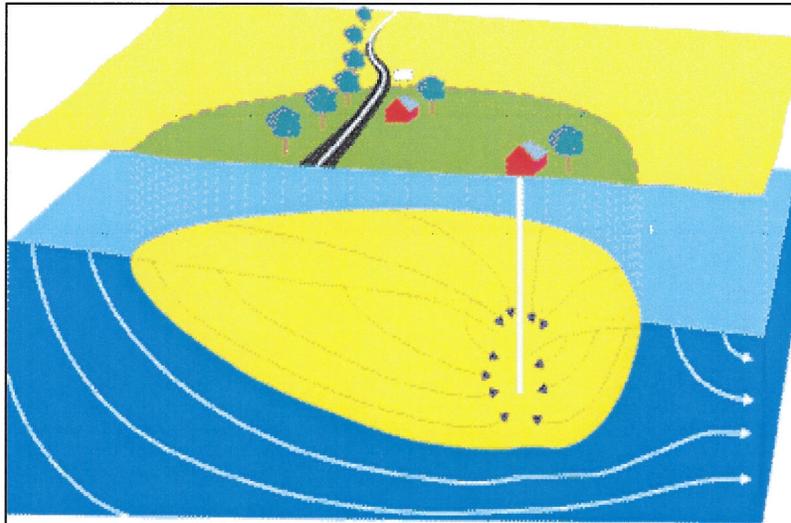


SOURCE WATER ASSESSMENT
FOR THE SOD RUN WASTEWATER TREATMENT PLANT
HARFORD COUNTY, MD



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October 2005



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SUMMARY

The Maryland Department of the Environment's Water Supply Program (WSP) has conducted an assessment of the vulnerability of the Sod Run Waste Water Treatment Plant ground water sources to contamination. The required components of this report as described in Maryland's Source Water Assessment Plan (SWAP) are: 1) delineation of an area that contributes water to the sources, 2) identification of potential sources of contamination, and 3) determination of the susceptibility of the water supply to contamination. Recommendations for protecting the drinking water supply conclude this report.

The Sod Run Waste Water Treatment Plant (Sod Run) obtains its water supply from unconsolidated Coastal Plain sediments known as the Potomac Group aquifer. Well log information shows clay deposits between the land surface and the aquifer supplying the production wells. As these layers are not believed to be contiguous over a large area, this assessment analyzed the susceptibility of the water supply as if it were an unconfined aquifer. Unconfined aquifers are generally vulnerable to any activity on the land surface that occurs within the wellhead protection area (WHPA). The system currently uses 2 wells to obtain potable and process water for the plant. The WHPA zones were delineated using U.S. EPA approved methods specifically designed for each source.

Potential sources of contamination within the assessment area were identified based on site visits, database reviews and land use maps. Well information and water quality data were also reviewed. Figures showing land use, sewerage coverage, and potential contaminant sources within the wellhead protection areas, and an aerial photograph of the well locations are enclosed at the end of the report.

The susceptibility analysis for the Sod Run Waste Water Treatment Plant water supply is based on a review of the water quality data, potential sources of contamination, aquifer characteristics, and well integrity. It was determined that the Sod Run wells are not susceptible to volatile organic compounds, synthetic organic compounds, regulated inorganic compounds including nitrate, microbiological pathogens, and radon-222. The susceptibility to other radionuclides could not be determined due to the absence of sampling data for this system. It must be noted, however, that nontransient noncommunity water systems are currently not regulated for radionuclides.

INTRODUCTION

Sod Run Waste Water Treatment Plant is located about 3.2 miles southwest of Perryman in Harford County. Its property borders the Aberdeen Proving Ground (APG) Military Base to the east and south, and Sod Run and Bush River to the west (Figure 1). The plant regularly serves 35 employees through one water connection. State regulations designate this type of facility as a nontransient noncommunity water system, which is defined as a public water system that regularly serves at least 25 of the same individuals over 6 months per year. The plant is owned and operated by the Harford County Department of Public Works. The water is supplied by two production wells pumped to one water treatment plant. The wells are primarily used for process water at the wastewater plant. The water used by the 35 employees for potable and sanitary purposes is estimated to be less than 1,000 gpd, and is therefore a “small” quantity with respect to the overall appropriation permit limits for this system. The plant and well locations are shown on Figure 1 and in Appendix A.

WELL INFORMATION

Well information was obtained from the Water Supply Program’s database, site visits, well completion reports, sanitary survey inspection reports and published reports. A review of well data and sanitary surveys of the Sod Run Waste Water Treatment Plant water system indicates that Well 2 meets current well construction standards for grouting and casing. Well 1 was drilled prior to 1973 when regulations went into effect, and may not meet current standards. As shown in Appendix A, Well 2 is located outside of the water treatment building, and is protected from vehicular collisions by two bollards and a moveable lighted road sign. Its casing extends to about 2.5 feet above ground surface. Well 1 is located inside the water treatment building and its casing extends only to about 0.5 feet above grade. Wells with casings that terminate near or below grade may be prone to flooding, which exposes the water supply to a variety of contaminants in storm water runoff. Since the well is located inside the treatment building, it should be protected from storm water runoff. However, it may be prone to contamination from chemical spills that occur inside the plant. According to Plant Assistant Superintendent Mr. Douglas Geiger, there are no other wells on the property. Table 1 is a summary of the well construction data.

PLANT ID	SOURCE NAME	WELL PERMIT NO.	TOTAL DEPTH (ft.)	CASING DEPTH (ft.)	YEAR DRILLED	AQUIFER
01	WELL 1	HA680131	118	103	1967	POTOMAC GROUP
	WELL 2	HA814574	135	120	1988	

Table 1. Sod Run Waste Water Treatment Plant Well Construction Information

Water Appropriation Permit No. HA1968G002 allows the system to use an average of 21,000 gallons per day (gpd) and 31,500 gpd in the month of maximum use. Based on reported pumpage data from 1994-2004, the average and maximum water useage reported at the plant exceeded the total allocation limits granted from the water appropriation permit in 1994, 2000, 2003, and 2004. According to Douglas Geiger, Well 1 is the primary well and is pumped between 35-40 gallons per minute (gpm). Secondary Well 2 is lower yielding, and is pumped at about 20 gpm. The plant now uses between 25,000 gpd to 35,000 gpd mainly for process water on a continuous basis. The permit is currently up for renewal, and will be re-evaluated based on this updated information.

HYDROGEOLOGY

The Sod Run Waste Water Treatment Plant Wells draw water from the Potomac Group, which consists of unconsolidated sediments of the Atlantic Coastal Plain Physiographic Province. The Potomac Group is of Cretaceous age and functions as an unconfined to semi-confined aquifer in this area. It consists of highly variable, inter-bedded, light-colored sand, variegated silty clay, and very gravelly sand (Drummond & Johnston, 1997).

The lithology of the Coastal Plain sediments in Harford County is extremely variable and aquifer boundaries do not coincide with formation boundaries. Hence, in a Maryland Geological Survey (MGS) study of the Coastal Plain aquifers of Harford County, the Coastal Plain sedimentary sequence was divided into four aquifers and three confining units (Drummond & Blomquist, 1993). From the shallowest to the deepest, the aquifers were designated numbers 1, 2, 3 and 4, and are separated by confining units 1, 2 and 3. Based on their depths and locations, the Sod Run Waste Water Treatment Wells are screened in Aquifer 2.

The thickness of Aquifer 2 ranges from 0 to about 175 feet. The transmissivity of this aquifer at the Sod Run Plant is estimated to be 2,000 ft²/day based on aquifer test data (Drummond & Johnston, 1997). Storativity and porosity estimates are 0.0002, and 0.30 respectively (Drummond & Blomquist, 1993). The aquifer receives recharge mostly as leakage from the overlying shallow water table Aquifer 1, and to a lesser extent as leakage from Aquifer 3 below. Semi-confining Unit 1, overlying Aquifer 2, consists of silt and clay with some sand lenses. Based on well log data, the thickness of this unit at the Sod Run Waste Water Treatment Plant is approximately 46 feet.

SOURCE WATER ASSESSMENT AREA DELINEATION

For ground water systems, a Wellhead Protection Area (WHPA) is considered the source water assessment area for the system. According to Maryland's Source Water Assessment Plan document approved by EPA (MDE, 1999), systems using an average of greater than 10,000 gpd located in unconfined Coastal Plain aquifers are to be delineated using the EPA's WHPA Code ground water model. The pumpage

used for the delineations was 21,000 gpd or 2807 ft³/day. This amount is based on the daily average quantity from the current Water Appropriation and Use Permit. Adjustments to this delineation will be necessary if the system is granted an increase in their appropriation limits during the permit renewal process. Since the two wells are within about 15 feet of each other, the model was run for a single well pumping the entire average appropriation limit based on simulation times of one and ten years. As shown in Appendix B, the values used for transmissivity, porosity, flow direction, and gradient in the WHPA Code model were obtained from the ground water flow model study of the Perryman Well Field completed by MGS (Drummond & Johnston, 1997).

Delineation Zones (see Appendix B and Figures)

Zone 1: Zone 1 is the WHPA delineated using a 1-year time-of travel (TOT) criterion. Zone 1 serves as the first zone of protection. The one-year criterion was based on the maximum survival times of microbial organisms in ground water. The resulting capture zone is oval-shaped and has an area of 2.5 acres.

Zone 2: Zone 2 is the WHPA delineated using a 10-year TOT criterion. It would take any contaminant present at the Zone 2 boundary 10 years to reach the well (if it moves at the same rate as the ground water), using the permitted quantity. Zone 2 provides adequate time for facilities outside the WHPA to address chemical contamination before it reaches the wells. The resulting capture zone for both wells is a larger oval-shaped WHPA. The total area of Zone 2 is 16.2 acres.

As is reflected in the MGS study, the WHPA Zones indicate a general ground water flow direction toward the southwest and Bush River (Figures 1 & 2).

POTENTIAL SOURCES OF CONTAMINATION

Potential sources of contamination are classified as either point or non-point sources. Examples of point sources of contamination are leaking underground storage tanks, controlled hazardous substance generators, discharge permit sites, and known ground water contamination sites. These sites are generally associated with commercial, or industrial facilities that use or store chemical substances that may, if inappropriately handled, contaminate ground water via a discrete point location. Non-point sources of contamination are associated with certain types of land use practices such as the use of pesticides, application of fertilizers, animal wastes, or septic systems that may lead to ground water contamination over a larger area.

The WSP met with Sod Run Waste Water Treatment Plant Assistant Superintendent, Douglas Geiger, on July 13, 2005 to discuss water quality concerns, and to observe the integrity of the wells. Also, data was collected regarding the locations of the wells using Global Positioning System (GPS) equipment, and a windshield survey was conducted to locate and map potential sources of contamination located within and near the WHPA zones using the GPS.

Point Sources

A review of MDE contaminant databases as well as the field surveys revealed some potential point sources of contamination within or near the Sod Run Waste Water Treatment Plant WHPA. The Sod Run Wastewater Treatment Plant receives, stores, and treats millions of gallons of wastewater every day. The storage and transmission of wastewater in tanks and pipes represent a potential source of ground water contamination. Past, present, or future activities on the Aberdeen Proving Ground military base in the WHPA zones may also present a risk of ground water contamination (Figure 2). Another facility not in the WHPA, but potentially upgradient of Sod Run's water supply is the Power Plant on Chelsea Road (Figure 2). Table 2 lists the facilities identified and their potential types of contaminants. The contaminants are based on generalized categories and often the potential contaminant depends on the specific chemicals and processes being used or which had been used at the facility. The potential contaminants are not limited to those listed. Potential contaminants are grouped as Volatile Organic Compounds (VOC), Synthetic Organic Compounds (SOC), Inorganic Compounds (IOC) namely perchlorate from APG, Metals (M), Heavy Metals (HM), Nitrate/Nitrite (NN), and Microbiological Pathogens (MP).

ID	Type¹	Site Name	Address	Potential Contaminant¹
1	SWDP, MISC	Sod Run Waste Water Treatment Plant	1212 Chelsea Rd.	MP, NN, VOC, SOC, M
2	SWDP, MISC	Aberdeen Proving Ground	Swale to Sod Run near Palmer Rd.	VOC, SOC, IOC, HM, M
3	MISC	BGE Power Plant/Constellation Energy	900 Chelsea Rd.	HM, M

Table 2. Potential Contaminant Point Sources within or near the Sod Run W.W.T.P. Wellhead Protection Area (see Figure 2 for locations)

¹ SWDP = surface water discharge permit sites, MISC = miscellaneous sites

VOC = volatile organic compounds, SOC = synthetic organic compounds, IOC = inorganic compounds

NN = nitrate/nitrite, MP = microbiological pathogens, M = metals, HM = heavy metals

Inspections of facilities located within and near the WHPA zones have been completed by MDE staff to determine the potential of any unpermitted ground water discharges (e.g. open floor drains) to the Coastal Plain aquifers. No violations within the WHPA have been reported. The reader may contact the MDE Ground Water Permits Program for details regarding these inspections.

Spills during the transportation of chemical products on Chelsea Road are also a potential source of contaminants that could reach the water supply (Figures 1 & 2). The application of de-icing chemicals on this road during the winter months may also be a source of chlorides to the water supply. Weapons and munitions testing activities in the WHPA at the military base also pose a potential

contaminant risk to the water supply. However, we do not have any specific information regarding base activities occurring in the WHPA zones. According to Mr. Douglas Geiger, there are no underground storage tanks on the wastewater treatment plant property.

The reader may contact the specific programs within the MDE Waste and Water Management Administrations for additional information on any of the potential contaminant sites described in this report.

Non-Point Sources

The Maryland Department of Planning’s 2002 digital land use map for Harford County was used to determine the predominant types of land use in the Sod Run Waste Water Treatment Plant WHPA (Figure 3). The breakdown of land use types in each WHPA zone is shown on Tables 3a and 3b. Note that forestland, followed by commercial (i.e. the Sod Run plant, and APG), make-up all of the land uses in the WHPA zones.

LAND USE TYPE	TOTAL AREA (acres)	PERCENTAGE OF WHPA
Commercial	0.19	7.63
Forest	2.30	92.37
Total Area	2.49	100.00

Table 3a. Land Use in the Sod Run WWTP WHPA Zone 1 (See Figure 3)

LAND USE TYPE	TOTAL AREA (acres)	PERCENTAGE OF WHPA
Commercial	3.65	22.52
Forest	12.56	77.48
Total Area	16.21	100.00

Table 3b. Land Use in the Sod Run WWTP WHPA Zone 2 (See Figure 3)

Activities at the Sod Run Waste Water Treatment Plant could pose a potential risk of contamination to the water supply. Sewerage overflows at the plant could result in nitrate loading of ground water. Sod Run Waste Water Treatment Plant has a surface water permit to discharge 20 million gpd of treated wastewater to Bush River. The supply wells were determined not under the direct influence of surface water based on an evaluation of raw water sampling results. Therefore, these discharges should not impact the water quality of the ground water system. Storm water runoff from APG and the plant is also a concern since it may contain various contaminants that could infiltrate into the ground near the supply wells.

The Maryland Department of Planning’s 2003 Harford County Sewerage coverage map indicates that most of the WHPA is not planned for service as shown on Tables 4a and 4b. These areas are primarily forestlands on APG

property (Figures 3 and 4). A small portion of the WHPA Zone 1 includes the Sod Run facility, which is served by its wastewater treatment plant. Our review found no evidence of discharge of on-site wastewater to the ground within the wellhead protection area.

SEWER SERVICE AREA CATEGORIES	TOTAL AREA (acres)	PERCENTAGE OF WHPA
No Planned Service Area	1.52	61.04
Existing Service Area	0.97	38.96
Total Area	2.49	100.00

Table 4a. Sewerage Coverage in the Sod Run WWTP WHPA Zone 1 (see Figure 4)

SEWER SERVICE AREA CATEGORIES	TOTAL AREA (acres)	PERCENTAGE OF WHPA
No Planned Service Area	16.21	100.00
Total Area	16.21	100.00

Table 4b. Sewerage Coverage in the Sod Run WWTP WHPA Zone 2 (see Figure 4)

WATER QUALITY DATA

Water Quality data was reviewed from the Water Supply Program's database and system files for Safe Drinking Water Act contaminants. The State's SWAP defines a threshold for reporting water quality data as 50% of the Maximum Contaminant Level (MCL). If a monitoring result is at or greater than 50% of a MCL, this assessment will describe the sources of such a contaminant and, if possible, locate the specific sources which are the cause of the elevated contaminant level. All data reported is from the finished (treated) water unless otherwise noted. The raw ground water from the wells is treated at the water treatment plant with sodium hypochlorite for disinfection, and caustic soda for corrosion control prior to distribution.

A review of the monitoring data since 1993 indicates that the Sod Run Waste Water Treatment Plant water supply meets the current drinking water standards. Table 5 shows the number of samples collected for each class of contaminant, and the number of samples where a contaminant was greater than 50% of an MCL.

PLANT ID	Nitrate		SOCs		VOCs		IOCs (except nitrate)		Radionuclides	
	No. of Samples	No. of samples > 50% MCL	No. of Samples	No. of samples > 50% MCL	No. of Samples	No. of samples > 50% MCL	No. of Samples	No. of samples > 50% MCL	No. of Samples	No. of samples > 50% MCL
01	19	0	4	0	7	0	7	1	1	0*

Table 5. Summary of Water Quality Samples for the Sod Run W.W.T.P. Water Supply

* Based on lower proposed MCL for radon-222

Inorganic Compounds (IOCs)

The only IOC detected above 50% of its MCL threshold is thallium. This IOC was detected above its MCL of 0.002 parts per million (ppm) in one sample taken on 5/14/01 as shown on Table 6. Subsequent sampling on 8/4/04 showed no thallium detections. It was also not detected previously in 3 sets of sampling data collected in 1995 and 1998. Nitrate levels are well below levels of concern in all of the samples collected since 1993. The MCL for nitrate is 10 ppm. The average nitrate level since 1993 for this system is 1.5 ppm. No other regulated IOCs were detected at levels of concern from available sampling data.

PLANT ID	CONTAMINANT	MCL (ppm)	SAMPLE DATE	RESULT (ppm)
01	THALLIUM	0.002	14-May-01	0.004

Table 6. IOC Detects above 50% of the MCL in the Sod Run W.W.T.P. Water Supply

Note: Results in bold are above the MCL

Volatile Organic Compounds (VOCs)

The only VOC detected from 7 sets of available sampling data was the disinfection by-products known as trihalomethanes (THMs). Disinfection byproducts were detected at the plant from two sets of sampling data at low levels in 1998, and again in 2001. The sum total of the four trihalomethanes (TTHM) detected was 34.1 parts per billion (ppb) in April 1998, and 1.1 ppb in May 2001. The specific compounds detected were bromodichloromethane, and chloroform. For regulated systems, the current MCL for TTHMs is 80 ppb. Disinfection byproducts are the result of a reaction between chlorine used for disinfection and organic material in the water supply. No THMS were detected from the latest round of sampling results in August 2004, and from four previous data sets between 1991 and 1997.

Synthetic Organic Compounds (SOCs)

Di(2-ethylhexyl) phthalate was the only SOC detected from 4 sets of available sampling data for this system since 1995. It was detected in 2001 at 2.5 ppb, and again in 2003 at 0.8 ppb, both well below its MCL of 6 ppb. Phthalate was also detected in the laboratory blank samples for these data sets and therefore the results are not interpreted to represent actual water quality.

Radionuclides

The only water sample submitted for laboratory analysis of radionuclides for this system is for radon-222. It was detected at 45 picocuries per liter (pCi/L) from a single set of sampling data collected on 5/20/97. At present, there is no MCL for radon-222, however EPA has proposed an MCL of 300 pCi/L or an alternate MCL of 4000 pCi/L for community water systems if the State has a program to address the more significant risk from radon in indoor air.

Microbiological Contaminants

Raw water samples were collected and tested for bacteria from both wells to determine whether the sources are ground water under the influence of surface water (GWUDI). The wells were initially classified as moderate risk to surface water influence. The protocol for moderate risk GWUDI sampling requires one raw water sample to be collected as soon as possible after a minimum of 0.5 inches of rainfall in 24 hours has occurred. As shown on Table 7, the test results for each well were negative for the presence of total and fecal coliform bacteria.

SOURCE NAME	RAIN DATE	RAIN AMOUNT (inches)	REMARK	SAMPLE DATE	TEMP. (°C)	PH	TURBIDITY (NTU)	TOTAL COLIFORM (col/100 ml)	FECAL COLIFORM (col/100 ml)
WELL 1	17-Nov-02	0.8	WET	18-Nov-02	13	5.4	0.25	-1.1	-1.1
WELL 2					14	5.4	0.71	-1.1	-1.1

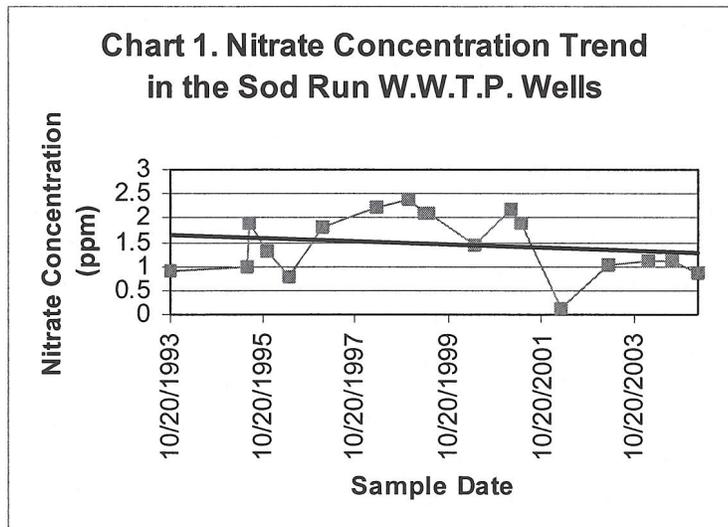
Table 7. Raw Water GWUDI Test Results for the Sod Run W.W.T.P. Supply Wells

SUSCEPTIBILITY ANALYSIS

The Sod Run Waste Water Treatment Plant wells obtain water from an unconfined Coastal Plain aquifer. Based on available well log information, there are overlying clay layers that may be considered semi-confining units thereby providing natural barriers for contamination at the surface from reaching the underlying aquifer used by this system. However, these layers are not considered fully confining as some surficial water movement is expected through them by leakage. Therefore, the Potomac Group aquifer used by the Sod Run Waste Water Treatment Plant is considered unconfined for conservative purposes in this report. Wells in unconfined aquifers are generally vulnerable to any activity on the land surface that occurs within the WHPA zones. Therefore, managing these zones to minimize the risk to the aquifer and continued routine monitoring of contaminants is essential in assuring a safe drinking water supply. The susceptibility of the wells to contamination is determined for each group of contaminants based on the following criteria: (1) available water quality data, (2) presence of potential contaminant sources in the WHPA, (3) aquifer characteristics, (4) well integrity, and (5) the likelihood of change to the natural conditions.

Inorganic Compounds (IOCs)

Nitrate is not present in the ground water supply at levels above 50% of its MCL of 10 ppm. Chart 1 shows the nitrate concentration trend over the past twelve years. The available data shows that nitrate levels have been consistently low, and the trend is decreasing slightly over time.



Nitrate concentrations in oxygenated ground water under land in natural settings are generally less than 0.3 ppm. The values measured at Sod Run indicate some influence of human activity, which has decreased over the past decade (Chart 1). A review of the land use within the WHPA indicates that the wastewater facility is a potential source of nitrogen to ground water. Possible sources include leaks in piping, and fertilizer applied to the ground for landscaping. Based on the sampling data history, nitrate has not been detected at levels of concern for this system, and therefore the potential sources at the plant do not appear to be adversely affecting the ground water aquifer. It is not known if any activity on the portion of the Proving Ground in the WHPA could affect nitrate levels.

The single thallium detection in 2001 above its MCL appears anomalous since this compound was not detected again from a subsequent data set, nor has it been detected in three previous rounds of sampling data. No known sources of thallium exist within or near the WHPA zones. Low levels of other inorganic constituents detected in the wells may likely represent the naturally occurring levels present in the aquifer from dissolving minerals in the unconsolidated sediments. Therefore, the water supply is **not** susceptible to regulated inorganic compounds including nitrate, based on available water quality data.

Volatile Organic Compounds (VOCs)

The only volatile organic compounds that were detected from seven sets of available sampling data since 1991 are the disinfection by-products known as trihalomethanes (THMs). THMs are the result of a reaction between chlorine used for disinfection and organic material in the water supply. The sum total of the four trihalomethanes (TTHM) detected was 34.1 ppb in 1998, and 1.1 ppb in 2001. These levels are typical of levels measured at other ground water systems in Maryland. For regulated systems, the MCL for TTHMs is 80 ppb. No THMs were detected from the latest set of sampling results in August 2004.

Surveys were conducted by the Harford County Health Department in 1994 regarding ground water conditions in area wells located at or near the western boundaries of the Aberdeen Proving Ground. Data was collected and evaluated at selected wells to determine possible VOC threats from past and present base activities (HCHD, 1994). A review of this data indicates VOC detections at some of the selected wells. However, none of these wells are located remotely close to or within the Sod Run Wastewater Treatment Plant WHPA Zones. Therefore, it is unknown if there was any past or present activity on the portion of the Proving Ground in the WHPA which could be a potential VOC threat to the wells. Activities at the wastewater plant, APG, and the nearby power plant are all potential point sources of VOCs as shown on Table 2. However, these sources do not appear to have any impact on the wells based on the seven sets of available water quality data for this system. Therefore, the Sod Run Waste Water Treatment Plant ground water supply is **not** susceptible to VOCs.

Synthetic Organic Compounds (SOCs)

The current land use indicates that there are no potential point sources of SOC's (e.g. pesticide storage, PCB storage) located within the WHPA zones. Di(2-ethylhexyl) phthalate was detected in two monitoring events. Both times, the levels were well below the MCL of 6 ppb. The low-level phthalate detects were also detected in the laboratory blanks and therefore are not believed to represent actual water quality. If the usage of synthetic organic compounds is occurring in the WHPA zones on APG or Sod Run, these sources do not appear to have any impact on the wells as indicated by the available water quality data. Based on this analysis, the ground water supply at Sod Run Waste Water Treatment Plant is **not** susceptible to SOC contamination.

Radionuclides

There is currently no MCL for radon-222, however EPA has proposed an MCL of 300 pCi/L or an alternative of 4000 pCi/L if the State has a program to address the more significant risk from radon in indoor air. The lone sample result for radon-222 taken in May 1997 was at 45 pCi/L, well below the more conservative proposed MCL. The source of radon and other radiological contaminants in ground water can be traced back to the natural occurrence of uranium in rocks. Radon may be present in unconsolidated Coastal Plain sediments due to the radioactive decay of uranium bearing minerals in aquifer material.

No water samples have been submitted for laboratory analysis of other radionuclides at the Sod Run Waste Water Treatment Plant. Nontransient noncommunity water systems are currently not regulated for radionuclides. However, samples collected at the nearby Perryman Well Field also withdrawing from the Potomac Group sediments have reported gross alpha, gross beta, and radium at concentrations below their respective MCLs in this aquifer. Based on the single sampling result for radon-222, the system is **not** susceptible to this contaminant. The susceptibility to other radionuclides cannot be determined

for this system to date due to the lack of available sampling data.

Microbiological Contaminants

Based on raw water bacteriological data (Table 7) the Sod Run Plant supply wells were determined not to be under the direct influence of surface water. Hence the wells are **not** susceptible to any microbiological contaminant present at the surface including *Giardia and Cryptosporidium*.

MANAGEMENT OF THE WHPA

The following recommendations should be considered for the protection of the Sod Run Waste Water Treatment Plant water supply:

Public Awareness and Outreach

- Since most of the WHPA lies within APG property, MDE recommends the implementation of an awareness program with the army base to minimize contamination occurrences within the WHPA zones.
- Results of this assessment should be made available to all employees of this facility if requested.
- Being aware of the sensitivity of ground water to land use practices will assist employees and others at the plant to use “common sense” practices with regard to the handling, placement and proper storage of chemicals, petroleum, wastewater, and other contaminants on facility grounds. Common sense practices can go a long way in protecting ground water from contamination.

Planning/New Development

- The preservation of the existing forested recharge areas within the WHPA zones is an important step that can be taken to ensure the long-term safety of the ground water supply (see Tables 3a & 3b).
- The Harford County Department of Public Works should stay in contact with APG regarding current and future base activities, and any proposed construction within or near the WHPA zones to ensure that it will not have any adverse effects on water quality. Plans for new construction at the Sod Run plant should stress the importance of adequate protection of the ground water sources.

Monitoring

- Continue to monitor for all Safe Drinking Water Act contaminants as required by MDE.
- Perchlorate testing should be considered at the Sod Run Waste Water Treatment Plant since much of the recharge area for the wells is on APG Property. Perchlorate has been detected in some of the City of Aberdeen’s municipal wells, which are adjacent to a former APG training area.
- Annual raw water bacteriological testing of each well is a good check on well integrity.
- Periodic inspections and a regular maintenance program of the supply wells will ensure their integrity and protect the aquifer from contamination.

Changes in Use

- Any increase in pumpage or addition of new wells to the system will require revisions to the WHPA zones since they are affected by pumpage. The system is required to contact the Water Supply Program when an increase in pumpage is applied for and when new wells are being considered. The Water Appropriation and Use Permit is currently up for renewal, and will be re-evaluated based on updated information from the plant. After the permit is renewed, adjustments to the WHPA zones may be necessary at that time.

Contaminant Source Inventory/Well Inspection

- The Public Works Department should conduct its own detailed survey to ensure that there are no other potential sources of contamination within the WHPA zones. Updated records of new activities or construction at APG within these zones should be maintained.
- The Public Works Department should continue to have periodic inspections and a regular maintenance program of the supply wells to ensure their integrity and to protect the aquifer from contamination.

Contaminant Source Management

- Guidelines should be developed to assist plant personnel in the proper handling and storage of hazardous materials including petroleum products, landscaping, and de-icing practices with emphasis on protecting ground water quality.

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OTHER SOURCES OF DATA

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Public Water Supply Inspection Reports
MDE Water Supply Program Oracle® Database
MDE Waste Management Sites Database
MDE Environmental Permits Database
MD Department of Natural Resources 1998 Digital Orthophoto Quarter Quadrangles for Perryman SW & NW
USGS 7.5 Minute Series Topographic Map, Perryman Quadrangle
MD Office of Planning 2002 Harford County Digital Land Use Map
MD Office of Planning 2003 Harford County Digital Sewerage Coverage Map
ADC® Digital Maps for Harford County
MD State Highway Administration Roads Map

FIGURES

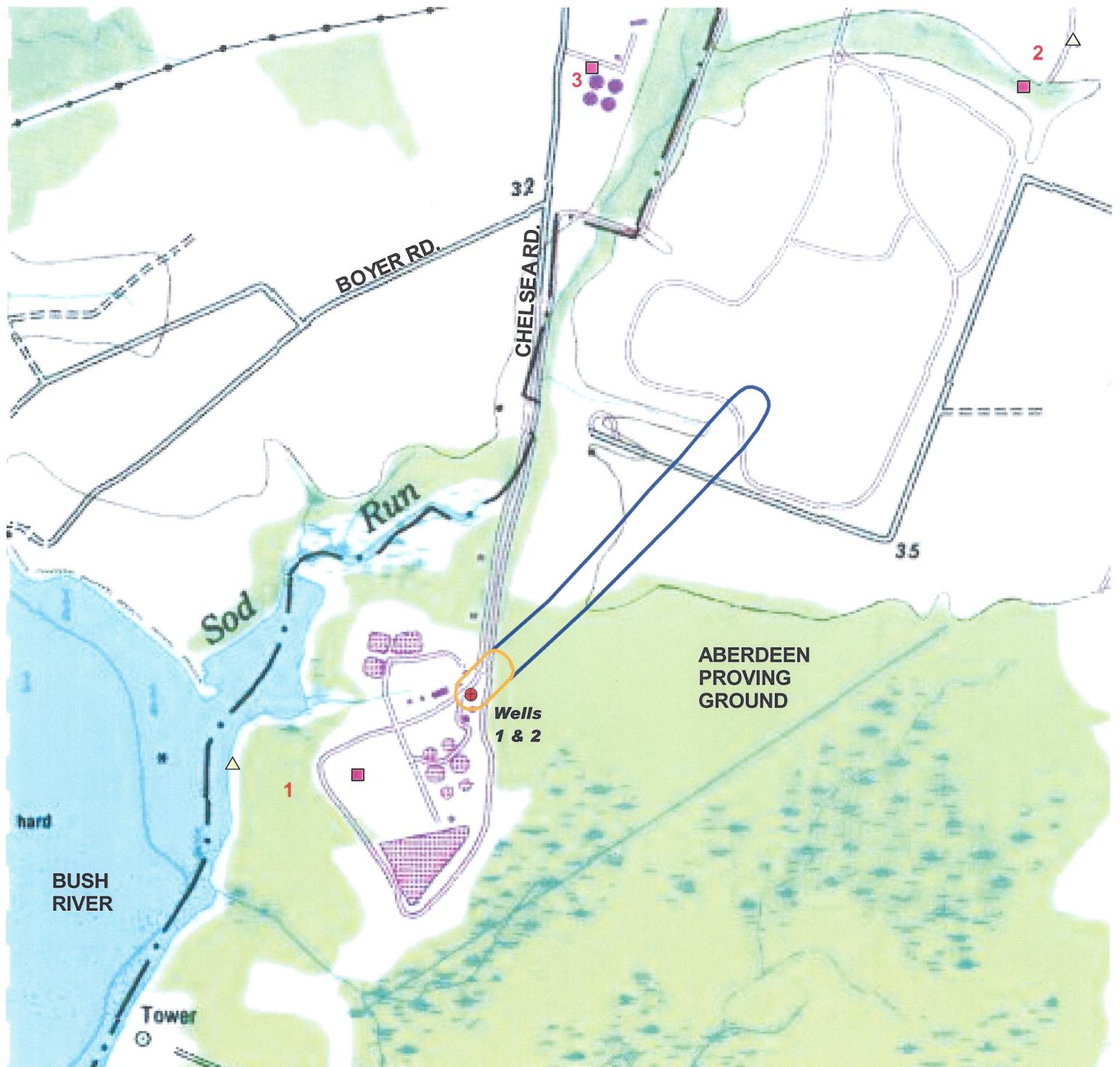
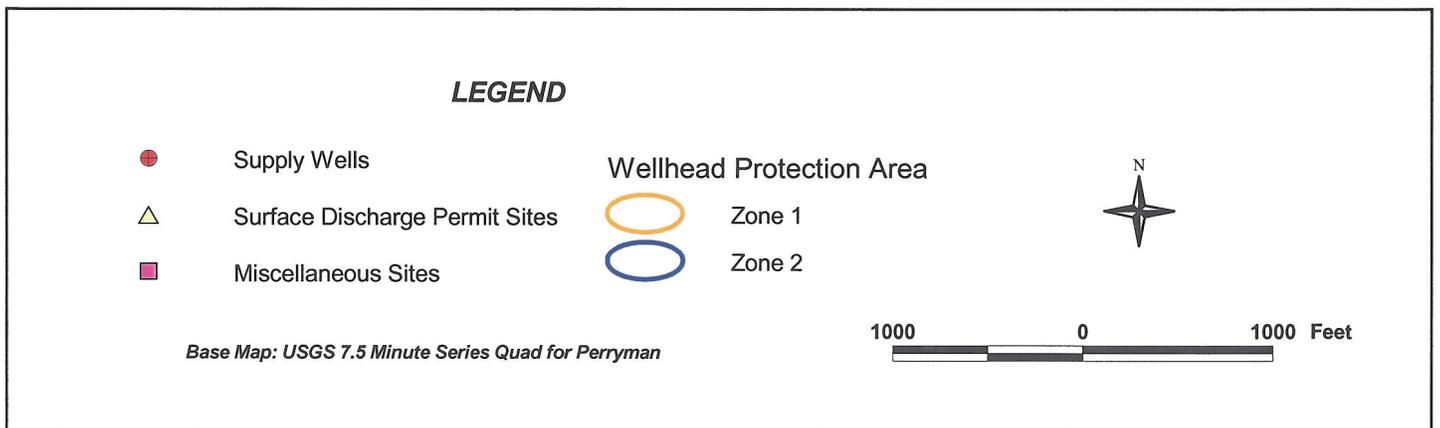


Figure 2. Sod Run W.W.T.P. Wellhead Protection Area with Potential Contaminant Sources



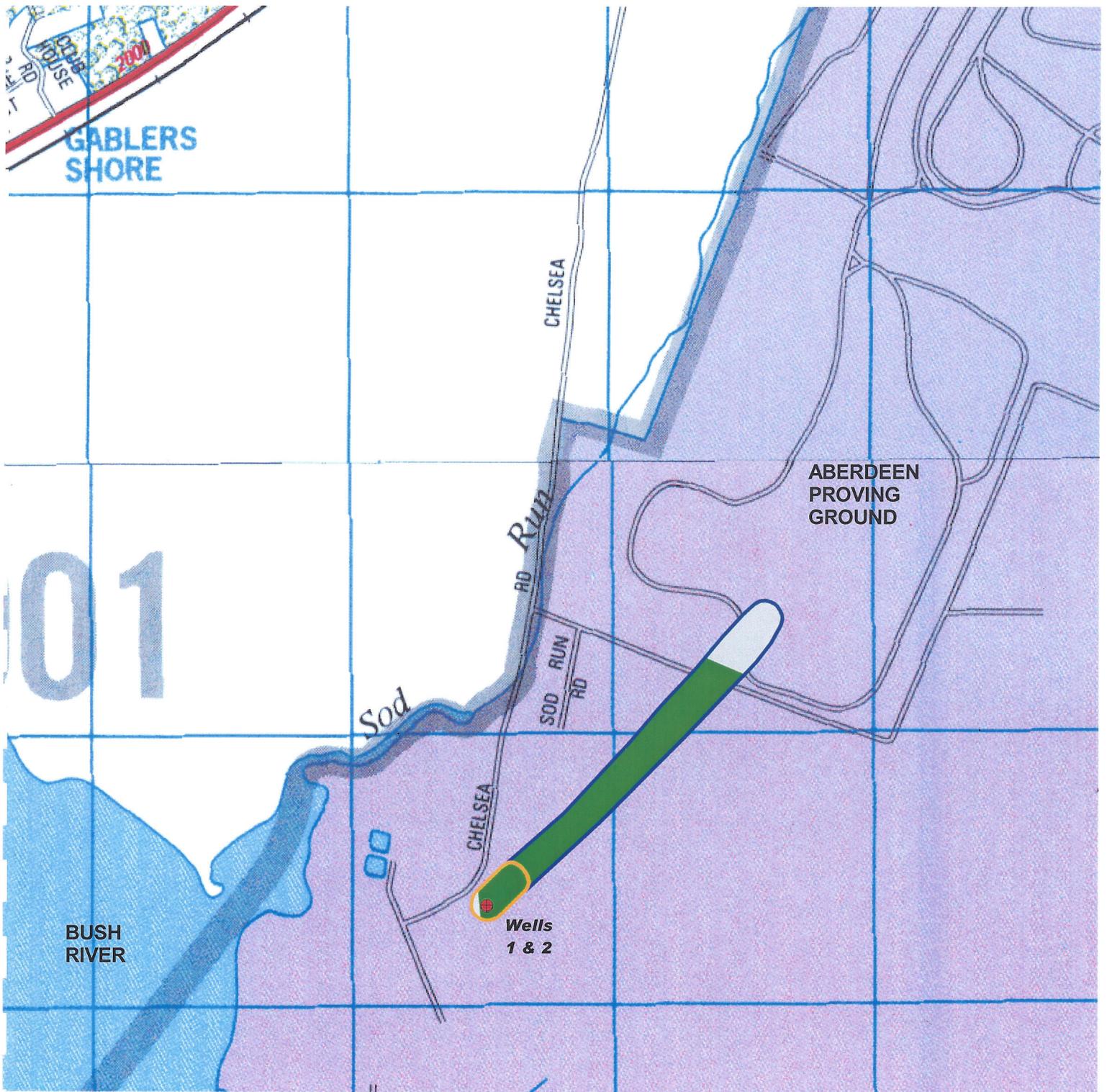
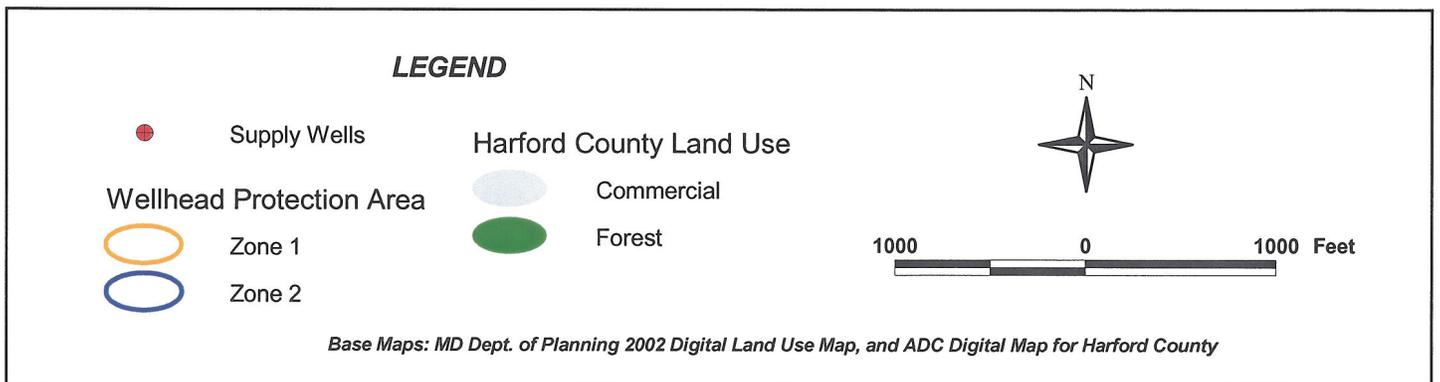


Figure 3. Land Use in the Sod Run W.W.T.P. Wellhead Protection Area



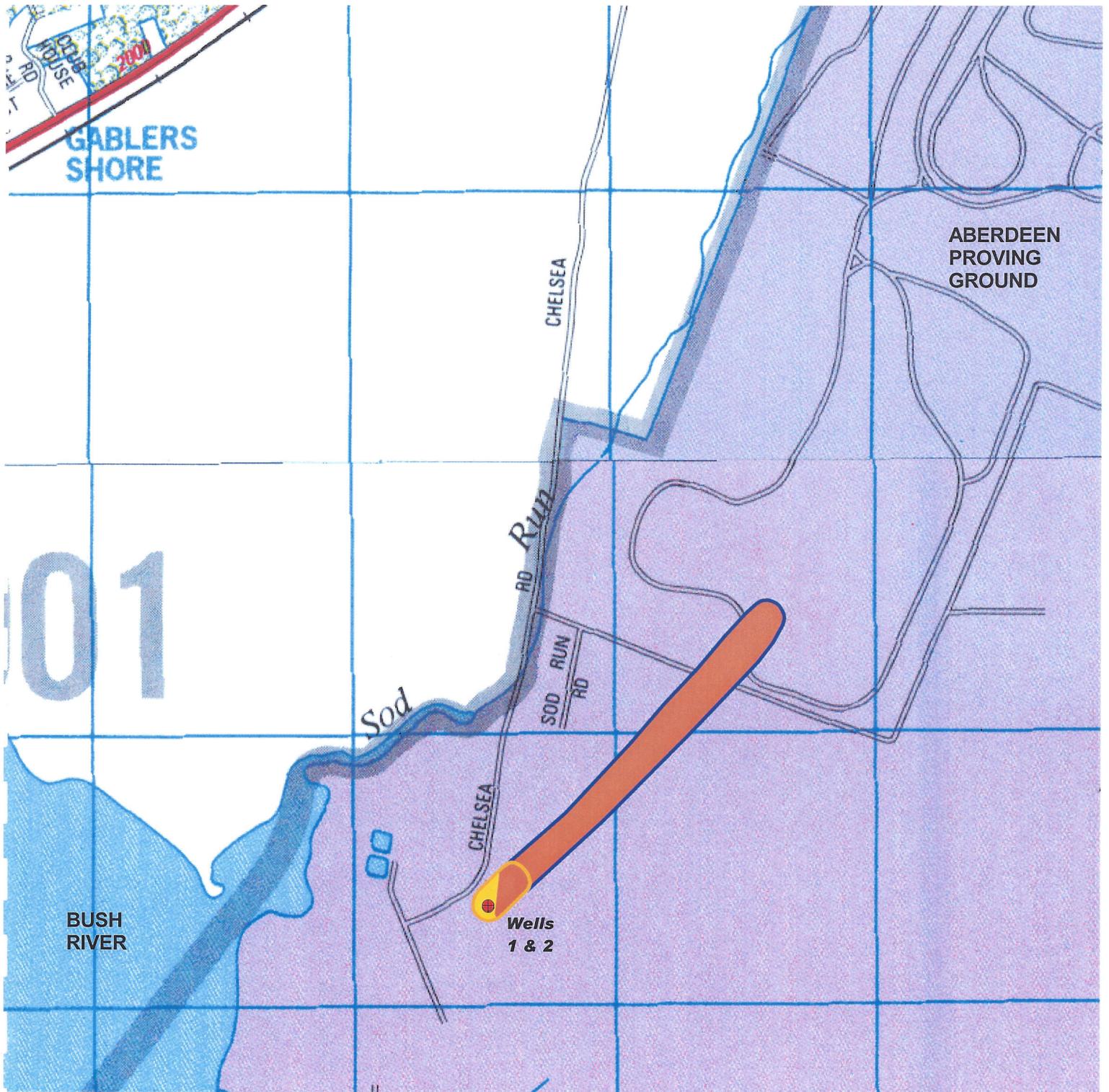
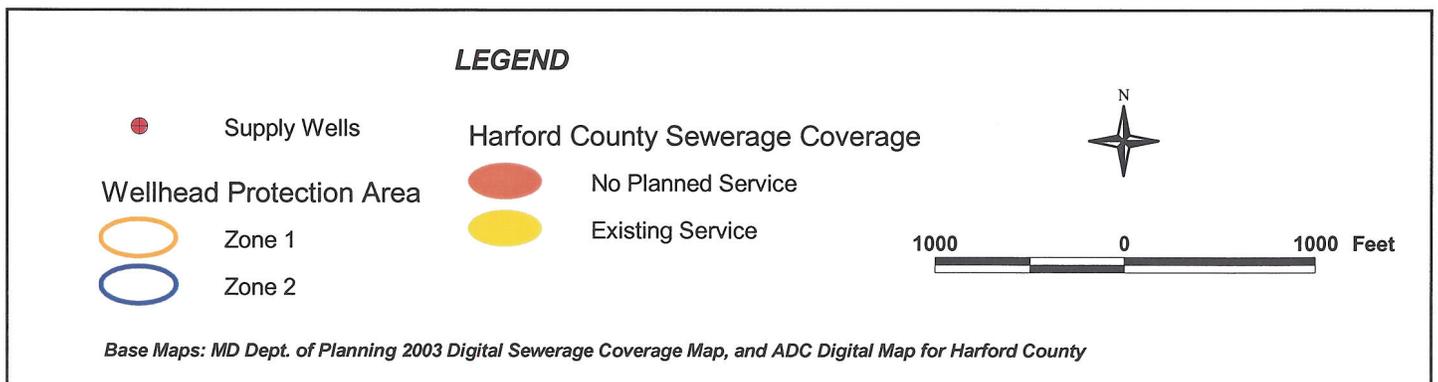
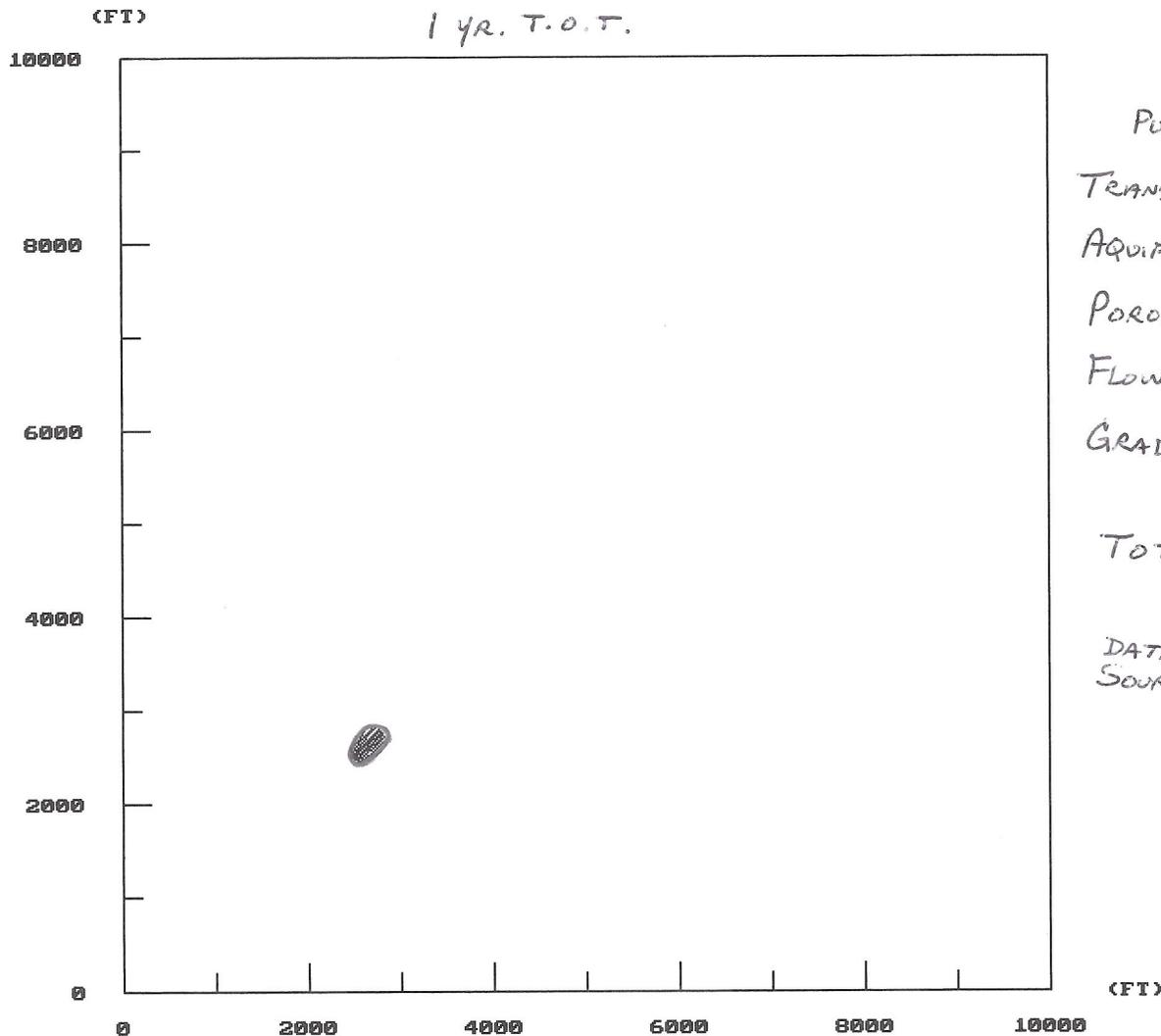


Figure 4. Sewer Service in the Sod Run W.W.T.P. Wellhead Protection Area



APPENDICES

APPENDIX B
EPA WHPA Code Model Input Parameters



INPUT PARAMETERS

PUMPAGE ---- 21,000 gpd = 2,807 ft³/day

TRANSMISSIVITY --- 2,000 ft²/day

AQUIFER THICKNESS --- 32 ft.

POROSITY ---- 0.30 (30%)

FLOW DIRECTION --- 225° (SW)

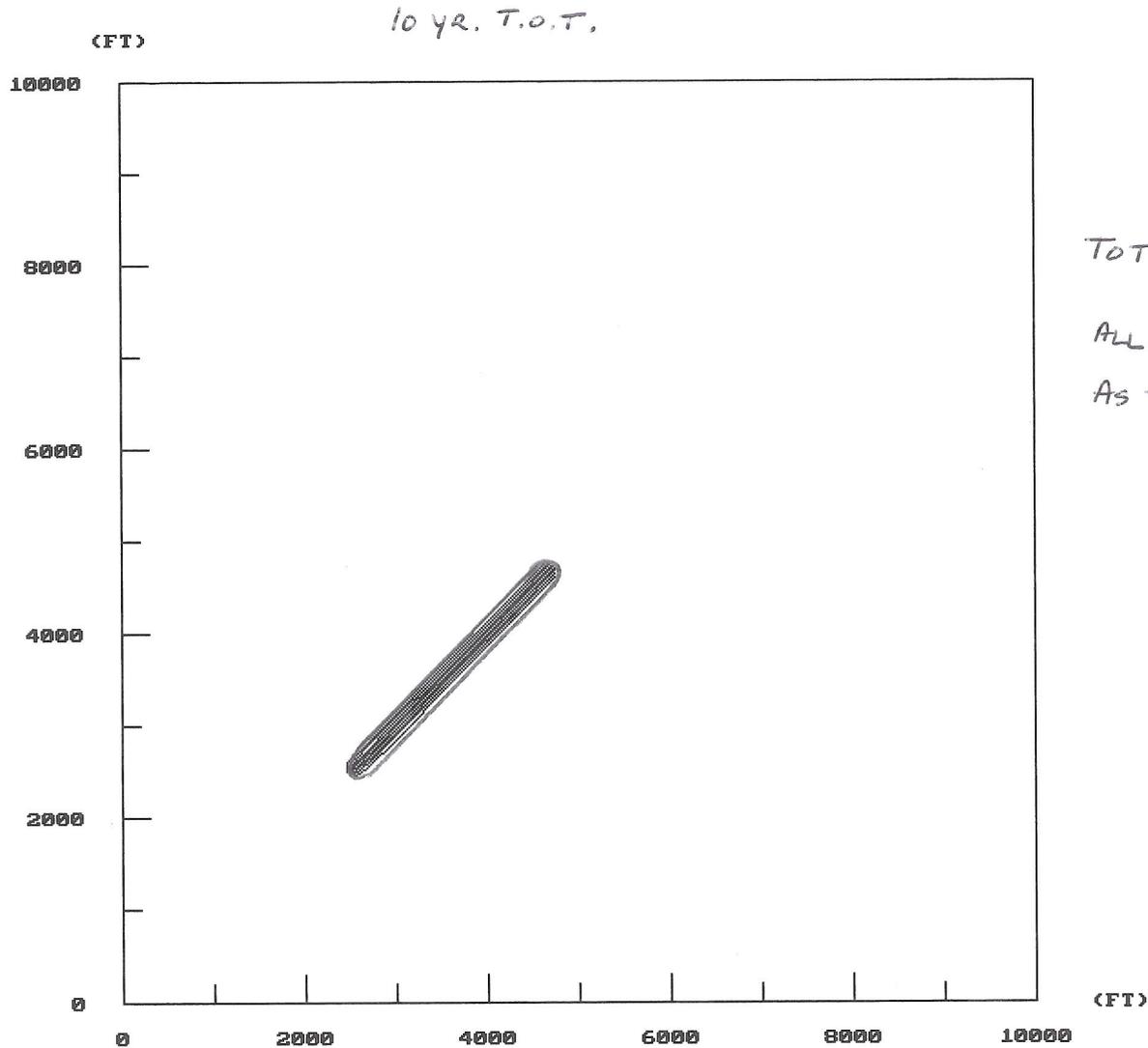
GRADIENT ---- $\frac{20'}{5000'} = 0.004$

TOT ---- 365 days

DATA

SOURCE: MGS R.I. 63 BY DRUMMOND &

JOHNSTON, 1997



INPUT PARAMETERS

TOT - - - - 3,650 days

ALL OTHER PARAMETERS ARE THE SAME
AS THE 1-YEAR WHPA.

APPENDIX C

Summary of Surface Discharge Permit Sites within or near the WHPA



General Information

Permit Type: **WMA2M** MAJOR SURFACE MUNICIPAL DISCH

App. #: **04DP1580** Permit #: **04DP1580**

Permit Category: **WASTEWATER TREATMNT PLANT**

App. Description: **20 MGD DESIGN FLOW**

NPDES #: **MD0056545** Project Manager: **CHAWLA** MAHENDRA

Date Received: **01/07/2004** Admin. Procedures Act Permit Revised: **01/07/2004**

Status Information

Permit Status: **ISSUED-RENEWAL** HB9 Refund Requested?

Date Status Changed: **08/27/2004** Complete Application: **01/16/2004**

Acknowledgement Sent: Acknowledgement Sent: **05/07/2005** Renewal Notice Sent: **05/16/2005**

Initial Projected Issuance: **05/07/2005** Total Processing Delay (Initial Issuance): **Rqst/Submt**

Revised Projected Issuance: **05/16/2005** Total Processing Delay (Rev Issuance): **Proc Delays**

Last Permit Issued: **09/01/2004** First Est. Tentative Determination: **06/07/2004**

Permit Expiration: **08/31/2009** Revised Est. Tentative Determination: **06/07/2004**

Prev Permit Expiration: **04/30/2004** Tentative Determination Complete: **06/07/2004**

- Application Info
- Contacts
- Public Participation
- Adjudication
- Watershed

- Permit Deta
- Billing/Pymn
- Cancel-Return
- Cancel
- Ok

PERMIT MAILED ON 8/25/04. RE-APPLICATION IS DUE BY 5/1/08. NEXT TD TARGET IS 7/1/06.

Facility:

3849

General Information

Permit Type: MAJOR SURFACE MUNICIPAL DISCH

App #:

Permit #:

Permit Category:

App. Description:

NPDES #:

Project Manager:

Date Received:

Admin. Procedures Act

Permit Revised:

Status Information

Permit Status:

HB9 Refund Requested?

Date Status Changed:

Complete Application:

Acknowledgement Sent:

Renewal Notice Sent:

Initial Projected Issuance:

Total Processing Delay (Initial Issuance):

Revised Projected Issuance:

Total Processing Delay (Rev Issuance):

Last Permit Issued:

First Est. Tentative Determination:

Permit Expiration:

Revised Est. Tentative Determination:

Prev Permit Expiration:

Tentative Determination Complete:

Application Info

Contacts

Public Participation

Adjudication

Watershi

Permit Deta

Billing/Pymt

Cancel-Return

Cancel

Ok

Facility: SOD RUN WWTP

3849



General Information

Permit Type: **WMA2M** MAJOR SURFACE MUNICIPAL DISCH

App. #: 92DP1580

Permit #: 92DP1580



Permit Category:

App. Description: MAJOR FACILITY



NPDES #:

Project Manager: CHAWLA

MAHENDRA

Date Received: 12/27/1996

Admin. Procedures Act

Permit Revised: 11/20/1996

Status Information

Permit Status: **X** HISTORY-NONSPEC



HB9 Refund Requested?

Date Status Changed: 12/27/1996

Complete Application:

Acknowledgement Sent:

Renewal Notice Sent:

Initial Projected Issuance:

Total Processing Delay (Initial Issuance): Rqst/Submt

Revised Projected Issuance:

Total Processing Delay (Rev Issuance): Proc Delays

Last Permit Issued: 07/01/1992

First Est. Tentative Determination:

Permit Expiration: 06/30/1997

Revised Est. Tentative Determination:

Prev Permit Expiration:

Tentative Determination Complete:



Permit Deta

Billing/Pymn

Cancel-Return

Cancel

Ok

Application Info

Contacts

Public Participation

Adjudication

Watershi

PERMIT AMENDED EFFECTIVE 4/10/1994

RE: TOXICITY REDUCTION STUDY



General Information

Permit Type: **WMA6SW** GENERAL INDUSTRIAL STORMWATER



App #: **02SW1727**

Permit #: **02SW1727**

Permit Category:

App. Description:

NPDES #:

Project Manager:

Date Received: **03/10/2003**

Admin. Procedures Act

Permit Revised: **2/17/2005**

Permit Deta

Billing/Pymn

Status Information

Permit Status: **IN** ISSUED-NEW



HB9 Refund Requested?

Date Status Changed: **05/08/2003**

Complete Application:

Acknowledgement Sent:

Renewal Notice Sent:

Initial Projected Issuance: **05/10/2003**

Total Processing Delay (Initial Issuance): **Rqst/Submt**

Revised Projected Issuance:

Total Processing Delay (Rev Issuance): **Proc Delays**

Last Permit Issued: **04/29/2003**

First Est. Tentative Determination:

Permit Expiration: **11/30/2007**

Revised Est. Tentative Determination:

Prev Permit Expiration:

Tentative Determination Complete:



Cancel-Return

Cancel

Ok

Application Info

Contacts

Public Participation

Adjudication

Watersh



General Information

Permit Type: **WMAT** SURFACE INDUSTRIAL DISCHARGE

App #: **06DP2517**

Permit #: **01DP2517A**



Permit Category:



App. Description:

NPDES #: **MD0003565**

Project Manager:

Date Received: **07/05/2005**

Admin. Procedures

Permit Revised: **07/07/2005**

Status Information

Permit Status: **PR** PENDING-RENEWAL



HB9 Refund Request

Date Status Changed: **07/07/2005**

Complete Application:

Acknowledgement Sent:

Renewal Notice Sent:

Initial Projected Issuance:

Total Processing Delay (Initial Issuance): **3qst/Subm**

Revised Projected Issuance:

Total Processing Delay (Rev Issuance): **2roc Delay**

Last Permit Issued:

First Est. Tentative Determination:

Permit Expiration:

Revised Est. Tentative Determination:

Prev Permit Expiration: **10/31/2006**

Tentative Determination Complete:



Permit Deta

Billing/Pymnt

ancel-Return

Cancel

Ok

Application Info

Contacts

Public Participation

Adjudication

Watershi



General Information

Permit Type: **WMA1** SURFACE INDUSTRIAL DISCHARGE

App #: 01DP2517A

Permit #: 01DP2517A

Permit Category:

App. Description: FOR MOD TO CHANGE OUTFALL LOCATION AT CHURCHVILLE TEST SITE

NPDES #: MD0003565

Project Manager: MCGILLEN

JOHN

Date Received: 03/04/2003

Admin. Procedures Act

Permit Revised: 02/10/2003

Permit Deta

Billing/Pymn

Status Information

Permit Status: **IF** ISSUED-REFILED

HB9 Refund Requested?

Date Status Changed: 07/07/2005

Complete Application:

Acknowledgement Sent:

Renewal Notice Sent:

Initial Projected Issuance:

Total Processing Delay (Initial Issuance):

Rqst/Submt

Revised Projected Issuance:

Total Processing Delay (Rev Issuance):

Proc Delays

Last Permit Issued: 05/12/2003

First Est. Tentative Determination:

Permit Expiration: 10/31/2006

Revised Est. Tentative Determination:

Prev Permit Expiration: 10/31/2006

Tentative Determination Complete:

Cancel-Return

Cancel

Ok

Application Info

Contacts

Public Participation

Adjudication

Watersh

List of Valid Facilities.

General Information

Permit Type: WMA1 SURFACE INDUSTRIAL DISCHARGE

App #: 01DP2517

Permit #: 01DP2517



Permit Category:

App. Description: FOR RENEWAL, STORMWATER, GROUNDWATER REMEDIATION, DEWATERING



NPDES #: MD0003565

Project Manager: MCGILLEN

JOHN

Date Received: 07/20/2000

Admin. Procedures Act

Permit Revised: 07/26/2000

Permit Data

Billing/Pymn

Status Information

Permit Status: XR HISTORY REPALED



HB9 Refund Requested?

Date Status Changed: 09/15/2003

Complete Application: 09/26/2000

Acknowledgement Sent:

Renewal Notice Sent:

Initial Projected Issuance: 04/06/2002

Total Processing Delay (Initial Issuance): 68 Rqst/Submt

Revised Projected Issuance: 11/28/2001

Total Processing Delay (Rev Issuance): Proc Delays

Last Permit Issued: 11/01/2001

First Est. Tentative Determination:

Permit Expiration: 10/31/2006

Revised Est. Tentative Determination:

Prev Permit Expiration: 02/28/2002

Tentative Determination Complete: 08/13/2001

Cancel-Return

Cancel

Ok

Application Info

Contacts

Public Participation

Adjudication

Watersh

General Information

Permit Type: **WMA1** SURFACE INDUSTRIAL DISCHARGE

App #: **96DP2517A** Permit #: **96DP2517A**

Permit Category: **GROUNDWATER REM- CHEMICAL**

App. Description: **FOR MODIFICATION TO ADD 3 DISCHARGES**

NPDES #: **MD0003565** Project Manager: **MCGILLEN** **JOHN**

Date Received: **03/09/2000** Admin. Procedures Act Permit Revised: **03/10/2000**

Status Information

Permit Status: **XR** HISTORY-REPLACED

HB9 Refund Requested?

Date Status Changed: **10/16/2001** Complete Application: **04/07/2000**

Acknowledgement Sent: Renewal Notice Sent:

Initial Projected Issuance: **05/09/2001** Total Processing Delay (Initial Issuance): Rqst/Submt

Revised Projected Issuance: **11/07/2001** Total Processing Delay (Rev Issuance): Proc Delays

Last Permit Issued: **07/24/2000** First Est. Tentative Determination:

Permit Expiration: **02/28/2002** Revised Est. Tentative Determination:

Prev Permit Expiration: Tentative Determination Complete: **05/17/2000**

Application Info

Contacts

Public Participation

Adjudication

Watersh **<< >>**

Permit Deta

Billing/Pymn

Cancel-Return

Cancel

Ok

Enter an Application Number for this permit.

General Information

Permit Type: **WMA1** SURFACE INDUSTRIAL DISCHARGE

App #: **96DP2517** Permit #: **96DP2517**

Permit Category: []

App. Description: []

NPDES #: **MD0003565** Project Manager: []

Date Received: **02/08/1996** Admin. Procedures Act Permit Revised: []

Status Information

Permit Status: **XR** HISTORY REPLACED HB9 Refund Requested?

Date Status Changed: **09/27/2000** Complete Application: []

Acknowledgement Sent: **02/08/1996** Renewal Notice Sent: []

Initial Projected Issuance: **04/03/1997** Total Processing Delay (Initial Issuance): [] Rqst/Submt

Revised Projected Issuance: [] Total Processing Delay (Rev Issuance): [] Proc Delays

Last Permit Issued: **03/01/1997** First Est. Tentative Determination: []

Permit Expiration: **02/28/2002** Revised Est. Tentative Determination: []

Prev Permit Expiration: [] Tentative Determination Complete: []

- Application Info
- Contacts
- Public Participation
- Adjudication
- Watershi

- Permit Deta
- Billing/Pymn
- Cancel-Return
- Cancel
- Ok

SUPERSEDED BY MODIFICATION ISSUED 7/24/2000.

Permit Information

Facility: U.S. ARMY ABERDEEN PROVING GROUND- EDGEWOOD AREA

2013

General Information

Permit Type: WMA1 SURFACE INDUSTRIAL DISCHARGE

App #: 90DP2517

Permit #: 90DP2517

Permit Category:

App. Description:

NPDES #:

Project Manager:

Date Received: 02/08/1996

Admin. Procedures Act

Permit Revised: 01/28/1998

Status Information

Permit Status: X HISTORY NON-SPEC

Date Status Changed: 02/08/1996

Acknowledgement Sent:

Initial Projected Issuance:

Revised Projected Issuance:

Last Permit Issued: 08/08/1991

Permit Expiration: 08/08/1996

Prev Permit Expiration:

HB9 Refund Requested?

Complete Application:

Renewal Notice Sent:

Total Processing Delay (Initial Issuance):

Total Processing Delay (Rev Issuance):

First Est. Tentative Determination:

Revised Est. Tentative Determination:

Tentative Determination Complete:

Rqst/Submt

Proc Delays

Permit Deta

Billing/Pymt.

Cancel-Return

Cancel

Ok

I. FACILITY DESCRIPTION/REGULATORY BACKGROUND

Business activities: testing of weapon systems, troop training, research testing of chemical warfare agents and equipment, ordnance testing and support of tenant activities

Manufacturing process/wastewater generation:

Wastewater generated at the following locations are identified in the permit application:

Outfall 005 – Deer Creek at Rt 136 and Harmony Church Road (offsite facility) (E:1009, N:644): washwater from washing of test vehicles

Outfall 006 – Gunpowder River at Days Point (Ricketts Point Road) (near end of Edgewood Area peninsula) (E:998, N:546): washwater from washing of test vehicles

Outfall 007 – swale to Sod Run near Palmer Road (western border of Aberdeen Main near Bush River) (E:1002, N:583): washwater from washing of test vehicles

Outfall 012 – unnamed tributary to Dipple Creek at Hopkins Road (NE border of Aberdeen Main near Spesutie Narrows) (E:1051, N:599): noncontact cooling water

Outfall 013 – Woodrest Creek at Building 423 (Aberdeen Main south of Outfall 012) (E:1048, N:594): noncontact cooling water

Outfall 014 – Bush River near UNDEX Test Facility excavation pit (E:1012.8, N:567.3): storm water and ground water

Potentially contaminated storm water runoff and groundwater discharge points were added in a permit modification during calendar year 2000. Although not identified in the permit application, the following outfalls will be included in the new permit:

Outfall 016, 017 and 018 – Bush River at Bush River Road (E:1004.3, N:571.6): groundwater and storm water from construction dewatering

In addition to the itemized sources show above, the permit also regulates storm water runoff generated throughout the site.

Compliance issues: none identified based on review of Inspection and Compliance Program files.

Special regulatory issues: none identified.

II. RECEIVING WATER/WATERSHED INFORMATION

Surface water discharges - discharges are to brackish water or to small streams or drainage swales which discharge to brackish water in a very short distance.

xx TMDL printout has been checked: Bush River listed on 303(d) list for nutrients. Aberdeen Proving Ground is listed for nutrients, suspended sediment and toxic substances.

III. WASTEWATER CHARACTERIZATION INFORMATION

Outfall 005, 006, 007

Type(s) of wastewater: wash water from test vehicle wash racks

Treatment Units: grit chamber, oil/water separation, settling pond

Effluent	Outfall 005 Concentration	Outfall 006 Concentration	Outfall 007 Concentration
<u>Characteristics</u>	<u>Maximum</u>	<u>Maximum</u>	<u>Maximum</u>
Flow	10 gpm	3	10
BOD (mg/l)	4	7	5
COD (mg/l)	10	20	55
TSS (mg/l)	9.1	38	128
Ammonia (mg/l as N)	not reported	not reported	not reported
pH	5.86 to 9.02	6.93 to 7.77	6.20 to 8.03

Outfall 012

Type(s) of wastewater: noncontact cooling water from the Army Research Laboratory

Treatment Units: none

Effluent	Concentration
<u>Characteristics</u>	<u>Maximum</u>
Flow	20 gpm
BOD (mg/l)	7
COD (mg/l)	10
TSS (mg/l)	7
Ammonia (mg/l as N)	not reported
pH	5.97 to 8.35

Outfall 013

Type(s) of wastewater: noncontact cooling water from Building 423

Treatment Units: settling pond

Effluent	Concentration
<u>Characteristics</u>	<u>Maximum</u>
Flow	5 gpm
BOD (mg/l)	not reported
COD (mg/l)	not reported
TSS (mg/l)	not reported
Ammonia (mg/l as N)	not reported
pH	6.64 to 8.46

Outfall 014

Type(s) of wastewater: ground water and storm water from UNDEX test facility

Treatment Units: settling pond; chemical addition

<u>Effluent Characteristics</u>	<u>Concentration Maximum</u>
Flow	2300 gpd
BOD (mg/l)	not reported
COD (mg/l)	not reported
TSS (mg/l)	64
Ammonia (mg/l as N)	not reported
pH	6.66 to 7.09

Outfalls 015, 016 and 017

Type(s) of wastewater: ground water and storm water from construction dewatering

Treatment Units: settling pond; chemical addition

<u>Effluent Characteristics</u>	<u>Concentration Maximum</u>
Flow	2300 gpd
BOD (mg/l)	not reported
COD (mg/l)	not reported
TSS (mg/l)	64
Ammonia (mg/l as N)	not reported
pH	6.66 to 7.09

Potential Toxic Components: Biomonitoring has not been performed since 1991. No toxicity observed in any testing of Outfalls 005, 006 and 007. Other outfalls have not been tested but information about the discharges does not suggest that toxic substances are present.

IV. TENTATIVE PERMIT LIMITATIONS

Rationale for Effluent Limitations:

Outfalls 005, 006, 007: There are no EPA effluent guidelines for vehicle and aircraft washing. Best engineering judgement has been used to establish the effluent limits for total suspended solids (TSS), oil & grease, and pH. These limitations are continued from the existing permit. Biochemical oxygen demand, which is sometimes chosen as an effluent limitation for vehicle washes has not been required here because of the intermittent flow and because the BOD will be removed incidental to solids and oil and grease. Monitoring will be on a monthly basis to verify that the treatment systems are working effectively.

The TSS limits are those that can be achieved by gravity settling. The oil & grease limit of 15 mg/l maximum can be achieved by gravity separation. The pH range of 6 to 9 is technology based and used in most EPA effluent guidelines. This range is not expected to violate stream water quality at this flow rate. Although the facility uses chlorinated municipal water for washing, this constituent

will not be limited because aeration from the spraying of the vehicles will dissipate the chlorine to the nondetectable level.

Outfalls 012 and 013: Temperature and total residual monitoring have been required in the previous permits. Review of the data generated by this monitoring indicates discharge temperatures below state water quality criterion. Total residual chlorine monitoring during the past three years indicates concentrations below the level required by COMAR 26.08.03.06 except for a single exceedance at each outfall.

Municipal water is the source of the noncontact cooling water at these locations and the permittee takes no steps to control either temperature or chlorine residual concentrations. Based on the monitoring history which shows these discharges conforming (with limited exceptions) with water quality criteria even in the absence of any controls or treatment by the permittee, the Department has determined that these parameters are not pollutants of concern for these discharges. As such, continued monitoring serves no useful purpose and the Department is proposing to eliminate temperature and total residual chlorine from this permit.

Outfall 014

I am continuing the total suspended solids effluent limitations from the existing permit. Although there is no more excavation work occurring here, underwater explosions and movements in the pit cause the suspension of sediment in the water column. The limits of 30 mg/l average and 60 mg/l maximum are those concentrations that can be achieved by gravity settling in well designed and maintained sedimentation ponds.

Loading Requirements for toxic substances and nutrients: Based on the description of contributing wastestreams and the analytical results in the permit application, there is little potential for the discharge of significant amounts of toxic substances or nutrients (on a mass loading basis). Therefore, no requirements to report loadings are proposed.

Outfalls 016, 017 and 018

EPA effluent limitation guidelines do not apply to these discharges. Therefore, best professional judgement has been used in establishing limits for this facility. The proposed limit of 100 $\mu\text{g/l}$ is that concentration that can be achieved by tertiary treatment by air stripping (BAT).

Loading Requirements for toxic substances and nutrients: Based on the description of contributing wastestreams and their volumes, there is little potential for the discharge of significant amounts of toxic substances or nutrients (on a mass loading basis). Therefore, no requirements to report loadings are proposed.

V. SPECIAL CONDITIONS

Special Condition B: Definitions - standard for all permits

Special Condition C: Toxic Pollutant Reporting - standard for all permits

Special Condition D: Removed Substances - standard for all permits

Special Condition E: Analytical Laboratory - standard for all permits

Special Condition F: Wastewater Operator Certification – standard for facilities which treat wastewater

Special Condition G: Flow Monitoring - reserved

Special Condition H: Flow Basis for Annual Discharge Fee - standard for all permits

Special Condition I: Reapplication for a Permit – standard for all permits

Special Condition J: Biomonitoring Program – previous biomonitoring and information about the discharges does not suggest that effluent toxicity is a concern with the discharges regulated by this permit. No biomonitoring requirements are proposed.

Special Condition K: Toxicity Reduction Evaluation – standard for all permits

Special Condition L: Water Treatment Chemicals - COMAR 26.08.03.01A(2) prohibits the discharge of any pollutant in toxic amounts. COMAR 26.08.04.03A allows the Department to require bioassay testing of the effluent.

Special Condition M: Oil-Water Separators - Oil-water separators must be cleaned regularly to operate efficiently.

Special Condition N: Detergents - The Department must make sure that any cleaners or detergents used at the facility are not toxic to aquatic life.

Special Condition O: Degreasers and Other Solvents - ^{Most} ~~All~~ solvents, degreasers, and anti-freezes ^{can be} ~~are~~ toxic to aquatic life.

Special Condition P: Spill Containment Structures - All fuel storage and transfer areas at the facility must be subjected to controlled drawdowns to prevent pollution of the waters of the State.

Special Condition Q: Hydrostatic Testing

1. New structures will not need any use-specific controls. Used structures may contain harmful contaminants.
2. Cleaning is usually necessary to perform the repairs or inspections that necessitated the testing.
3. Oil & grease limits are included because oil may be present from product residual or as preservative on new steel. TSS limits are imposed because of impurities and solid particles that may be present on the bottom of the tank or from the influent water. A chlorine limit is required because chlorinated municipal water is often used for testing. D.O. and pH limits for chemically dechlorinated water are included because this practice may reduce the dissolved oxygen and depress the pH. Since this discharge will be slug flow, it could stress the aquatic life in a small receiving stream. Iron monitoring is included because of the possible introduction of scale. The oil & grease and TSS limits are technology-based. TRC is in accordance with COMAR 26.08.03.06. D.O. and pH limits are equal to receiving water criteria set by COMAR 26.08.02 on the assumption that a slug discharge of this kind will at least temporarily make up most or all of the receiving water flow or have a significant zone of

impact.

4. Water sitting in a tank during the summer can get hot.
5. Advanced notification is the only practical way that we can ever observe these discharges and enforce the permits.
6. These are means of minimizing solids uptake. Since it is impossible to distinguish solids added to the test water by the operator's activities from those solids that were already in the test water, the Department is unable to give net allowances for solids.
7. This is to not only assure proper treatment of test water pollutants, but to make sure that this surge does not blow out pollutants already trapped in the treatment system.

Special Condition R: Outfall Identification - This requirement is to ensure that all outfalls and sampling locations can be easily identified.

Special Condition S: Swimming Pool Wastewater - This requirement prohibits the discharge of swimming pool filter backwash or swimming pool wastewater to the waters of the State.

Special Condition T: Storm Water Associated With Industrial Activity – provides coverage for storm water discharges. Required based on the potential for exposure to storm water of various operations.

VI. CHANGES FROM PREVIOUS PERMIT

1. eliminated provision for net credit at Outfall 005 and moved monitoring point to a location prior to entering the receiving stream.
2. reduced monitoring frequency at Outfalls 005, 006, 007 and 014
3. eliminated monitoring for temperature and total residual chlorine at Outfalls 012 and 013
4. added Outfalls 016, 017 and 018 associated with construction of the mustard agent disposal facility