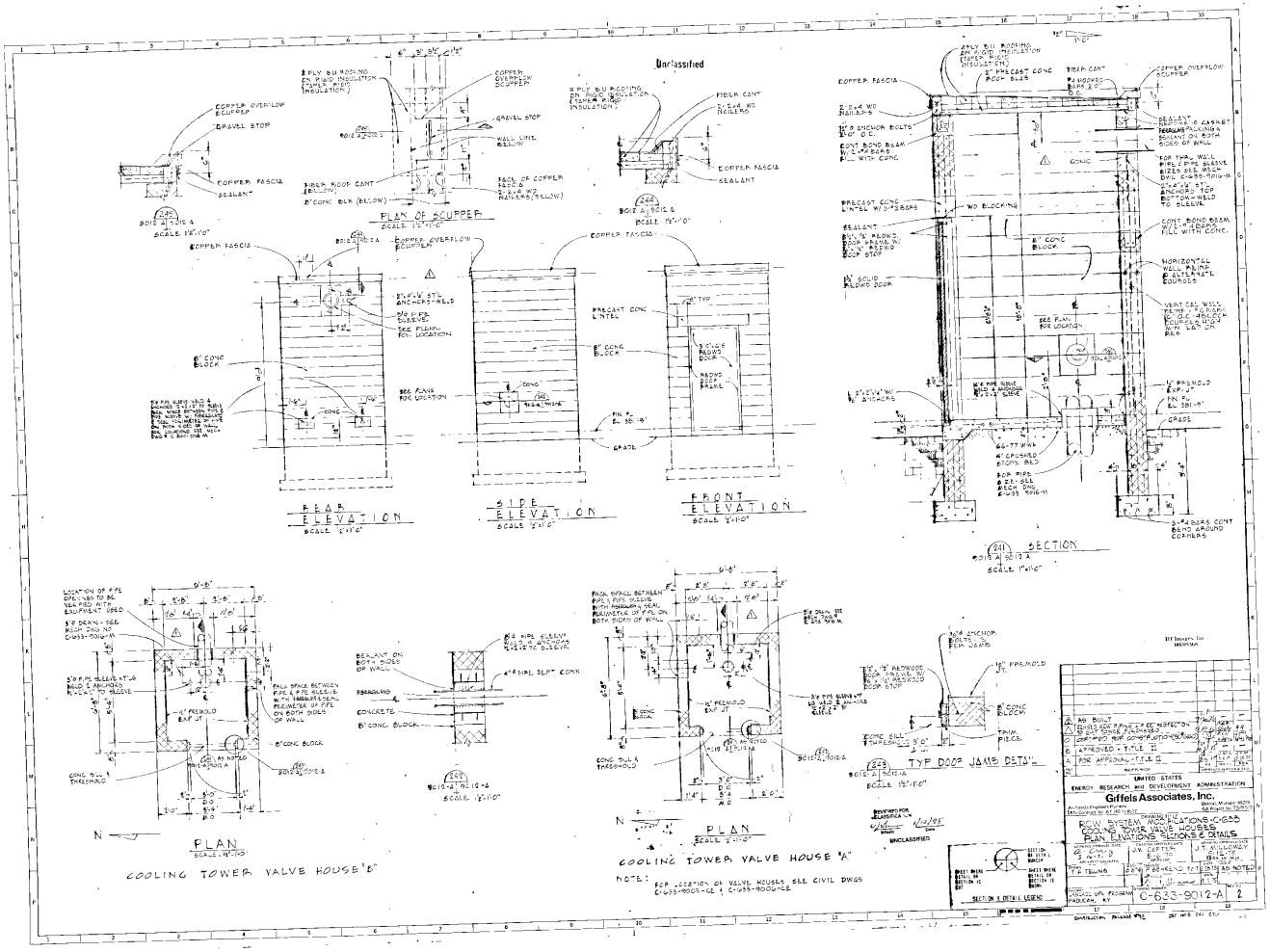


C-633-9014-M, Rev 3

C-633-4 and C-633-5 Engineering Drawings

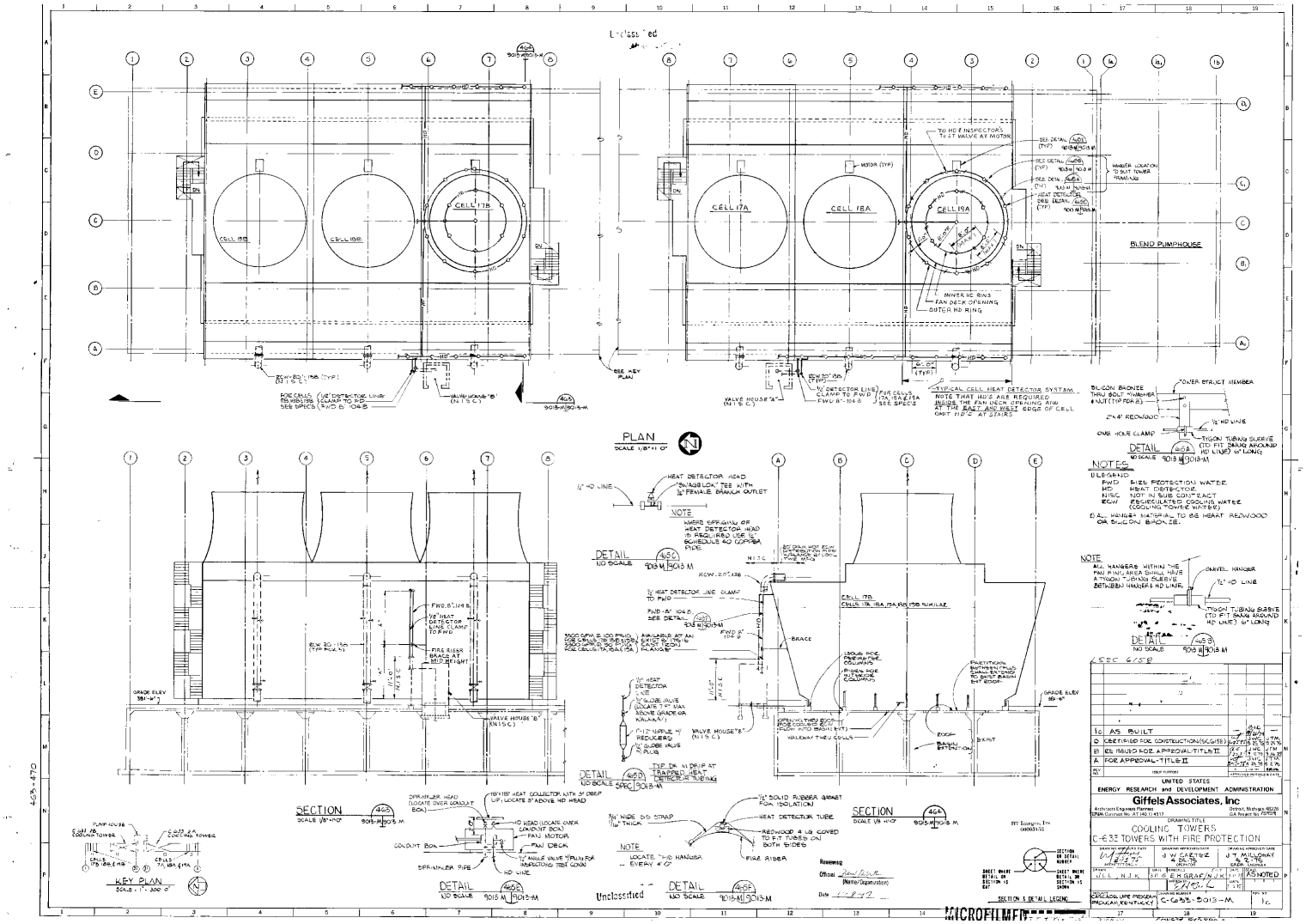


C-633-4 and C-633-5 Engineering Drawings

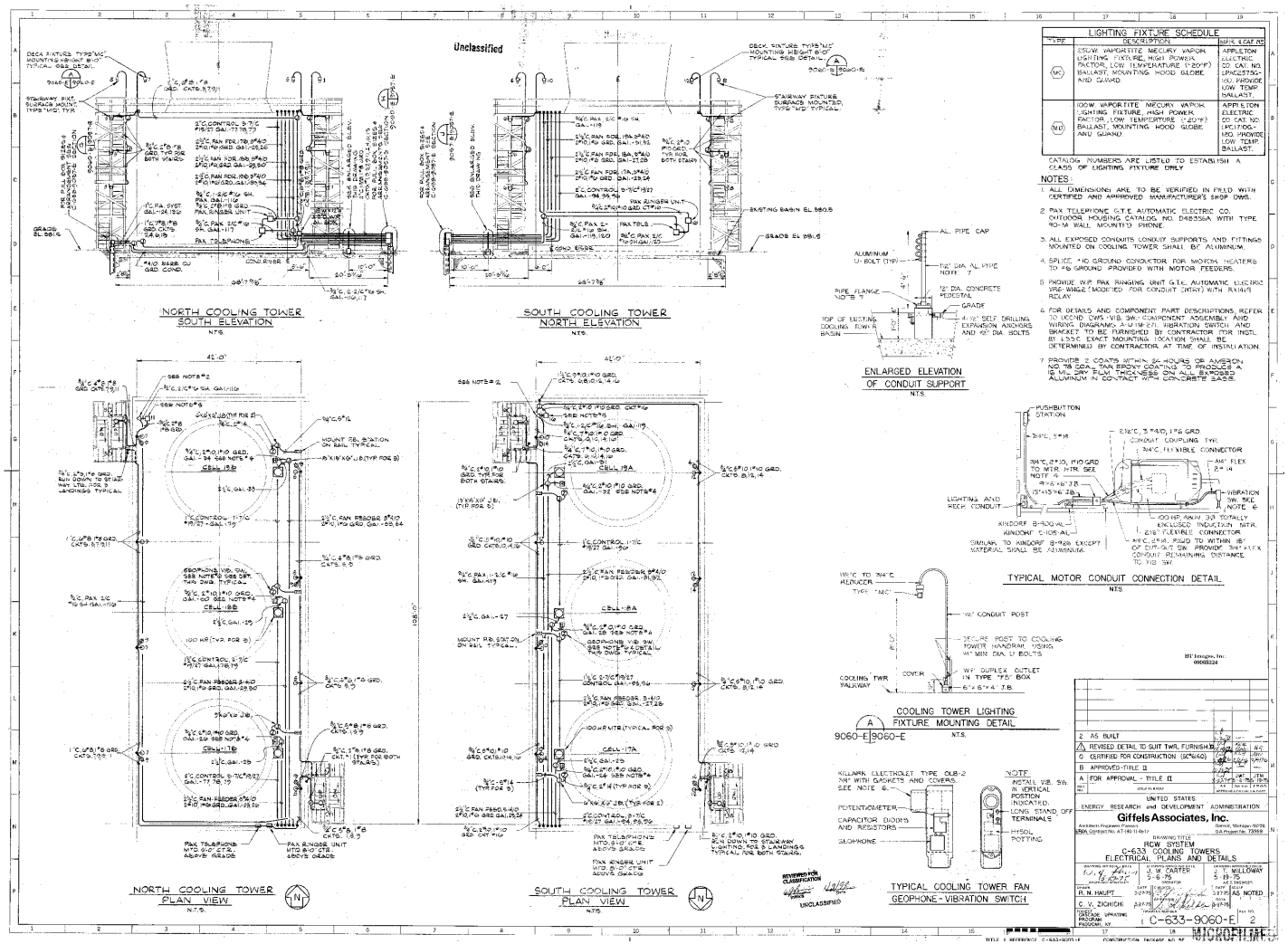


C-633-9012-A; Rev 2

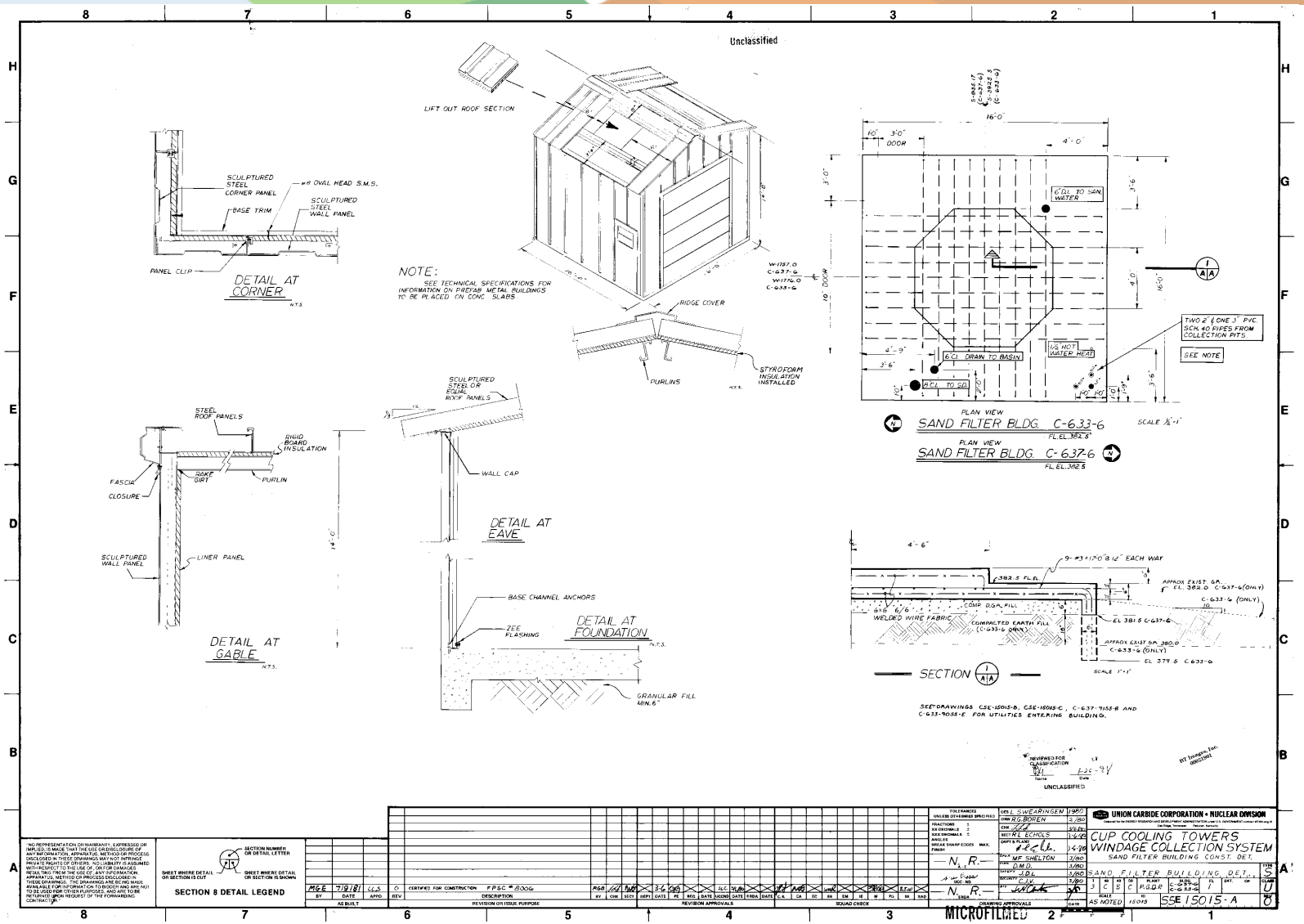
C-633-4 and C-633-5 Engineering Drawings



C-633-4 and C-633-5 Engineering Drawings

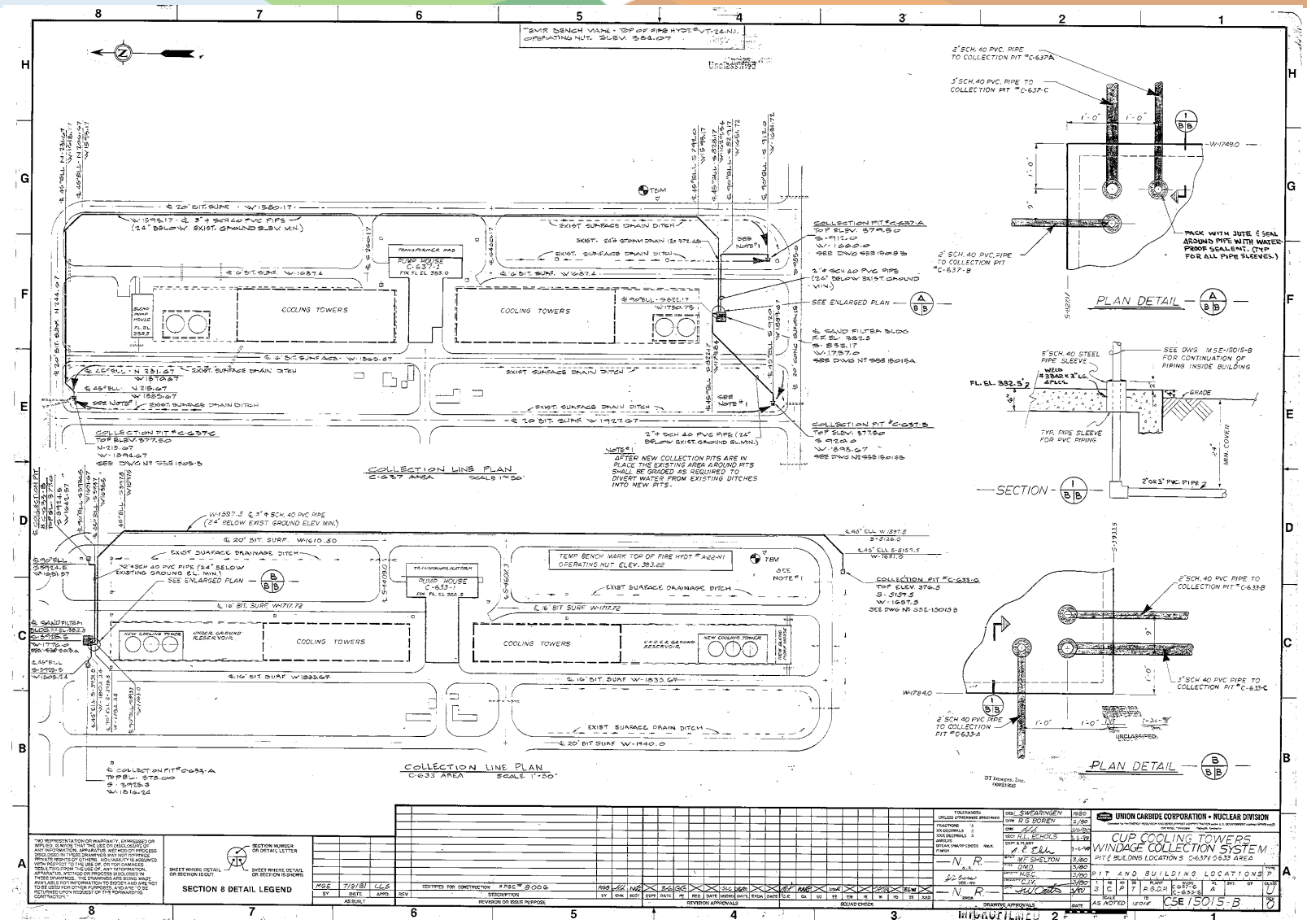


C-633-6 Engineering Drawings



S5E-15015-A, Rev 0

C-633-6 Engineering Drawings



C-633 Pumphouse and Cooling Tower (SWMU 87) Sources

- Engineering Drawings:
  - Provided in presentation
- Databases:
  - USEC's BPS
  - Issues Management System
  - Regulatory Compliance Archive Spill Log (pre-2018)
  - PCB Database (1989 – 2021)
  - Active GSAs and SAAs Master List
  - Asbestos Walkdown (October 2020)
- Employee Interviews:
  - Utility Operations Subject Matter Expert (45 years plant expertise; operator/manager/supervisor)
  - Power Operations Subject Matter Expert (31 years plant expertise)
  - Compliance Subject Matter Expert (45 years plant expertise; trained on system)
  - Systems Engineer (Lead) Subject Matter Expert (34 years plant expertise)
  - Systems Engineer (Senior) Subject Matter Expert (32 years plant expertise)
  - Chemical Engineer Subject Matter Expert (31 years plant expertise)
- Documents:
  - Paducah Gaseous Diffusion Plant Sitewide Strategy Facility Background Information, FPDP-RPT-0021, May 2016
  - Report for Environmental Audit Supporting Transition of the Gaseous Diffusion Plants to the United States Enrichment Corporation, DOE/OR/1087&V5 (June 1993)

C-633 Pumphouse and Cooling Tower (SWMU 87) Sources

- Documents (Continued):
  - Paducah Asbestos Survey Executive Summary (Lee Wan Report), October 1990
  - Cultural Resource Management Plan for the Paducah Gaseous Diffusion Plant Paducah, Kentucky, BJC/PAD-691, May 2005
  - Operations Division Training Manual – Utilities Operations, KYD-1482, July 1962
  - Evaluation of Corrosion Inhibitors for Open Recirculating Water Systems, KY-455, May 1964
  - Cooling Tower Drift Studies at the Paducah, Kentucky Gaseous Diffusion Plant, Conf-790109-1, January 1979
  - Paducah Gaseous Diffusion Plant Environmental Report for 1989, ES/ESH-13/V3, October 1990
  - Paducah Gaseous Diffusion Plant Environmental Report for 1990, ES/ESH-18/V3, September 1991
  - Paducah Gaseous Diffusion Plant Environmental Report for 1991, ES/ESH-22/V3, October 1992
  - Paducah Gaseous Diffusion Plant Environmental Report for 1992, ES/ESH-36, KY/E-164, September 1993
  - Oversight New, Newsletter of the Commonwealth's Environmental Oversight of the Paducah Gaseous Diffusion Plant (PGDP), September 2014
  - 2018 Annual Hazardous Waste Report, Assessment Return, and Claim for Exclusion for the Paducah Gaseous Diffusion Plant, McCracken County, Kentucky, Permit Number KY8-890-008-982, Summary of Noncompliance, 2018
  - Specifications for CUP Cooling Tower Windage Collection System at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, PAD/LSCR-004324, March 1980