



WATER-RIGHT DOCKET

Shenandoah National Park

Docket No: 16

WELL. MATHEW'S ARM AREA WATER SYSTEM

Preliminary Docket Information

00-00-0000: docket #16: matthew's arm area water system

SHENANDOAH NATIONAL PARK

DOCKET #16

Matthew's Arm Area Water System

I N D E X

PART I - INVESTIGATION

1. Figure 1. Locations of Two Proposed Test Well Sites.
2. Matthew's Arm Area Preliminary Recommendations prepared by Virginia Division of Mineral Resources, Charlottesville, Virginia, November 15, 1961.
3. Chart Giving Pump Test Information and Drawdown Curve, Test Hole No. 2.
4. Pump Test Data, Test Hole No. 2.
5. Geologic Log, Test Hole No. 2.
6. Water Well Completion Report, Test Hole No. 2.
7. Geologic Log, Test Hole No. 1.
8. Water Well Completion Report, Test Hole No. 1.
9. Final Report, Matthew's Arm Area, prepared by Virginia Division of Mineral Resources, Charlottesville, Virginia, September 23, 1963.

PART II - WATER RIGHT

COMMONWEALTH OF VIRGINIA
DEPARTMENT OF CONSERVATION AND ECONOMIC DEVELOPMENT
DIVISION OF MINERAL RESOURCES

Box 3067, University Station, Charlottesville, Virginia

FORM 850
WCR 74

WATER WELL COMPLETION REPORT

OWNER: Shenandoah National Park Mailing Address: Leahurst, Virginia
TENANT: Matthews Arm #1 Mailing Address: _____
DRILLER: Sydney Pump & Well Co. Inc. Mailing Address: Richmond 12, Virginia
WELL LOCATION: County Page Approx. _____ ft.
(direction) of _____
(Show direction and distance in feet or miles of drive from two reference points: roads, towns, rivers, etc. on state highway or other map)

WATER CONDITIONS

DEPTH

STATIC WATER LEVEL 15 when drilled see remarks

WATER ZONES (fractures or formations supplying water)

(from) (to) (from) (to)
____ ft. ____ ft. ____ ft. ____ ft.

QUANTITY OF WATER

WELL PUMPED (or bailed) at 3 Gal. per Min. with
190 feet DRAWDOWN after 2 HOURS PUMPING.

FLOW (natural) _____ GPM HEAD _____ ft. (above ground)

REMARKS Air lift test

QUALITY OF WATER

COLOR OK TASTE OK from observation at time of air test

ODOR OK OTHER _____

ANALYSIS AVAILABLE— Yes ☐ No ☐ ATTACHED Yes ☐ No ☐

TEMPERATURE _____

WATER (from) _____ ft. (to) _____ ft.
(salt, brackish, iron, sulfur acid, other)

USE OF WATER: Domestic ☐ Town ☐ Industry ☐ Farm ☐ Other ☐

CONSTRUCTION

RIG TYPE (or method): Air rotary
(rotary, cable, bored, driven, etc.)

DATE Started 6-12-63, Completed 6-17-63

TOTAL DEPTH 200 ft.

BEDROCK at 50 ft.

GROUTING INFORMATION

METHOD USED Gravity

GROUTING MATERIAL Cement & water

DEPTH OF GROUTING 57

HOLE SIZE

(diam.)	(from)	(to)	(diam.)	(from)	(to)
10	0	57	6 11/32	0	59
62	57	200			

CASING SIZE

SCREEN (or perforations)
(diam.) (from) (to) (opening size)

PUMP (installed)

TYPE _____ Cap (gpm) _____

H.P. _____ Depth of intake _____ ft.

REMARKS: Log & samples to Div. of Min. Resources

Static level 17'-8" on 7-3-63 measured by Mr. Foley of Shenandoah National Park

Log of well (over)

Matthews Arm
Well No. 1

LOG

FURNISHED BY Snyder Pump & Well Co. Inc.DATE 6-17-63

Data from driller's notes by Jesse Snyder, Jr.

DEPTH (feet)		TYPE OF SOIL OR ROCK PENETRATED (gravel, clay, etc., hardness, color, etc)	REMARKS (logs, water, etc., depth, pump, etc)
FROM	TO		
0	1	Soil	
1	50	Red clay	
50	68	Greenstone with some weathering from 50' to 55'	
68	69	Broken greenstone slight weathering	about 1 G.P.M.
69	94	Hard greenstone	
94	95	Broken greenstone	2 to 3 G.P.M.
95	164	Hard greenstone	
164	170	Greenstone with pink rock	
170	172	Broken greenstone	no noticeable increase in water-now getting 3 G.P.M.
172	200	Pink and green rock hard	
		3 G.P.M. at end of 2 hr. air test	

Log of well (over)

Well No. 2
Matthews Arm

LOG

FURNISHED BY Snyder Pump & Well Co. Inc.

DATE 6-17-63

Data from driller's notes by Jesse Snyder, Jr.

DEPTH (feet)		TYPE OF SOIL OR ROCK PENETRATED (gravel, clay, etc., hardness, color, etc.)	REMARKS (logs, casing, shot, screen, sample, etc.)
FROM	TO		
0	5	S&T clay boulders	
5	15	Clay and boulders	
15	42	Hard greenstone	
42	43	Broken weathered greenstone	4 G.P.M. (air)
43	47	Greenstone	
47	48	Broken weathered greenstone	7 G.P.M. total (air)
48	54	Greenstone	
54	55	Weathered greenstone	
55	61	Hard greenstone	
61	62	Broken rock	
62	73	Greenstone	
73	76	Red & green rock	total of 13 G.P.M. air test
76	109	Greenstone	
109	110	Weathered broken	total of 17 G.P.M.
110	164	Hard greenstone	
164	175	Greenstone with some white rock	
175	200	Hard greenstone	

Land History

Form 10-55a
(Nov. 1958)

U.S. DEPARTMENT OF THE INTERIOR - NATIONAL PARK SERVICE

FIXED PROPERTY RECORD

DESCRIPTION OF PROPERTY (Include reference to the location within the Park, how the asset was acquired, name of contractor, etc.)

Location: Piney River Ranger Station & Maintenance Area - North District

One Spring
 Collection Trenches and Boxes
 One 5000 Gallon Wooden Elevated Storage Tank
 6,342 Linear Feet of Pipe
 One Fire Hydrant

Gravity System

Constructed by CCC in 1938

Line	DATE	REFERENCE		QUANTITY			COST		
		Journal Vou.	Other	Unit	No. of Units	Accumulated Total	Direct Costs	Indirect Costs	Accumulated Costs
1	8/27/59	37-10		System	1				5,800.00
2									
3									
4									
5									
G.L. Acct. No.		General Classification			Sub-Classification		Region	State	Park or Office
100.8		Utility			Water System		One	Va.	SNP

Other Supporting Information

Form 10-174
(June 1962)UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

Work Order No.

211717

Fund Symbol

14x1035

FACE SHEET FOR COMPLETION REPORT

Park	Shenandoah National Park	Region	Southeast	Year Programmed	1966
Location in Park	Matthews Arm Developed Area North District	State(s)	Virginia	PCP No. B-127 U-111-1 U-93-1 U-130-1 (U-92-1) (U-93-1)	
		County or Counties	Rappahannock and Page	Master Plan No.	ND-SHE-3146B (18 sheets)
				Master Plan Corrected By	
				As Built Drawings By	William H. Thorn (PSC-DC)
				Date Started	April 1966
				Date Completed	June 1968
Work Order Title	C Matthews Arm Campground				

DESCRIPTION OF FIXED ASSETS (For completion by employee in charge of project)	TOTAL COSTS (For completion by FFO)
220 - General Buildings: 8 - <u>Service</u> : Five standard comfort stations, concrete block and wood construction. Buildings No.: 5-44, 5-45, 5-46, 5-47, 5-48, Total 1860 S.F.	\$ 46,720.00
230 - Utility Systems: 1 - <u>Water Systems</u> : 200' production well hooked to system and the following equipment installed: Cast Iron Water Pipe 6" ID - 866 LF Cast Iron Water Pipe 4" ID CL 150 - 3900 LF Cast Iron Water Pipe 4" ID CL 250 - 3651 LF Galvanized Steel Water Pipe 2" - 1537 LF Galvanized Steel Water Pipe 1" - 398 LF Water Line Markers - 58 6" Gate Valve and Box - 1 4" Gate Valve and Box - 5 2" Gate Valve and Box - 6 1" Gate Valve and Box - 1 1/2" Air Relief Valve - 100% 2" Pressure Reducing Valve Assby Water Stations - 7 100,000 Gallon Storage Reservoir	
(Continued on next page)	TOTAL

Form 10-174
(June 1962)UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

FACE SHEET FOR COMPLETION REPORT

Park Shenandoah National Park		Region Southeast	Work Order No. 211717
Location in Park Matthews Arm Developed Area North District		State(s) Virginia	Fund Symbol 14x1035
☒ Contract and/or ☒ Day Labor		County or Counties Rappahannock and Page	Year Programmed 1966
Work Order Title Matthews Arm Campground		PCP No. B-127 U-111-J, U-93-1 U-130-1 U-92-1	
		Master Plan No. NP-SHE-3146 B (18 sheets)	
		Master Plan Corrected By -	
		As Built Drawings By William H. Thom (PSC-DC)	
		Date Started April 1966	
		Date Completed June 1968	
DESCRIPTION OF FIXED ASSETS (For completion by employee in charge of project)		TOTAL COSTS (For completion by FFO)	
1 - Water Systems: Continued Chlorinator House (Spring Supply) Chlorinator House (Well Supply) Control Wires 2 #12 Type USE - 6423 LF Frost Proof Hydrant Total for Water Systems.....		98,717.05	
2 - Sewer Systems: 8" Vit. Clay or Concrete Sewer - 770 LF 6" Vit. Clay or Concrete Sewer - 3787 LF 4" Vit. Clay or Concrete Sewer - 79 LF 8" Cast Iron Sewer Pipe - 301 LF 6" Cast Iron Sewer Pipe - 813 LF 24" Diameter Type I Manhole - 19 48" Diameter Type II Manhole - 7 Sanitary Disposal Station Sewage Disposal Plant 4" Cleanouts 25' of 4" C.I. Sewer Pipe Total for Sewer Systems.....		64,185.25	
Continued			
TOTAL			

Form 10-174
(June 1962)UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

FACE SHEET FOR COMPLETION REPORT

Park Shenandoah National Park		Region Southeast	Work Order No. 211717
Location in Park Matthews Arm Developed Area North District		State(s) Virginia	Fund Symbol 14x1035
☒ Contract and/or ☒ Day Labor		County or Counties Rappahannock and Page	Year Programmed 1966
Work Order Title Matthews Arm Campground			PCP No. B-127 U-111-1 U-130-1, U-92-1, U-93-1
			Master Plan No. NP-SHE-3146B (18 sheets)
			Master Plan Corrected By -
			As Built Drawings By William H. Thorn (PSC-DC)
			Date Started April 1966
			Date Completed June 1968
DESCRIPTION OF FIXED ASSETS (For completion by employee in charge of project)			TOTAL COSTS (For completion by FFO)
<u>240 - Grounds and Other Improvements:</u> 1 - General: Clearing, grubbing, topsoiling, seeding, and general tree work in general development for a total of 8.00 acres..... 2 - Campgrounds: Improvements at 186 designated camping sites including fireplaces, tables, ½ interest in refuse can, and improvement of actual site..... 7 - Signs: Redwood routed signs of varying sizes up to 6'x18' campground registration sign. Total - 18 signs.			4,691.30 21,948.00 3,155.00
<u>262 - Equipment Not Subject to Depreciation:</u> Funding: Purchase of a one-man brush cutter for use in clearing operations..... PS&S Added			213.85 38,340.87
TOTAL			\$ 277,971.32

DISTRIBUTION		THE FIXED ASSET DESCRIBED ABOVE HAS BEEN COMPLETED IN ACCORDANCE WITH APPROVED DRAWINGS, SPECIFICATIONS, AND AUTHORIZED CHANGES		
No.	To	Submitted By:	Title:	Date:
1	WASO	<i>Robert R. Wiley</i>	Project Supervisor	MAR 7 1969
1	PSC DC	By: <i>Robert R. Wiley</i>	Title:	Date:
1	SERO	Approved: <i>R. Taylor Hoskins</i>	Superintendent	MAR 7 1969
1	SERO FO	By: <i>R. Taylor Hoskins</i>	Title:	Date:
1	Shenandoah	COSTS VERIFIED	Regional Accountant	MAR 31 1969
		BY <i>T. J. Baer</i>		

GSA DC 65-14218

11360

Form 10-174A
(June 1962)UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICEOrder Number
211717

COMPOSITION OF COST FOR COMPLETION REPORT

Fund Symbol
14x1035Park
Shenandoah National ParkRegion
SEYear Programmed
1966Location in Park
Matthews Arm Developed Area, North DistrictWork Order Title
Matthews Arm Campground

COMPOSITION OF COST

COSTS CHARGED TO FUNDS ALLOTTED TO FIELD FINANCE OFFICE

(1) Personal Services.....	\$ 15,172.52	
(2) Travel.....		
(3) Contract Work	205,292.05	
(4) Supplies and Materials.....	15,909.76	
(5) Other Direct Expenses.....	1,798.80	
(6) Operation of Equipment.....	1,243.47	
(7) Depreciation of Equipment.....		
(8) Purchase of Construction Equipment.....		
(9) Purchase of Other Accountable Equipment.....	213.85	
(10) Other Costs:		
(11) TOTAL COST CHARGED TO FFO FUNDS	XXXXXXXXXX	\$ 239,630.45

OTHER COSTS:

(12) PS&S, AP, and/or Facilitating Services @ 16 %.....	\$ 38,340.87	
(13) Inventory and Other Non-Fund Costs		38,340.87
(14) GROSS WORK ORDER COSTS	XXXXXXXXXX	\$ 277,971.32

LESS:

(15) Residual Value of Construction Equipment on Line 8	\$	
(16) Other Credits		
(17) NET COST OF FIXED ASSETS	XXXXXXXXXX	\$ 277,971.32

Identify other costs and other credits by line item entry, on an attached schedule, or explain in narrative.

11J61

COMPLETION REPORT**Construction of Comfort Stations and Utilities**

Matthews Arm Campground

Shenandoah National Park

Contract No. 1:134:0193

Bid Invitation Number	BODC-E-8-66
Date of Bid Opening	November 4, 1965; 2:00 p.m.
Number of Bids	Three (3)
High Base Bid - (Baughn Construction Co.)	\$323,147.35
Low Base Bid - (Contractors Incorporated)	\$208,014.00
Date of Award	November 24, 1965
<u>Prime Contractor:</u>	Contractors Incorporated P.O. Box 4657 Richmond, Virginia 23229
<u>Subcontractor:</u>	Cram Corporation (Pre-Stressed Concrete) Gainesville, Florida (100,000 Gallon Reservoir)
Preconstruction Conference Date	March 10, 1966
<u>In Attendance:</u>	Mr. R. Taylor Hoskins, Superintendent, Shenandoah NP Mr. Jerry B. House, Assistant Supt., Shenandoah NP Mr. William Bergen, Chief Ranger, Shenandoah NP Mr. A.P. Koster, Administrative Officer, Shenandoah NP Mr. Jerry Eubanks, Chief, Park Maint., Shenandoah NP Mr. Robert Johnson, N. Dist. Ranger, Shenandoah NP Mr. Buck Burgess, General Supply Specialist, Shenandoah NP Mr. Ritchie, President, Contractors Inc. Mr. Fleet, Contractor Superintendent Mr. Mike Rumbaltis, Construction Coordinator, PSC-DC Mr. John Wilburn, Project Supervisor, PSC-DC Mr. Joe Beer, Project Supervisor, PSC-DC Mr. John Flister, Project Supervisor, PSC-DC
Notice to Proceed Sent	April 1, 1966
Receipt of Notice to Proceed	April 5, 1966
Designated Starting Date	April 6, 1966
Actual Starting Date	April 6, 1966
Number of Days in Contract	210
Original Date for Completion	November 1, 1966

Completion Date Extended by the Following:

Stop Order - Effective April 12, 1966. Resume Work Order - Effective April 18, 1966 (7 days). Completion date changed to November 7, 1966.

Change Order No. 1 - Effective July 8, 1966. Increased the contract cost to \$208,314.00 and extended the completion date two days. Completion date changed to November 9, 1966.

Change Order No. 2 - Effective July 11, 1966. A change in the contract drawing was involved and did not result in any change of contract price or time.

Change Order No. 3 - Effective July 25, 1966. Increased the contract price to \$208,514.00 and extended the completion date three days. Completion date changed to November 12, 1966.

Change Order No. 4 - Effective September 15, 1966. Decreased the contract cost to \$208,282.75 and extended the completion date two days. Completion date changed to November 14, 1966.

Change Order No. 5 - Effective September 30, 1966. Extended the completion date thirty-seven days. Completion date changed to December 21, 1966.

Change Order No. 6 - Effective October 28, 1966. Increased the contract cost to \$209,410.95 and extended the completion date seven days. Completion date changed to December 28, 1966.

Stop Work Order - Effective November 28, 1966. Resume Work Order - Effective December 8, 1966 (10 days). Completion date changed to January 7, 1967.

Stop Work Order - Effective December 13, 1966. Resume Work Order - Effective January 16, 1967 (thirty-four days). Completion date changed to February 10, 1967.

Stop Work Order - Effective January 19, 1967. Resume Work Order - Effective May 8, 1967 (109 days). Completion date changed to May 30, 1967.

Change Order No. 7 - Effective May 25, 1967. Extended the completion date eleven days. Completion date changed to June 10, 1967.

Suppliers:

Crider and Shockey - Ready Mix Concrete
Front Royal, Virginia

Glamorgan Pipe and Foundry Co. - Cast Iron Pipe
Lynchburg, Virginia

Richmond Concrete Pipe Company - Concrete Sewer Pipe
Richmond, Virginia

Reda Pump Company - Submersible Pump
Bartlesville, Oklahoma

Economy Cast Stone Corporation - Cast Stone
Richmond, Virginia

Bif Industries - Chlorinating Equipment

Autocon Industries - Electric Water Control
St. Paul, Minnesota

Date of Semi-Final Inspection

June 7, 1967

In Attendance: Mr. R. Taylor Hoskins, Superintendent, Shenandoah NP
Mr. Jerry B. House, Assistant Supt., Shenandoah NP
Mr. Dale Hoak, Acting Chief of Maint., Shenandoah NP
Mr. Robert Wiley, Project Supervisor, PSC-DC
Mr. William H. Thorn, Project Supervisor, PSC-DC
Mr. Robert Fleet, Contractor Superintendent

Actual Completion Date (Pending correction of punch list) June 8, 1967

Final Inspection

August 24, 1967

In Attendance: Mr. Robert Fleet, Contractor Superintendent
Mr. Dale Hoak, Acting Chief of Maint., Shenandoah NP
Mr. Robert Wiley, Project Supervisor, PSC-DC

Letter of Complete Acceptance

August 24, 1967

Letter Requesting Release of Claims

August 24, 1967

Release of Claims (signed)

August 25, 1967

Date of Final Payment and Amount

August 28, 1967

\$12,225.70

Total Contract Cost

\$205,292.05

NARRATIVE

This contract provided for five comfort stations and utilities, including water pump, chlorination treatment reservoir, water mains, drinking fountains, sewers, cleanouts, trailer sanitary sewage disposal and a complete sewage disposal plant sufficient to service the first section of a new campground being constructed at Matthews Arm in Shenandoah National Park.

Although the contract was awarded on November 24, 1965, it was considered advisable to start work in April of 1966 to avoid the interference of bad weather that would be likely during the winter months in this mountainous location. Even so, it was still necessary to grant several stop orders, amounting to a total of 125 days, because of adverse weather conditions.

In addition, change orders to the contract added a total of 62 more days and changed the contract cost from \$208,014.00 to a final cost of \$209,410.95. These changes were as follows:

Change Order No. 1 - To reduce the depth of excavation for sewer installation between comfort stations 3 and 4, two additional manholes were placed between manholes 6 and 7. This permitted raising the invert elevations of manholes 6 and 7, thereby reducing the trench depth. This change cost an additional \$300.00 and required two additional days.

Change Order No. 2 - This change order merely reflected a change in the location of the sludge drying bed to permit proper flow of sludge from the Imhoff tank to the drying bed. There was no change in cost or time.

Change Order No. 3 - Because of a sharp dip in elevation from four of the comfort stations to the sewer mains, cleanouts were added to facilitate future cleaning of sewer lines. Also, to prevent freezing of the faucet in the winter, a frost-proof hydrant was added to the line between the reservoir and the chlorinating house. These changes added \$200.00 to the contract cost and required three additional days.

Change Order No. 4 - This change corrected the difference between the actual number of manholes placed and the number required originally in the bid schedule. It increased Type I manholes from 13 (including two provided by Change Order No. 1) to 19, and decreased Type II manholes from 12 to 7. It also provided for 25' of 4" cast iron soil pipe needed for comfort station connections, but not provided for in the contract. This change order resulted in a decrease of \$231.25 in the contract cost and added two days to the contract time.

Change Order No. 5 - The Contractor was delayed a total of thirty-seven days in shipment, by the Economy Cast Stone Company of South Richmond, Virginia, of the cast stone coping used in the comfort stations. This delayed work on the construction of the comfort stations and the Contractor was granted a thirty-seven day extension of contract time.

Change Order No. 6 - The Contractor, in a letter dated July 11, 1966, submitted three claims for additional compensation and time. The first was a claim for \$206.50 for a change in location of the 2" water main to comfort station No. 2. This claim was denied and the Contractor accepted the denial. The second claim was for \$263.00 because of alleged incorrect elevations given by the Government Engineer. This claim was also denied and the denial was accepted by the Contractor. The third claim was for \$1,128.20 additional compensation for having to lower a 4" water line three feet below the required three feet of depth for approximately 130 feet of length. This claim was found justifiable and Change Order No. 6 was issued for this amount of increase, along with a seven day extension to the contract time.

Change Order No. 7 - This change order granted an eleven day extension of time due to adverse weather conditions between May 8 and 22, 1967.

During the course of the contract construction, there were a few incidents, causing the relationship between the representatives of the Contractor and those of the government to become somewhat strained. These differences were overcome and the government obtained a complete, usable and durable utility system, together with five comfort stations ready to serve the new campground at Matthews Arm being constructed under another contract. Work was completed within the allowable time for completion and for a cost less than the estimated cost.



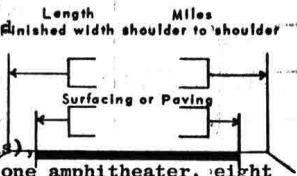
William H. Thorn
Project Supervisor

Form 10-411
(Rev. 2/62)UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

PROJECT CONSTRUCTION PROPOSAL

1. Statement of requirements, proposed work and construction data, justification, etc. (Use additional sheets as necessary.)

Construct a complete water supply and distribution system to serve a 250-site campground including a concessioner operated campstore. See estimated quantities and costs on reverse side. See PCP U-111 attached sketch. See final report on Matthews Arm area. Contract 14-10-0137-0135. A well (#2) is to be used for the water supply. The system is to supply a 250-site campground (peak daily attendance of 1,250 persons), consisting of seven comfort stations, one checking station, one amphitheater, eight drinking fountains, and a campstore (2400 sq. ft.). (Estimated value of building and merchandise, \$100,000.)



The development of this campground is included in the MISSION 66 prospectus and holds a high priority in Park planning. This water system is essential for the operation of the proposed campground. Other PCP's required for the development have been approved.

It is the opinion of those concerned that the springs were inadequate and that the water supply will come from Test Well #2 which supplies 23 GPM with a stabilized drawdown of approximately 38 feet.

2. Land Status (If Govt.-owned, what agency), Water Rights, Research, Etc.

NOTE: Previously approved by Elbert Cox, Regional Director, 2/2/62, for \$62,100. This revision is prepared from the Construction Cost Indices, dated 2/10/64. Government-owned (NPS)

3. PCP Data Prepared by (Name, Title & Date)

Joe H. Beer 5/1/64
Joe H. Beer
Park Landscape Architect

J. Marvin Stump 5/1/64
J. Marvin Stump
Park Engineer

4. Cross-reference PCP's to this Project: U-130-1, 131-1, B-122-1, R-159-1, B-128-1
PCP numbers of previously completed portions:

5. Construction by:

Day Labor ☐ Contract ☒

Work supervised by:

Park ☐ Reg. ☐ Design Office ☒

6. CLASS C ESTIMATE

Construction.....	\$ 55,900
Plans, Surveys, & Supervision.....	8,050
Contingencies.....	3,350
SUB TOTAL	67,300
Exhibits, Audio-Visual Installations, etc.....	
GRAND TOTAL	\$ 67,300

7. DISTRIBUTION OF COPIES

No. COPIES TO BE DISTRIBUTED

6 SERO TO BE DISTRIBUTED

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8. Recommended by Park Office (Signature, title, date)

B. Taylor Hoskins
B. Taylor Hoskins, Superintendent May 12, 1964

9. Approved by Regional Office (Signature, title, date)

Elbert Cox MAY 27 1964
Regional Director

10. Reviewed by D&C Field Office (Signature, Title, Date)

Vincent N. Mauro
Vincent N. Mauro, Project Control Officer, EODC, 6/24/64

11. Location within Area or Termini

Matthews Arm

12. Master Plan No.

NP-SHE-3039

13. Bldg. or Rt. # and Sec.

R-44; Bldg. 5-44 through 5-49 and 7-35

14. Region

SE

15. Park

Shenandoah National Park

16. Project

Water system - Matthews Arm Campground

Page

(County)

Virginia

(State)

17. PCP Index No.

U-111-1

18. P. S. & S. by

BPR ☐

NPS ☒

National Park Service
Contract No. 14-10-0137-0135

FINAL REPORT
Mathew's Arm Area
Shenandoah National Park

Test hole drilling and evaluation

Two test holes were drilled in June 1963 at the sites recommended in the Mathew's Arm Preliminary report prepared by the Virginia Division of Mineral Resources in November 1961. Each test hole was completed at a depth of 200 feet and penetrated only metamorphosed basalt of the Catoctin formation beneath 20 feet of surficial weathered material.

Pump test data indicate maximum drawdown was attained in test hole No. 1 after only 2 hours pumping at the rate of 3 gallons per minute. Test hole No. 2 was pumped for 25 1/2 hours; at the end of 21 2/3 hours 23 gallons per minute was being discharged with a stabilized drawdown of approximately 38 feet. The pumping data for this test is attached. Also attached are copies of the Water Well Completion Report forms and geologic logs for test holes No. 1 and 2, the drill cuttings of which have been assigned well numbers 850 and 856, respectively, in the Virginia Division of Mineral Resources repository.

Water well recommendation

The location of a drilling site for a water well has been selected 250 feet west of test hole No. 2, on the north side of Jeremy's Run. A well at this location should be approximately 250 feet deep; it is anticipated that fractured rocks of the Catoctin formation will be penetrated beneath about 25 feet of weathered material.

Virginia Division of Mineral Resources
Charlottesville, Virginia
September 23, 1963

National Park Service
Contract No. 14-10-0137-123

MATHEW'S ARM AREA

Preliminary Recommendations

A campground of 150 or more sites has been proposed for the Mathew's Arm area located in the northern district of Shenandoah National Park near milepost 22, about 1/2 mile west of Skyline Drive and the Piney River Ranger Station. The area is underlain by greenstone that dips 15 to 35 degrees to the west and southwest.

Eight springs occur within the area investigated, and have individual estimated flows that range from 2 to 15 gallons per minute. No records are available for the flows of any of these springs prior to November 1, 1961, when several temporary wooden weir-boxes were installed by the Park Service. The locations of the springs, with estimated flows on September 27-28, 1961, and possible locations for future collecting galleries are shown on Figure 1. No further work should be done on the springs until at least one year of spring-flow data is available for study.

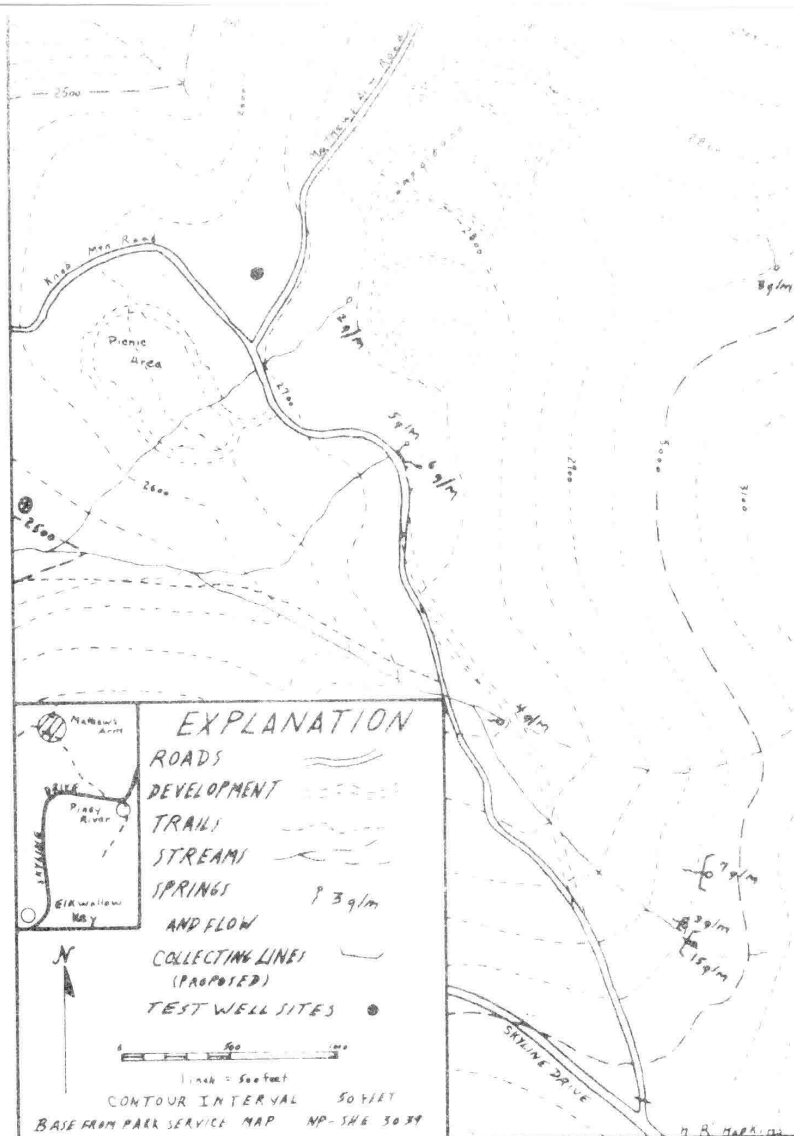
The locations of two proposed test-well sites are shown on Figure 1. The test sites are located at the intersection of east-west and north-south trending minor lineaments. The water encountered during test-drilling will be obtained from open water-filled fractures in the greenstone. It is not possible to tell in advance of drilling the number or depth of fractures that may be present, or if they are open and water-bearing. A test well should

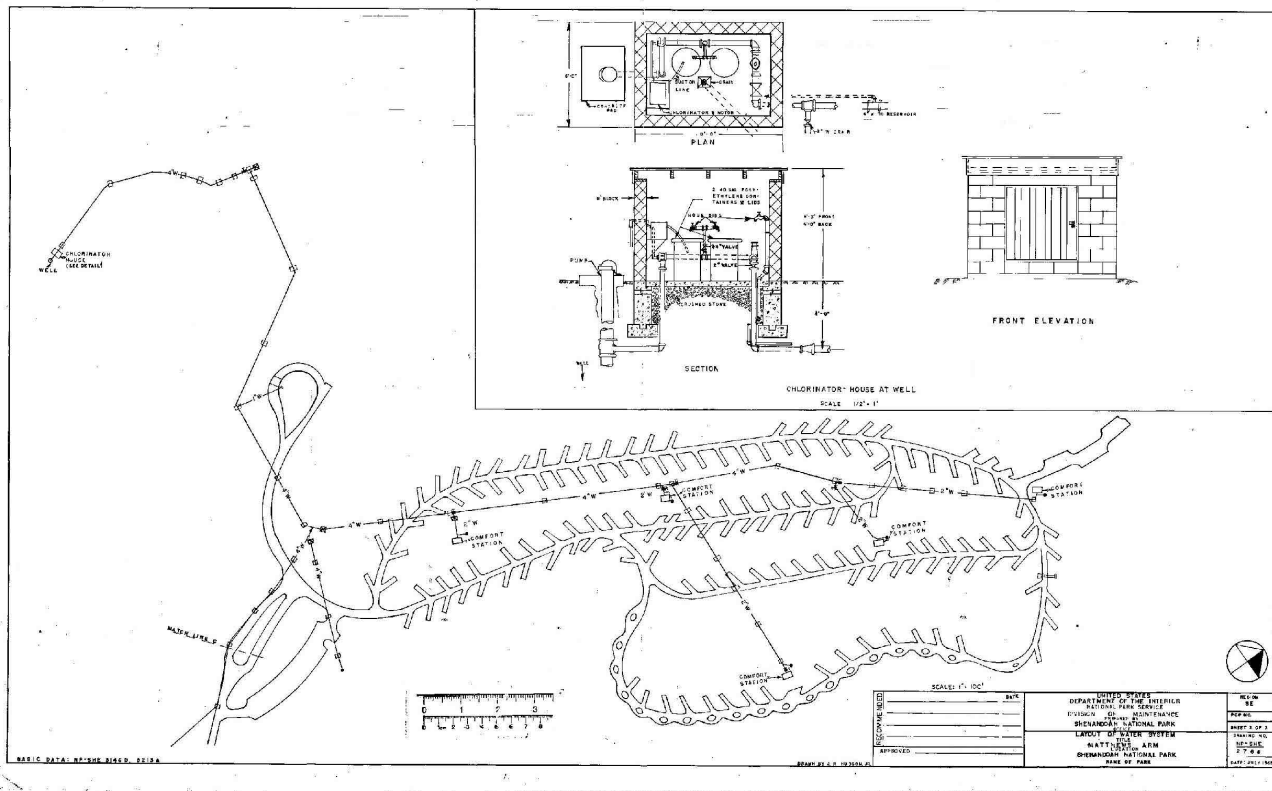
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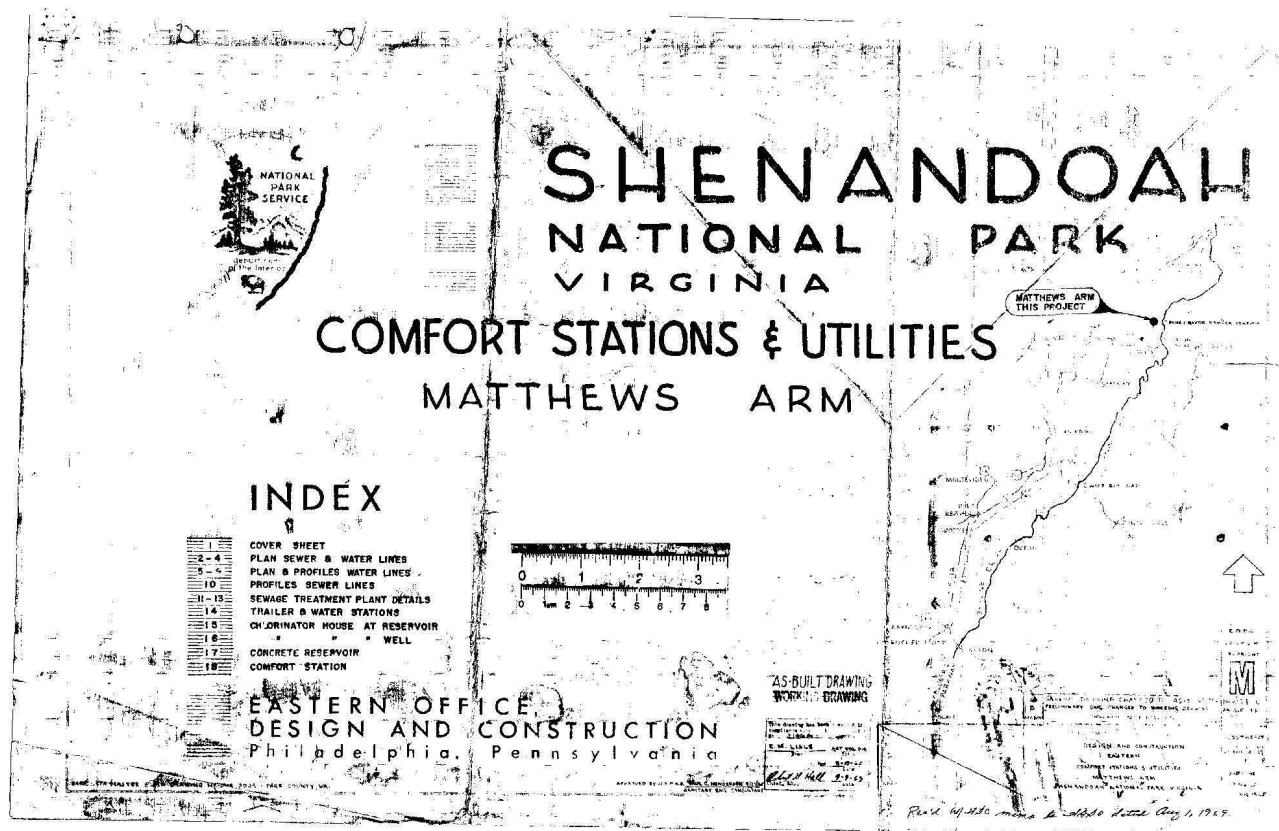
be drilled at each of the proposed sites to a minimum of 150 feet or a maximum of 300 feet in depth, to determine the probable amount of groundwater available in the area.

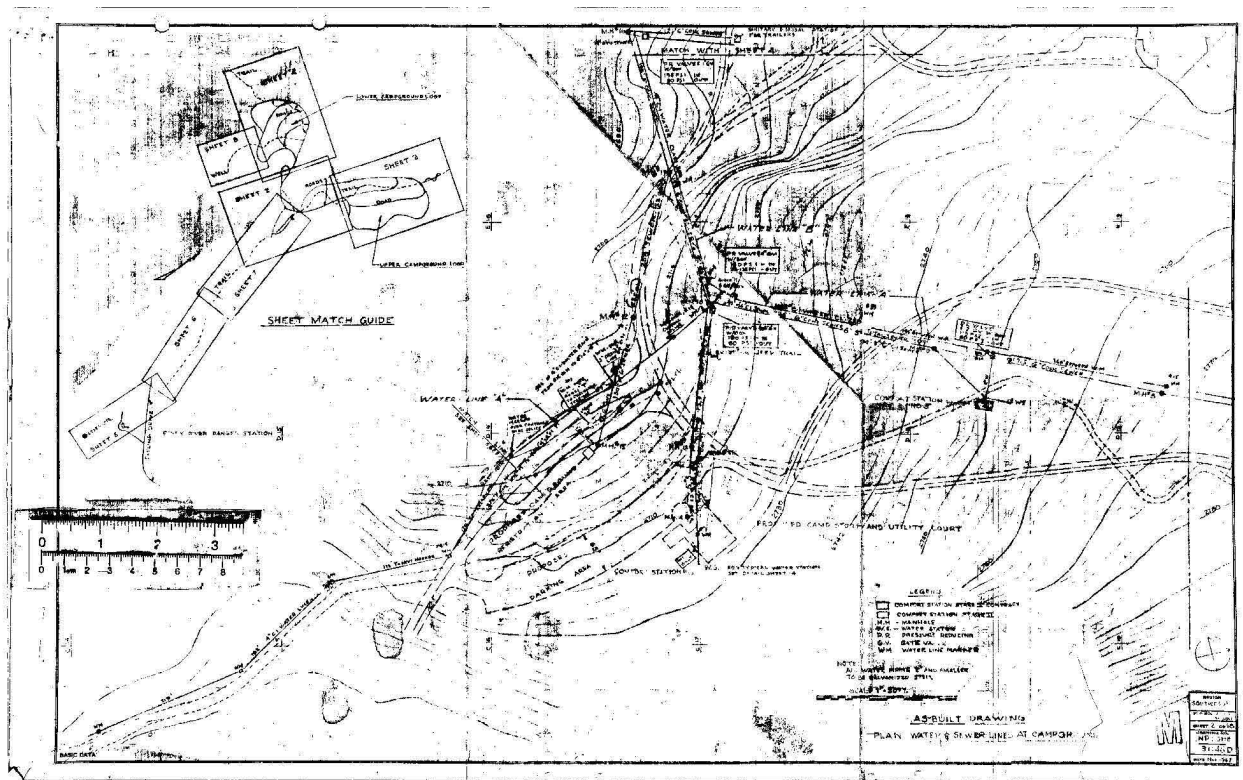
Final recommendations will be submitted after data from the completed test wells have been evaluated and after all available spring flow data has been compiled and analyzed.

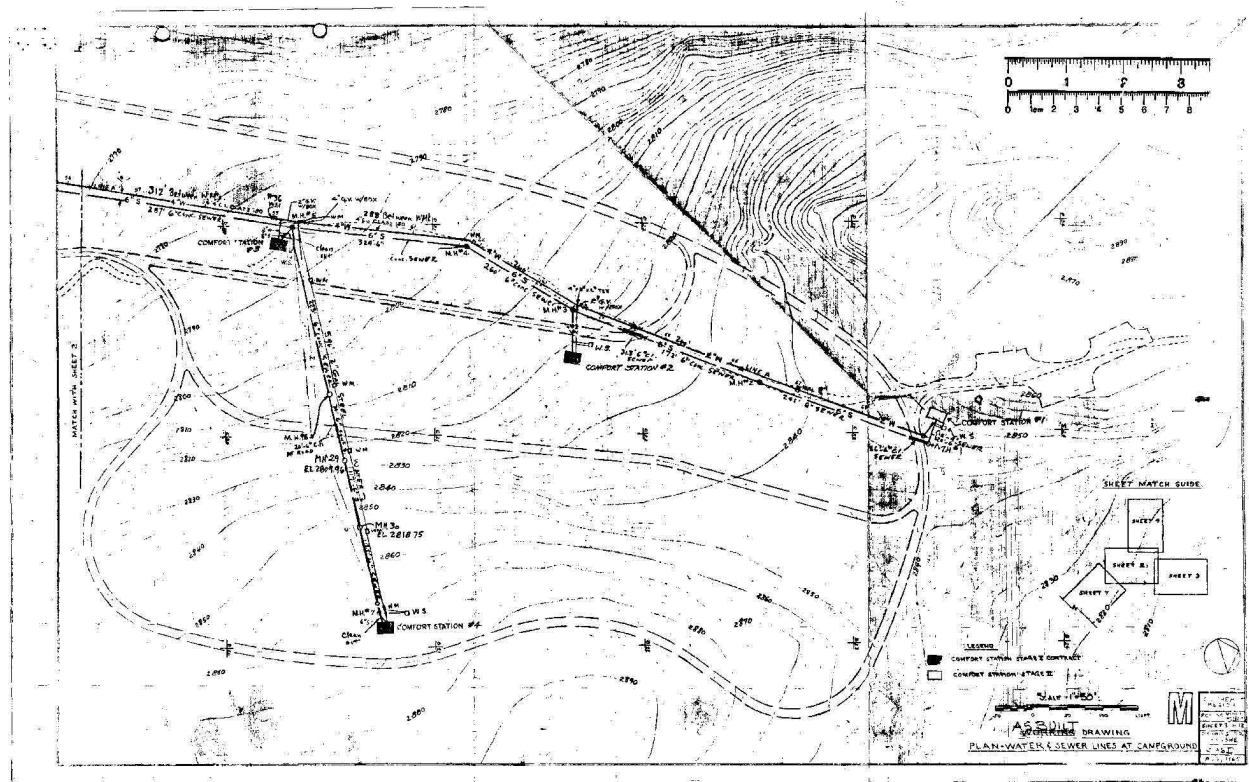
H. R. Hopkins
November 15, 1961

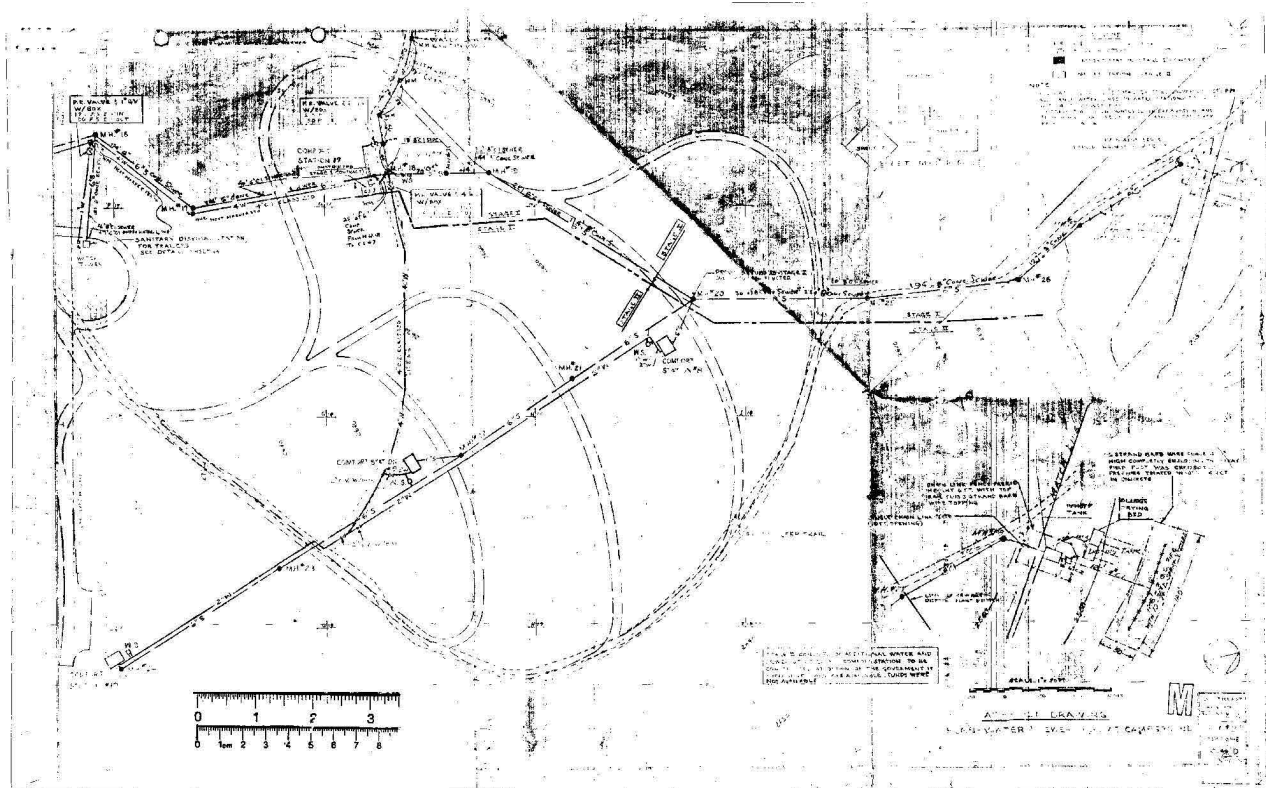


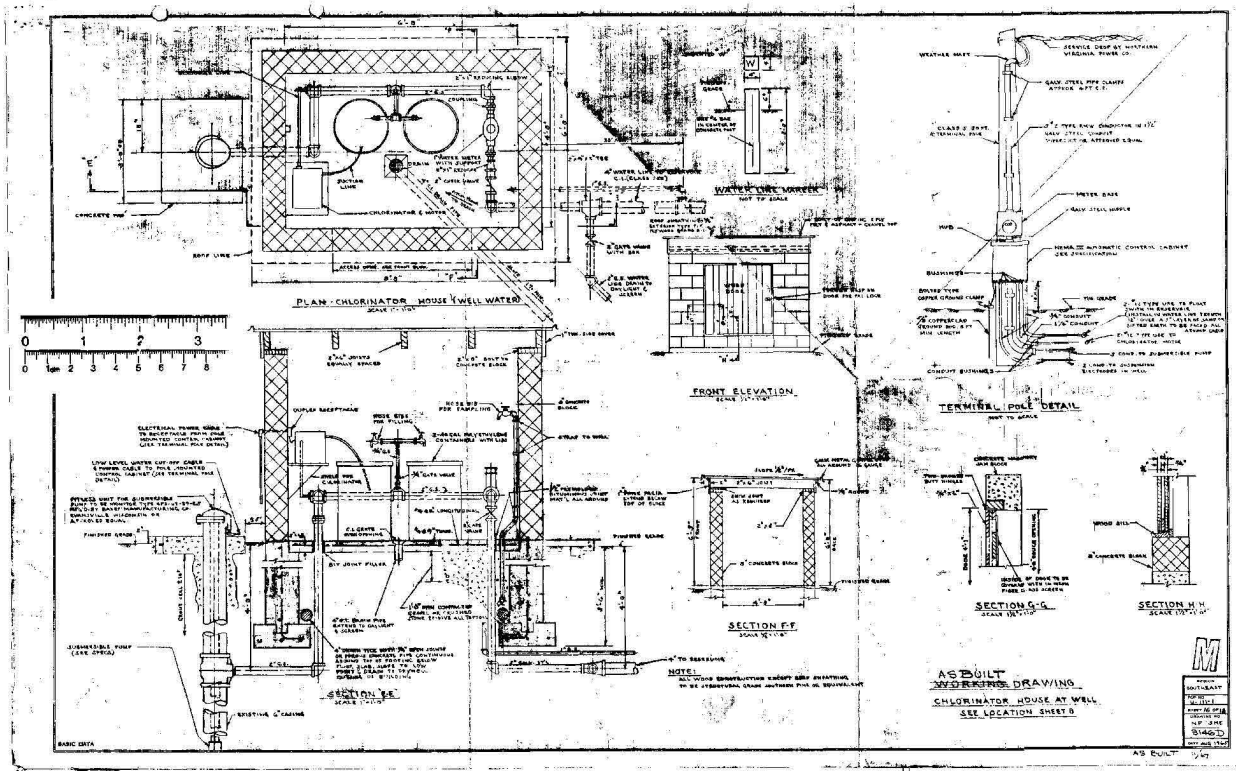


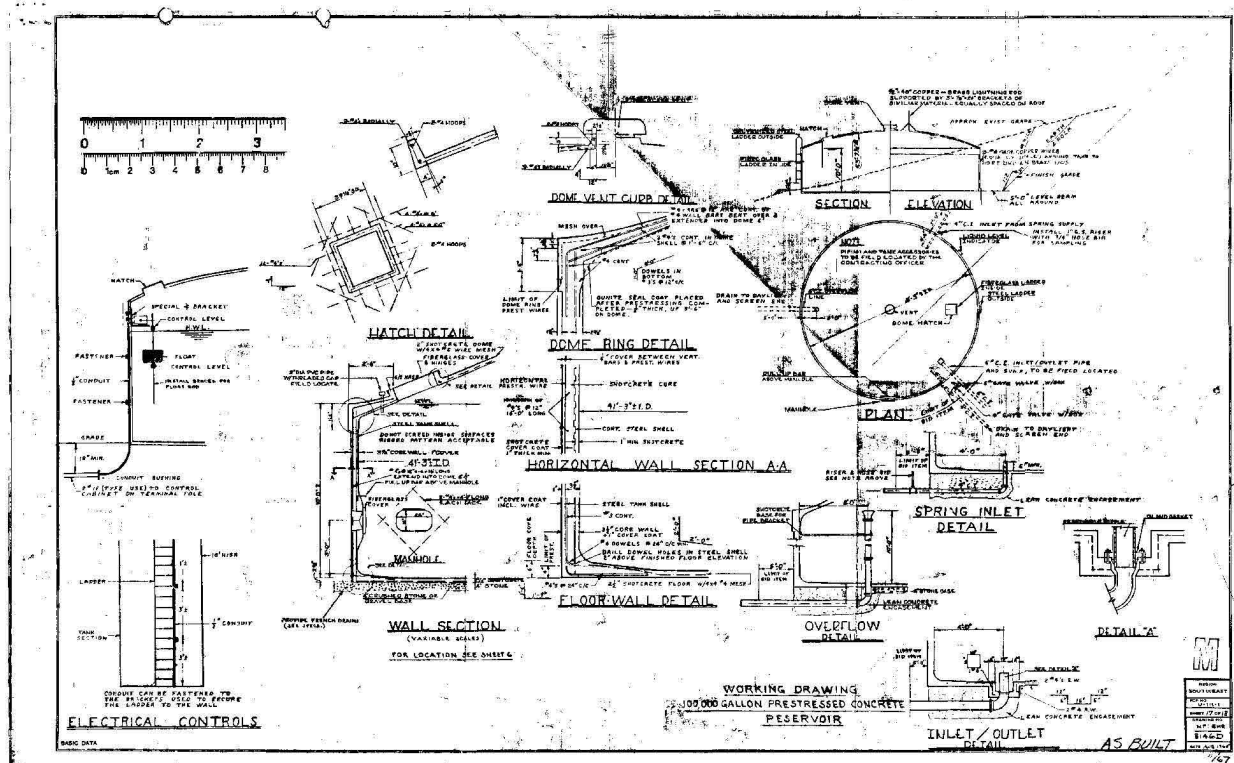












Docket Information

Number of Documents in Docket 29

Documents Dated from 11/15/1961 to 3/7/1969

Docket Compiled: 6/17/2011