

May 1993

WATER RESOURCES

Highfield Water Company Should Not Receive Compensation From the U.S. Army



Resources, Community, and
Economic Development Division

B-247037

May 10, 1993

The Honorable Max S. Baucus
Chairman
The Honorable John H. Chafee
Ranking Minority Member
Committee on Environment and
Public Works
United States Senate

The Honorable Norman Y. Mineta
Chairman
The Honorable Bud Shuster
Ranking Minority Member
Committee on Public Works
and Transportation
House of Representatives

This report responds to section 116(t) of the Water Resources Development Act of 1990 (P.L. 101-640), which requires us, for the purpose of making recommendations for an appropriate settlement, to study the facts and circumstances concerning the claims of the Highfield Water Company (Highfield) against the U.S. Army. Highfield has claimed that it should receive between \$17.7 million and \$52 million as compensation for lost property and damages. Highfield is appealing for legislative relief on the basis of its assertion that it has never received a fair hearing on the merits of its case since its court actions were dismissed on technical grounds.

Highfield and the Army, at Fort Ritchie, Maryland, shared groundwater from an aquifer from 1943 to 1978. Highfield claims that Fort Ritchie excessively pumped the aquifer during periods of drought between 1974 and 1978. According to Highfield, this deprived the company of water that it needed to meet its customers' requirements, causing the Maryland Public Service Commission (PSC) to revoke the right of the company to exercise its franchise to sell water to its customers. The company also claims that the Fort's use of groundwater was not authorized by the state of Maryland and that Highfield had superior rights to the water.

Results in Brief

Fort Ritchie did not pump groundwater excessively from the aquifer between 1975 and 1978 (water-use data were not available for 1974), and

Highfield's inability to meet customers' demands for water was not related to actions by Fort Ritchie. Instead, the company experienced problems primarily because it relied on a single well that did not have the capacity to meet customers' demands. The company's water distribution system also had serious structural and maintenance problems, which the company, in the opinion of the Maryland PSC, was not financially capable of resolving.

As a Maryland landowner, Fort Ritchie had a legal right to use the water that was located beneath its property. As a federal installation, the Fort did not have to obtain a state permit before pumping groundwater from its wells. Highfield's authority to sell water did not constitute ownership of, or grant the company superior rights to, the area's groundwater.

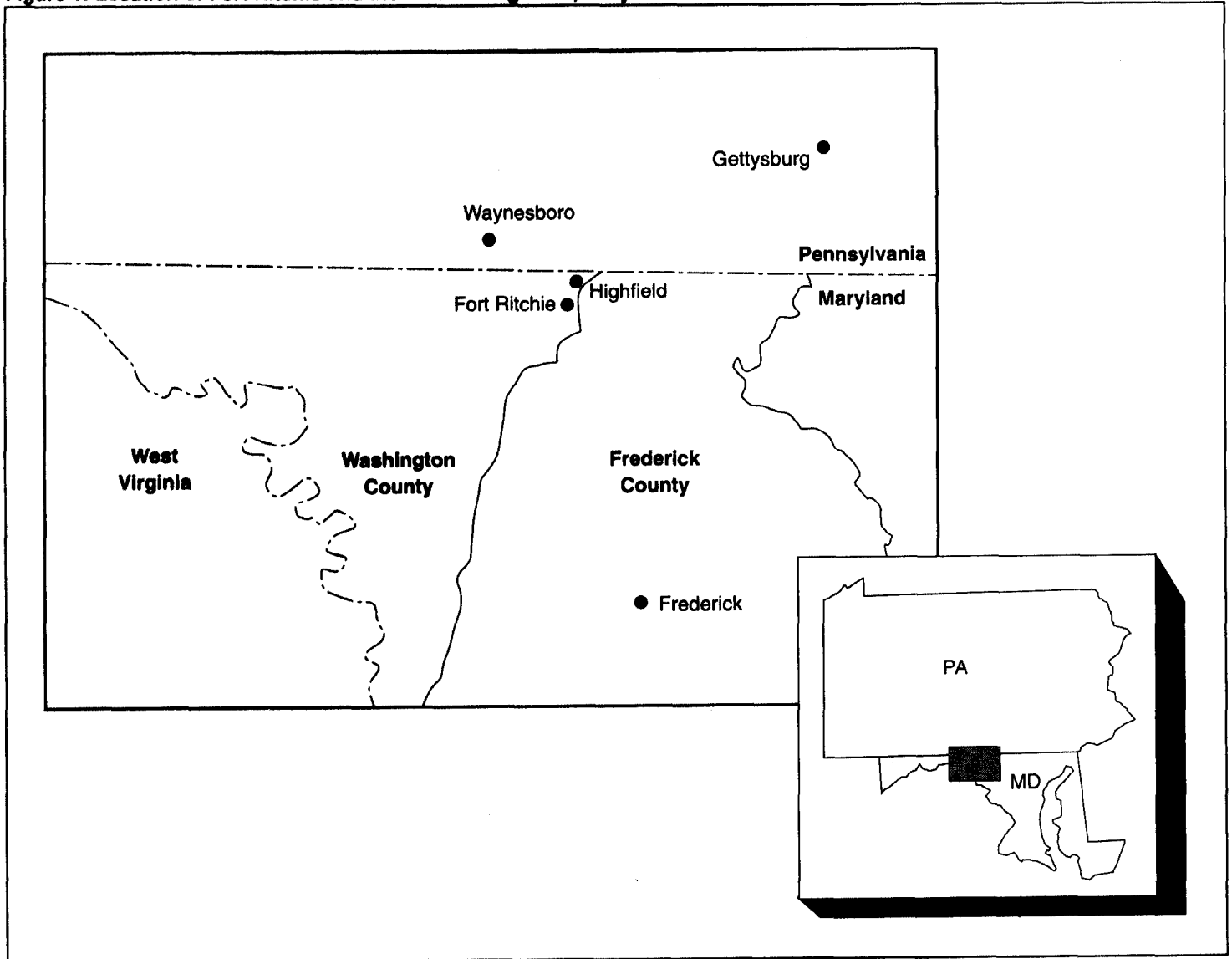
Since Highfield was not damaged by the Fort's reasonable use of the groundwater and Highfield neither owned nor had superior rights to the water, we believe that the facts and circumstances do not support Highfield's claim against Fort Ritchie and that Highfield is not entitled to any compensation.

Background

Fort Ritchie and the town of Highfield, Maryland, are located in a rural mountainous area along the border between Pennsylvania and Maryland, about 20 miles north of Frederick, Maryland. (See fig. 1.) The water supply for the Fort Ritchie/town of Highfield area's wells and springs depends upon precipitation that fills joints and fractures in a thick, dense layer of volcanic rock.

Two small water supply companies—the Blue Ridge Water Company (Maryland) and the Blue Ridge Water Supply Company (Pennsylvania)—were incorporated, in about 1905 and 1906, to supply water to customers in this area. The companies shared water from a common storage tank and, in effect, operated jointly as an interstate system. The Blue Ridge Water Company supplied water to customers in and around the towns of Highfield and Cascade, Maryland, while the Blue Ridge Water Supply Company supplied water to several small Pennsylvania communities. The companies drilled one well near the town of Highfield in 1935 and another well close by in 1940. In 1967, the Maryland company changed its name to the Highfield Water Company.

Figure 1: Location of Fort Ritchie and the Town of Highfield, Maryland



The two water companies were purchased by American Utilities, Inc., in 1967 and continued to share water from a common storage tank until 1974. At that time, American Utilities was forced—through condemnation proceedings—to sell the Pennsylvania company to the Washington Township (Pennsylvania) Municipal Authority. The sale included wells located in Pennsylvania that were an important source of water for the

towns of Highfield and Cascade. After the sale, the Highfield Water Company had to purchase the water that it obtained from the Pennsylvania wells. Highfield requested in 1975 that water from Fort Ritchie be made available to the company. In 1977, the company purchased water from the Fort, and in 1978, the company offered to purchase a well from the Fort. Fort Ritchie agreed to supply water during emergencies but declined to sell the well or enter into long-term contracts to supply water.

In the 1920s, the state of Maryland began to construct the Fort Ritchie facilities for use as a National Guard training site. During World War II, the U.S. Army leased the Fort from Maryland. Water was supplied by eight wells and two springs. Four of the wells and the two springs were located within the Fort's boundaries, and four wells were located outside the Fort's boundaries. While documentation is not complete, records that we reviewed from the U.S. Geological Survey and Fort Ritchie indicate that the wells were drilled before 1943. In September 1951, Maryland sold both the Fort and its water supply facilities to the U.S. government.

The Fort has two storage tanks to hold up to 1.3 million gallons of water—a 1-million-gallon tank stores springwater collected in the southwest area of the Fort's property and provides the Fort's primary means of fire protection; a 300,000-gallon tank provides additional storage and pressure for the system. The Fort also has two small lakes and a filtration plant that can be used as a backup water supply during summer months.

On September 8, 1978, the Maryland PSC revoked the right of Highfield to exercise its franchise to provide water after October 1, 1978. The PSC concluded in its revocation order that (1) Highfield's service was inadequate, (2) the company would be unable to provide adequate service within a reasonable period of time at an acceptable rate, and (3) public ownership of the water facilities was necessary to provide water service to the Highfield area. On September 15, 1978, the Maryland Department of Health and Mental Hygiene ordered the Washington County Sanitation District to operate the Highfield water system as of October 1, 1978. Highfield unsuccessfully appealed the revocation of its operating authority and, in 1979, filed a lawsuit against the state of Maryland, local state agencies, and certain individuals. In 1984, the company settled its claims for \$400,000 and transferred its property to the Washington County Sanitation District. The next year, it sued the U.S. government in U.S. Claims Court, charging that its water had been unlawfully taken by the

U.S. Army. This lawsuit was dismissed in 1987 because it was not filed in time to meet the statute of limitation's requirements. No court considered the merits of Highfield's claims. Appendix I details the Highfield Water Company's claims and litigation concerning the company's rights.

The following sections examine the issues surrounding the Highfield Water Company's claims and present our analysis.

Fort Ritchie's Pumping Did Not Exceed the Aquifer's Capacity or Deprive Highfield of the Supply It Needed

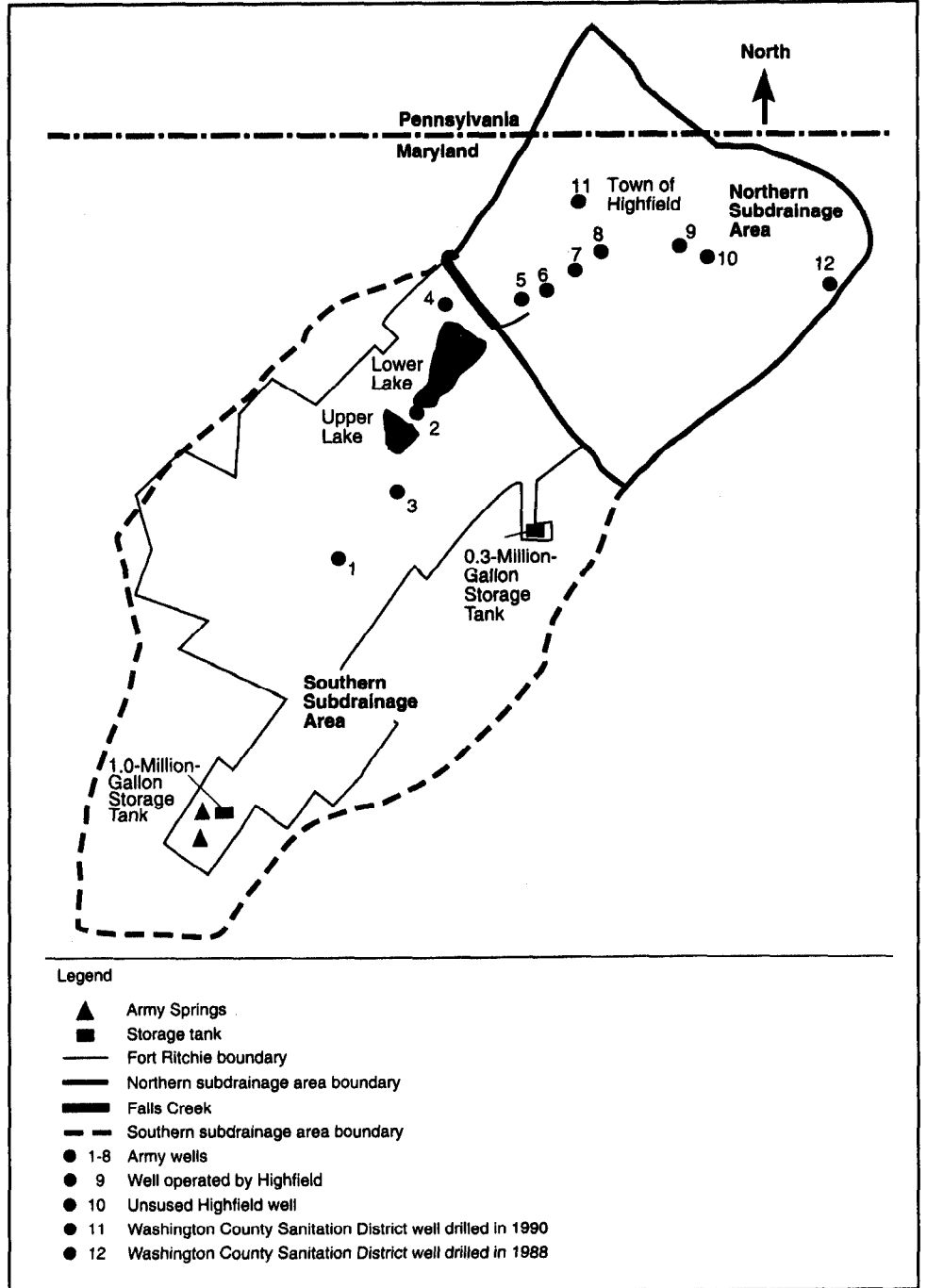
On the basis of our geohydrologic analysis of the Fort Ritchie/town of Highfield area, we concluded that groundwater supplies were sufficient to meet the needs of consumers at the Fort, Highfield, and other nearby areas during the period from 1975 to 1978. This analysis was reviewed by the hydrologist responsible for recent Maryland Geological Survey studies of Washington County, Maryland. Highfield's water supply problems were caused primarily by limits on the capacity of the company's single operating well and were not related to Fort Ritchie's use of groundwater. In addition, Highfield's distribution system, consisting largely of relatively old galvanized pipe, was corroding and leaking. According to the Maryland PSC and others, Highfield's assets and projected revenue were not sufficient to correct deficiencies in the company's storage and distribution systems.

Groundwater Capacity Exceeded Needs

A drainage basin is that portion of the earth's surface that gathers and channels precipitation to a common outlet. The drainage basin in the Fort Ritchie/Highfield valley is divided topographically into a northern and a southern subdrainage area, and the outlet for the basin is Falls Creek. Fort Ritchie withdrew water from four wells, and the Highfield Water Company withdrew water from one well, in the northern subdrainage area. Fort Ritchie also withdrew water from four wells and two springs in the southern subdrainage area.

Figure 2 shows the location of the two subdrainage areas, the Fort Ritchie and Highfield wells, and the Fort's storage tanks and lakes.

Figure 2: Location of Water Sources in the Fort Ritchie/Town of Highfield Area



Source: GAO presentation of data from the Maryland Department of Geology, Mines, and Water Resources, Bulletin 24 (1962); from the U.S. Army at Fort Ritchie, Maryland; and from the Washington County Sanitation District.

Although Highfield officials stated that a drought extended from 1974 to 1978, our review of meteorological data for this period did not show a sustained period of drought lasting that long. Precipitation in the Fort Ritchie/town of Highfield area was normal or above normal for calendar years 1975, 1976, and 1978; about 2 inches below normal in 1974; and about 3 inches below normal in 1977. Meteorological records from the two closest National Weather Service stations—Edgemont and Catoctin Mountain Park (about 4 miles from the Fort Ritchie/town of Highfield area)—showed that the driest period during the 5 years included parts of 2 calendar years—the 11 months from November 1976 through September 1977. Records from Edgemont, the closest station in this area from which National Weather Service annual data were gathered for the last 30 years, showed that precipitation was 10.35 inches (about 27 percent) below normal for this 11-month period.

A portion of the precipitation within each subdrainage area is captured in the volcanic rock joints and fractures and is available to replenish water that is pumped from wells. Water that is recycled from various sources, such as septic systems and garden watering, is also available. The rate at which the wells can be replenished is called the “recharge.” We estimated that the recharge for the northern subdrainage area from 1975 to 1978 ranged from about 342,000 gallons per day (gpd) to about 475,000 gpd; this estimate includes the groundwater recharge from both precipitation and recycled water. For the 11-month dry period in 1976 and 1977, we estimated that the recharge for the northern subdrainage area was about 282,000 gpd. During this period, Fort Ritchie pumped about 69,000 gpd, and Highfield and others pumped about 62,000 gpd from the northern subdrainage area. Thus, on average, daily groundwater recharge in the northern subdrainage area exceeded daily groundwater withdrawals by about 151,000 gallons during the 11-month dry period. See appendix II for the details of our analysis.

Highfield Needed More Wells

During the 1970s, Highfield recognized that its single operating well was inadequate to meet its customers' water requirements. After the company lost direct access to Pennsylvania wells in 1974, it began purchasing water from the Washington Township (Pennsylvania) Municipal Authority. In a December 1977 response to a Maryland PSC order, Highfield's owner said that the system's supply problem

was the direct result of a Pennsylvania Municipal Authority's condemnation of a large portion of the Company's [Highfield's] 'total water system,' including one large well.

Highfield Water Company immediately recognized the need to acquire a new water supply source and began negotiations with Fort Ritchie.

In 1991, during low rainfall conditions that, according to our analysis, were more severe than those that prevailed in 1977, Highfield's successor, the Washington County (Maryland) Sanitation District, used three wells and met the demands of more customers than Highfield served in 1977. The District had refurbished an unused Highfield well in 1987 and had drilled a third well in 1988. The District had drilled a fourth well in 1990 to meet future demand but did not need to use this well during the dry period in 1991.

Highfield's Consultant and Others Determined That the Company's Distribution System Was Inadequate

Highfield's consultant, John J. Mooney Associates, acknowledged in a June 1977 report that the company had serious distribution system problems. The report proposed a program that included two phases to improve the distribution system and a third phase to replace the entire system over 10 years.

According to the Maryland PSC, Highfield's inadequate distribution system worsened the company's water supply problem. In a 1986 U.S. Claims Court statement, Highfield asserted that its distribution system was not antiquated but was "in good to excellent condition, approximately 75% of which was installed in 1954 or later." An April 1978 Maryland PSC hearing concluded, however, that the system was inadequate and corroded. According to a Maryland PSC official, deterioration of Highfield's distribution system was the principal reason that the company lost its right to exercise its water utility franchise.

According to a 1981 study performed for the Washington County Sanitation District by engineering consultants, only about 13 percent of Highfield's system could be identified as having been installed after 1954, another 6 percent was installed during the 1950s, and the other 81 percent was installed between 1907 and 1953. The study also found that only about 16 percent of the system consisted of cast iron pipe, which does not corrode as readily as the galvanized pipe from which the rest of Highfield's system was made. (App. III presents more detailed information on the size, age, and composition of the pipes in Highfield's system.)

Cost to Repair/Replace the Distribution System Probably Exceeded Highfield's Economic Capability

According to the Highfield consultant's 1977 report, no major rebuilding was possible because Highfield's limited number of customers (320) could not generate the necessary revenue to provide the company with adequate borrowing power. A 1978 study for the Maryland Department of Health and Mental Hygiene estimated that improvements to Highfield's distribution system would cost over \$440,000. The study concluded that it was highly unlikely that these improvements could be carried out, since the company was not eligible for grants and claimed that it was unable to obtain loans. Additionally, since the company could not obtain grants, the customers would have had to bear the entire cost through significant increases in water rates.

The Maryland PSC's September 8, 1978, order, which revoked the right of Highfield to exercise its franchise, recognized the financial limitations of the company and the unacceptable rates that continued private ownership would impose on ratepayers. The PSC concluded that it would be impractical, if not impossible, to direct Highfield to make necessary improvements to the system and that even if Highfield could obtain financing, the annual cost to customers would be between 2-1/2 and 3-1/2 times greater than if the system were publicly owned.

Fort Ritchie Had a Legal Right to Use Aquifer Groundwater

Under Maryland law, each landowner has the right to use the water from beneath his or her property but must use it reasonably. The landowner may be held liable for a use of water that causes injury if it can be shown that the use is not a reasonable exercise of the property owner's right. Unreasonable use, under Maryland law, includes the unauthorized sale of water and use that is wasteful, negligent, or malicious.¹ Highfield did not present evidence or base its claims about the Fort's unreasonable use of water on these criteria.

Highfield's claim that Fort Ritchie's water use was unreasonable was based on assertions that the Fort did not (1) have authority to drill its eight wells, (2) have Highfield's permission to pump groundwater, (3) have a Maryland permit to pump groundwater, and (4) use surface water available from the Fort's two small lakes. However, these assertions do not affect the legal rights of Fort Ritchie to use the water that was located beneath its property. Additionally, on the basis of available data, we believe that the Fort's water use appears to have been reasonable.

¹In the leading Maryland case on groundwater, the State Court of Appeals held that a quarry operator had no liability for sink hole damage to adjoining property because draining the groundwater from the quarry was a legitimate activity and there was no proof of malice, waste, negligence, or sale of the groundwater (Finley v. Teeter Stone, Inc. 251 Md. 428, 248 A. 2d 106 (1968)).

Records Indicate That the Wells Were Drilled When the State of Maryland Owned Fort Ritchie

We found no evidence to support Highfield's claim that Fort Ritchie drilled the eight wells. Records that we reviewed from the U.S. Geological Survey and Fort Ritchie indicate that the eight wells were drilled before 1943 (8 years before the state of Maryland sold the property to the U.S. government in 1951). The U.S. government was leasing the Fort when the four off-post wells were drilled, but the records did not indicate that the U.S. government, rather than the state of Maryland, had authorized and/or paid for drilling the wells.

Fort Ritchie Did Not Need Highfield's Permission to Pump Groundwater

Under Maryland law, Fort Ritchie, as a Maryland landowner, has a legal right to use the water that is located beneath its property. Even though the Fort's off-post wells were located on small parcels of federal land surrounded by the Highfield service area, the Fort owned the land and was entitled to reasonable use of the water beneath its land. Highfield's authority to sell water did not grant the company ownership of, or superior rights to, the groundwater in the aquifer that it shared with Fort Ritchie.

In Maryland, a state water appropriation permit grants a water user the authority to pump groundwater. However, neither a permit nor any other provision of state law granted Highfield ownership of, or superior rights to, the aquifer's water. Maryland law gives each landowner the right to reasonable use of the water beneath his or her property.

Federal Installations Are Not Required to Obtain State Water Appropriation Permits

Highfield asserts that the Fort illegally pumped aquifer water, since it did not have an authorizing permit from the state or permission from Highfield.

Fort Ritchie did not obtain a Maryland water appropriation permit even though Maryland law expressly includes federal facilities among the entities that are subject to permit requirements. However, federal agencies are not subject to state regulatory requirements unless federal sovereign immunity is specifically waived, and the United States has not waived immunity in this case. Additionally, federal case law has not established that state water appropriation permits can be required for U.S. military installations.²

²See *Nevada ex rel. Shamberger v. United States*, 165 F. Supp. 600 (D. Nev. 1958), affirmed, 279 F.2d 699 (9th Cir. 1960), which makes clear that the United States cannot be compelled without its consent to obtain a state permit to use groundwater at a naval installation.

Maryland took no actions to require the Fort to obtain groundwater appropriation permits, and the state did not seek to prevent or limit the Fort's use of the wells pending permit approval. Maryland did request that the Fort apply for a surface water appropriation permit, but, in a letter dated September 22, 1969, Fort Ritchie officials declined the state's request on the grounds that "[t]he 'Federal immunity' doctrine protects Federal activities from burdensome State regulations. . . ." The state did not pursue its request for Fort Ritchie to apply for a surface water appropriation permit.

Finally, even if Fort Ritchie had been subject to the state's water appropriation permit requirements, the lack of a permit would not have altered the Fort's basic water-use rights as a property owner—the Fort would still have been authorized reasonable use of the groundwater. Since we have found that the Fort's use of groundwater was reasonable and did not cause any harm to Highfield, the lack of a state water appropriation permit is not relevant.³ The Fort did not need permission from Highfield to use the aquifer, since Highfield neither owned the water nor had superior rights to it.

Fort Ritchie Was Not Required to Use Surface Water Before Pumping Groundwater

The Fort obtained a relatively insignificant portion of its total water usage between 1975 and 1978 from lake water that was processed by the Fort's filtration plant. During this time, the plant was operated for only 8 days and provided a total of 468,700 gallons.⁴ However, according to the Deputy Director for the Maryland Department of Natural Resources, Water Resources Administration, there is no state law or regulation to require the Fort to use surface water in lieu of groundwater.

Conclusions

We believe that the facts and circumstances concerning the aquifer's capacity and Fort Ritchie's use of groundwater do not support Highfield's claim against Fort Ritchie for four reasons: (1) During the driest 11-month period between 1975 and 1978, average groundwater recharge for the northern subdrainage area that served the Fort Ritchie and Highfield wells exceeded average daily withdrawals by about 151,000 gpd; (2) Highfield was unable to meet its water utility service obligations because its well capacity and water distribution systems were inadequate; (3) the authority under its franchise to sell water to its customers did not constitute ownership of, or grant Highfield superior rights to, the groundwater that it

³Md. Natural Resources Code Ann. §§ 8-101, 8-801, 8-802, 8-812, 8-813, and 8-814 (1991).

⁴Data for 1975 are based on records for 11 months; no record was available for January 1975.

shared with Fort Ritchie; and (4) Fort Ritchie did not need to obtain a state water appropriation permit before pumping groundwater from its wells. Accordingly, since Highfield's water supply problems were not caused by Fort Ritchie and Highfield did not own the groundwater, we believe that there is no appropriate basis for Highfield to be awarded compensation from the U.S. Army.

Agency Comments

The Department of Defense concurred with the report and offered no further comments. (See app. IV.)

On February 6, 1993, Highfield provided us with extensive comments on the facts presented in a draft of this report. Highfield characterized the draft report as "a non-objective rationalization and defense of the Army's action in this dispute rather than an impartial report on the merits." The water company disputed our presentation of the facts in three principal areas: (1) the volume of water available and used, (2) legal issues pertaining to water ownership and regulatory requirements, and (3) the age and condition of the company's distribution pipe. We found nothing in Highfield's comments to cause us to revise our understanding of the facts presented in this report or to change the report's conclusions. Appendix V contains the full text of Highfield's comments and our response to these comments.

Scope and Methodology

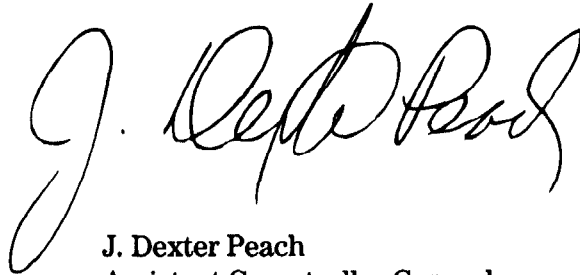
We interviewed officials and examined records at Fort Ritchie, Maryland, and at the Maryland and Pennsylvania Departments of Natural Resources. We interviewed officials and reviewed documents from the Highfield Water Company and the Washington County Sanitation District. We also examined engineering studies of the aquifer underlying the Fort Ritchie/town of Highfield area and of the condition of Highfield's water supply and distribution systems. We reviewed documents provided by Highfield; the Maryland psc; the U.S., Maryland, and Pennsylvania Geological Survey offices; and the National Weather Service.

To evaluate the availability of groundwater and determine whether water withdrawals by Fort Ritchie had exceeded the local supply in the Fort Ritchie/town of Highfield area, our senior geologist visited the site and analyzed geologic, hydrologic, and meteorologic data in detail. The geologist constructed computerized topographic maps and planimetered (i.e., measured the acreage of) the two subdrainage areas, calculated the potential recharge and availability of groundwater using water well and

meteorologic information, and compared this information with estimates of groundwater withdrawals for the period from 1975 to 1978. As previously noted, the hydrologist responsible for recent Maryland Geological Survey studies of Washington County independently reviewed this analysis. He offered some technical suggestions, which we considered and incorporated in the report where appropriate.

To evaluate the legal issues, we reviewed pertinent laws and regulations, administrative proceedings, and court decisions, as well as the litigation concerning the revocation of the right of Highfield to exercise its franchise to sell water. We performed our review between November 1991 and February 1993 in accordance with generally accepted government auditing standards.

This work was performed under the direction of James Duffus III, Director, Natural Resources Management Issues, who can be reached on (202) 512-7756 if you or your staff have any questions. Other major contributors to this report are listed in appendix VI.



J. Dexter Peach
Assistant Comptroller General

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Abbreviations

DOD	Department of Defense
GAO	General Accounting Office
gpd	gallons per day
PSC	Public Service Commission

Prior Claims and Litigation by the Highfield Water Company Concerning Revocation of Its Franchise Authority

The Highfield Water Company (Highfield) challenged the authority of the Maryland Public Service Commission (PSC) to revoke the exercise of the company's franchise. The Court of Special Appeals of Maryland in Highfield Water Co. v. P.S.C. of Maryland, Md. App., 416 A.2d 1357 (1980), affirmed the judgment of a lower court that had upheld the PSC's action. In doing so, the appellate court indicated that since a franchise is a legislative grant, the PSC could not revoke it; however, according to the court, the PSC had properly revoked Highfield's right to exercise the franchise. The court noted that the company's franchise remained a valuable asset that might, under certain conditions, be sold and might, in other hands, again be exercisable. Finally, the court concluded that the PSC had not "taken" Highfield's property and therefore owed the company no compensation. If the water company's operation were to be acquired, fair market value would have to be paid for it.

Highfield also filed suit in 1979 against the state of Maryland, six Maryland state and local agencies, and 24 persons, charging antitrust and civil rights violations as well as an unconstitutional taking without compensation in connection with the state's takeover of its water system on October 1, 1978. In Highfield Water Company, et al., v. Public Service Commission, et al., 488 F. Supp. 1176 (D. Md. 1980), the U.S. District Court for the District of Maryland dismissed the suit against the state, its agencies, and individuals in their official capacities on the basis of the Eleventh Amendment, which provides immunity to states and their agencies but not to local governmental bodies.

In 1984, this lawsuit, as well as condemnation actions pending in the Circuit Court for Washington County, was settled by the payment of \$400,000 to Highfield by the Washington County Sanitation District. This settlement transferred Highfield's assets to the District and released from liability all state and local agencies and individuals that had been named as defendants. The District agreed to assign to Highfield any rights to claims that the District might have against the U.S. Army because of the Army's use of groundwater.

By letter dated April 24, 1984, Highfield filed a claim with the Army. In a subsequent letter dated June 18, 1984, the company made claim for more than \$22 million—a figure that, according to the company, included (1) over \$21 million for the value of water taken by Fort Ritchie for over 34 years plus simple interest of 10 percent and (2) \$1,395,246 for the value of the company.

**Appendix I
Prior Claims and Litigation by the Highfield
Water Company Concerning Revocation of
Its Franchise Authority**

By letter of July 16, 1984, the U.S. Army Claims Service denied the claim as barred under the statute of limitations. The Claims Service pointed out that although Highfield first had knowledge as early as 1947 of the wells drilled at Fort Ritchie and the franchise was terminated in 1978, a claim was not filed until 1984. The claim was treated as having been made under the Federal Tort Claims Act, which allowed 2 years for filing.

On April 4, 1985, Highfield filed suit against the United States in the U.S. Claims Court, No. 192-85L, seeking just compensation under the Fifth Amendment for a taking by the U.S. Army for Fort Ritchie of the value of water used, which the company claimed was its property.

On December 17, 1987, the Claims Court dismissed the complaint because the lawsuit had not been initiated within 6 years of the franchise's termination on October 1, 1978, and consideration of the claim was therefore barred by the statute of limitations applicable to such claims. The court pointed out that "to assert a valid claim under the 'taking' clause of the Fifth Amendment, a plaintiff must be the owner of the property in question at the time of any taking." According to the court, whatever right Highfield had to the water in question was terminated by the state proceedings as of October 1, 1978, when the company lost its right to exercise its franchise, but Highfield's suit was begun in the Claims Court in 1985, more than 6 years later.

Additionally, the court held that the assignment of any claim the Washington County Sanitary District had against the United States was not valid with respect to the United States, since "only the owner of the property at the time of any taking may assert a valid claim against the United States," citing 31 U.S.C. §3727, and *Farrell v. United States*, 9 Cl. Ct. 757, 759 (1986). On September 23, 1988, the U.S. Court of Appeals for the Federal Circuit, No. 88-1252, affirmed the dismissal.

Analyses of Geohydrologic Conditions, Meteorologic Data, Water Availability, and Water Use

We reviewed the data on geohydrologic and meteorologic conditions and on the availability of water in the Fort Ritchie/town of Highfield area for the years 1974 to 1978 to determine whether enough water was available during this period to meet the needs of the Fort, the town of Highfield, and other water users in the area. Because water-use data were not available for 1974, our analysis was limited to the period from 1975 to 1978. Our analysis showed that the groundwater supply between 1975 and 1978 exceeded the combined needs of the Fort, the Highfield Water Company, and other valley water users. While it cannot be precisely determined how much of the remaining groundwater could have been pumped from wells, it is clear that the ability of Highfield to serve its customers was limited primarily by the capacity of its one operating well, not by the quantity of groundwater in the area. Highfield needed additional wells to provide enough water to meet its customers' demand.

Local Geology and Hydrology

Fort Ritchie and the town of Highfield are located in a valley of a mountainous area south of the Maryland/Pennsylvania border near Frederick, Maryland. The valley is situated nearly 1,400 feet above sea level and is surrounded on three sides by mountains that rise about 200 feet to 700 feet above the site. On the fourth side, the valley floor continues north into Pennsylvania.

The area lies within the Blue Ridge geographic province, which is primarily underlain by metamorphic rocks that are erosional remnants of a rock fold belt trending northeast/southwest. The town of Highfield is underlain by the Catoclin Formation, a metamorphosed volcanic basalt (metabasalt) of Precambrian age that is the principal water-bearing rock in the area. The western part of Fort Ritchie and the area west of the town of Highfield are underlain by the stratigraphically younger Precambrian or Cambrian-age Weverton Formation. This formation is a sandstone that transmits most of the water that it derives from precipitation into the underlying Catoclin Formation.

The water supply for wells and springs within the area depends upon precipitation that falls within a drainage area formed by the valley and adjacent mountain slopes. Some of the precipitation within the drainage area enters joints and fractures in the thick, dense layer of volcanic rock and becomes available for well use.

According to our analysis, the Fort Ritchie/town of Highfield drainage area is divided into southern and northern subdrainage areas that are defined

**Appendix II
Analyses of Geohydrologic Conditions,
Meteorologic Data, Water Availability, and
Water Use**

essentially by local topography. Groundwater within each subdrainage area, if not used or stored within the valley, exits the valley to the west through Falls Creek. We calculated that the southern subdrainage area comprises about 1,243 acres and the northern subdrainage area about 461 acres.

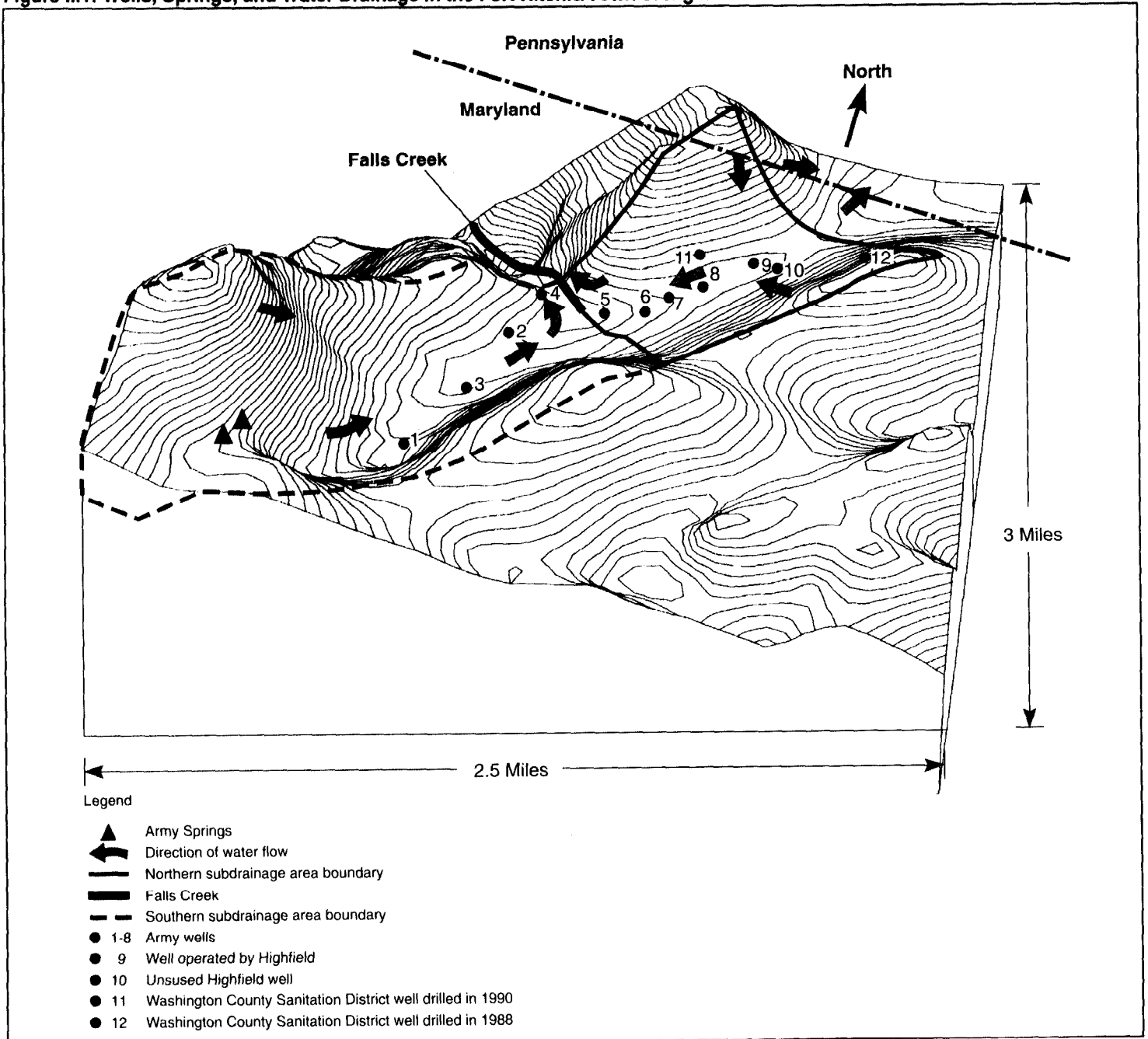
**Fort Ritchie/Town of
Highfield Water Sources**

During the period from 1975 to 1978, Fort Ritchie used water from eight wells, two springs, and two small lakes (well #4 was not in service for most of this period). The wells are strategically located along low points of the valley floor. Wells #1 through #4 are within the Fort's boundaries, and wells #5 through #8 are outside the Fort's boundaries. The two springs are in the southwestern region of the Fort. The lakes are within the Fort's boundaries and can be used during dry summer months to supplement well and spring water.

As figure II.1 shows, the southern subdrainage area provides the water for wells #1 through #4 and the two springs; the northern subdrainage area provides water for wells #5 through #8 and the well that the Highfield Water Company used (#9). The company also owned a second well (#10), which was close to its operating well, but Highfield officials told us that the second well could not be used because its operation reduced the capability of the first well. The figure also shows the location of two wells drilled by the Washington County Sanitation District in 1988 and 1990 (#11 and #12, respectively). Wells across the Pennsylvania state line from Highfield withdraw water from a different drainage area.

**Appendix II
 Analyses of Geohydrologic Conditions,
 Meteorologic Data, Water Availability, and
 Water Use**

Figure II.1: Wells, Springs, and Water Drainage in the Fort Ritchie/Town of Highfield Area



Source: Locations of wells and springs provided by the Maryland Department of Geology, Mines, and Water Resources, Bulletin 24 (1962), and by the Washington County Sanitation District.

Annual Precipitation Levels Between 1974 and 1978

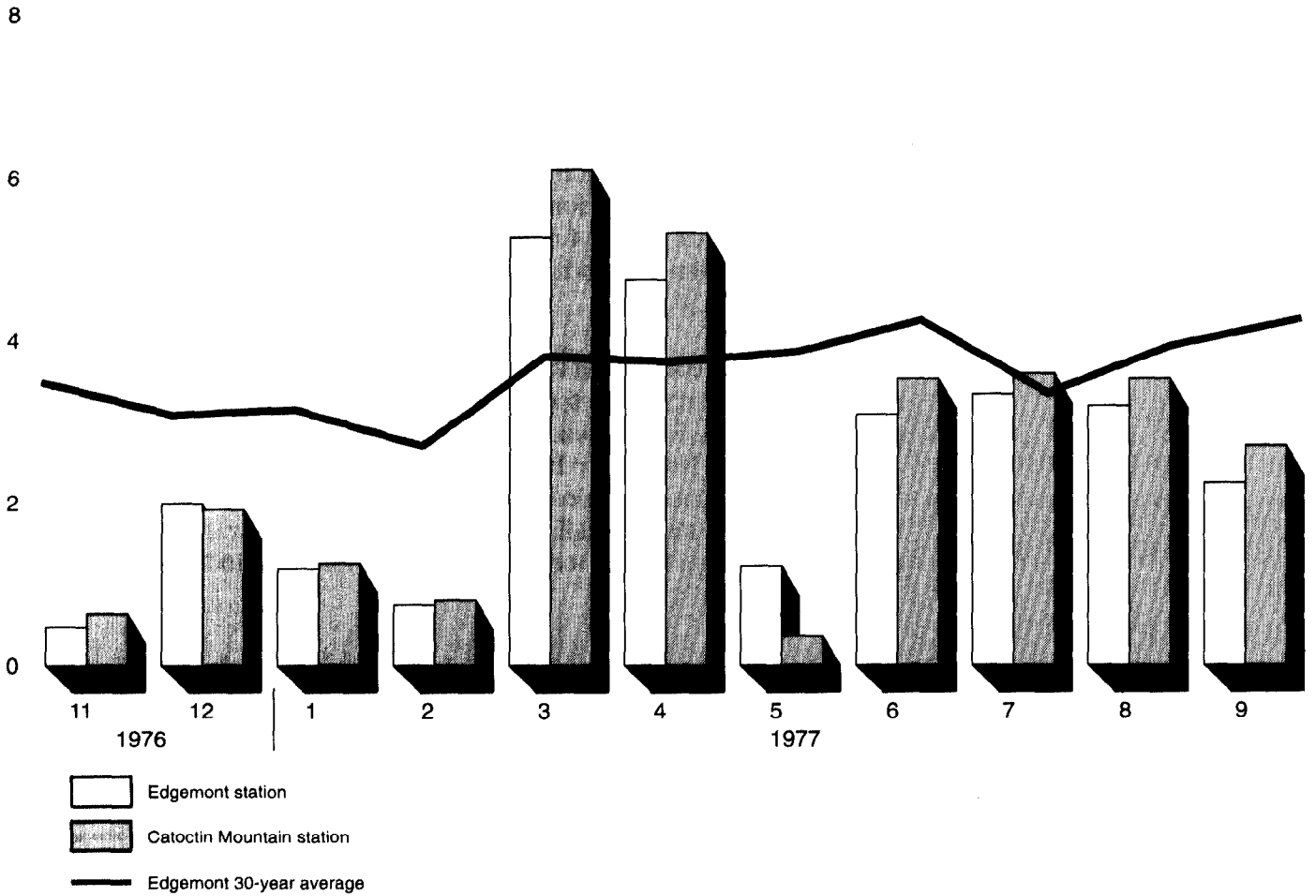
Although Highfield officials stated that a drought extended from 1974 to 1978, our review of meteorological data for the period did not show a sustained period of drought lasting that long. Precipitation in the Fort Ritchie/town of Highfield area was normal or above normal for calendar years 1975, 1976, and 1978. Precipitation was about 2 inches below normal in 1974 and about 3 inches below normal in 1977.¹

No National Weather Service station is located at Fort Ritchie or the town of Highfield, but basin conditions for the study period can be measured with data from nearby stations. Two stations, at Edgemont and Catoctin Mountain Park, are within 4 miles of the Fort and the town, and two other stations, at Ennitsburg and Hagerstown, are about 10 miles and 15 miles away, respectively.

Meteorological records from the two closest National Weather Service stations, Edgemont and Catoctin Mountain Park, showed that the driest period during the 5 years was an 11-month period that covered parts of 2 calendar years—November 1976 through September 1977. Precipitation at Edgemont, the closest station in this area for which National Weather Service annual data are available for the last 30 years, was 10.35 inches (about 27 percent) below normal for this 11-month period. (See fig. II.2.)

¹U.S. Geological Survey precipitation data are recorded on a "water year" basis, from October 1 through September 30. Water year precipitation measurements, from October 1, 1973, through September 30, 1978, for the Fort Ritchie/town of Highfield area appear comparable to the calendar year measurements—at or above normal for all years except 1974 and 1977.

Figure II.2: Precipitation Measurements at Two National Weather Service Stations, November 1976 Through September 1977



Source: GAO presentation of data furnished by the National Climactic Data Center, U.S. Department of Commerce.

Availability of Groundwater

The rate of groundwater recharge, or replenishment, depends on several factors, such as the acreage within the drainage area, the amount of precipitation, the type and density of vegetative cover, and the amount of water lost to evaporation and runoff. Precipitation can evaporate, flow over the land surface into streams, or infiltrate the ground. Plants can take

up some of the water that infiltrates the ground and return it to the air (transpiration). The remaining groundwater can emerge as springs, be available for pumping from wells, or eventually be discharged into streams and lakes.

Critical to determining the availability of groundwater is an estimate of the percentage of precipitation that ultimately becomes groundwater. We identified three hydrologic analyses that estimated the groundwater recharge in the Highfield valley area.

A 1962 Maryland study calculated that the effective groundwater recharge for the Catoclin Formation metabasalt, at a location 5 miles southwest of Highfield, was 300,000 gallons per day (gpd) per square mile.² The study estimated that 17 percent of the annual precipitation became groundwater at that location.

On the basis of data collected during 1978, two hydrologists, Meiser and Earl, published a hydrologic analysis for Washington County in 1979. This analysis estimated the available water supply for the northern subdrainage area at approximately 307,000 gpd, assuming a groundwater recharge area of 464 acres.³ (The analysis did not include an estimate of the available water supply for the southern subdrainage area.) The analysis assumed that a conservative annual groundwater recharge for that part of the Highfield valley was equal to 9 inches of precipitation, or 21 percent of the annual average precipitation recorded at the Edgemont, Maryland, weather station.

We considered the 1979 study to be more relevant than the 1962 study to determining the recharge rate for our analysis because the 1979 study was designed specifically to study the Fort Ritchie/town of Highfield area, whereas the 1962 study focused on an area 5 miles to the southwest. We discussed this rationale with a hydrologist who co-authored a 1991 study on the water resources of Washington County for the Maryland Geological Survey, and he agreed that the 21-percent recharge rate was more reasonable than the lower estimate developed in 1962.⁴

²The Water Resources of Allegheny and Washington Counties, Maryland Department of Geology, Mines, and Water Resources, Bulletin 24 (Baltimore: 1962).

³Meiser and Earl, Feasibility of Ground Water Supply Development for Highfield, Maryland (State College, Penn.: Pennsylvania State University, 1979).

⁴Mark Duigon and James Dine, Water Resources of Washington County, Maryland, Maryland Geological Survey (1991).

A more recent analysis for this area lends support to the higher recharge rate. The Maryland Department of Natural Resources concluded, on the basis of 1991 well-test data, that the recharge for a 461-acre area including Highfield was equal to 322,700 gpd—a recharge rate of about 22 percent, according to our estimate.⁵ This study covered essentially the same area as the 1979 study; however, the number of acres measured differs slightly.

No Evidence to Support Highfield Water Company's Assertion That the Supply of Groundwater Was Insufficient

Because we identified an 11-month period in 1976 and 1977 when precipitation levels were lower than at any other time between 1974 and 1978, we focused our analysis of groundwater usage and supply during this period. Our analysis, which was based on a hydrologic method for computing groundwater volume, showed that significant amounts of water remained in the ground (see table II.1). While it cannot be determined precisely how much of the remaining groundwater could have been pumped from wells, our examination of pumping data from Highfield's successor—the Washington County Sanitation District—during a recent dry period provides additional support for our conclusion that there was enough groundwater in 1976 and 1977 to meet Highfield's needs.

Groundwater Supply in Excess of Demand From 1975 to 1978

For calendar years 1975 to 1978 and for the 11-month dry period, we calculated how much groundwater was available and how much groundwater was used in order to estimate the amount of remaining groundwater. In our calculation for each year, we estimated that a significant amount of groundwater remained after all users' needs had been met—from about 208,000 gpd in 1977 to about 367,000 gpd in 1975. For the 11-month dry period, we estimated that about 151,000 gpd remained. (See table II.1.)

We derived our calculations as follows. To determine the potential groundwater recharge (in gpd), we multiplied annual precipitation data (obtained from the Edgemont National Weather Service station) by the 21-percent recharge rate derived by Meiser and Earl and confirmed by the Maryland hydrologist for the northern subdrainage area. To estimate the volume of water returned to the ground from private residences' septic systems and from garden watering (recycled water), we multiplied Meiser and Earl's estimate of the volume of water used for these purposes in 1978 by a 77-percent rate of return developed by the U.S. Geological Survey. We added the results of these two calculations to estimate how much

⁵Amendment to Water Appropriation and Use Permit, #WA88GO32/3, Maryland Department of Natural Resources, Annapolis (1991).

**Appendix II
Analyses of Geohydrologic Conditions,
Meteorologic Data, Water Availability, and
Water Use**

groundwater was available for use. To determine Fort Ritchie's water use, we used the Fort's pumping records for the four wells in the northern subdrainage area. To determine Highfield's water use and the use of water from private wells, we used Meiser and Earl's estimates—based on 1978 data—of Highfield's pumpage and of pumpage from private wells. We subtracted these calculations of water used from our estimate of how much groundwater was available for use to arrive at our estimate of how much groundwater remained after all users' needs had been met. Table II.1 displays these calculations for calendar years 1975 to 1978 and for the 11-month dry period.

Table II.1: Groundwater Availability and Use in the Fort Ritchie/Town of Highfield Northern Subdrainage Area, 1975-78

	Water in thousands of gallons per day (approximate)				
	Calendar years and period of low precipitation				
	1975	1976	November 1976 through September 1977	1977	1978
Annual precipitation at Edgemont (inches)	57.75	50.39	28.35	39.29	44.00
Potential groundwater recharge	416	363	223	283	317
Plus estimated recycled water ^a	59	59	59	59	59
Minus Fort Ritchie use	45	56	69	72	63
Minus estimated Highfield use	50	50	50	50	50
Minus estimated private use	12	12	12	12	12
Remaining groundwater ^b	367	303	151	208	251

^aRepresents 77 percent of the water used (76,000 gpd) in the Highfield area in 1978, according to Meiser and Earl's estimates: 50,000 gpd from the Highfield well, 14,000 gpd imported from Pennsylvania, and 12,000 gpd from private wells in the Highfield area.

^bMay not add because of rounding.

We recognize that because some groundwater flowed out of the drainage basin through Falls Creek and some water probably collected in rock formations where wells were not located between 1975 and 1978, not all of the 151,000 gpd was accessible during the dry period for extraction and use. Determining the precise amount of groundwater available was not possible because detailed hydrologic studies of the area have not been made. However, we are convinced that additional water was available to meet the water company's needs. Since 1978, Highfield's successor, the Washington County Sanitary District, has drilled two additional wells and was permitted by the state of Maryland to increase its annual average water pumpage to 100,000 gpd. In 1991, the District pumped more water

for its customers than Highfield did in 1977 even though, according to Fort Ritchie and District officials and National Weather Service records, a much drier period occurred in 1991 than in 1977.⁶ The District's pumpage from three of four wells averaged about 70,000 gpd during the summer of 1991—about 20,000 gpd more than Highfield could pump from its single well. District officials told us that a fourth well was available to meet anticipated future demand but was not needed in 1991.

Because the District was able to pump more water from its wells in the northern subdrainage area during a later period that was drier than the 1977 dry period, we believe that groundwater supplies were adequate during the earlier dry period. The Highfield Water Company simply was unable to pump enough water from its single well to meet its customers' needs. If the company had drilled additional wells at the proper places, it could have pumped enough water to supply its customers adequately.

Effect of Cold Temperatures on Availability of Groundwater

During our review, a Highfield Water Company official asserted that sustained low temperatures during the winter months had frozen the ground to greater depths than usual for 3 years in a row—a condition that, according to this official, would have altered underground recharge patterns. In general, the longer and the more the air temperature is below freezing, the greater the depth to which the ground becomes frozen. Our review of National Weather Service data showed that for each of three winters—1975 to 1976, 1976 to 1977 and 1977 to 1978—average monthly air temperatures were below freezing for 2 to 3 months at the Catoctin Mountain Park station (Edgemont had no temperature readings for these periods). However, hydrologists and engineers at the U.S. Geological Survey and the U.S. Army Corps of Engineers Cold Regions Research and Engineering Laboratory told us that at these temperatures, in general, the ground would have frozen to a depth of only a few feet at most and would have thawed quickly in the spring after the first rain or in the first days when air temperatures rose above freezing. They said that the coldness of the ground would not have affected the recharge of rock fractures during the spring months.

⁶Data for the Edgemont weather station are incomplete for 1991. However, data from three other nearby weather stations show that a much drier period occurred in 1991 than in 1977. From February through August 1991, precipitation was down by 19 percent at Catoctin Mountain, by 28 percent at Hagerstown, and by 34 percent at Emmitsburg.

Size, Age, and Composition of Pipe in Highfield's Distribution System

Year(s) Installed	Age in years	Size in inches ^a	Length in feet	Percent of system	Cumulative percentage
1907-08	74	3.00	1,770		
1907-08	74	4.00	2,860		
			4,630	10.7	10.7
1907-50	53 ^b	0.75	1,020		
1907-50	53 ^b	1.00	2,880		
1907-50	53 ^b	1.50	490		
1907-50	53 ^b	2.00	4,480		
			8,870	20.4	31.1
1930s	46 ^b	1.00	620		
1930s	46 ^b	2.00	4,450		
1935	46	3.00	350		
1940-42	40	6.00	6,100		
			11,520	26.5	57.6
1952	29	1.00	1,210		
1952	29	2.00	2,590		
1952	29	3.00	1,085		
1952	29	4.00	4,300		
1950s	28 ^b	2.00	2,590		
1954	27	3.00	800		
1955	26	3.00	600		
			13,175	30.3	87.9
1960	21	6.00	990		
1960-65	19 ^b	4.00	1,200		
			2,180	5.0	92.9
1970s	6 ^b	1.00	800		
1970s	6 ^b	2.00	1,190		
1975	6	3.00	425		
1976	5	2.00	650		
			3,065	7.1	100.1

^aThe composition of the 6-inch pipe is cast iron; that of all other pipe is galvanized steel.

^bEstimated average age.

Source: Rummel, Klepper, and Kahl, Highfield Water System Valuation Study (Baltimore: 1981).

Comments From the Department of Defense



OFFICE OF THE ASSISTANT SECRETARY OF DEFENSE

WASHINGTON, DC 20301-8000

01 MAR 1993

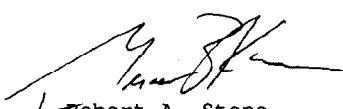
Mr. James Duffus III
Director, Natural Resources
Management Issues
Resources, Community, and Economic
Development Division
U.S. General Accounting Office
Washington, DC 20548

Dear Mr. Duffus:

This is the Department of Defense (DoD) response to the General Accounting Office (GAO) draft report, "WATER RESOURCES: Highfield Water Company Should Not Receive Compensation From the U.S. Army," dated December 23, 1992 (GAO Code 140870/OSD Case 9291).

The DoD has reviewed the draft report and concurs without further comment. The Department appreciates the opportunity to review the report in draft form.

Sincerely,


Robert A. Stone
Deputy Assistant Secretary of Defense
(Installations)

Comments From the Highfield Water Company

Note: GAO comments supplementing those in the report text appear at the end of this appendix.

COMMENTS ON THE DRAFT REPORT
of the
GENERAL ACCOUNTING OFFICE
in the matter of
CLAIMS OF THE HIGHFIELD WATER COMPANY
against
THE UNITED STATES ARMY

February 6, 1993

Submitted by:

Richard W. Velde, Esq.
Eugene M. Frese, Esq.
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(202) 347 7701

Appendix V
Comments From the Highfield Water
Company

COMMENTS ON THE GAO DRAFT REPORT
HIGHFIELD WATER COMPANY CLAIMS

This report is the response of Highfield Water Company to the Draft General Accounting Office's Report to the Chairman, Committee on Public Works and Transportation, entitled: Highfield Water Company Should Not Receive Compensation From the U.S. Army. The GAO report responds to Section 116(t) of the Water Resources Development Act of 1990 (P.L. 101-640). The Comptroller General of the United States was directed to "conduct a study of the facts and circumstances concerning the claims of the Highfield Water Company, NJ, against the United States Army Corps of Engineers, for the purpose of making recommendations for an appropriate settlement of such claims." The Comptroller General was to report no later than six months after enactment on November 28, 1990.

This study was not begun until late fall 1991, and then only after several Members of Congress expressed considerable interest. The Highfield Company owners and representatives met several times with the GAO Office of Resources, Community and Economic Development Division, Washington, DC, during the first six months of 1992. Every effort was made to provide comprehensive information regarding the facts and circumstances supporting Highfield's claim. This draft report was completed in May 1992 but was not released for comment until December 23, 1992 -- a year and one half past the statutory due date. The information to follow is offered in further support of Highfield's claims, and to refute what is essentially a non-objective rationalization and defense of the Army's action in this dispute rather than an impartial report on the merits.

Highfield argues and offers supporting documentation that GAO distorted the facts in several key respects:

See comment 1.

1. The report asserted that the average daily withdrawal by the Army from the Highfield aquifer averaged 60,000 gpd rather than 250-300,000 gpd.

See comment 2.

2. The age and condition of the water distribution system was mischaracterized. The report states that only 13% was installed after 1953, when in fact over 50% was installed after 1953 and over 70% after 1943.

See comment 3.

3. The GAO study of the hydrogeology of the Highfield aquifer and recharge basin included a major area that in fact does not supply water to the Highfield aquifer. This analysis led to the false conclusion that new wells could have been drilled to solve Highfield's water shortage, even though engineering studies done at the time unanimously reached an opposite conclusion.

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See comment 4.

4. The report grossly distorts the relationship between Highfield and the Blue Ridge Company after the Pennsylvania Company was taken over in 1974 by its local Public Sanitary District. In fact, the two companies frequently provided water to each other by an existing connection until 1977 when severe drought conditions prevented further exchanges.

See comment 5.

5. The report misinterprets the federal case law in this matter ignoring the fact that the rationale of the District Court's opinion was overturned by the Appellate Court, although the opinion was affirmed on other grounds.

See comment 6.

6. The report does not take into account Maryland Water Rights Law and assumes that the Army could make unlimited withdrawals from the Highfield aquifer without state permits. In fact, the Maryland law allows a land owner to take no more than 10,000 gpd without a permit.

See comment 7.

7. The report ignores recently declassified information identifying the real mission of Ft. Ritchie. This mission as a secret underground Pentagon required large water reserves in the event of war.

See comment 8.

8. The report did not take into consideration applicable DoD Directives regarding application for water permits. These regulations place an affirmative duty of all Defense Department organizations to comply with all applicable EPA and state water laws and regulations.

TOWN INFRASTRUCTURE

The City of Highfield was founded in the latter portion of the 19th century; its water company was chartered in 1905. Eventually the company built up its service so as to serve more than a thousand residents and several commercial customers. No military installations existed during the first quarter of the 20th century. The town was primarily a mountain resort community. In later years, with the construction of a significant number of military installations nearby, the town grew both as a bedroom community and a commercial service center. The town is adjacent to Fort Ritchie. Many of the civilian workers and military personnel at Fort Ritchie have lived in Highfield over the years.

See comment 9.

This community has a functioning water system that operated in compliance with Maryland law from 1905 to the present. The GAO report considers the town as a satellite nuisance to Fort Ritchie and alleges that the town had no prior rights to its own water supply. The report asserts that all that was needed was for the town to sink a few new wells anywhere and simply write out a voucher to pay for the improvements the way the Army would do it.

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See comment 10.

This assumption simply ignores territorial franchise limits, prior possession and franchise rights. It ignores decades of peaceful coexistence between the military and the civilian community, except for a brief period when the Army arbitrarily and temporarily denied access to the common aquifer in time of dire need.

See comment 11.

The GAO report concludes that the facilities of the private water company were antiquated and inadequate, and that 73 years of continuous operations were --"an encroachment upon federal rights enuring to Fort Ritchie," and that all investments in and the successful operation of the company for decades were irrelevant.

See comment 12.

Yet, immediately after the private company was taken over by the public authority and for the next decade, the Army allowed water to be transferred back to the public water company. Only in 1988 after federal funding was finally obtained to expand the water facility to add two new pumps did the Army stop sharing the water from Highfield's underground supply.

See comment 13.

During the brief period in 1978 in which the Army abruptly stopped providing emergency supplemental water supplies, irreparable harm was done to the private company. It was forced out of business by suspension of its franchise and the seizure of its assets.

See comment 14.
Now on p. 4.

HIGHFIELD AQUIFER

Fort Ritchie operated eight wells, four of which were located within the Highfield service area boundaries and four were inside the boundaries of Fort Ritchie, (see page 8 of the GAO report). All of these wells were drilled directly into the Highfield aquifer.

See comment 15.

The GAO alleges that this aquifer is fed by surface drainage within a very restricted catchment area from two different slopes, inferring that the characteristic of the surface drainage feeds more directly into the Army wells. Also, it infers that the "old inadequate" wells of Highfield are disadvantageously located with respect to surface drainage. This allegation is not supportable. Underground aquifers do not parallel surface topographies but often flow towards and into surface bodies of water. Indeed, drilling of wells is often left to chance with no guarantees of success. Water drilling may not be any more successful than oil drilling.

See comment 16.

But aside from the false inference of surface drainage determining precise underground watering holes, the Highfield well, in fact, performed for many years without problems in spite of the Army's encroachment. From 1945-1974, there was ample supply in the Highfield aquifer for everyone. In 1975 drought conditions began to occur intermittently in which the Highfield Company experienced some water pressure problems in its fringe homes located up the

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mountain side. By 1976, the Highfield well was having difficulty pumping its normal output, and prolonged ground freezes caused serious pressure problems in one heavily populated street where the town Street Department had cut road cover significantly to expose the main trunk supply line.

See comment 17.

During the winter of 1976-1977, this one area had a chronic problem of the pipes freezing. However, the company refurbished its pumps so that the well was in excellent operating condition. Still shy of water, engineers were called in to start up the second well and to explore possible well sites within the franchise area. After extensive study, the engineers found the aquifer's supply was seriously diminished, making any new investment useless since there was insufficient water to draw.

See comment 18.

How could this be when there was plenty of water all these prior years? The engineers learned that Fort Ritchie's wells had sustained a high pumping rate over this long period of time and had depleted the recharge ability of the aquifer. Although the aquifer was indeed capable of providing a 300,000 gpd rate, the heavier pumps of Fort Ritchie drew water continuously allowing insufficient rest and recharge. This was aggravated in the drought years.

See comment 19.

In the meantime the water company's application before the Public Service Commission was denied because of citizen complaints of inadequate water pressure. Everyone assumed that the company could get additional supplies by simply drilling more wells, but later it was proved by engineering studies that the aquifer would not support more well development. At this time Fort Ritchie engineers cooperated in the engineering studies and showed the company's engineers the eight wells. They then learned for the first time from Army disclosures the extent of the Army's use of the Highfield aquifer.

See comment 20.

The company then attempted to purchase or lease one or more of the Army wells, since apparently only four of the eight wells had been actively used. The Army engineers then disclosed that there was a 300,000 gallon reservoir and a filtration plant located on the post. However, officials at Fort Ritchie insisted that the reservoir could not be counted as part of the active water supply: "it was strictly a standby facility." In fact, the Fort Ritchie engineer explained that even for emergency fire protection, an additional natural lake supply on base was designated for use.

STRANGE BEHAVIOR AT FORT RITCHIE

See comment 21.

In 1977, the drought continued and became more severe. Highfield officials again pressed for acquisition of an excess well, but the Army ruled that it did not meet the definition of "excess property" and thus could not be sold or leased. Highfield then asked for an arrangement whereby the Fort's reservoir could

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See comments 10 and 21.

release water during extreme shortage periods. This was a logical supply arrangement since it would relieve excess pumping on Army wells and provide respite for aquifer recharge. However, the Army continued to refuse any consideration of using the reservoir.

See comment 22.

Highfield had no alternative but to plea for an arrangement involving an "Army" well within its franchise, one that was tapping the aquifer more aggressively than the Highfield well could. The negotiation was difficult and was delayed despite many shortages that occurred. As the drought continued, the town was without fire protection at times in addition to severe pressure drops. Finally, the Commanding Officer of the Fort agreed to permit an interconnection at well #4, providing that the costs of interconnection be borne by Highfield. The company installed a meter and promptly began paying the rate established by the Army (\$1 per 1,000 gallons).

See comment 23.

This arrangement solved the city's water problems until suddenly and with only a few days notice, the Army cut off the service. Within hours a demand was made by the county to the Public Service Commission to void the water company's franchise. Within two days county authorities seized the water company's assets. Appeals to the PSC were moot, since the Highfield company was no longer in possession of the facilities. Shortly thereafter, the Army turned the water from well #4 back on and provided water the public water company for a decade thereafter. These takings without just compensation and the arbitrary action by the Army spawned a series of lawsuits by Highfield against various state and county entities and individuals. This litigation was settled five years later in which plaintiff's legal expenses only were paid (see exhibit #1). The agreement left Highfield free to go against the Army for its wrongful action.

See comment 24.

FORT RITCHIE'S SECRET MISSION

Why was the 300,000 gallon reservoir and filtration held in reserve all of those years, even in drought conditions?

See comment 7.

On May 31, 1992, the Washington Post Magazine carried a feature story entitled "Last Resort." (See exhibit #2). It described three primary standby facilities, created at the height of the cold war, to house the Federal Government in case Washington were to be destroyed. A posh facility near the Greenbriar resort in southwest Virginia would house the Congress. An underground "Pentagon" was built under a mountain in Maryland. Nearby Fort Ritchie was to provide support. All three facilities were on standby, including self-contained water reservoirs and operating systems. The mystery had been solved. The top secret mission of Fort Ritchie precluded everyday use of its standby water system, even in time of local water shortage.

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The documents relating to the mission of the Fort had been recently declassified, which was the basis for the article. The article was called to the attention of the GAO staff by Highfield's counsel at the time, but apparently no effort was made to obtain the declassified information. Recently, a request has been made to the sponsoring congressional committee to obtain the information. Hopefully, it will be available shortly.

EXCESSIVE PUMPING BY THE ARMY

Highfield contends that the Army excessively pumped ground water from the Highfield aquifer between 1974 and 1987, as well as during earlier periods.

The company calculated the recharge rate, based on a 461 acre drainage area which supplied water to the Highfield aquifer. The GAO draft at pages 29 and 30 cites three studies which estimated the daily recharge rate at 300,000 gpd, 307,000 gpd, and 309,000 gpd. Highfield had previously submitted for review by the GAO a report of Fisher and Sampson, Engineers dated 3/27/90 (see exhibit #3), which reached the same conclusion. A 1978 study completed for the Washington County sanitation District by Baker-Wibberley Associates, (also previously provided to GAO) also established a recharge rate of 300,000 gpd. These and two additional engineering studies combined show an average daily recharge rate of 307,000 gpd.

Now on p. 23.
See comment 25.

On page 32 of the GAO draft report is a Table II-1 titled "Ground Water Availability and use in the Ft. Ritchie/Highfield Northern Sub-Drainage area, 1975-1978. The fourth line of the table entitled "Minus Ft. Ritchie Use" depicts Ft. Ritchie water usage of 45,000 gpd and a high of 72,000 gpd in 1977.

Now on p. 25.
See comment 26.

These pumping rates do not accurately reflect actual daily Army water use, and are dramatically inconsistent with the conclusions in the engineering reports cited above.

Consider the Meiser-Earl Report, "Feasibility of Ground Water Development of Highfield, Maryland", State College, Pennsylvania (Pennsylvania State University), (see exhibit #4). The GAO draft report favorably refers to this study at pages 29 and 30. The following paragraph is the text as it appeared on pages IV-12:

Now on p. 23.

"The arithmetic of demands, however, is simple. The sum of the Army's use (from U.S. nos. 4, 5, 6, 7, and 8) in the Highfield basin is 260,000 gpd; the Highfield No. 1 well produces about 50,000 gpd, for a grand total of 310,000 gpd. This actually exceeds the theoretical calculated availability. It simply demonstrates that there is indeed no room for development of additional supplies."

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See comment 27.

See also at page VI-11 references to a conversation with Mr. Bill Barnes, Supervisor of the Sanitation Section, Utilities Division, Ft. Ritchie, that wells #4 through #8 were used to meet Base demand of 200,000 gpd to 350,000 gpd.

See comment 26.

Also, consider on page 19 of the Baker-Wibberly study the following:

"Total ground water (Highfield) withdrawal from private wells would total approximately 12,000 gpd. The Highfield well #1 has a reliable sustained yield of about 350 gpm or 50,000 per day. The most important withdrawal of ground water in the Highfield study base is by 5 wells, owned and operated by the U.S. Army to serve Ft. Ritchie. These wells are used in combination with three other wells that Ft. Ritchie uses to supply the base demand of 200,000 to 300,000 gpd. The total combined pumping rates of five wells outside the military base when used together is approximately 260,000 gpd.

It has been calculated that the average ground water recharge rate for Highfield area is approximately 300,000 gpd. This recharge value represents an upper limit of available ground water that cannot be exceeded. In most cases it is impossible to extract quantities approaching this limit. The sum of the Army's use from the five wells in the Highfield basin is 260,000 gpd; the Highfield #1 well produces about 50,000 gpd, for a total of 310,000 gpd. This actually exceeds the theoretical calculated availability. This demonstrates that the development of additional supplies is not possible. It is therefore concluded that reliable ground water sources in excess of those presently being utilized in the Highfield basin do not exist."

In evaluating the recharge rate and available water in the aquifer it is imperative to bear in mind that only a percentage, considerably less than 100% of the daily flow can actually be extracted and recovered. (See Meiser-Earl report at pages IV-6 through 12: "this recharge value therefore represents an upper limit of available ground water which cannot be exceeded. In most cases, it is impossible to actually extract quantities approaching this limit.")

We also submit a copy of the "Contract For the Sale of Utilities Services", September 14, 1979, between the U.S. Army and the Washington County Sanitary District (see exhibit #5). This document indicates at page 6-7 IIA:

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"the Army's average daily demand placed upon the post water works is 213,000 gpd, with occasional peak requirements for 350,000 gpd during the summer."

The inescapable conclusion from the information cited above is that the water pumped from Highfield aquifer is the main source of water supply at Ft. Ritchie. It further appears that Ft. Ritchie's use of water from that source averaged from a low of about 250,000 gpd to a high of almost 350,000 gpd. Therefore, the information supplied in the GAO draft report on line four of Table II-1 (page 32) is inaccurate as are the conclusions based upon that information.

It has been established, based on discussions with competent engineers, that depending upon the geology of the structure containing the aquifer, that on average, between 65-80% of recharged and/or recycled water is actually available for extraction in any given aquifer. If we use the high value of 80%, then the amount of recharged water actually available in the Highfield aquifer on a daily basis is 80% of 307,000 gpd or 246,000 gpd. The Army's use alone of 250,000 gpd on average exceeds the maximum rechargeable water included in the Highfield aquifer. This resulted in daily deficits and shortages through many years -- not just starting in 1974. These figures assume normal climatic conditions averaged over many years. The shortfall became acute during the drought conditions that persisted between the 1974 and 1978.

The Army, by its own admission in the contract with the Washington County Sanitary District, acknowledged the daily use of 213,000 gpd, except during the summer where it often went to 350,000 gpd. This calculation was based on using 274 days with a low volume and ninety days at the high volume which gives an average daily use of for the year of 247,000 gpd. With Highfield drawing 50,000 gpd and other users drawing 12,000 gpd, the average daily pumping was 309,000 gpd, even though the reasonable recovery recharge basis was only 246,000 gpd. This daily shortfall over many years guaranteed the disaster that struck Highfield in 1977 and 1978, putting it out of business when the Army refused to allow diversion of "its" water.

As was previously indicated, Highfield Water Company was incorporated in 1905 and was franchised by the State of Maryland as a private water company. It had a mandate to provide potable water to the community of Highfield using the underground water then available from the Highfield aquifer. It is important to note that it does not matter whether the franchise is given to a municipality or a private company. The rights to distribute and sell water in that area and the obligation on the water company to meet its public responsibility in supplying adequate potable water are the same. Why is it that Ft. Ritchie and the Army Corps of Engineers have made a distinction between being unfair to a private company

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in contrast to its subsequent treatment with Washington County, a public entity.

There were over the years some thirty to forty private domestic users taking in accordance with Maryland State Law. In 1978, this amounted to some 12,000 gpd from the aquifer. Highfield, in 1974 through 1978, had one operating well and pumped 50,000 gpd from the Highfield aquifer. An additional 14,000 gpd was usually procured from an adjoining Pennsylvania utility company in order to meet customer needs. This Pennsylvania company was struck by the same drought that befell the Highfield basin in 1976 and 1977. In late 1977 that company stopped selling water to Highfield in order to meet its own needs.

Ft. Ritchie was initially constructed in the 1920's as a Maryland National Guard facility and apparently met its limited water needs from the abundant surface water supply available on the site. Under the War Emergency Act of 1940, the Army leased the facility from the State and proceeded to develop and greatly expand the facility. In 1941 and 1942, in order to meet its increased water needs, the Army entered an agreement with Highfield Water Company to purchase water from its system, thus acknowledging Highfield's paramount rights to distribute water in the area. Simultaneously, the Army began construction on the eight wells at the base which were completed in 1943. The Army at Ft. Ritchie illegally constructed these wells without procuring a permit from the State as required by Maryland law.

In the GAO draft report (page 14) there is a gratuitous assertion that the State may have drilled the wells. Why would the State drill the wells when in fact the facilities were constructed when the Army was the sole user of the facility? That the wells were not in place before 1942 or 1943 is evidenced in the Army's procuring its water from the Highfield Water Company. Notwithstanding who drilled the wells, they were clearly operated on a continuous basis illegally and contrary to State law from 1943 until present.

WATER LAW OF MARYLAND

Maryland is a so called riparian state. As a result of the State's granting Highfield Water Company an exclusive franchise to distribute water to the village of Highfield and the surrounding areas, it became a riparian owner of the surface and ground water within its legislated franchised boundaries. As such, it is entitled to the use of all water therein. This includes ground waters, as water utilities define their source and product in terms of supply.

The Maryland State Legislature has recognized the State as a riparian state and enacted legislation specifically designed to protect the riparian rights of land owners and water utilities by

See comment 6.

Now on p. 10.

See comment 28.

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monitoring and regulating the use of water within the state. The annotated code of Maryland Natural Resources, subtitle 8-801 et seq., provides that water users including the Federal government are required, "to obtain a permit from the Department to appropriate or use any waters of the state whether surface or underground." (see exhibit #6).

The United States, through the Army at Ft. Ritchie was operating its wells located within the Highfield Water company's service area without any permits to appropriate or use these waters.

All water resources remain under the permanent jurisdiction of the State for inspection, review, and regulation. Permit applications must specify and delineate evidence of existing streams, types of proposed wells, spoil analysis of the drilling area, clear identification of any proposed aquifer, requested withdrawal volumes, peak demand assumptions, etc. When data are collected, neighboring well owners and other interested parties are provided notice for public hearings, at which time any objections may be heard. At issue is the health and safety of citizens and their rights to public resources.

Clearly, adjacent public water suppliers have an interest in preservation of surface and underground supplies, aquifer recharge rates, and withdrawal demands on the water shed catchment area or aquifers. If the permits are approved, the withdrawal volume is stipulated to assure nonintervention with other existing supplies, community energy needs or other requirements. This practice is common in all states, as chaos would result if one is permitted to drill wells at random within an existing water company's distribution area. This is true whether the franchise is the water department of Washington, DC, or a rural community system.

In the instant case, had the Army made proper application for the required permits, the great damage done to Highfield Water Company could never have happened. There would have been a full discussion of the recharge rate necessary to meet both the needs of Highfield and the Army at Ft. Ritchie. The State regulatory agency is mindful of over-pumping and schedule withdrawal routinely. It is probable that Ft. Ritchie would have been required to use its own surface water reprocessing facility and reservoir. These are located on the facility and could have been used part of the time since Ft. Ritchie's surface water system is sufficient for its needs. the Highfield system could then be used as a reserve or backup supply. It has a greater capacity than the total supply of the Highfield aquifer. These water facilities were existing and available to the Army at all times. But for reasons not disclosed, the Army refused to use them.

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In its response to the State of Maryland in 1969 when requested to obtain a permit under the provisions of the law cited above, the Army gave two reasons for not needing permits: (a) its belief in a higher federal prerogative and (b) an assertion that it did not have to comply with the state law. This is a patent misstatement of American jurisdictional law. The governing legal principle that applies when the Federal government is called upon to comply with state or local governmental laws is known as the principle of concurrent jurisdiction. This principle of law states that the federal government will comply with the administrative and legal requirements of state and other local laws, including the requirements to procure permits, licenses, filing reports, making applications, etc. In all cases unless such compliance will unreasonably inhibit the Federal government or its agencies in the exercising of their Federal powers or duties (*Bute v. People of the State of Illinois* 58 S CT 763, 33 U.S. 640; *U.S. v. Butler* Mass. 56 S CT 312, 297 US1; *U.S. v. Nebo Oil Company*, DC LA 90 F S OPP 73.)

In this matter, it is clear that the filing of permits by the Army would not have unreasonably interfered with the exercise of its powers or mandates. A hearing on the permits would have permitted Highfield the opportunity to protect its interest and the public health, welfare and safety of the citizens the company served. A compromise reserving sufficient capacity for needs would have been negotiated at the state level. Any shortage in water supply to the Army resulting from such compromise could easily have been made up by the Army using its reprocessing facility and reservoir, which were adequate to meet all of the Army's needs for water without invading Highfield's aquifer.

If the Army at Ft. Ritchie did have a right to take water from the Highfield aquifer, did it do so as a reasonable co-owner with Highfield? Please review the letter of December 22, 1989, from the law firm of Hesse and Hesse (see exhibit #7). This firm specializes in Maryland riparian law and is considered to be experts in the field of water rights. On page two of this memorandum, the firm expressed its opinion that Maryland, as a riparian state, through its courts would apply the "American" or "reasonable use" rule of law. This rule, as set forth in the Hesse memorandum, is as follows:

"The right of land owners to subterranean waters percolating through his own and his neighbor's land and which are common cause of supply for the lands of two or more of them, is limited to a reasonable and beneficial use of the water. Where common supply is not sufficient for all, each land owner may take only his fair share or proportionate share and only such amounts as he really needs for beneficial circumstances.

"Accordingly, it is our opinion, that Ft. Ritchie's action in over-pumping and draining the common aquifer were in violation of Highfield Water company's rights to that source of water

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See comment 1.

(active since 1905) to the extent Ft. Ritchie's taking was in excess of their private on-site water supply that remained unused. To the extent Ft. Ritchie's taking is "applicable to the reasonable use" rule, they had a responsibility not to drain the aquifer beyond the flow Highfield Water Company required to supply the domestic and safety needs of the town of Highfield, pursuant to its public supply franchise.

See comment 30.

"Where a community's water service has been in operation continuously since 1905 with the same underground water aquifer source of supply, any threat to diminish, divert or divide such water source impairs franchisee's ability to perform its obligation. (In fact, one of the findings of the Maryland Public Service Commission here referred to 'Health and safety of Highfield community threatened by low water supply.')

Since Ft. Ritchie had available an adequate alternative service source of water at its on-site reprocessing facility and reservoir at all times, the test of reasonableness for taking water away from Highfield fails. The Army had no legal right to take and deplete the waters of the Highfield Water Company. That taking and depletion was the sole and proximate cause of the loss of Highfield's seventy year old, ongoing utility business. Further, the Highfield Water Company should be reimbursed for the water which was taken illegally from 1941 to 1984, as well as recovering damages for the loss of profit, good will and water distribution plant, storage facilities and complete system. See page IV-2 Meiser & Earl report (see exhibit #4):

"Based on lengthy discussions with MD DNR Water Resources Administration personnel, there appear to be two legal issues which must be addressed and resolved.

"First, Maryland is a riparian state; therefore it seems that the residents of Highfield have a reasonable right to adequate ground water supplies from the aquifer underlying their community. Furthermore, this aquifer receives all of its recharge from the area served by the Highfield system. The U.S. Army's right to these supplies appears to be secondary, since they own only their well sites as "islands" within the Highfield community.

"Second, the State of Maryland controls the use of its water resources; in this capacity, it requires all users of ground water supplies (other than single family domestic users) to obtain a Ground Water Appropriation Permit (GAP). The Ft. Ritchie wells do not have permits. Among the considerations in issuing these permits for wells are the impacts on surrounding areas and interference with other water users. If and when the Ft. Ritchie wells do seek compliance with the requirement of having GAPs, it is questionable that the State

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would allow the quantities of present ground water withdrawal from within the Highfield area which preclude development of sufficient supplies for the community itself.

"Nevertheless, the fact remains that under existing conditions, additional ground water supplies are not available in the Highfield basin and we recommend that no exploratory well drilling and testing be considered at this time."

It is asserted in the GAO draft that Ft. Ritchie as a land owner after 1951, eight years after the wells were built, had a legal right to use the water beneath its property. Highfield concurs, but subject to the prevailing laws of the State of Maryland which requires a permit to build wells and to take water from them. The only exception under Maryland law is that up to 10,000 gpd may be used by a land owner for domestic purposes other than for heating and cooling, or for agricultural purposes (Annotated Code Maryland: Natural Resources Subtitle 8-801,802, see exhibit #6).

The use of water by Ft. Ritchie does not meet these exceptions. Thus a permit was required to prevent the very disaster that befell Highfield Water Company by virtue of the excessive illegal and unreasonable taking of water from the Highfield aquifer. At a 100% recharge rate the Army was using 80% of the available water to the detriment of Highfield and the citizens it was serving. At the reasonable recharge rate of 246,000 gpd, the Army was using 100% of available water. This is patently unreasonable, negligent and malicious. The negligence is prima facia; the Army simply refused to comply with the mandated statutory requirement for the fair allocation of underground waters among riparian owners and users. (Finly v. Teeter Stone, Inc., 250 MD,218; 248 A.2d 106 (1968)).

See comments 1, 3, and
26.

The Army acted arbitrarily when, after granting the reasonable request of Highfield to lease water to them in 1977, it suspended the lease and supply of water during the height of the drought in September 1978 without cause, knowing the Highfield Water company and its customers had a shortfall of supply of 14,000 gpd because of the drought. The same drought that affected Highfield's normal source of supply from the adjoining Pennsylvania utility. As a direct result of the excessive over pumping by the Army at Ft. Ritchie over many years and particularly during the drought; the Army's refusal to use its abundant surface water reserves and its refusal to meet Highfield's temporary shortfall, the Maryland Public Utility Commission suspended the Highfield Water company franchise effective October 1, 1978.

See comment 31.

This conduct by the Army was malicious (see Finly v. Teeter in supra), particularly when within weeks of the suspension, Ft. Ritchie began resupplying the same water to Highfield's successor, the Washington County Sanitary District. In fact, the Army not only

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Now on p. 10.

met the shortfall of 14,000 gpd, but agreed to furnish up to 94,000 gpd if needed. The GAO draft report (page 15) states:

"Ft. Ritchie did not obtain a Maryland water appropriation permit even though Maryland law expressly includes federal facilities among the entities that are subject to permit requirements. However, federal case law has not established that state groundwater permits can be required for U.S. military installations.² Additionally, Maryland did not require the Fort to obtain groundwater permits and the state did not seek to prevent or limit the Fort's use of the wells pending permit approval."

See comment 32.

In regard to these assertions we refer to our previous legal discussions on the law of concurrent sovereignty and jurisdiction that requires the federal government in conducting its activities to comply with state and local laws unless a federal mandate or mission would be inhibited. Routinely, government agencies, military and civilian sign contracts to purchase water, electricity, and may other needs and where required, procure permits for such use and permits for construction of all kinds, and even are subject in the normal course of business to complying with local building and fire codes. Indeed, on surveying military installations in Maryland we find permits were filed for Ft. Deitrich and Ft. Meade.

In fact, we know of no case except for Ft. Ritchie where the state laws were ignored. The laws of Maryland exist to protect the citizens and businesses of the state and whether or not the State of Maryland chooses to enforce a certain law or not to enforce it does not exempt the third party (here Ft. Ritchie) from the consequences of their illegal actions as it affects or damages the rights of affected citizens or businesses. Ft. Ritchie's illegal and excessive taking of water without a permit and proper allocations was the direct cause of Highfield Water Company losing its business, investments, plant and good will with damages totaling many millions of dollars.

Now on p. 10.
See comment 5.

In regard to the citation in GAO draft report (page 15) of "Nevada ex rel Shamberger v. U.S. 165 F Supp 600 (D Nev 1958), affirmed on other grounds, 279 F 2nd 699 (9th Cir. 1960), please refer to Highfield's prior memorandum (see exhibit #8). The appellate court opinion expressly states that this case is no precedent to avoid the requirement for a permit. Specifically the upper court agreed with the lower court that no permit was required, but on entirely different grounds.

The Circuit Court in effect stated that the District Court had erroneously relied on the federal statute to give the court jurisdiction to hear the case when in fact, that statute did not apply. The District Court should not have heard the case or rendered an opinion on it. The court in fact had no jurisdiction,

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thus rendering the case moot. The Circuit Court additionally ruled on the facts that in the area where the wells were located the state engineer had not designated as a basin or sub-basin as required by Nevada law, nor was the area a proven artesian basin. Rather the wells tapped only percolating surface waters which were not subject to the permit process in Nevada. Thus, the U.S. Government or any other person could have drilled wells there without a permit. This is in stark contrast to the instant case where Ft. Ritchie was a user in excess of 10,000 gpd, and under Maryland law must comply with the permit and allocation process.

FT RITCHIE VIOLATED DOD DIRECTIVES

In refusing to obtain a Maryland state permit to draw water from the public aquifer, Fort Ritchie did not comply with applicable Defense Department Directives. For example, the current DOD Directive on the subject of Safe Drinking Water, DoDD 6230.1, requires that all Defense agencies and Military Departments:

"will comply with substantive and procedural drinking water regulations established by the Environmental Protection Agency (EPA) or the regulations and procedures of those states with primary enforcement responsibility for Federal facilities, as granted by EPA." (see exhibit #10).

In addition the Secretary of the Army was responsible for carrying out the DoD Directive and failed to: (1) monitor this for compliance with State laws requiring permits, (2) obtain certification, (3) notify users of noncompliance.

Maryland has received the appropriate delegation by EPA. The current DOD Directive was issued in April 1978; however, it superseded the earlier versions which were applicable to the Army's conduct in this matter. The 1978 version simply added flouridation requirements to the prior versions.

Maryland passed a Drinking Water Law in the early 1970s to implement the federal Safe Drinking Water Act and implementing regulations. (see exhibit #11). Its scope includes "federal agencies" as defined as well as "public water systems." Again, the Army was under the DOD Directive to comply, yet, apparently it was the only DoD installation in the state that refused to do so. This arbitrary non-compliance by the Army at Fort Ritchie violated Federal and State law as well as DoD regulations.

INADEQUATE DISTRIBUTION SYSTEM

The GAO draft report on page 11 asserts that Highfield's distribution system was inadequate. It is argued that a Washington County sanitary District engineer study done in 1981 concluded that only 13% of Highfield's system could be identified as having been

See comment 8.

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installed after 1954, and that another 6% was installed in the 1960's and that the other 81% was installed between 1909 and 1953.

See comment 33.

The study was never made available to Highfield, however, it is known that it was prepared to support a request for a government grant to allow for the projected replacement of the existing water distribution system. Hence, assertions that the water mains were "antiquated" strengthened the prospects for the grant. In fact, the original request for a grant was turned down soon after the County took the system over. The Washington County Sanitary District operated the Highfield system for over ten years with only minor repairs to the distribution system. In fact, repairs being made by Highfield at the time of the seizure were discontinued. The Washington County Sanitary district did get a grant finally in 1988 for the construction of two new wells, as well as repairing some of the system, but the basic Highfield distribution system operates today substantially intact.

See comment 2.

AGE OF THE HIGHFIELD PIPING SYSTEM

The estimate of the age of the distribution system was referred to in "The Revised Cost Valuation Study of Water Facilities, Highfield Water Company, Washington County, Maryland, June 1982" prepared by Alexander M. Churchill Associates, Engineers (see exhibit #9). Table II shows the actual date of installation of all pipe together with its expected service life based upon Highfield's records. This detailed report demonstrates that 75% of the system was built after 1943 and 50% built after 1953 and projected a long future service life.

See comment 2.

PRIOR SETTLEMENT

A clarification is needed of the GAO draft report comment (page 6) where it states "in 1984 the company settled its claim for \$400,000.00 and transferred its property to the Washington County Sanitary District." This implies that the \$400,000.00 was a consideration paid for the property.

See comment 24.
Now on p. 4.

In fact, no monies were paid by Washington county or anyone else for Highfield's property. The property was a complete loss to Highfield caused by the actions of Ft. Ritchie. The monies were paid to reimburse Highfield for six years of litigation costs and this fact was expressly stipulated in the court ordered settlement. (see exhibit #2). Highfield was assigned all rights to pursue compensation against the U.S. Army by the "purchaser," the Washington County Sanitary District, in a letter from its counsel, Mackley, Gilbert & Marks of July 17, 1984. (see attachment #12).

See comment 34.

ADDITIONAL WELLS

As to the question raised in the GAO draft in regards to the failure of Highfield water Company to build additional wells, please refer the prior Baker-Wibberly report, at page 19:

"this demonstrates that the development of additional supplies is not possible. It is therefore concluded that reliable ground water sources in excess of those presently being utilized in the Highfield basin does not exist."

The Meiser & Earl report (page IV-13) further states:

"Because of the heavy existing use of ground water in the Highfield basin and the impossibility of demonstrating regional availability of additional significant sustained well yields by the foregoing budget approximations, we recommend that no exploratory well drilling and testing be considered at this time.

"Should the allocations of ground water production be changed by Maryland Water Policy, and the present withdrawal by the U.S. Army from the Highfield basin to Ft. Ritchie be considerably reduced, we feel that one or two additional wells located in the Falls church valley immediately northeast of U.S. Well #8 could realistically supply the projected demands of the Highfield system. Any such ground water exploration should logically start with testing and evaluation of the Railroad well. Because of the uncertainty of such exploration, it is pointless to pursue specific potential well locations and drilling procedures any further.

See comment 19.

It is clear based on Highfield's engineering reports as well as those advisory reports procured by the Washington County Sanitary District that there was insufficient water available in the summer or fall of 1978 or during any average period, to allow for the successful construction of additional wells. Additional wells could not draw from the aquifer that was being drained dry by the excessive and unreasonable pumping being done by Ft. Ritchie.

See comment 35.

Unanimous findings from these studies showed a declining source of supply. This professional opinion prevented Highfield Water Company from obtaining the financing necessary to expand its system or to develop new wells. The company was solvent. Had there been sufficient water available to it from the Highfield aquifer, private financing for new well construction would have been readily available.

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EXHIBITS

1. General Release. Highfield Water Co. v. Public Service Commission. Date not legible, but during 1984.
2. "Last Resort." Feature Article, Washington Post Magazine, May 31, 1992.
3. Fisher & Sampson, Civil Engineers and Land Surveyors, Cherry Hill, N.J.:
"Report on Diversion and Use of Water from Highfield Aquifer, Washington County, Md." March 27, 1990.
4. Meiser & Earl, Pennsylvania State College, State College, Pa:
"Feasibility of Ground Water Development of Highfield, Md." June, 1982.
5. U.S. Army and Washington County Sanitary District:
"Contract for Sale of Utilities Services." 14 Sept 1979.
6. Annotated Code of Maryland: "Natural Resources", Subtitle 8-801."
7. Hessey & Hessey, Attorneys at Law, Baltimore, Md. Legal Opinion. December 22, 1989.
8. Nevada ex rel Shamberger v. U.S.(Commentary).
165 F. Supp. 600 (D Nevada 1958); affd diff grds, 279 F. 2nd 699.(9th Cir., 1960).
9. Alexander M. Churchill Associates, Consulting Engineers, Berlin, N.J.:
"Revised Cost Valuation Study, Water Facilities, Highfield Water Co., Washington County, Md." June, 1982.
10. Department of Defense Directive 6230.1, 24 April 1978, superceding DoD Directive 6230.1, 10 August 1977:
"Safe Drinking Water."
11. Annotated Code of Maryland: "Maryland Drinking Water Law", Title 9, Subtitle 4.
12. Mackley, Gilbert & Marks, Attorneys at Law, Settlement Clarification Letter. July 17, 1984.

The following are GAO's comments on the Highfield Water Company's statement dated February 6, 1993. The first three comments respond to three of Highfield's most significant disagreements with the information and conclusions presented in our report. Highfield refers to these disagreements several times in its statement.

GAO Comments

1. From 1975 to 1978, Fort Ritchie withdrew water from both the northern and the southern subdrainage areas (about 461 acres and 1,243 acres, respectively). In the northern subdrainage area, where the Highfield well is located, the Fort withdrew from four wells an annual average of between 45,000 gpd and 72,000 gpd (our report does not mention the 60,000 gpd figure cited by Highfield). In the southern subdrainage area, the Fort withdrew the remainder of its annual average water usage of about 300,000 gpd from the four wells and two springs that were located on-post.

Highfield relies on Meiser and Earl's 1979 hydrological analysis to assert that the Army pumped 250,000 gpd to 300,000 gpd from the "Highfield aquifer."¹ However, Meiser and Earl's analysis did not include either the recharge to, or withdrawals from, the southern subdrainage area. Consequently, their analysis (1) overestimated the Fort's withdrawals from the northern subdrainage area by assuming that the Fort withdrew all of its water from this area and (2) underestimated the water available to Fort Ritchie by not attributing any water recharge to the 1,243-acre southern subdrainage area.

2. Highfield derived its information about the relatively young age of its distribution system from a report that was designed to establish the company's value. This report did not include the system's older 1-inch and 3/4-inch lines, since they were considered to be "ineffective" or "100 percent depreciated." This exclusion significantly affects the company's conclusions about the system's age. For example, Highfield claims that over half of the system was installed after 1953. However, according to a 1981 study, if all of the pipes in the operating system are included—even the ineffective and fully depreciated pipe—at least 81 percent of the system's 43,440 feet of pipe was installed between 1907 and 1953. Highfield also claims that the basic Highfield distribution system operates today substantially intact. However, according to the Washington County Sanitation District, all of the Highfield distribution system was replaced between 1986 and 1988 except for 3,460 feet of 6-inch main line

¹Meiser and Earl, *Feasibility of Ground Water Supply Development for Highfield, Maryland* (State College, Penn.: Pennsylvania State University, 1979).

(cast iron) pipe. Over 3,600 feet of cast iron pipe were replaced, as was all of the galvanized pipe (over 34,000 feet).

3. We stand by the hydrologic analysis and conclusions presented in our report concerning the 1,243-acre southern subdrainage area, which provided most of the water that Fort Ritchie used from 1975 to 1978. The Highfield well—located in the northern subdrainage area—was unaffected by the Fort's withdrawals from the southern subdrainage area.

According to our hydrologic analysis, the recharge for the northern subdrainage area during the period from 1975 to 1978 was 342,000 gpd to 475,000 gpd. Since Highfield and others pumped about 62,000 gpd during this period, the Fort's pumpage of 45,000 gpd to 72,000 gpd clearly did not exceed the aquifer's capacity.

Our conclusion that additional wells could have been drilled is based on (1) our analysis of water pumpage and recharge data for the two distinct subdrainage areas, (2) a 1991 Maryland Department of Natural Resources analysis of water available in the northern subdrainage area, and (3) the fact that Highfield's successor, the Washington County Sanitation District, was able to pump more water from three wells during a drier period in 1991 than Highfield faced in 1977 with one well. See comment 1.

4. We do not state or imply that Highfield was cut off from Pennsylvania water in 1974. Rather, we state that after the sale of the Pennsylvania company, Highfield had to pay for the Pennsylvania water. The practical effect of the sale was that Highfield no longer had direct managerial ties to the Pennsylvania system and, as Highfield states, Pennsylvania wells could no longer be relied upon in times of low water to supply Highfield with additional water.

5. We disagree with Highfield's comments regarding the precedential value of Nevada ex rel. Shamberger v. United States, 165 F. Supp. 600 (D. Nev. 1958), affirmed, 279 F. 2d 699 (9th Cir. 1960). In our view, the decision in this case is not moot and is relevant to the issue of a state's authority to require a federal facility located on U.S. land to obtain a permit before using the waters under its property. Although the appellate court in Shamberger affirmed the lower court's opinion on the ground that the United States had not consented to be sued, its holding is consistent with the district court's decision. The district court concluded, in large part on the basis of the early Supreme Court case of McCullough v. Maryland, that the activities of the federal government are not, without its consent,

subject to state law. Thus, both opinions support the well-established principal that state laws and regulations are applicable to the actions of the federal government only when the federal government consents to make them so.

6. Under Maryland law, the United States, as the owner of Fort Ritchie, has the right to the reasonable use of groundwater underlying its lands. We did not find examples in federal or Maryland case law to indicate that U.S. military installations are required to obtain Maryland water appropriation permits.

7. Fort Ritchie's wartime mission and the presence of two water storage tanks and two small lakes on the Fort have no bearing on the basic conclusion in this report, namely, that Fort Ritchie did not overpump the aquifer to deprive Highfield of groundwater.

8. Highfield states that a Department of Defense (DOD) directive (6230.1, Apr. 24, 1978) requires DOD installations to comply with state groundwater appropriation permit requirements. Highfield's assertion is incorrect. This directive provides guidance to DOD components, including Fort Ritchie, on compliance with regulations and procedures issued by the Environmental Protection Agency or by states with primary enforcement responsibility. This guidance is in accordance with the federal Safe Drinking Water Act, as amended, 42 U.S.C. 300f, et seq., which is concerned with drinking water quality. This law specifically includes federal agencies in its coverage, thereby waiving the doctrine of sovereign immunity and, in states that qualify for primary enforcement responsibility, making federal agencies subject to the state's enforcement of this federal act. However, neither the act nor the directive provides any basis for requiring Fort Ritchie to obtain a state groundwater appropriation permit.

9. Our report does not state or infer that the town of Highfield is a "satellite nuisance" to Fort Ritchie or that the town had no prior rights to its water supply. Nor does the report assert that Highfield simply had to sink wells and pay for them. The report acknowledges statements by Highfield's consultant and the Maryland Public Service Commission (PSC) that the company did not have the financial resources to effect large-scale system improvements.

10. Highfield did not provide us with any evidence to show that the Fort ever interfered with Highfield's right to pump aquifer water from the company's wells. On September 12, 1978—4 days after the Maryland PSC

issued its order to revoke Highfield's franchise authority—the Army properly exercised its rights as a property owner when it denied Highfield's request to (1) sell its well #6, (2) allow Highfield to operate the Fort's water plant, and (3) establish an indefinite emergency supply contract with the company. The Fort's files indicate that, before this time, Fort Ritchie officials had engaged in a lengthy process to gain approval from higher headquarters to grant Highfield emergency short-term access to the Fort's water supply.

11. Our report concludes that Highfield's well capacity and water distribution systems were inadequate but does not contain any of the other conclusions that Highfield attributes to it.

12. During the first 9 months of 1978, when the Highfield Water Company owned and operated the water system, Fort Ritchie supplied the company with an average of 9,445 gpd for 7 months; the company purchased no water from the Fort in May and September. The water was supplied under a contract that allowed the Fort to sell the water if Highfield declared an emergency. We found no evidence during our review to show that Highfield had either requested or been denied water during either May or September. For the remaining 3 months of 1978, the Fort sold the Washington County Sanitation District an average of 8,945 gpd. For calendar years 1979 through 1987, the Fort sold water to the District in amounts that ranged from 760 gpd for 4 months in 1983 to 26,300 gpd for 12 months in 1981.

13. The Maryland PSC revoked the right of Highfield to exercise its franchise, in part, because of the financial limitations that would have prevented Highfield from repairing the distribution system and the unacceptable rates that continued ownership would have imposed on ratepayers. We found no evidence during our review to show that the Army had abruptly stopped providing emergency supplemental water to Highfield. See comments 10 and 12.

14. Highfield uses the term "Highfield aquifer" to describe the aquifer that underlies the Fort Ritchie/town of Highfield area. However, Highfield did not own either the aquifer or the water in the aquifer. All landowners in the Fort Ritchie/town of Highfield area have a right to the reasonable use of the aquifer's water.

15. We are not aware of any evidence to support Highfield's statement about aquifers in general or about the Highfield aquifer in particular.

Groundwater recharge flow directions are determined by the influence of gravity and local geology. Water moves over or through the ground, usually paralleling the local topography (which reflects the geology), to reach the lowest points, where the water may collect either above or beneath the ground. Water movement in the Fort Ritchie/town of Highfield area is guided by the topography and geology of two distinct subdrainage areas.

The two newest (and successful) wells in the Highfield area were drilled by the Washington County Sanitation District in the northern subdrainage area, and their locations were determined through a geological analysis of fractures in the Catoctin metabasalt, not by chance. The report does not characterize the Highfield wells as "old inadequate wells" or infer that they are "disadvantageously located." See comment 3.

16. There was no intermittent drought in the Highfield area during 1975. Our examination of meteorological data showed that precipitation was normal or above normal for calendar years 1975, 1976, and 1978; about 2 inches below normal in 1974; and about 3 inches below normal in 1977. Reports and documents that we reviewed cited Highfield well withdrawals of 46,000 gpd and 50,000 gpd. We found no evidence to document a decrease in the well's daily pumping capacity in 1976.

17. The aquifer had sufficient water. See comments 1 and 3.

18. These statements are incorrect. See comments 1 and 3.

19. The aquifer could have supported more wells; the Washington County Sanitation District successfully drilled additional wells. See comments 1, 3, and 15.

20. This statement is incorrect. The Fort regularly withdrew water from seven of its eight wells and from the two springs during this time. (The eighth well was damaged when an automobile rammed the well house, and the well was inactive for most of the period from 1975 to 1978.)

21. We believe that Highfield's efforts to purchase water and an "excess well" from the Fort suggest that the company thought that the aquifer had enough water to supply the company's needs but needed more than one well to gain access to the additional water. Highfield's efforts appear to be inconsistent with the company's stated position that the aquifer was already being overpumped.

Fort Ritchie's 1-million-gallon storage tank, which is fed by springwater, provides fire protection; using water from this tank (about a 4-days' supply) would have increased the Fort's vulnerability to fire without appreciably increasing near-term water supplies in time of drought. The Fort also has a 300,000-gallon storage tank (about a 1-day's supply). This tank is used to pressurize the system, and the wells are used, as needed, to keep the tank topped off. According to Fort officials, the entire system would suffer pressurization problems if the water level in this tank were appreciably decreased.

22. Highfield sought to interconnect its system to the Army's well #4. This well was not "tapping the aquifer more aggressively than the Highfield well could." The Fort's records show that well #4 was pumped at a lesser rate and volume than were reported for the Highfield well. During 1977, the Army's well #4 was pumped for only 18 days during October at an average rate of 42,500 gpd. Between January and October 1, 1978, the well was pumped for 18 days at an average rate of 44,600 gpd. The Highfield well was pumped continuously during 1977 and 1978 at an average rate of about 50,000 gpd.

23. We found no evidence in Fort Ritchie's or the Maryland PSC's files, and Highfield has submitted no documentation, to support Highfield's contention that Fort Ritchie's actions or inactions precipitated the Maryland PSC's revocation of the company's right to exercise its water franchise authority. The PSC's action on September 12, 1978, preceded the Fort's denial of Highfield's request for additional water supply commitments. See comments 10 and 13.

24. The statements by Highfield that its property was taken without just compensation and that the litigation settlement included payment for its legal expenses only, not for its property (pp. 34 and 45), are incorrect. Our statement in the report that Highfield settled its claims against the state, local state agencies, and certain individuals for \$400,000 and transferred its property to the Washington County Sanitation District is correct. The Washington County Sanitary District had filed a petition for condemnation against Highfield. According to the deed signed by Highfield's owner on July 19, 1984, \$400,000, was paid "in full and complete settlement of the subject matter of that condemnation, as well as [in] settlement of an action filed in the United States District Court . . ." The deed conveys to the District "all lands and easements . . . water mains, pumping stations, wells, and appurtenant equipment . . ." The deed was recorded and the property transferred on July 31, 1984.

25. None of the studies cited by Highfield are hydrologic studies. Rather, they refer to the Meiser and Earl analysis, which estimated a recharge rate of 307,000 gpd for the northern subdrainage area. See comments 1 and 3.

26. The information contained in pages 35 through 37 of Highfield's statement concerns the location of the water and the capacity of the aquifer that the Fort was using. Highfield contends that the Fort used up to 350,000 gpd from the same aquifer that Highfield was using to serve its customers. This contention is not accurate. The Fort drew an average of only about 45,000 gpd to 72,000 gpd from the northern subdrainage area where the Highfield well was located and drew the balance from the southern subdrainage area.

The Meiser and Earl analysis, upon which the Highfield assertions are based, did not consider that the Fort had access to water in the southern subdrainage area and assumes that the Fort withdrew all of its water from the northern subdrainage area. See comments 1 and 3.

27. Highfield did not fully disclose the facts from the Meiser and Earl analysis. Page IV-11 said that wells #4 through #8 were used "in combination with three other wells within Fort Ritchie to supply the base demand of 200,000-300,000 gpd." Mr. Barnes, the Fort's sanitation supervisor, is also cited in the report as having said that the two springs contribute significantly to the Fort's water supply during wet seasons.

28. Highfield was not entitled to the use of all of the water within the boundaries of its franchise. All landowners in Maryland, including Fort Ritchie, are entitled to reasonable use of the groundwater beneath their lands. Highfield's franchise to distribute water conferred no right of ownership or exclusive use of the groundwater in the franchise area.

29. Highfield was not damaged by Fort Ritchie's water usage (see comment 1). According to the Maryland Deputy Director of Natural Resources (1) there is no Maryland law or regulation to require that surface water be used in lieu of groundwater and (2) the state would probably not attempt to force Fort Ritchie to reduce its groundwater consumption, particularly if a water shortage was not the result of a significant increase in the Fort's historical pumping levels.

The statements about the Fort's surface water system capacity and use are incorrect. See comment 21.

30. Highfield's "low water supply" deficiencies cited by the Maryland PSC referred to the company's inadequate pumping and storage capability, not to a lack of water in the aquifer.

31. Fort Ritchie sold water to Highfield during 7 of the 9 months that the company was in business in 1978 (there were no sales in May or September). We found no evidence in Fort Ritchie's or in the Maryland PSC's files, and Highfield gave us no evidence, to show that it had requested and been denied water by the Fort in May or September 1978. See comments 10, 12, and 13.

32. In support of the assertion that Fort Ritchie should have obtained a water appropriation permit, Highfield claims that "permits were filed for Fort Detrich [sic] and Fort Meade." However, federal agencies are not subject to state regulatory requirements unless federal sovereign immunity is specifically waived, and Fort Ritchie did not waive its immunity in this case. The sovereign immunity of the United States was waived when officials at Fort Meade obtained a Maryland water appropriation permit in 1969. Fort Detrick, however, did not have a permit in the 1970s (but did obtain one in 1988). As of March 1993, there were 39 files at the Maryland Department of Natural Resources pertaining to water appropriation permits for federal installations (some installations have more than one permit file). Of these files, 24 showed that an active permit was in effect, 8 showed that permits were inactive (lapsed), and 7 showed that permits had never been granted.

33. Highfield gave us a copy of the 1981 study by Rummel, Klepper, and Kahl in January 1992. We discussed this information with Highfield officials in March 1992.

34. The Baker-Wibberly report is not a hydrologic analysis. This report cited and discussed conclusions from the Meiser and Earl analysis, which (1) overstated the volume of groundwater withdrawn by Fort Ritchie from the northern subdrainage area—since the analysis assumed that the Fort withdrew all of its water from this area—and (2) understated the volume of water available to Fort Ritchie—since the analysis did not consider the recharge from the 1,243-acre southern subdrainage area. See comments 1 and 3.

35. A 1977 report by Highfield's consultant and conclusions in the Maryland PSC's 1978 order to revoke Highfield's franchise authority cast

**Appendix V
Comments From the Highfield Water
Company**

serious doubts on the company's ability to obtain revenue (from 320 customers) and loans for major capital investment.

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