

Attachment J03

Fort A.P. Hill Potable Water System

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J03 Fort A.P. Hill Water System

J03.1 Fort A.P. Hill Overview

Fort A.P. Hill (APH) is a U.S. Army Installation serving every component of the U.S. Armed Forces, active and reserve, and several other agencies of the U.S. Government including the Bureau of Alcohol, Tobacco, and Firearms, the Immigration and Naturalization Service, and the State Department. The Installation annually hosts between 500,000 and 800,000 man-days of training.

While one of the largest installations in terms of landmass, Fort A.P. Hill is also one of the smallest in terms of permanent garrison staff with just 183 full time civilian employees and 13 active duty soldiers currently authorized. Primary products and services include delivery of maneuver and live fire training services, logistics support (shelter, food, and ammunition), recreational support, telecommunications and automation services, and public work services. The range complex consists of 50 direct fire ranges and 50 indirect fire ranges capable of accommodating mortar, artillery, and combined running fire, hover fire, and terrain flight aerial gunnery. Fort A.P. Hill is continually adjusting its ranges and services with its integrated creative team of professionals designing solutions to meet the pressing dynamic needs of an Army in transformation.

Fort A.P. Hill hosts the National Boys Scouts of America (BSA) Jamboree in a four-year cycle. During the Jamboree, which spans a 10-day period, Fort A.P. Hill's population explodes making it very unique among all military installations. Among other services, Fort A. P. Hill provides potable water to the Boys Scouts during the Jamboree.

J03.2 Water System Description

The water distribution systems at Fort A.P. Hill consist of water wells, chlorination disinfection systems, booster pumps, water storage tanks, water mains, fire hydrants, isolation valves, air release valves and service lines. There are eight water distribution systems; one community system and seven non-community systems.

A unique requirement of the APH water system is to accommodate the BSA Jamboree that has been held at APH every four years since 1981. The actual BSA Jamboree lasts for only 10 days, but takes months to prepare the water system to accommodate the water demand from the Jamboree's enormous attendance. It is estimated that APH hosts approximately 30,000 boy scouts and nearly 300,000 visitors during the Jamboree. Statistics from the 1993 Jamboree are provided below:

- Total water consumption was 5,132,800 gallons
- Maximum day water use was 963,500 gallons
- Minimum day water use was 594,900 gallons
- Average daily consumption was 733,260 gallons
- Maximum hourly peak flow rate was 1,400 gpm
- Average daily consumption per person was 21.81 gallons
- Peak hourly consumption per person was 59.96 gpd
- Arena #1, Davis #2, and Drop Zone Well #1 accounted for 61% of total water production

The following data is an estimated potable water use analysis from the 2001 Jamboree:

- Total potable water flow was 9,600,670 gallons
- Maximum daily potable water flow was 1,200,000 gallons
- Average daily potable water flow was 990,000 gallons
- Increased water sampling requirements; 10 points per sub-camp for the 2 week period

J03.2.1 Water Sources

Water sources for Fort A.P. Hill are the Aquia, Middle and Lower Potomac aquifers. There are 29 active wells that draw water from the aquifers and supply the distribution systems, as listed in the following table, and three well casings. The well casings may be developed in the future if permitted and water requirements dictate. The well casings will require minimal maintenance, such as painting, etc. Fort A.P. Hill requires at least two independent water sources to serve mission critical functions. Usually, two wells within the same aquifer can be considered as an independent water source.

TABLE 3.2.1
Well Inventory

Well No.	Location	Well Depth (feet)	Well Capacity (gpm)	Pump Capacity (gpm)	Year of Construction
Headquarters Area					
PWAT29	Headquarters #1	448	133	121	1987
PWAT28	Headquarters #2	446	160	138	1982
PWAT372	HQ Water Lab	450	55	12	1978
Anderson Camp					
PWAT02	Anderson	320	42	26	1980
Wilcox Camp					
PWAT22	Wilcox #1	360	152	131	1979
PWAT23	Wilcox #2	510	40	25	1979
PWAT43	Wilcox #3	550	130	151	1990
PWAT13	Wilcox, 25,000	524	42	40	1961
PWAT41	Wilcox WWTP	366	55	71	1990
Archer Camp					
PWAT03	Archer	422	103	135	1961
Central Camp					
PWAT12	Rodes #1 - To be replaced with new well in FY2004	503	130	Sealed	2004
PWAT40	Rodes #2 - To be replaced with new well in FY 2004	595	103	Sealed	2004
PWAT36	Arena #1	534	324	302	1990

Well No.	Location	Well Depth (feet)	Well Capacity (gpm)	Pump Capacity (gpm)	Year of Construction
PWAT37	Arena #2 - To be replaced with new well in FY 2004	532	162	Sealed	2004
PWAT34	Longstreet	512	128	121	1987
PWAT19	Davis #1	558	84	93	1961
PWAT39	Davis #2	590	234	214	1990
PWAT45	Davis #3	525	250	399	1990
PWAT07A	Heth	423	109	92	1966
PWAT33	Drop Zone #1	555	340	340	1985
PWAT38	Drop Zone #2	527	180	100	1990
PWAT44	Lodge #2	540	200	225	1990
TISA Area					
PWAT35	TISA	490	44	60	1988
Cooke Camp					
PWAT42	Cooke #1	358	240	156	1992
PWAT04	Cooke #2	230	55	43	1958
Pender Camp					
PWAT09	Pender	182	72	59	1957
Rappahannock Camp					
PWAT11	Rappahannock	473	48	31	1957
PWAT11A	Rappahannock	400	46	20	1957
Laser Range					
PWAT26	Laser Range	500	60	12	1982
Well Casing Only					
PWAT30	Archer	Requires periodic maintenance; painting etc			1993
PWAT31	EP4				1987
PWAT32	Longstreet				1987

J03.2.2 Treatment System

The water treatment process at Fort A.P. Hill consists only of chlorination disinfection. Chlorination is effected by chlorine gas or hypochlorite liquid. Chlorination facilities are located adjacent to wells in a separate building and are equipped with heaters and adequate ventilation. Chlorine gas from a 150-pound gas cylinder is mixed with a portion of the well water forming an aqueous chlorine solution, which is injected by a booster pump directly into the water from the wells. The chlorine

booster pump operation is synchronized with the well operation. The feed rate varies from 5 to 25 pounds of gaseous chlorine per day depending on the well production.

Hypochlorite tablets are added to small chlorine solution tanks and mixed with water to produce saturated hypochlorite liquid. A pump injects the saturated hypochlorite liquid to the well water and operates synchronously with the well pump. In addition to chlorination at wells, the potable water is re-chlorinated in some storage tanks, detention tanks and large water pipes to achieve a minimum 30-minute chlorination detention time. The following tables show the chlorination system data at Fort A.P. Hill:

TABLE 3.2.2
Chlorination System Data

Chlorination Systems Integrated with Wells			
Location	Well No.	Pipe Diameter (inches)	Pipe Length (feet)
Heth	PWAT07A	12	500
Rodes 1	PWAT12	18	230
Lodge	PWAT44	6	181/112
Drop Zone 1	PWAT33	16	800
Longstreet	PWAT34	24	65
Arena 1	PWAT36	24	230
Arena 2	PWAT37	30	60
Drop Zone 2	PWAT38	24	225
Davis 2	PWAT39	24	50
Rodes 2	PWAT40	24	400
Cooke	PWAT42	18/4	360/20

Re-Chlorination Systems Integrated with Elevated Tanks		
Location	ID	Capacity (gallons)
Anderson	PO0150	60,000
Archer	PW1343	125,000
Engineer Road	PO1565	300,000
Cooke	PO0822	100,000
Wilcox	PO1602	25,000
EP-4	PW1208	240,000
Longstreet	PO1537	60,000
Headquarters 1	PWT100	125,000
Arena 1	PO1560	300,000
Jackson	PWT416	100,000

Re-Chlorination Systems Integrated with Standpipe Tanks		
Location	ID	Capacity (gallons)
Pender	PO0501	42,500
Rappahannock	PO0706	42,500
EP-4	PO12131	42,500
Davis	PO1401	100,000
TISA Fire Storage	PT1339	158,000
TISA Portable Hydromatic	PT1338	3,000
Seal Team Fire Storage	PO2202	65,000
Wilcox	PO1646	300,000
Headquarters	PWT101	3,500

J03.2.3 Water Storage Tanks

The Fort A.P. Hill water system includes 18 active storage tanks. Tanks with cathodic protection shall be tested annually, as detailed in the table below:

TABLE 3.2.3
Water Storage Tanks Inventory

Building #	Location	Year Built	Capacity (gals)	Bottom Height (feet)
Headquarters Area				
PWT100	Headquarters (new) - has cathodic protection	1986	125,000	125.0
PO12131	EP-4 (old)	1971	42,500	Ground
PW1208	EP-4 (new)	1998	240,000	107.3
PO0150	Anderson Camp	1966	60,000	53.5
PO1602	Wilcox #1	1964	25,000	40.0
PO1647	Wilcox #2 - has cathodic protection	1977	300,000	Ground
PW1343	Archer Camp - has cathodic protection	1992	125,000	117.75
PWT101	Headquarters	1971	3,500	Ground

Building #	Location	Year Built	Capacity (gals)	Bottom Height (feet)
Central Camp				
PW1560	Arena Tower - has cathodic protection	1989	300,000	80.8
PO1537	Longstreet Camp	1968	60,000	100.9
PO1401	Davis Camp	1984	100,000	Ground
PW1564	Engineer Road Tower	1995	300,000	87.0
PWT416	Jackson Tower	1989	100,000	82.8
PF0411	Jackson Camp	1984	100,000	Ground
Cooke Camp				
PO0822	Cooke Camp	1969	100,000	70.0
Pender				
PO0501	Pender	1964	42,500	Ground
Rappahannock Camp				
PO0706	Rappahannock Camp	1964	42,500	Ground
TISA				
PT1338	Portable Hydromatic	1985	3,000	Ground
Fire Fighting Use				
PO2202	Seal Team	1994	65,000	Ground
PT1339	TISA	1985	158,000	Ground

J03.2.4 Pumping Stations

The following pumping stations are located in the system to augment system pressure when needed.

TABLE 3.2.4
Booster Pump Stations Inventory

Location	Number of Pumps	Capacity (gpm)	Year of Construction
Jackson	1	512	1989
Wilcox	2**	750	1977
Davis	2	140	1984
Rappahannock	2*	75	1964

** (2) Potable Booster Pumps and (2) Fire Booster pumps with different capacities, four pumps total

* (2) Potable Booster Pumps that alternate

J03.2.5 Distribution Systems

The water systems within the Installation are operated and maintained by Installation personnel. The water distribution systems at Fort A.P. Hill consist of eight independent distribution systems, as follows:

1. Headquarters system;
2. Wilcox system;
3. Archer system;
4. Anderson system;
5. Central Camp system serving Campsites: Davis, Longstreet, Rodes, Lodge Area, Heth, Engineer Road, Jackson and Mahone areas;
6. Rappahannock Camp system;
7. Pender Camp system; and
8. Cooke Camp system.

The stand alone systems of Headquarters, Wilcox, Archer, and Anderson can be interconnected by opening appropriate valves as discussed below. The water systems within Fort A.P. Hill provide water for both domestic and fire protection use. With few exceptions, lines are located adjacent to roadways and fire hydrants readily accessible and each fire hydrant has its own isolation valve. Isolation valves are located near most pipe intersections making it easy to isolate portions of the system. The normal distribution pressure is approximately 54 pounds per square inch (psi) and is adequate for fire protection. The distribution systems are described below.

Headquarters System

The Headquarters system serves a consistent demand throughout the year as the buildings served are occupied year-round. This distribution system is operated as four isolated subsystems utilizing normally closed water valves. The four subsystems are:

1. The Headquarters system serving the Headquarters area, the EP-4 Compound, and the Navy Seals Complex;
2. Anderson Camp;
3. Archer Camp; and
4. Wilcox Camp.

The wells and storage tanks in each of the subsystems are identified in Tables 3.2.1 and 3.2.3, respectively. The Headquarters subsystem is isolated from the Wilcox Camp by a normally closed 6-inch valve near the intersection of Wilcox Drive and North Range Road, and a 6-inch valve near the intersection of A.P. Hill Drive and Fortune Road that is normally closed. The Anderson Camp is interconnected by a 6-inch line to the Headquarters subsystem, but operates independently with a normally closed valve. Similarly, the Archer Camp operates independently of the Headquarters subsystem with a normally closed valve in the 8-inch interconnecting line.

The schematic system diagram of the area is given in Figure 3.2.1.

Central Camp System

The Central Camp system is capable of supporting a population of 50,000, which occurs during a four-year cycle of the Boy Scouts of America Jamboree. The Central system consists of eight subsystems interconnected with each other and also capable of independent operation through closing appropriate water valves. The subsystems are:

1. Drop Zone
2. Jackson Campsite
3. Davis Campsite
4. Longstreet Campsite
5. Rodes Campsite
6. The Lodge Area
7. Heth Campsite
8. Engineer Road

The Central Camp system's major water distribution loop consists of an 8-inch line from Jackson Tower to Rodes #1 Well and a 12-inch line completing the loop from Rodes #1 Well to the Jackson Tower. The wells and storage tanks in this system are identified in Tables 1 and 3, respectively.

The schematic system diagram of the area is given in Figure 3.2.2.

Other Independent Systems

There are small independent systems separated from the Headquarters and Central Camp systems. The schematic system diagrams of these areas are given in Figure 3.2.3. The independent areas are:

1. Rappahannock Camp System
2. Pender Camp System
3. Cooke Camp System
4. Headquarters Laboratory System
5. Picnic Area System (well sealed, connected to Archer Water Main)
6. TISA System
7. Wilcox Wastewater Treatment Plant System
8. Laser Range System

J03.2.6 System Operations

Fort A.P Hill personnel currently operate the potable water systems. The majority of the systems have telemetry to monitor and control the operation of wells and the tank levels. Some of the wells and tanks do not have telemetry, and are operated directly by the level of the tank it is connected to. These wells have manual overrides so that Fort A.P Hill personnel can operate the wells from the well site.

The computer and terminal of the potable water telemetry system is integrated with the wastewater system and is located in the wastewater plant. The storage tank level controls the well operation. The control system is utilized to rotate the operation of all wells at various times. The tank level control set points that also controls the wells can be remotely changed from the computer. The plant operators

vary the set points to match the system demand, to avoid poor water quality during low usage periods. The telemetry system is capable of relaying system status and failures during off duty hours to operators through telephone. Some of the operators can access the telemetry system from their home to monitor and operate the system.

The following table shows the wells controlled by the telemetry system and the controlling tank levels and the remote telemetry units for the potable water facilities on Fort A.P. Hill. The new utility service provider will be required to own, operate and maintain this system. The new utility service provider will also be required to meet all Installation frequency and security requirements in the operation of this system.

TABLE 3.2.6.A

PW Remote Telemetry Units

Well Name	RTU No.	Turn On (feet)	Turn Off (feet)	Location of Reading
Arena #2	0	26.2	29.23	Arena Tower
Drop Zone #1	1	25.5	28.8	Jackson Tower
Drop Zone #2	2	26.4	28.5	Jackson Tower
Heth	3	26.8	28.0	Jackson Tower
Rodes #1	4	26.5	28.5	Engineer Tower
Davis #1	5	44.0	46.25	Jackson Tower
Arena #1	6	27.0	28.75	Arena Tower
Davis #2	7	27.0	29.0	Arena Tower
Rodes #2	8	27.0	29.0	Engineer Tower
Lodge	9	26.5	29.0	Engineer Tower
Longstreet	10	20.0	28.75	Longstreet Tower
HQ #1	11	26.5	28.5	HW Tower #1
Anderson	12	13.5	14.75	Anderson Tower
Archer Well	13	25.0	26.5	Archer Tower
TISA Well	14			
	15			EP-4 Tower
Davis #3	16			
	17			Jackson Tower
	30			Wilcox Master
	34			Engineer Road Tower
Pender	35			
Rappahannock	38			
Cooke #1	40			
Wilcox Lead	47	50.0	51.5	Wilcox Tank
Wilcox Lag	48	49.5	51.25	Wilcox Tank

Well Name	RTU No.	Turn On (feet)	Turn Off (feet)	Location of Reading
Wilcox #3	49			
	50			Wilcox Booster Station
HQ #2		4.10	5.60	HQ Chlorine Tank
Davis Booster		26.75	28.90	Arena Tower

The water distribution systems at Fort A. P. Hill are regulated by the Virginia Department of Health. The following table shows the water sampling requirements for each distribution system:

TABLE 3.2.6.B
Water Systems Sampling Schedule

FORT A.P. HILL DRINKING WATER SAMPLING SCHEDULE

AREA/PWSID	PWAT	PARAMETER	NUMBER/TYPE OF SAMPLES	SAMPLING FREQUENCY	LAST SAMPLE DATE	NEXT SAMPLE DUE
TRANSIENT COMMUNITY WATERWORKS						
HEADQUARTERS 6033251		BACTI	DISTRIBUTION SYSTEM	MONTHLY		SELF EXPLANATORY
		CCR REPORT	N/A - ANNUAL REPORT	ANNUALLY	7/1/03	JUNE 2004
	PWAT28	TTHM & HAA5	1 AT ENTRY POINT AFTER TREATMENT EACH WELL	ANNUALLY Taken at location that represents the maxi. residence time and during the month with warmest temp.	EFFECTIVE 1/1/04	JUNE 2004
	PWAT29					JUNE 2004
	PWAT28	NITRATE/NITRITE	1 AT ENTRY POINT RAW EACH WELL	ANNUALLY	6/26/02, 6/24/03	JUNE 2004
	PWAT29				6/26/02, 6/24/03	JUNE 2004
	PWAT28	MPN - RAW H2O	1 AT ENTRY POINT RAW EACH WELL	ANNUALLY	6/26/02, 6/24/03	JUNE 2004
	PWAT29				6/26/02, 6/24/03	JUNE 2004
	PWAT28	INORGANIC	1 AT ENTRY POINT AFTER TREATMENT EACH WELL	EVERY 3 YEARS	08/24/00, 6/11/03	JUNE 2006
	PWAT29				08/24/00, 6/11/03	JUNE 2006
		LEAD & COPPER	5 TAP SAMPLES DISTRIBUTION SYSTEM	EVERY 3 YEARS Ultimate reduced monitoring	6/12/02	Jan 2003-Dec 2005
	PWAT28	METALS	1 AT ENTRY POINT AFTER TREATMENT EACH WELL	EVERY 3 YEARS	6/21/00, 6/11/03	JUNE 2006
	PWAT29				6/21/00, 6/11/03	JUNE 2006

	PWAT28	VOCs	1 AT ENTRY POINT AFTER TREATMENT	ANNUALLY	12/5/01	JANUARY 2004
	PWAT29		EACH WELL		12/5/01	JANUARY 2004
	PWAT28	RADIOLOGICAL	1 FROM DISTRIBUTION SYSTEM	EVERY 4 YEARS	4/11/02	JANUARY 2006
	PWAT29					
	PWAT14					
	PWAT28	SOCs Cyanide	1 AT ENTRY POINT AFTER TREATMENT	ONCE DURING MONITORING PERIOD	5/1/96	JANUARY 2004
	PWAT29		EACH WELL	1/1/2002-12/31/2010 WAIVER GRANTED 6/21/02 FOR 1/1/02-12/31/04	5/1/96	JANUARY 2004 REAPPLY FOR WAIVER IN January-04
TRANSIENT NON-COMMUNITY SYSTEMS						
ANDERSON 6033253 PWAT02	N/A	BACTI	DISTRIBUTION SYSTEM	QUARTERLY	SELF EXPLANATORY	SELF EXPLANATORY
		NITRATE/NITRITE	SAMPLE/ENTRY POINT EACH WELL	ANNUALLY	June-03	JUNE 2004
		MPN - RAW H2O	1 AT ENTRY POINT - RAW EACH WELL	ANNUALLY	June-03	JUNE 2004
ARCHER 6033254 PWAT03	N/A	BACTI	DISTRIBUTION SYSTEM	QUARTERLY	SELF EXPLANATORY	SELF EXPLANATORY
		NITRATE/NITRITE	SAMPLE/ENTRY POINT EACH WELL	ANNUALLY	June-03	JUNE 2004
		MPN - RAW H2O	1 AT ENTRY POINT - RAW EACH WELL	ANNUALLY	June-03	JUNE 2004
CENTRAL CAMP 6033256 ARENA 36 & 37 DAVIS 19, 39 & 45 DROP ZONE 33 & 38 RODES 12 & 40 HETH 07A LODGE 44 LONGST 34	N/A	BACTI	DISTRIBUTION SYSTEM	QUARTERLY	SELF EXPLANATORY	SELF EXPLANATORY
		NITRATE/NITRITE	SAMPLE/ENTRY POINT	ANNUALLY	June-03	JUNE 2004
		MPN - RAW H2O	1 AT ENTRY POINT - RAW EACH WELL	ANNUALLY	June-03	JUNE 2004
COOKE 6033255 PWAT04 & 42	N/A	BACTI	DISTRIBUTION SYSTEM	QUARTERLY	SELF EXPLANATORY	SELF EXPLANATORY
		NITRATE/NITRITE	SAMPLE/ENTRY POINT EACH WELL	ANNUALLY	June-03	JUNE 2004
		MPN - RAW H2O	1 AT ENTRY POINT - RAW	ANNUALLY	June-03	JUNE 2004

			EACH WELL			
PENDER 6033261 PWAT09	N/A	BACTI	DISTRIBUTION SYSTEM	QUARTERLY	SELF EXPLANATORY	SELF EXPLANATORY
		NITRATE/NITRITE	SAMPLE/ENTRY POINT EACH WELL	ANNUALLY	June-03	JUNE 2004
		MPN - RAW H2O	1 AT ENTRY POINT - RAW EACH WELL	ANNUALLY	June-03	JUNE 2004
RAPPAHANNOCK 6033263 PWAT11 PWAT11A	N/A	BACTI	DISTRIBUTION SYSTEM	QUARTERLY	SELF EXPLANATORY	SELF EXPLANATORY
		NITRATE/NITRITE	SAMPLE/ENTRY POINT EACH WELL	ANNUALLY	June-03	JUNE 2004
		MPN - RAW H2O	1 AT ENTRY POINT - RAW EACH WELL	ANNUALLY	June-03	JUNE 2004
WILCOX 6033265 PWAT 22 - #1 PWAT23 - #2 PWAT13 - 25K PWAT43 - #3	N/A	BACTI	DISTRIBUTION SYSTEM	QUARTERLY	SELF EXPLANATORY	SELF EXPLANATORY
		NITRATE/NITRITE	SAMPLE/ENTRY POINT EACH WELL	ANNUALLY	June-03	JUNE 2004
		MPN - RAW H2O	1 AT ENTRY POINT - RAW EACH WELL	ANNUALLY	June-03	JUNE 2004

The backflow prevention devices at Fort A. P. Hill require annual testing by a Certified Backflow Prevention Tester and the results are provided to the Virginia Department of Health. The following table details the backflow prevention devices located on Fort A. P. Hill:

TABLE 3.2.6.2.C
Backflow Prevention Devices

Bldg No	Status	Device Type	Device Size	Manufacturer	Model	Serial No	X-Con Location	Equip Served
107	ACTIVE	RPZ	2	WILKINS	975	667511	Mech Room	Car wash Main
138	ACTIVE	RPZ	1	WATTS	009	32019	Mechanical room	Cold water main
141	ACTIVE	DCV	1	WATTS	007	80833	Mechanical room	Cold water main
145	ACTIVE	DCV	1	WATTS	007	36366	Mechanical room	Cold water main
151	ACTIVE	DUCV	.5	WILKINS	700	5494	Mechanical room	Boiler
156	ACTIVE	DCV	1	WATTS	007	80425	Mechanical room	Cold water main
172	ACTIVE	RPZ	2	WILKINS	975	337523	Basement bar	Cold water main
179	ACTIVE	AVB	1.25	UNKNOWN	UNKNOWN	NONE	Supply room	Hot water heater
216	ACTIVE	RPZ	2	WILKINS	975	337524	Basement	Cold water main
242	ACTIVE	RPZ	4	WATTS	909	175825	Mechanical room	Cold water main
242	ACTIVE	RPZ	1.5	WATTS	909	26434	Mechanical room	Boiler
303	ACTIVE	RPZ	2.5	WILKINS	975	14151	Bldg exterior	Cold water main
306	ACTIVE	AVB	.75	UNKNOWN	UNKNOWN	NONE	Shower area	Laundry sink
419	ACTIVE	RPZ	4	WATTS	909	175790	Mechanical room	Cold water main
419	ACTIVE	RPZ	1.5	WATTS	009	26565	Mechanical room	Boiler
820	ACTIVE	RPZ	3	WILKINS	975	14116	Mechanical room	Cold water main

Bldg No	Status	Device Type	Device Size	Manufacturer	Model	Serial No	X-Con Location	Equip Served
820	ACTIVE	RPZ	2	WILKINS	975	UNKNOWN	Mechanical room	DCW Main
1246	ACTIVE	RPZ	1	WATTS	009	16430	Mechanical room	Cold water main
1247	ACTIVE	RPZ	2	WATTS	909	257354	Mechanical room	Cold water main
1247	ACTIVE	RPZ	.75	WATTS	909	122746	Mechanical room	Hot water system
1247	ACTIVE	RPZ	1.5	WATTS	909	237526	Chemical Mix room	DCW Supply
1247	ACTIVE	RPZ	.75	WATTS	909	122746	Entomology lab	Maintenance area
1253	ACTIVE	DUCV	.75	WATTS	7	8610A	Mechanical room	Hot water system
1253	ACTIVE	DUCV	.75	WATTS	7	8610A	Hot water heater room	DCW supply
1286	ACTIVE	DUCV	1	WATTS	007	30347	Mechanical room	Boiler
1287	ACTIVE	RPZ	1	WATTS	009	40297	Mechanical room	DCW Main
1290	ACTIVE	RPZ	3	AMES	4000SS	4810410	Maint. Garage	Cold water main
1329	ACTIVE	RPZ	4	WATTS	909	175780	Mechanical room	Cold water main
1329	ACTIVE	RPZ	1.5	WATTS	009	26448	Mechanical room	Boiler
1329	ACTIVE	HCVB	.75	WATTS	N8	NONE	Bldg exterior	Hose bib
1329	ACTIVE	HCVB	.75	WATTS	N8	NONE	Bldg exterior	Hose bib
1329	ACTIVE	HCVB	.75	WATTS	N8	NONE	Bldg exterior	Hose bib
1336	ACTIVE	RPZ	3	WILKINS	975	14119	Mechanical room	Cold water main
1336	ACTIVE	RPZ	.75	WATTS	909	143632	Mechanical room	Boiler
1433	ACTIVE	RPZ	1.5	WATTS	009	26564	Mechanical room	Boiler
1433	ACTIVE	HCVB	.75	WATTS	N8	NONE	Bldg exterior	Hose bib
1433	ACTIVE	HCVB	.75	WATTS	N8	NONE	Bldg exterior	Hose bib
1433	ACTIVE	HCVB	.75	WATTS	N8	NONE	Bldg exterior	Hose bib
1433	ACTIVE	RPZ	4	WATTS	909	175820	Mechanical room	Cold water main
1433	ACTIVE	RPZ	1.5	WATTS	909	26564		Cold water main
1525	ACTIVE	RPZ	3	WILKINS	975	14116	Mechanical room	Cold water main
1525	ACTIVE	RPZ	1	WATTS	909	354713	Mechanical room	Boiler
1531	ACTIVE	RPZ	.75	WATTS	909	425353	Mechanical room	Cold water main
1532	ACTIVE	AVB	.75	UNKNOWN	UNKNOWN	NONE	Latrine	Laundry mop sink
1547	ACTIVE	RPZ	4	WATTS	909	174520	Mechanical room	Cold water main
1547	ACTIVE	RPZ	1.5	WATTS	009	26939	Mechanical room	Boiler
1605	ACTIVE	RPZ	2	WATTS	909	297931	Mechanical room	Cold water main
1606	ACTIVE	RPZ	4	WATTS	909	17582	Mechanical room	Cold water main
1607	ACTIVE	RPZ	2	WATTS	009	27474	Mop sink closet	Cold water main
1611	ACTIVE	DCVA	1.5	FEBCEP	805Y	A135246	Chemical room	Non-potable water
1611	ACTIVE	DUCV	1	HERSEY	BSG	900019	Chemical room	DCW supply
1641	ACTIVE	AVB	.75	UNKNOWN	UNKNOWN	NONE	Dishwashing area	Mop sink
1641	ACTIVE	RPZ	.75	WATTS	909	503090	Mechanical room	Boiler
1650	ACTIVE	RPZ	2	WILKINS	975	337621	Mop closet	Cold water main
1659	ACTIVE	RPZ	2	AMES	UNKNOWN	UNKNOWN	Mechanical room	Boiler
1659	ACTIVE	RPZ	.75	WATTS	909	495628	Mechanical room	Boiler
1664	ACTIVE	RPZ	2.5	WILKINS	975	14152	Ext. rear of bldg.	Cold water main
1664	ACTIVE	RPZ	.75	WILKINS	975	UNKNOWN	Ext. rear of bldg.	Boiler
1675	ACTIVE	RPZ	2	WILKINS	975	337526	behind bldg 1641	Potable water fillin

Bldg No	Status	Device Type	Device Size	Manufacturer	Model	Serial No	X-Con Location	Equip Served
1690	ACTIVE	RPZ	.75	WATTS	909	503832	Feed water	Boiler
2100	ACTIVE	RPZ	1	WATTS	909	403175	Mechanical room	Boiler
2203	ACTIVE	DUCV	.5	WILKINS	UNKNOWN	UNKNOWN	Kitchen	Ice Maker
2203	ACTIVE	DUCV	.25	UNKNOWN	UNKNOWN	UNKNOWN	Kitchen	Coffee maker

J03.2.7 Water System Fixed Equipment Inventory

Table 3.2.7 provides a general listing of the major water system fixed assets for the Fort A.P. Hill water system included in the purchase. The system will be sold in a “as is, where is” condition without any warranty, representation, or obligation on the part of Government to make any alterations, repairs, or improvements. Ancillary equipment attached to, and necessary for, operating the system, though not specifically mentioned herein, is considered part of the purchased utility.

TABLE 3.2.7
Fixed Inventory

Description	Unit	Quantity	Avg. Age
Polyvinylchloride (PVC) Pipe	inch	LF	Years
	1	1,070	14
	2	13,910	13
	3	13,305	17
	4	29,330	15
	6	80,050	16
	8	68,075	12
	10	4,505	9
	12	24,000	18
	16	1,200	4
Cast Iron (CI) Pipe	inch	LF	Years
	3	1,440	24
	6	1,690	24
	8	370	24
	10	1,200	24
	12	6,360	20
Galvanized Steel (GS) Pipe	inch	LF	Years
	2	1,000	46
	4	3,400	46
	6	2,880	45
	18	360	45
Ductile Iron (DI) Pipe	inch	LF	Years
	24	2,020	18
Potable Water Line Subtotal		256,165	
Valves	inch	Each	Years
	2	25	12
	3	26	17
	4	72	19

Description	Unit	Quantity	Avg. Age
	6	134	17
	8	117	12
	10	9	11
	12	46	19
	16	1	14
Remote Telemetry Units	Each		Years
	27		2
Active Wells	Each		Years
	29		34
Well Casings	Each		Years
	3		15
Chlorination Systems	Each		Years
	30		34
Elevated Tanks	Capacity (gal.)	Each	Years
Anderson	60,000	1	38
Archer	125,000	1	12
Engineer Road	300,000	1	9
Cooke	100,000	1	35
Wilcox #1	25,000	1	40
EP-4 (new)	240,000	1	6
Longstreet	60,000	1	36
Headquarters #1	125,000	1	18
Arena #1	300,000	1	15
Jackson Tower	100,000	1	15
Standpipe Tanks	Capacity (gal.)	Each	Years
Pender	42,500	1	40
Rappahannock	42,500	1	40
EP-4	42,500	1	33
Davis	100,000	1	19
TISA Fire Storage	158,000	1	19
Seal Team Fire Storage	65,000	1	10
Wilcox #2	300,000	1	27
Jackson Camp	100,000	1	20
Headquarters	3,500	1	33
TISA Portable Hydromatic	3,000	1	19
Booster Pump Stations	Capacity (gpm)	# of Pumps	Years
Jackson	512	1	15
Wilcox	750	4	27
Davis	140	2	20
Rappahannock	75	2	40
Backflow Preventers	Capacity (gal.)	Quantity	Years
RPZ	0.75	8	34
RPZ	1	5	34

Description	Unit	Quantity	Avg. Age
RPZ	1.5	7	34
RPZ	2	10	34
RPZ	2.5	2	34
RPZ	3	4	34
RPZ	4	6	34
AVB	0.75	3	34
AVB	1.25	1	34
DCV	1	3	34
DUCV	0.25	1	34
DUCV	0.5	2	34
DUCV	0.75	2	34
DUCV	1	2	34
HCVB	0.75	6	34
DCVA	1.5	1	34
Meters		14	24

J03.3 Non-Fixed Equipment and Specialized Tools Inventory

Table 3.3.A lists other ancillary equipment (spare parts) and Table 3.3.B lists specialized vehicles and tools included in the purchase. Offerors shall field verify all equipment and tools prior to submitting a bid. Offerors shall make their own determination of the adequacy of all equipment and tools. The successful Contractor shall provide any and all equipment, vehicles, and tools, whether included in the purchase or not, to maintain a fully operating system under the terms of this contract.

TABLE 3.3.A
Spare Parts

Quantity	Item	Make/Model	Description	Remarks
No spare parts are available.				

TABLE 3.3.B
Specialized Equipment and Vehicles

Description	Quantity	Location	Maker
No specialized equipment or vehicles for maintenance of the Fort A.P. Hill water distribution system will be transferred to the new owner of the system.			

J03.4 Water System Manuals, Drawings, and Records Inventory

Table 3.4 lists the manuals, drawings, and records that will be transferred with the system.

TABLE 3.4
Manuals, Drawings, and Records

Quantity	Item	Description	Remarks
Fort A.P. Hill maintains a limited collection of technical manuals, drawings, and records on the installed components of the water distribution system. This information will be transferred to the new owner during the transition period. System maps will be available in the bidders' library. A preliminary Technical Library list is included in Section J14.			

J03.5 Current Service Arrangement

None.

J03.6 Secondary Metering

The Installation may require secondary meters for internal billings of their reimbursable customers, utility usage management, and energy conservation monitoring. The Contractor shall assume full ownership and responsibility for existing and future secondary meters IAW Clause C.3.

J03.6.1 Existing Secondary Meters

TABLE 3.6.1
Existing Secondary Meters

Meter	Location
Armory	Armory
Laser Range	Laser Range
Seal Team Compound #1	Seal Team Compound
Seal Team Compound #2	Seal Team Compound
Trailer Court Lot #1	Trailer Court
Trailer Court Lot #2	Trailer Court
Trailer Court Lot #3	Trailer Court
Trailer Court Lot #4	Trailer Court
Trailer Court Lot #5	Trailer Court
Trailer Court Lot #6	Trailer Court
Trailer Court Lot #7	Trailer Court
Trailer Court Lot #8	Trailer Court
Trailer Court Lot #9	Trailer Court
Trailer Court Lot #10	Trailer Court

J03.6.2 Required New Secondary Meters

The Contractor shall install and calibrate new secondary meters as listed in Table 3.6.2. New secondary meters shall be installed IAW Clause C.17, Transition Plan. After installation, the Contractor shall maintain and read these meters IAW Clauses C.3, H.5, and J03.8 below.

TABLE 3.6.2

New Secondary Meters

Meter Location	Meter Description
No new secondary meters are identified.	

J03.7 Monthly Submittals

In addition to the submittal requirements from Clause H.5, the Contractor shall provide the Government monthly submittals for:

1. Invoicing (IAW G.2) for the previous month's services. The Contractor's invoice shall be prepared in a format proposed by the Contractor and accepted by the Contracting Officer.
2. Monthly Service Interruption Report for the previous month.
3. Meter Reading Report in support of internal billings, water usage management, and monitoring.
4. System Efficiency Report. If required by Clause C.3, the Contractor shall submit a system efficiency report in a format proposed by the Contractor and accepted by the Contracting Officer.

J03.8 Energy Savings and Conservation Projects

IAW C.3, Utility Service Requirement, there have been no projects implemented by the Government for energy conservation purposes. Any renewals, replacements or upgrades shall utilize energy efficient equipment.

J03.9 Service Area

IAW Clause C.4, Service Area, the service area is defined as all areas within the Fort A.P. Hill boundaries.

J03.10 Off-Installation Sites

There are no off-Installation sites associated with this scope.

J03.11 Specific Transition Requirements

IAW Clause C.17, Transition Plan, Table 3.11.A lists service connections and disconnections required upon transfer, and Table 3.11.B lists the improvement projects required upon transfer of the Fort A.P. Hill water system.

TABLE 3.11.A

Service Connections and Disconnections

Location	Description
None identified	

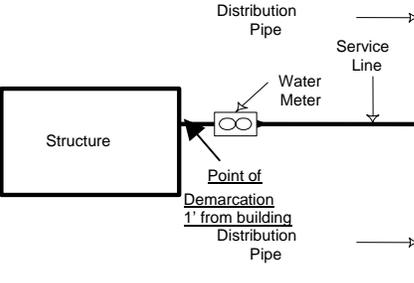
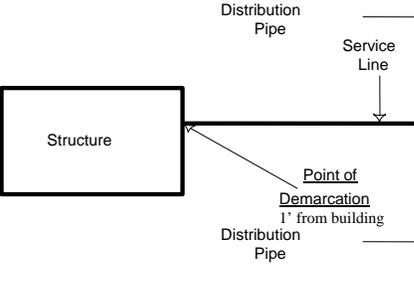
TABLE 3.11.B
System Improvement Projects

Project Location	Project Description
Post-wide	System improvements for the 2005 BSA Jamboree; new wells (3), replacement of some older water lines

J03.12 Potable Water System Points of Demarcation

The point of demarcation is defined as the point on the piping system where ownership changes from the Grantee to the building owner. The table below identifies the general locations of these points with respect to the building served. During the operation and maintenance transition period, concurrence on specific demarcation points will be documented during the joint inventory of facilities.

TABLE 3.12
Points of Demarcation

Point of Demarcation	Applicable Scenario	Sketch
Point of Demarcation is one foot from where the service line enters the structure.	Water meter, backflow device, or valve is located on the service line entering the structure within 25 feet of the exterior of the structure.	 <p>The diagram shows a rectangular box labeled 'Structure' on the left. A horizontal line representing the 'Service Line' enters the structure from the right. On this service line, there is a circular symbol representing a 'Water Meter'. To the right of the water meter, the line continues as a 'Distribution Pipe'. A vertical line with arrows at both ends represents the 'Distribution Pipe' running parallel to the service line. A label 'Point of Demarcation 1' from building' points to the junction where the service line enters the structure.</p>
Point of Demarcation is one foot from where the service line enters the structure.	No water meter, backflow device, or valve exists on the service line entering the structure. Service valve may be within 25 feet of the structure at any time.	 <p>The diagram shows a rectangular box labeled 'Structure' on the left. A horizontal line representing the 'Service Line' enters the structure from the right. To the right of the structure, the line continues as a 'Distribution Pipe'. A vertical line with arrows at both ends represents the 'Distribution Pipe' running parallel to the service line. A label 'Point of Demarcation 1' from building' points to the junction where the service line enters the structure.</p>
If the fire suppression system has a storage tank, then the point of demarcation (POD) is located on the outlet side of the isolation valve device closest to the storage tank. If no storage tank is present, the POD is located on the inlet side of the PIV or isolation valve closest to the fire suppression pumps.	Fire suppression system is provided flow and/or pressure by the potable water distribution system. These systems typically dedicated to serving one facility or a small cluster of facilities.	None

Point of Demarcation	Applicable Scenario	Sketch
<p>If the fire suppression system has a fire pump station, then the point of demarcation (POD) is located on the outlet side of the isolation valve device closest to the storage tank. If no isolation valve device is present, the POD is located on the first flange closest to the tank on the inlet pipe of the tank from the fire suppression pumps.</p>	<p>Fire suppression system is provided flow and/or pressure by the potable water distribution system. These systems typically dedicated to serving one facility or a small cluster of facilities.</p>	None
<p>The point of demarcation (POD) is located on the inlet side of the PIV, isolation valve, or backflow prevention device closest to the fire suppression system.</p>	<p>Fire suppression system is connected to the potable water distribution system.</p>	None
<p>The POD for irrigation systems is inlet side of the backflow prevention device or isolation valve closest to the irrigation system.</p>	<p>Irrigation system fed directly from potable water distribution system.</p>	None
<p>The POD will be the inlet side of the hose bib or water fountain assembly's connection to the service lateral.</p> <p>Note: Service valve may be installed within 25 feet of the hose bib or water fountain at any time. Inlet side of the service valve will become the new point of demarcation.</p>	<p>Drinking Fountains and Hose Bibs connected to the water distribution system (typically found at ball fields and outdoor recreation areas.) <u>No valve is located on the lateral</u> providing water service to the drinking fountain or hose bib within 25 feet of these connections.</p>	None
<p>The POD will be the inlet side of the service valve.</p>	<p>Drinking Fountains and Hose Bibs connected to the water distribution system (typically found at ball fields and outdoor recreation areas.) <u>Service valve is located on the lateral</u> providing water service to the drinking fountain or hose bib within 25 feet of these water use devices.</p>	None
<p>POD is at the overhead service line's connection to the service entrance mast.</p> <p>Note: If an electric meter is present, or is to be installed, the owner of the electric distribution system on the installation is the owner and maintainer of the electric meter and the can. The</p>	<p>Electric power is provided to a water facility via an overhead service drop. This configuration could be found at facilities dedicated to the water utility such as a water well, pump station, or water tower.</p>	None

Point of Demarcation	Applicable Scenario	Sketch
<p>POD for the electric meter is at the water utility owner’s conductors to the electric utility owner’s conductors. This meter POD applies regardless of the location of the electric utility owner’s meter. The water utility owner will own the service entrance mast.</p>		
<p>POD is at the transformer secondary terminal spade.</p> <p>Note: If an electric meter is present, or is to be installed, the owner of the electric distribution system on the installation is the owner and maintainer of the electric meter. The POD for the meter is at the water utility owner’s conductors to the electric utility owner’s conductors. This meter POD applies regardless of the location of the electric meters and transformers.</p>	<p>Electric power is provided to a water facility via an underground service connection. This configuration could be found at facilities dedicated to the water utility such as a water well, pump station, or water tower.</p>	<p>None</p>

J03.12.1 Unique Points of Demarcation

The following table lists anomalous points of demarcation that do not fit any of the above categories.

TABLE 3.12.1
Unique Points of Demarcation

Building No.	Point of Demarcation Description
<p>Various Security Buildings</p>	<p>A unique downstream point of demarcation will at those facilities. The downstream demarcation point will be 5-feet upstream of the outside security fence. Downstream of this point will remain the responsibility of the Owner.</p>

J03.13 Special APH Requirements

Excavation Permit: Because of the special subsurface conditions at APH, all excavations shall be performed in accordance with the unique APH specifications. See Section J12, APH Excavation Permit.

Grass Mowing: All grass mowing responsibilities must be realized and captured within services provided and cost associated. The perimeter fence, berms, and site area must be maintained per the permit. The cost of grass mowing needs to be captured. In addition to mowing and baling, any field improvements needed must be addressed. All distribution system right-of-ways need to be cleared and maintained. This cost needs to be captured in the proposal. The SOW for grass mowing is attached in Technical Library.

Technical Library: Important contract requirements, operational manuals and other important data will be contained within the Fort A.P. Hill PW and WW Utility Privatization Technical Library. The Technical Library will be made available for inspection during the Site Visit or other at times by agreement of Fort A.P. Hill. Section J14 lists the preliminary contents of the Technical Library.