



Department of Energy

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February 19, 2021

Mr. Brian Begley
Federal Facility Agreement Manager
Division of Waste Management
Kentucky Department for Environmental Protection
300 Sower Boulevard, 2nd Floor
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PPPO-02-10009462-21

Mr. Victor Weeks
Federal Facility Agreement Manager
U.S. Environmental Protection Agency, Region 4
61 Forsyth Street
Atlanta, Georgia 30303

Dear Mr. Begley and Mr. Weeks:

**TRANSMITTAL OF THE SITE EVALUATION REPORT FOR THE C-729
ACETYLENE BUILDING AT THE PADUCAH GASEOUS DIFFUSION PLANT,
PADUCAH, KENTUCKY, DOE/LX/07-2453&D1**

In accordance with Appendix 4 of the approved Site Management Plan of the Paducah Federal Facility Agreement (FFA), the U.S. Department of Energy (DOE) is submitting the D1 *Site Evaluation Report for the C-729 Acetylene Building at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/LX/07-2453&D1 (SE), to the U.S. Environmental Protection Agency (EPA) and the Kentucky Department for Environmental Protection (KDEP) for review and comment. A joint policy issued under the DOE and EPA memorandum, dated May 22, 1995, *Policy on Decommissioning Department of Energy Facilities Under CERCLA*, establishes a framework for conducting the decommissioning of DOE facilities and provides guidance on the use of Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) response authority to decommission DOE facilities. This policy states that DOE is required to conduct a removal site evaluation, in accordance with the National Contingency Plan and interagency agreements (i.e., FFA), to assess site conditions and determine whether a release or substantial threat of release exists at the facility. DOE, EPA, and KDEP have agreed to conduct decontamination and decommissioning activities for those facilities that pose an environmental release threat at the Paducah Site under the existing FFA. Section IX, *Site Evaluation(s)*, of the FFA requires DOE to conduct integrated site evaluations that consist of the removal site evaluation, remedial site evaluation, and solid waste management unit assessment reports. These integrated site evaluations are to be documented in an SE report.

The enclosed SE recommends that CERCLA action for the facility is not warranted. Upon approval, the *Detailed Facility D&D OU Facilities List* in Appendix 4 will be updated to

indicate the facility requires no further action. In accordance with Section XX of the FFA, EPA and KDEP have a 30-day review period to provide comments and/or approval of the document.

If you have any questions or require additional information, please contact me at (270) 441-6862.

Sincerely,

Tracey L.
Duncan

Digitally signed by Tracey
L. Duncan
Date: 2021.02.19
07:34:31 -06'00'

Tracey Duncan
Federal Facility Agreement Manager
Portsmouth/Paducah Project Office

Enclosures:

1. Certification Page
2. *Site Evaluation Report for the C-729 Acetylene Building at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2453&D1*

Administrative Record File—DDARC

cc w/enclosures:

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CERTIFICATION

Document Identification: *Site Evaluation Report for the C-729 Acetylene Building at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2453&D1*

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Four Rivers Nuclear Partnership, LLC

MYRNA REDFIELD Digitally signed by MYRNA
(Affiliate) REDFIELD (Affiliate)
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2/18/2021

Myrna E. Redfield, Program Manager
Four Rivers Nuclear Partnership, LLC

Date Signed

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

U.S. Department of Energy

Jennifer R. Woodard Digitally signed by Jennifer R. Woodard
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Jennifer Woodard, Paducah Site Lead
Portsmouth/Paducah Project Office
U.S. Department of Energy

Date Signed

**DOE/LX/07-2453&D1
Primary Document**

**Site Evaluation Report for the
C-729 Acetylene Building at the
Paducah Gaseous Diffusion Plant,
Paducah, Kentucky**



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**DOE/LX/07-2453&D1
Primary Document**

**Site Evaluation Report for the
C-729 Acetylene Building at the
Paducah Gaseous Diffusion Plant,
Paducah, Kentucky**

Date Issued—February 2021

U.S. DEPARTMENT OF ENERGY
Office of Environmental Management

Prepared by
FOUR RIVERS NUCLEAR PARTNERSHIP, LLC,
managing the
Deactivation and Remediation Project at the
Paducah Gaseous Diffusion Plant
under Contract DE-EM0004895

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ACRONYMS

ACM	asbestos-containing material
AOC	area of concern
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
D&D	decontamination and decommissioning
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
FFA	Federal Facility Agreement
KPDES	Kentucky Pollutant Discharge Elimination System
NAL	no action level
NTCRA	non-time-critical removal action
OU	operable unit
PEGASIS	Portsmouth/Paducah Project Office Environmental Geographic Analytical Spatial Information System
RCRA	Resource Conservation and Recovery Act
RI	remedial investigation
SE	site evaluation
SMP	Site Management Plan
SWMU	solid waste management unit

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1. FACILITY/UNIT NUMBER

C-729

2. FACILITY/UNIT NAME

Acetylene Building

3. DATE

February 18, 2021

4. REGULATORY STATUS

A joint policy issued under a U.S. Department of Energy (DOE) and U.S. Environmental Protection Agency (EPA) Memorandum dated May 22, 1995, *Policy on Decommissioning Department of Energy Facilities under CERCLA* (DOE 1995), establishes a framework for conducting decommissioning of DOE facilities and provides guidance on the use of Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) response authority to decommission DOE facilities. The Policy states that DOE is required to conduct a removal site evaluation (SE) in accordance with the *National Contingency Plan* and interagency agreements [i.e., Federal Facility Agreement (FFA)] to assess site conditions and determine whether a release or substantial threat of release exists at the facility. At any facility for which DOE conducts a removal site evaluation, DOE will consult with EPA and will provide, as requested, EPA with such information necessary for EPA to review such evaluation. DOE, EPA, and the Commonwealth of Kentucky have agreed to conduct decontamination and decommissioning (D&D) activities for those facilities that pose an environmental release threat at the Paducah Gaseous Diffusion Plant under the existing FFA. Section IX [Site Evaluation(s)] of the FFA requires that DOE conduct integrated SEs that consist of the removal site evaluation, remedial site evaluation, and solid waste management unit (SWMU) assessment reports. The integrated SEs are to be documented in a site evaluation report consistent with the format in Appendix D of the FFA (EPA 1998).

Industrial facilities that DOE has determined to pose a potential threat of release of hazardous substances to the environment are listed as part of the facility D&D Operable Unit (OU) in Appendix 4 of the Site Management Plan (SMP) (DOE 2020). The SE report shall state whether demolition of the facility should be conducted using a CERCLA Non-Time-Critical Removal Action (NTCRA) and will serve to designate any facility, or portions thereof, that are related to any identified release as a SWMU and/or area of concern (AOC).

5. LOCATION

The C-729 Acetylene Building is located in the southcentral portion of the industrialized area of the Paducah Site, northeast of the C-720 Maintenance and Storage Building. Figures 1 and 2 provide the location of C-729.

6. APPROXIMATE DIMENSION OR CAPACITY

C-729 is a one-story, rectangular-plan building with a concrete foundation, concrete slab floor (unspecified thickness), an exterior of transite panels, and a shed roof of transite. The approximate dimensions of C-729 are 32 ft × 14 ft, with a footprint of approximately 430 ft². Figure 3 provides a portion of Engineering Drawing M5E-16075-C (Rev. 1) that shows the building plan, and Figure 4 is an exterior photograph of the facility. Additional engineering drawings are provided in the appendix to this report.

7. FUNCTION

C-729 generated and distributed acetylene to other facilities for use in maintenance activities. The acetylene generation process, which occurred until the mid-1970s, involved the combination of water and calcium carbide to generate acetylene and calcium hydroxide.

8. BRIEF HISTORY

C-729 was constructed in 1956 and operated until the mid-1970s to generate acetylene for various maintenance activities. After the mid-1970s, acetylene was distributed using bottled gas rather than being generated in C-729.

9. OPERATIONAL STATUS

Shutdown

10. DATES OPERATED

1956 to mid-1970s

11. SITE/PROCESS DESCRIPTION

C-729 operated until the mid-1970s to generate acetylene. The process involved the combination of water and calcium carbide to generate acetylene and calcium hydroxide. The process was flushed constantly with water and residue was discharged to drain pits located immediately east of the building (SWMU 170) (Figure 5). The acetylene generated was connected directly to a manifold system for distribution to various locations at the site. After the mid-1970s, acetylene was no longer generated in C-729. Bottled acetylene was connected to the manifold system for distribution of acetylene gas until the distribution was moved to the C-720 Maintenance and Storage Building north truck alley. Figures 6 and 7 are interior photographs showing the current condition of the C-729 Acetylene Building. The building utilities are disconnected currently.

The drain pits on the east side of C-729 (i.e., SWMU 170—C-729 Acetylene Building Drain Pits) consist of two open rectangular concrete pits separated by a concrete divider wall (Figure 5). The drain pits are outside the C-729 footprint and not included in the scope of this SE. They are discussed herein due to their relation to the acetylene generation process in the C-729 building. Each pit is 8 ft long, 8 ft wide, and 3 ft deep. Each pit has a single influent and effluent pipe. While in operation, the acetylene generation system in C-729 periodically discharged residue (calcium hydroxide) to these drain pits. The open pits accumulated process sediments from the discharged residue and sediments carried by rainwater. A 4-ft vitrified clay pipe connects the effluents of the pits to the site storm drainage system at a manhole northeast of C-729. These drain pits were evaluated as part of the Waste Area Groups 9 and 11 Site Investigation (DOE 1997; DOE 1999) and the Soils OU (DOE 2013). The Kentucky Pollutant Discharge Elimination System (KPDES) Permit issued in 1986 identified the drains from the C-729 Building as a permitted effluent for KPDES Outfall 008 (KDEP 2017). Note that this SE is for the C-729 Building since the drain pits (SWMU 170) have already been investigated and evaluated.

12. WASTE DESCRIPTION

The primary waste stream that would be generated during D&D of C-729 would be nonhazardous construction and/or demolition debris. This demolition debris will be comprised primarily of metal structural components, metal piping, equipment, insulation, and metal and transite siding. Wastes such as

polychlorinated biphenyl (PCB)-containing liquids and electrical components, non-radioactive Resource Conservation Recovery Act (RCRA) and/or mixed waste sludges or liquids are not anticipated to be generated with exceptions noted below.

The transit and insulation are typically asbestos-containing material (ACM). Painted surfaces, based on the age of the facility, may have been painted with lead-based paint.

Limited infrastructure items remain in the facility (e.g., light fixtures, instrumentation panels, alarms) that could potentially contain *de minimis* quantities of regulated items (e.g., mercury, lead) or PCBs, which will be removed to the extent practicable during deactivation. Generation of any residual amounts of mercury will be properly containerized, characterized, and dispositioned in accordance with applicable regulatory requirements.

13. WASTE QUANTITY

Based on the waste forecast information available in the *Remedial Investigation/Feasibility Study Report for CERCLA Waste Disposal Alternatives Evaluation at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky* (DOE 2018), the waste volume associated with C-729 is approximately 105 yd³. This volume is assumed to be nonhazardous solid waste.

14. SUMMARY OF ENVIRONMENTAL SAMPLING DATA

Limited sampling of environmental media has occurred near C-729. Environmental sampling data were queried and viewed on DOE's Portsmouth/Paducah Project Office Environmental Geographic Analytical Spatial Information System (PEGASIS). PEGASIS allowed a visual evaluation of environmental data located in proximity to C-729. Environmental data were available from eight locations within 50 ft of C-729. These data were collected as part of previous environmental studies and investigations conducted at the Paducah Site with all samples being associated with the evaluation of the C-729 Acetylene Building Drain Pits (SWMU 170) (DOE 1997; DOE 1999; DOE 2013). Soil samples were collected from six locations (i.e., five locations in 1998 and one location in 2010). The sample collected in 2010 from sampling location SOU170-RAD was associated with the Soils OU (DOE 2013). There were two sludge samples collected from the drain pits in 1993. The sampling locations for these data are shown in Figure 8.

Soil data associated with SWMU 170 drain pits were evaluated in the Soils OU Remedial Investigation (RI) Report (DOE 2013). The report provided comparisons to provisional background values, where available, and comparisons to no action levels (NALs) and action levels for the industrial worker. The anticipated future land use is likely to be industrial. In addition, detected soil concentrations were compared to soil concentrations for the protection of groundwater. A discussion of the data comparison to the NAL criteria is included in section 18.

A sludge sample was collected from each of the SWMU 170 drain pits in January 1993 (sample locations WC-702 and WC-703 in Figure 8). Analyses of the samples indicated the presence of volatile organic compounds (VOCs) and radionuclides. The compounds observed included acetone, 2-butanone, toluene, total uranium, and uranium-235 that were detected at concentrations above the analytical detection limit. Releasable hydrogen sulfide was also observed at less than 150 mg/kg and the pH was 12.3 (DOE 1999). These drain pits are outside the footprint of the C-729 building and are not within the scope of this SE.

For the soil sample evaluation provided in the RI report, four radiological constituents (i.e., neptunium-237, plutonium-239/240, uranium-235/236, and uranium-238) were detected that exceeded the associated Paducah Site provisional background values (DOE 2013). There is no evidence that radionuclides in the soil in the vicinity of C-729 are related to the function or operation of the facility. Radiological materials

were not used or stored in C-729. The VOC contaminants of potential concern detected in the drain pits were not detected in soil samples.

15. DESCRIPTION OF RELEASE AND MEDIA AFFECTED

<u>Groundwater:</u>	None Known
<u>Surface Water:</u>	None Known
<u>Soil:</u>	None Known
<u>Ecology Affected</u> (i.e., threatened/endangered species):	None Known
<u>Air:</u>	None Known

No releases to the environment are known to have occurred. By virtue of the nature of past operations within C-729, and the equipment and materials contained therein, the building is not considered a potential risk to human health or the environment.

16. DOCUMENTATION OF NO RELEASE

There have been no known spills or releases of materials from C-729 to soil, groundwater, or surface water. C-729 has not been identified as a SWMU or AOC, nor did it contain any areas designated as a SWMU or AOC. No information was identified warranting the designation of the C-729 building, or portions thereof, as a SWMU or AOC.

17. IMPACT ON OR BY OTHER SWMU/AOC

This building is connected to an adjacent SWMU, C-729 Acetylene Building Drain Pits (SWMU 170). While in operation, residue from acetylene generation (i.e., calcium hydroxide and water) would be flushed from the building into the drain pits. Since the cessation of acetylene production in the mid-1970s, this connection to the drain pits has been inactive.

18. PRELIMINARY REMEDIATION GOAL COMPARISON

Based on the Soils OU RI (DOE 2013), there were two radionuclides (i.e., cesium-137 and uranium-238) associated with the SWMU 170 investigation that had soil concentrations that exceeded the industrial worker NAL. One of the cesium-137 exceedances occurred in surface soil, while the other was in subsurface soil. The maximum detected concentration of cesium-137 was less than the Paducah Site provisional soil background concentration. The uranium-238 exceedance occurred in subsurface soils.

The only analyte in soil that exceeded background concentrations and the groundwater protection screening values was neptunium-237 (DOE 2013).

There is no evidence that radionuclides in the soil in the vicinity of C-729 are related to the function or operation of the facility.

19. RCRA FACILITY INVESTIGATION NECESSARY

A RCRA Facility Investigation is not recommended as necessary for C-729. There is no evidence of a release, or threat of any release, to the environment from the building, and the facility is not believed to pose a risk to human health or the environment.

20. CERCLA NTCRA NECESSARY

A CERCLA NTCRA is not recommended as necessary for demolition of the facility structure following completion of deactivation. Limited non-RCRA infrastructure items and any RCRA-regulated items remaining in the building will be removed, to the extent practicable, during deactivation. Building materials used for construction could contain lead-based paints and ACM, both of which can be verified effectively during a pre-demolition inspection, contained, and properly managed using standard demolition and waste management practices. Deactivation will include removal of any accessible loose items being stored to the extent practicable, prior to demolition.

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; therefore, the demolition and disposal of the facility can be conducted outside of the FFA and/or CERCLA process.

All applicable laws, regulations, and DOE procedures and/or 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.

21. OU ASSIGNMENT

C-729 currently is assigned to the Facility D&D OU, Other Buildings (non-SWMUs) (SMP Appendix 4) (DOE 2020).

22. REFERENCES

DOE (U.S. Department of Energy) 1995. *Policy on Decommissioning of Department of Energy Facilities under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)*, Joint policy from the U.S. Department of Energy and U.S. Environmental Protection Agency, May 22, 1995.

DOE 1997. *Sampling and Analysis Plan for the Site Evaluation of Waste Area Groupings 9 and 11 at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/OR/07-1582&D2, U.S. Department of Energy, Paducah, KY, June.

DOE 1999. *WAGs 9 & 11 Site Evaluation Report at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/OR/07-1785&D2, U.S. Department of Energy, Paducah, KY, June.

DOE 2013. *Soils Operable Unit Remedial Investigation Report at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/LX/07-0358&D2/R1, U.S. Department of Energy, Paducah, KY, February.

DOE 2018. *Remedial Investigation/Feasibility Study Report for CERCLA Waste Disposal Alternatives Evaluation at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, DOE/LX/07-0244&D2/R2, U.S. Department of Energy, Paducah, KY, July.

DOE 2020. *Site Management Plan, Paducah Gaseous Diffusion Plant, Paducah, Kentucky, Annual Revision—FY 2021*, DOE/LX/07-2450&D1, U.S. Department of Energy, Paducah, KY, November.

KDEP (Kentucky Department for Environmental Protection) Division of Water, 2017. Kentucky Pollutant Discharge Elimination System Permit (KPDES) Modification to Permit Number KY0004049, AI No. 3059, effective date October 12, 2017.

EPA (U.S. Environmental Protection Agency) 1998. *Federal Facility Agreement for the Paducah Gaseous Diffusion Plant*, DOE/OR/07-1707, U.S. Environmental Protection Agency, Atlanta, GA, February.



Figure 1. Aerial Photograph Showing the C-729 Acetylene Building Location

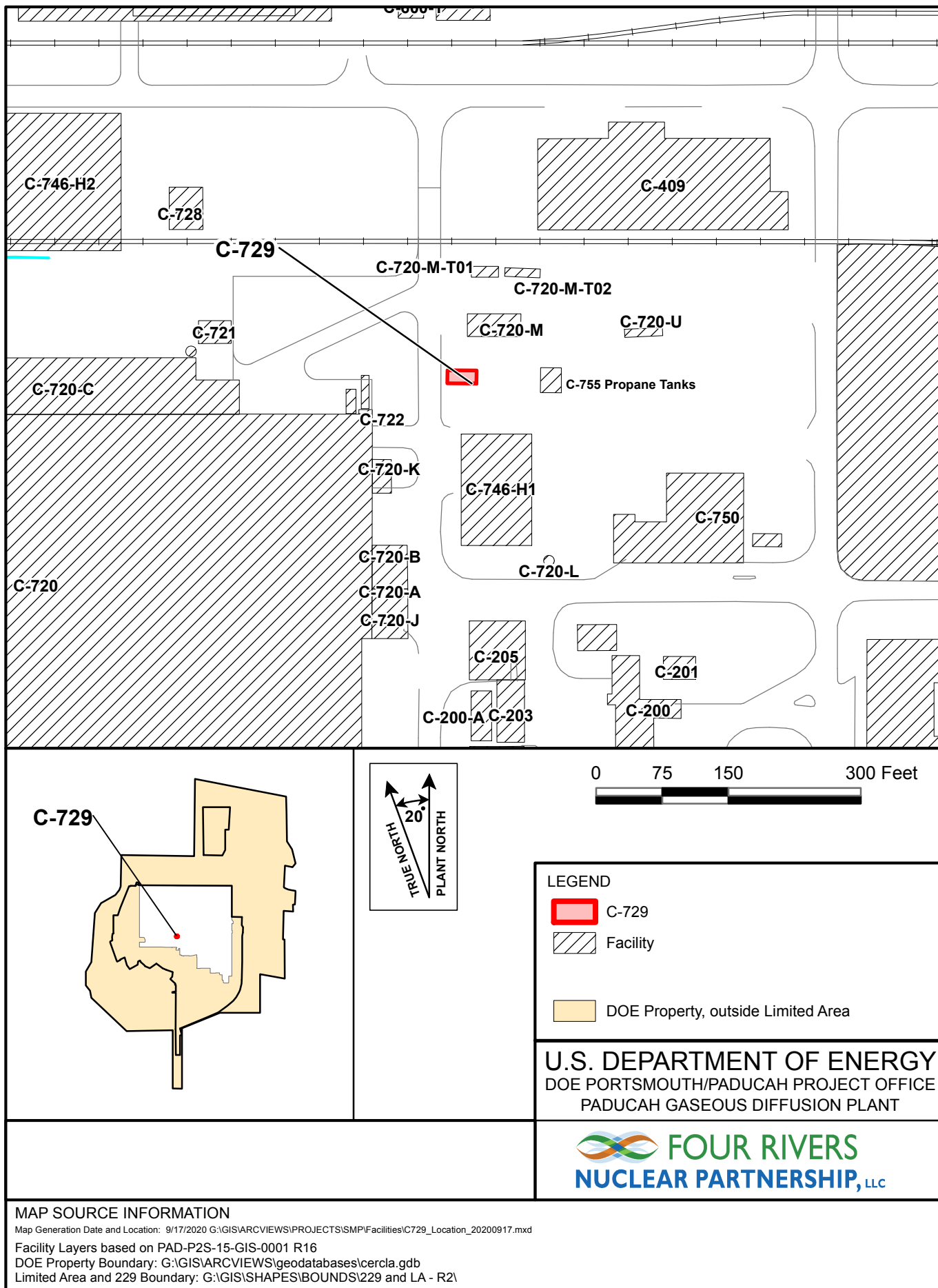


Figure 2. Map Showing the C-729 Acetylene Building Location



Figure 4. Exterior View of C-729 (Looking Southeast)



Figure 5. View of East Side of C-729 Showing the SWMU 170 Drain Pits (Looking North)



Figure 6. Interior View of the C-729 Acetylene Building



Figure 7. Interior View of C-729 Showing the Acetylene Generator

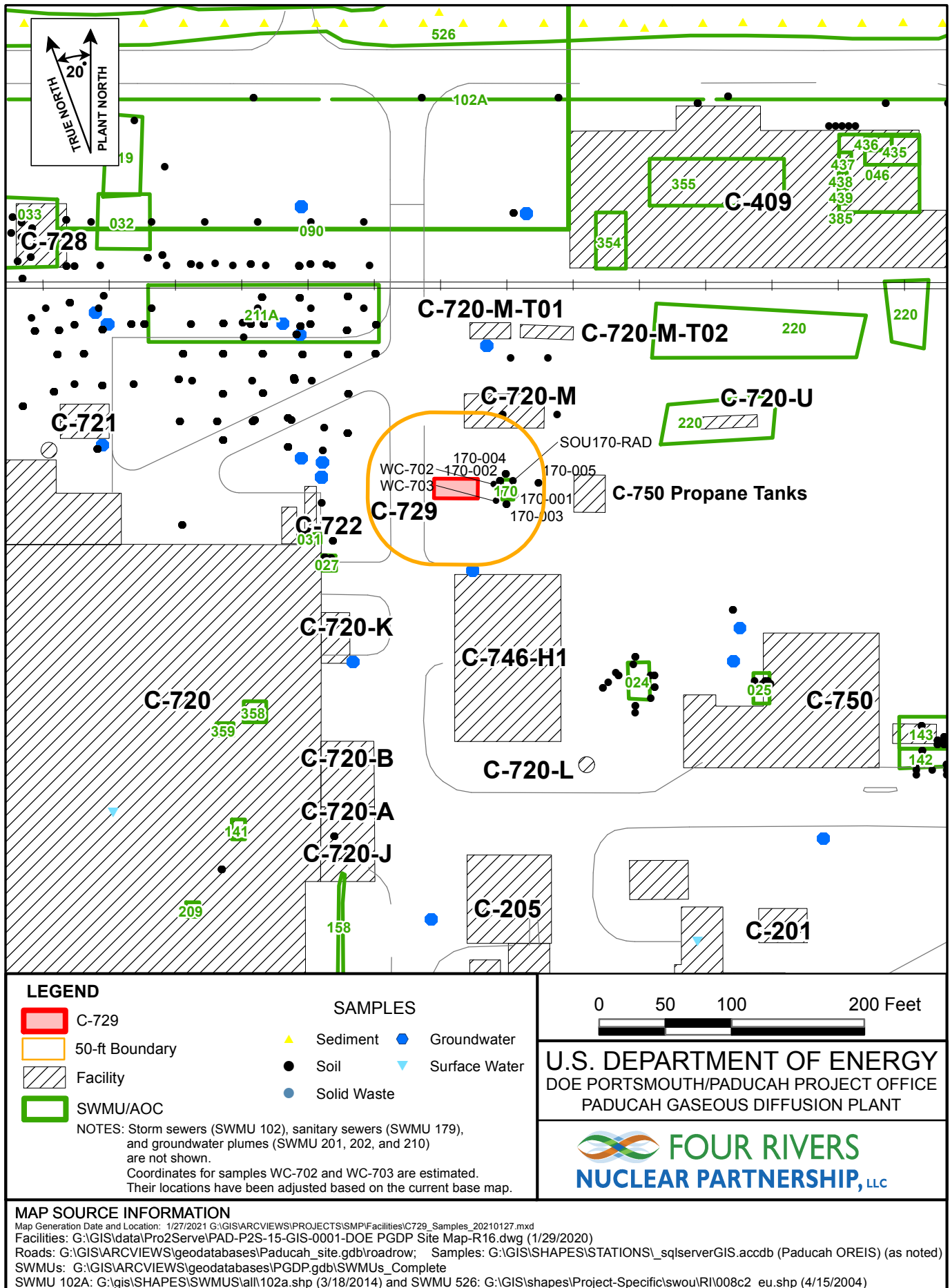


Figure 8. SWMU and Sample Locations near C-729

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APPENDIX

ENGINEERING DRAWINGS

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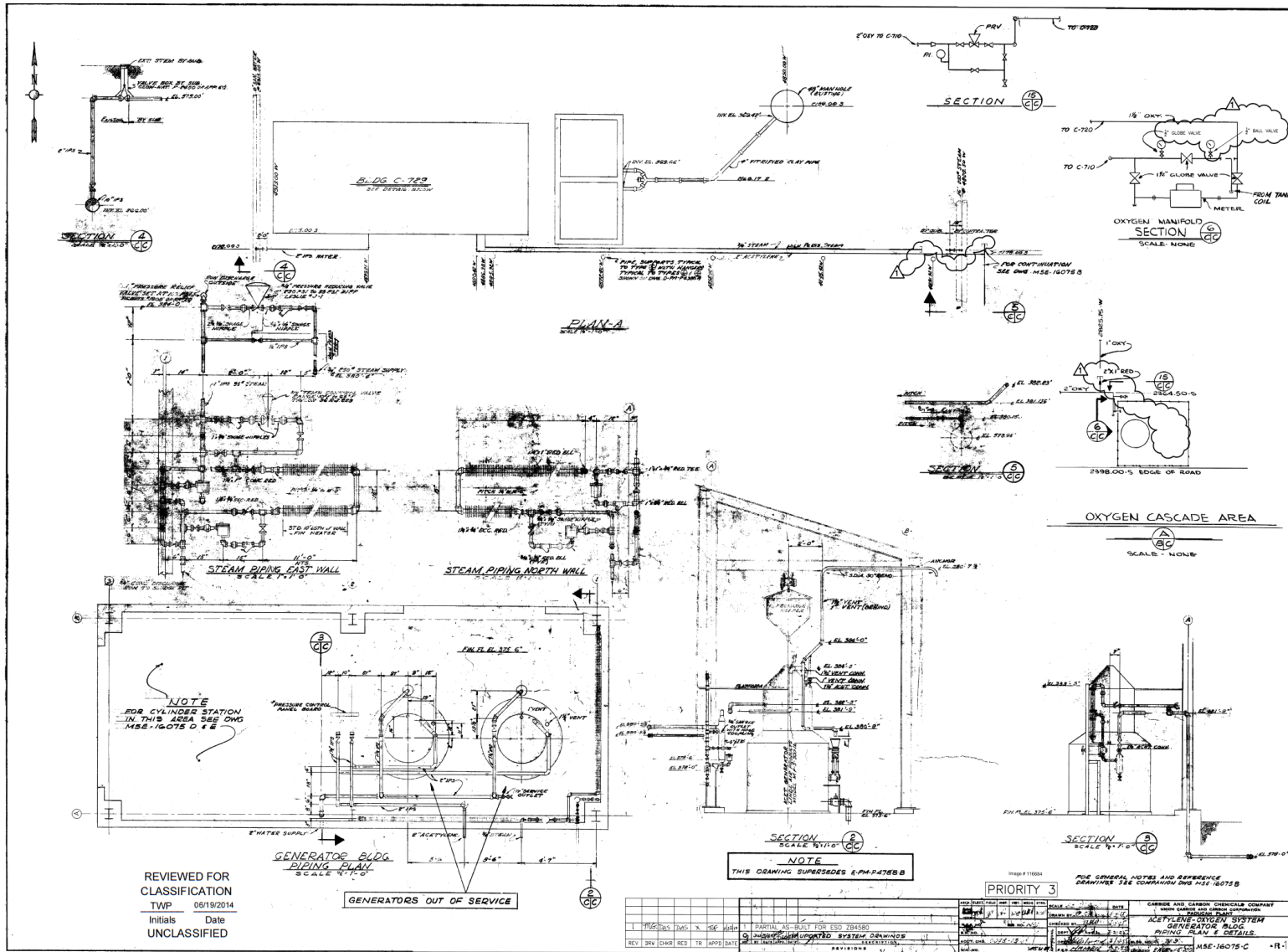


Figure A.1. Engineering Drawing M5E-16075-C, Rev. 1

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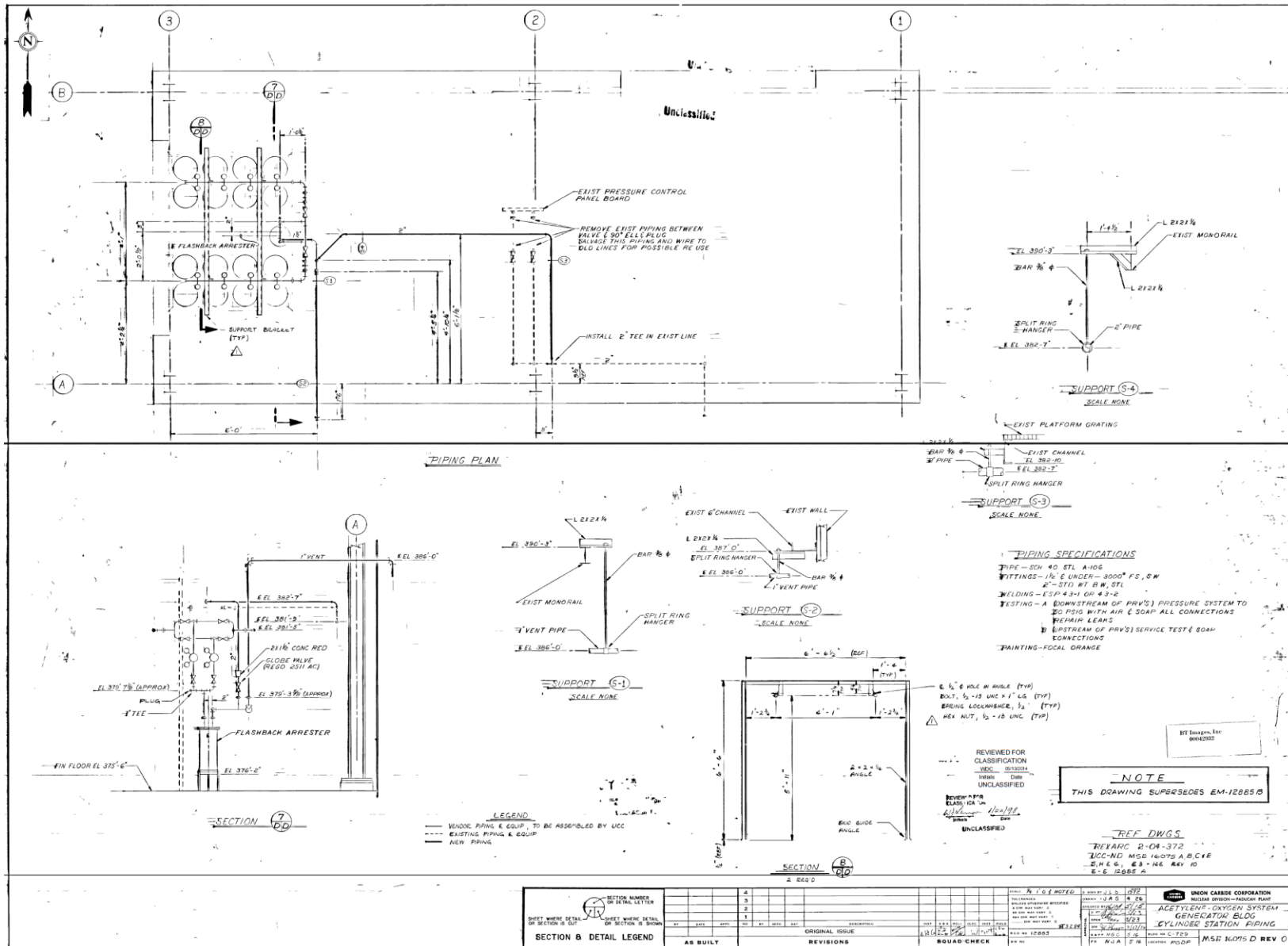


Figure A.2. Engineering Drawing M5E-16075-D, Rev. 0

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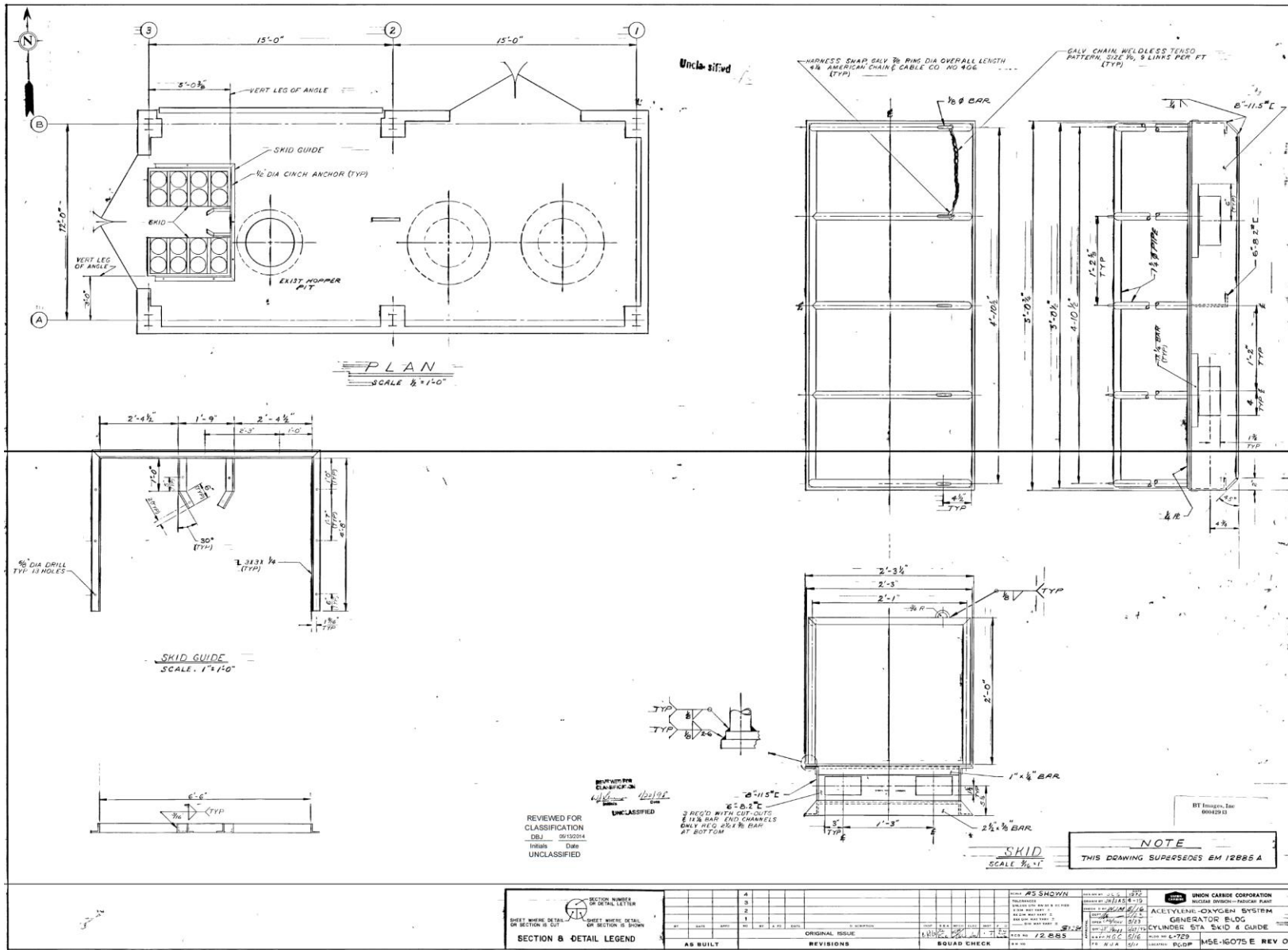


Figure A.3. Engineering Drawing M5E-16075-E, Rev. 0

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