

Public Health Assessment

Fridley Commons Well Field, Fridley Minnesota
(61ST AVENUE, NE & 7TH STREET, NE, FRIDLEY, MN 55432)
(EPA # MN985701309)

Anoka County, Minnesota

December 20, 2001

Prepared by:

The Minnesota Department of Health
Under Cooperative Agreement with the
Agency for Toxic Substances and Disease Registry

FOREWORD

This document summarizes potential public health concerns at the Fridley Well Field, Fridley, Minnesota. It is based on a formal site evaluation prepared by the Minnesota Department of Health (MDH). A number of steps are necessary to do such an evaluation:

- ! **Evaluating exposure:** MDH scientists begin by reviewing available information about environmental conditions at the site. The first task is to find out how much contamination is present, where it's found on the site, and how people might be exposed to it. Usually, MDH does not collect its own environmental sampling data. We rely on information provided by the Minnesota Pollution Control Agency (MPCA), U.S. Environmental Protection Agency (EPA), and other government agencies, businesses, and the general public.
- ! **Evaluating health effects:** If there is evidence that people are being exposed—or could be exposed—to hazardous substances, MDH scientists will take steps to determine whether that exposure could be harmful to human health. The report focuses on public health—the health impact on the community as a whole—and is based on existing scientific information.
- ! **Developing recommendations:** In the Public Health Assessment (PHA), MDH outlines its conclusions regarding any potential health threat posed by a site, and offers recommendations for reducing or eliminating human exposure to contaminants. The role of MDH in dealing with hazardous waste sites is primarily advisory. For that reason, the PHA will typically recommend actions to be taken by other agencies—including EPA and MPCA. However, if there is an immediate health threat, MDH will issue a public health advisory warning people of the danger, and will work to resolve the problem.
- ! **Soliciting community input:** The evaluation process is interactive. MDH starts by soliciting and evaluating information from various government agencies, the organizations responsible for cleaning up the site, and the community surrounding the site. Any conclusions about the site are shared with the groups and organizations that provided the information. Once a PHA has been prepared, MDH seeks feedback from the public. *If you have questions or comments about this report, we encourage you to contact us.*

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Introduction

This Public Health Assessment (PHA) evaluates potential exposures to contaminants found at the Fridley Commons Well Field superfund site, Fridley, Minnesota,. The Fridley Commons Well Field site was proposed by the United States Environmental Protection Agency and the Minnesota Pollution Control Agency for the National Priorities List (NPL) on September 29, 1998, and was listed on January 19, 1999. Because the site is listed on the NPL, and pursuant to the Comprehensive Environmental Response and Liability Act (CERCLA) law, this Public Health Assessment was conducted.

The subject of this public health assessment is the municipal well field owned and operated by the of City of Fridley. This document examines contaminated media (water, air and soil), transport mechanisms and routes of exposure (ingestion, inhalation and dermal contact) to determine the likelihood of individuals being exposed to contamination. This Public Health Assessment contains a summary of information obtained from the City of Fridley, Minnesota Pollution Control Agency (MPCA) and its contractor Barr Engineering Corporation (Barr) and conclusions and recommendations by the Minnesota Department of Health (MDH). This Public Health Assessment discusses data and results collected prior to September 1999.

Site file reviews and a site visit, form the basis for this PHA. Health effects that might be associated with any exposures are also discussed.

BACKGROUND

Site Description and History

The Fridley Commons Park Well Field is a 50 acre site with eight public wells (numbered 2,3,4,5,6,7,8,and 9), owned by the City of Fridley. The well field serves a population of approximately 29,000. The Site is located within the city of Fridley, Anoka County, Minnesota, approximately one mile north-northwest of the intersection of Interstate Highway 694 and Minnesota State Highway 65 (Figure 1). The Site is approximately one mile east of the Mississippi River the federally designated Mississippi National River Reach and Recreation Area, and approximately 0.2 miles northwest of Moore Lake. The Commons Park provides recreational activities; land use in the area surrounding the Site is mostly residential, with some areas of commercial and industrial use.

The City could pump from 13 municipal wells. At the Fridley Commons Well Field site, there are eight municipal water supply wells (wells 2,3,4,5,6,7,8,and 9) and a water treatment plant (Commons Park Treatment Plant/Plant #1). Wells 2-5 are open to the Mt. Simon Hinkley aquifer and wells 6-9 are open to the Prairie du Chien-Jordan (PdCJ) aquifer (See Table1). Water

from Wells 2-8 are blended and treated at Plant #1. Well 9 was taken out of service in November 1989 because high concentrations of Trichloroethylene (TCE) were measured (1). The City also can operate 4 other wells (wells 1, 10,12, and 13) that are not located at the Commons Well Field (Figure 1). Well 13 is operated intermittently, but the others are used routinely. A state-funded evaluation report has indicated that if the contaminant levels remain the same or increase, the city’s blended water from Fridley Commons Well Field will exceed the MCL for TCE when the four contaminated wells (6-9) must be used during periods of peak demand (1).

Trichloroethylene (TCE) was first detected in Well #9 in 1984. Subsequent tests have revealed low level VOC contamination of Wells #6 thru #8. Well #9 has consistently had the highest concentrations of TCE. TCE concentrations found in Well #9 have often been above the Maximum Contaminant Level (MCL) of 5 micrograms per liter (: g/L). TCE has been detected in well water from: Well #9 at up to 79 : g/L (4/9/92); Well #8 up to 17 : g/L(10/3/91); Well #7 up to 29.7 : g/L (6/9/92); and Well #6 up to 9.2 : g/L (11/1/90) (See Figures 2-5). In November 1989, Well #9 was removed from service when blended water from the well field was found to contain concentrations of TCE above the MCL. Since all Prairie du Chien-Jordan wells in the well field have exhibited TCE contamination, the City has attempted to decrease reliance on those wells (1). It has been demonstrated that the concentrations of TCE found in wells 6-8 are generally related to the pumping volume(1). As pumping increases, so does TCE concentrations (See Figures 6-8). Figure 9 illustrates that well 9 TCE concentrations remain above the MCL even though it was taken off line in 1989. It is anticipated that if it is used as a supply well in the future, the concentration of TCE will return to previous levels. In addition, continued pumping of wells 6,7, and 8 can potentially cause higher TCE concentrations to migrate to these wells and render them unfit for municipal use without treatment.

Table 1

Fridley Commons Park Well Field Wells Specification Table		
Well # /Unique I.D. #	Water Bearing Formation	Well Depth
Well 2 / 206674	Mt. Simon Hinckley	842
Well 3 / 206670	Mt. Simon Hinckley	840
Well 4 / 201158	Mt. Simon Hinckley	830
Well 5 / 206675	Franconia Hinckley	845
Well 6 / 206673	Prairie du Chien-Jordan	250
Well 7/ 206678	Prairie du Chien-Jordan	262
Well 8 / 206669	Prairie du Chien-Jordan	265
Well 9 / 206672	Prairie du Chien-Jordan	262

At the Commons Park Well Field, water from the Mt. Simon Hinkley wells (2,3,4, and 5) are manifolded together and sent into filters 5,6, and 7 (see Figure 10). Filters 6 and 7 are designed for removing iron and suspended solids found in the Mt. Simon Hinkley aquifer. Water from the Jordan wells are manifolded together into filters 1,2,3, and 4. Filters 1-5 contain green sand and Anthracite which is used to remove dissolved iron and manganese. Water from all wells in use are manifolded together (blended) and treated with chlorine and fluoride before being sent to the ground storage and elevated tank reservoirs for distribution into the municipal system. The highest concentration of TCE found in the distribution system was 4.9 ug/l on July 7, 1992 at the Fridley Middle School (1).

Wells 1, 10-12, and 13 are not located at the Commons Well Field (Figure 1). See figure 11 for treatment plant layout for wells 10 and 11 (Lock Park Treatment Plant) and 12 (Treatment Plant 3). Figure 12 illustrates how wells 1, 13, and the New Brighton Water Connection are introduced to the municipal system. Well 13 (Prairie du Chien-Jordan well) has been contaminated with TCE, chloroform, and carbon tetrachloride since the late 1980s as noted in a MDH Health Assessment for Kurt Manufacturing (6). Table 2 contains recent detections of contaminants found in well 13. (See section Evaluation of Contamination and Exposure for explanation of HRLs) Well 13 is occasionally used during peak periods in the summer months. Water appropriations records show that in 1997, 872,000 gallons/year were pumped from this well. From 1998 through 2000, 53,000, 33,000, and 14,000 gallons were pumped from well 13 respectively. When well 13 is used, it is treated with chlorine and fluoride and pumped directly into the distribution system. From the distribution system, some municipal water users may receive mixed water (Commons park and well 13 water). Other users may receive primarily well 13 water with little or no dilution with other water in the system. This may be a problem if well 13 contaminant concentrations increase above drinking water criteria. In any case, exposure to contaminants in well 13 will be intermittent based on past well use. Since 1997 no additional VOC data have been located for well 13.

A well needs to be purged of a sufficient amount of water in order to collect reliable water quality data. Well 13 is not constructed with a discharge/purge valve. Thus every time well 13 is tested it discharges directly into the distribution system. According to the Fridley Public Works Director, Jon Haukaas, well 13 will be reconstructed with a discharge valve to allow for more frequent water quality monitoring. Future use of well 13 will entail collecting a VOC sample before the well is used and weekly sampling while the well is in use.

The City receives some water from New Brighton via an interconnect when a surplus is available. During peak usage in the summer, the interconnect does not supply a significant amount of water to Fridley. Therefore, during the summer months it is necessary for the City to use large amounts of blended water from contaminated wells to maintain supplies (1). Currently the City is attempting to determine the extent and severity of the TCE contamination, identify sources of clean water, and review treatment alternative, to meet anticipated need in the future.

Table 2

Fridley Well 13 Volatile Organic Compound Detections					
Date	Compound	Result (ug/l)	Maximum Contaminant Level (ug/l)	Health Risk Limit (ug/l)	Toxicological Endpoint
9/6/1995	Carbon tetrachloride 0.4	0.4	5	3	cancer
9/6/1995	cis-1,2dichloroethene	0.5	70	70	blood system
9/6/1995	Chloroform	0.3	100	60	cancer
9/6/1995	Trichloroethylene	1.0	5	30	cancer
10/26/1995	Carbon tetrachloride	0.3	5	3	cancer
10/26/1995	Chloroform	0.1	100	60	cancer
10/26/1995	Trichloroethylene	0.3	5	30	cancer
2/16/1996	Trichloroethylene	0.2	5	30	cancer
5/6/1997	Chloroform	0.4	100	60	cancer

The Minnesota Pollution Control Agency (MPCA) staff completed a Preliminary Assessment (PA) that was approved by the U.S. Environmental Protection Agency (EPA) on September 20, 1991. A Screening Site Inspection (SSI) was conducted by MPCA staff on November 5 and 6, 1991. The SSI report, submitted to EPA and approved on July 6, 1992, recommended the Site for an Expanded Site Inspection (ESI). The Site was added to the State of Minnesota's Permanent List of Priorities, or State Superfund List, in June 1992. The 1996 ESI recommended listing on the NPL and more effort to define the source within the limitations of cost.

The Fridley Commons Well Field was listed as National Priority List (NPL); "superfund" site on January 19, 1999. The MPCA conducted a responsible party search and submitted their findings to the EPA. No responsible party has been identified. The MPCA is currently in the process of applying for federal funds to conduct a site investigation and cleanup.

The remedial investigation and subsequent remedial work necessary at the Site will be conducted by the MPCA under contract with the EPA. The MPCA has received partial funding from the EPA to conduct the Remedial Investigation and Feasibility Study. The MPCA will further investigate whether any responsible parties can be identified.

Site Visit

Lisa Pogoff (MDH Health Educator) and Daniel Peña (MDH Health Assessor) joined Bob Smude (MDH Public Water Supply Unit) during one of the quarterly monitoring events at the city of Fridley municipal water system on May 18, 1999. Water samples were collected at each of the City's water treatment facility effluents: Commons Park Well Field (treatment plant 1), Locke Park (treatment plant 2), and Treatment plant 3. A tour of each facility was conducted.

Demographics, Land Use, and Natural Resources Use

The City of Fridley occupies 9.906 square miles in Anoka County and has a population of 28,335 (1998 estimate). The Fridley Commons Well Field is surrounded by residential property (see Figure 13). To south of the Site are Fridley High School and Fridley Community Education Center. In the southeast corner of the Well Field are Fridley Middle School and Moore Lake (see Figure 14).

A search of the MDH County Well Index (CWI) identified 15 private domestic wells within a two mile radius of the Commons Park Well Field (1). Four public supply wells were identified within a two mile radius. A public supply well is well that serves the public but is not a municipal well. The public wells usually belong to a business, school, or any other entity that serves the public, but is not a residence. Fridley High School and Fridley Middle School have irrigation wells within a 1000 feet of Commons Park Well Field. Both schools have water appropriation permits from the Minnesota Department of Natural Resources (DNR) to pump from the Prairie du Chien aquifer. Fridley Middle School is permitted to use up to 6.5 million gallons/year (DNR permit 916160). Fridley High School is permitted to use up to 36 million gallon/year (DNR permit 681184). How the use of these wells contributes to the migration of contamination toward the Fridley Commons Well Field is not known.

General Regional Issues

A MPCA file search conducted by Barr Engineering Co. has located the following TCE release sites within a two mile radius of the site: Boise-Onan-Medtronic, Naval Industrial Reserve Ordnance Plant (NIROP)/FMC, Kurt Manufacturing, Dealers Manufacturing (1). However, none of these TCE impacted sites has been established as the source of the contamination at Commons Park Well Field. It is thought that Kurt Manufacturing has contributed to the TCE and other potential tetrachloroethylene (PERC) decay products found in the groundwater plume impacting Fridley well 13 (6). Contaminants of concern associated with Kurt include solvents PERC, 1,1,1-trichloroethane (TCA), and 1,2-dichloroethane (DCE) (6). Kurt Manufacturing is on the federal National Priorities List (NPL).

A number of Prairie du Chien-Jordan wells within a 2 mile area of the Site have been analyzed

for TCE; and several have indications of TCE contamination. Eleven wells identified within a two mile radius are known to be contaminated with volatile organic compounds. The wells which have TCE contamination include: the Fridley Middle School (irrigation well) adjacent and southeast of the Site; Stylmark, less than ½ mile northeast of the Site; MPCA #3, greater than a mile east-southeast of the Site; and Kurt Manufacturing and NIROP both about 1 mile south-southwest of the Site (see Figure 15). The source of the TCE plume which affects the Commons Park Well field is unknown. Three Prairie du Chien-Jordan monitoring wells were drilled in May 1994 in an attempt to identify potential contamination sources (figure 14). TCE analysis of water from these wells has been negative.

The Prairie du Chien-Jordan aquifer is believed to flow toward the Mississippi River (west-southwest) in the area of concern. However, in the vicinity of the Site the Prairie du Chien-Jordan is believed to contain significant numbers of bedding planes, joints, fractures, and solution cavities. Proximal location of specific wells in relation to these geological irregularities could significantly affect the flow dynamics of a plume in the aquifer. Therefore, the construction of a groundwater model may be necessary to determine potential TCE reservoirs or sources.

Community Involvement

A community relations plan is being drafted for the site by the MPCA which will include plans for community involvement as required by Superfund policies. MDH will participate and assist PCA in community involvement activities. MDH received comments from the public on a Draft Public Health Assessment. These are discussed in a separate section below.

Agency For Toxic Substances and Disease Registry (ATSDR) Involvement

MDH, under a cooperative agreement with the U.S. Agency for Toxic Substances and Disease Registry (ATSDR), evaluated the public health significance of contamination associated with Fridley Commons Well Field. More specifically, MDH and ATSDR cooperated to determine whether health effects are possible and to make recommendations to reduce or prevent possible health effects. ATSDR, located in Atlanta, Georgia, is a federal agency within the U.S. Department of Health and Human Services. ATSDR is mandated by the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 as amended by Superfund Amendments and Reauthorization Act (SARA 1986) to conduct a public health assessment at each site proposed for or listed on the National Priorities List (NPL). In cooperation with ATSDR, the Minnesota Department of Health (MDH) has evaluated the public health significance of Fridley Commons Park Well Field.

Evaluation of Contamination and Exposure

On the basis of MDH's review and evaluation of environmental information collected from the MPCA Site file, MDH records, and a site visit, MDH concludes that the current contaminant

exposure levels from drinking water do not pose a current public health hazard. MDH has determined that a complete exposure pathway via drinking water exists for TCE. TCE concentrations are monitored along with 41 other volatile organic compounds at Fridley Municipal Water Treatment Plants as part of their water quality monitoring program. After iron and manganese are removed from the ground water, chlorine and fluoride are added before it is distributed to approximately 29,000 people in Fridley.

Because low levels of TCE have been detected in Fridley municipal water, residents who use this water are exposed to TCE via ingestion (cooking and drinking), inhalation (cooking and bathing), and dermal contact. MDH considers TCE to be a probable human carcinogen. MDH has a Health Risk Limit (HRL) for TCE of 30 : g/L. MDH considers cancer risk to be negligible, when the concentration of a carcinogen in drinking water is at or below the HRL. The calculation of the HRL assumes that an individual drinks 2 liters of water per day from the contaminated source. A negligible cancer risk is defined by MDH as 1 or fewer additional cases of cancer in 100,000 individuals exposed for a lifetime. MCLs, on the other hand, are maximum concentrations of hazardous chemicals allowed by federal law in municipal drinking water. The HRLs are strictly health based. MCL calculations also factor in chemical specific characteristics such as detection limits and ease/cost of treatment. In the case of TCE, the MCL (5 : g/L) is less than the HRL. Sometimes the HRL is lower than the MCL for the same reasons mentioned above.

HRLs for contaminants classified as non-carcinogens are assumed to have thresholds below which there is not risk. They are calculated from a “reference dose” which is a daily ingestion rate that is safe for the general population including sensitive subgroups, such as children, the elderly, and the immune compromised. For these chemicals a “relative source contribution factor” is also used because not all of an individual’s exposure to some types of contaminants comes only from drinking contaminated water. Other pathways, such as inhalation, skin contact, or eating food containing the contaminant can also contribute to the amount of individual exposure. For non-carcinogens this is directly accounted for through the “relative source contribution factor.” HRLs for contaminants which may be associated with an increased cancer risk in humans (including TCE and CCl_4) do not include this factor in the HRL calculation. However, cancer risks and other assumptions used to calculate HRLs are upper bound estimates which likely overstate risks. In addition, the carcinogenicity of TCE is also currently being re-evaluated, and there is some scientific debate as to whether or not it is a carcinogen.

Studies have shown that exposure to VOCs in drinking water through inhalation or skin contact during such activities such as showering, bathing, or washing dishes can be significant in certain situations. The ratio of inhalation uptake versus direct ingestion of contaminated water has been estimated to be as high as 6:1 (McKone 1989) or as low as less than 1:1 (Lindstrom and Pleil 1996). A variety of variables influence uptake making accurate estimates very difficult. These variables include such things as water temperature, size of the shower enclosure, the type of shower head used, length of time spent in the shower, and the ventilation rate. Several studies have demonstrated that simply ventilating the shower stall can greatly reduce the estimated exposure to VOCs in shower air (McKone and Knezovich 1991; Aggarwal 1994).

Agency for Toxic Substance and Disease Registry (ATSDR) Child Health Initiative

ATSDR's Child Health Initiative recognizes that the unique vulnerabilities of infants and children make them of special concern to communities faced with contamination of their water, soil, air, or food. Children are at greater risk than adults from certain kinds of exposures to hazardous substances. Often health risk calculations, including the MCLs and HRLs, do not include values for children. They are shorter than adults, which means they breathe heavy vapors that may collect close to the floor. Children are also lighter, resulting in higher doses of chemical exposure per body weight. The developing organ systems of children can sustain permanent damage if toxic exposures occur during critical growth stages. Most importantly, children depend completely on adults for risk identification and management decisions, housing decisions, and access to medical care.

At the present time, child exposure to levels of VOCs in excess of MCLs is not occurring from municipal water. Exposure of children to TCE in drinking water at levels below the MCLs is likely occurring at most residences. However, as stated above, MDH believes that the TCE MCL is conservative and protective of human health, including children.

Current Pathways

Air (indoor): No TCE indoor air data has been collected. It is likely that inhalation of TCE would occur mostly while showering, and to a lesser extent while bathing. Factors like water temperature, room size, TCE water concentrations, and whether the water is standing or sprayed will influence TCE inhalation exposure. Because the TCE water concentrations are considerably below the TCE HRL, exposure to TCE via inhalation is not a current health hazard.

Soil: This is not a relevant pathway for the Commons Well Field site.

Groundwater: Contaminated groundwater results in ingestion and dermal contact with TCE. Cooking, cleaning, and drinking, municipal water from Commons Park Well Field and Well 13 will result in TCE exposure. Because the TCE municipal water concentrations are well below the TCE HRLs, current exposure is not of health concern. Any additive effects of other contaminants detected in Well 13 are not a health concern if the well is pumped and mixed with other water or if the water is used unmixed based on current contaminant concentrations and well use.

Potential Future Pathways: If future activities at Commons Park Well Field include excavation within the contaminant plume or source area(s), exposures may occur via inhalation of soil gases and/or dermal contact.

In general, potential future pathways will remain the same as they are now (ingestion, inhalation, and dermal contact). Concentrations of contaminants could increase above the MCLs and HRLs in the future, resulting in a possible health risk. Another future exposure scenario is via

volatilization of soil gases from source areas into nearby buildings. However, no source areas have been identified.

Public Comments

In December 2000 MDH released a Draft Public Health Assessment (DPHA) for this site. The Public Comment Period lasted from December 2000 to January 30, 2001. In all, 4 comment letters were received from the following :

- Jon Haukaas, Public Works Director for the City of Fridley
- Bart Biernat, Environmental Health Specialist, Anoka County MN
- Sheri Bianchin, Remedial Project Manager, U.S. Environmental Protection Agency (EPA)
- Niles, Fellows, Project Manager Site Response Section, Minnesota Pollution Control Agency (PCA)

Several changes were made to the Draft Public Health Assessment (DPHA) in response to these comments. The bulk of the comments received were incorporated in this draft and helped improve the accuracy of various points regarding Fridley Commons Well Field Superfund site. Comments were received from the City of Fridley, Anoka County, and PCA questioning the emphasis on well 13 even though it is not part of the Fridley Commons Well Field. However, MDH believes that an evaluation of Fridley Commons needs to include a more general discussion of water quality and water wells serving the City of Fridley. A review of the Fridley municipal water quality data and distribution system, showed that city well 13 is contaminated with low levels of VOCs. Well 13 is pumped directly into the distribution system without chemical treatment. MDH determined that well 13 is sporadically used and is not monitored regularly. MDH is concerned that well 13 water quality could worsen without notice under these conditions. City officials have since agreed to additional monitoring at well 13.

Comments regarding the need for new replacement wells or the use of treatment technologies to remove TCE were received from the City of Fridley and the PCA. Although the DPHA discussed the potential need for replacement wells, it did not exclude the use of treatment technologies as a possible solution. In general MDH does not make treatment or remedial recommendations in PHAs. However, more discussion regarding the potential use of treatment technologies to remove TCE from contaminated wells was included in this draft. Neither a Remedial Investigation nor Feasibility Study have been conducted for the Fridley Commons Well Field. The PCA is in the process of securing funding from the U. S. Environmental Protection Agency to further investigate the site.

Conclusions

On the basis of MDH's evaluation of available environmental information collected during the Preliminary Assessment (PA), Screening Site Inspection (SSI), Expanded Site Inspection (ESI), and a review of MPCA site files, MDH reached the following conclusions and assigned public health conclusion categories.

MDH determined that Fridley Commons Park Well Field and Well 13 drinking water pose *no current human health hazard*. However, the potential for contaminants to exceed the MCLs at anytime is possible in well 13 and to a lesser extent at Fridley Commons Park Well Field effluent.

Conclusions Continued

- Wells 6,7,8, and 9 are similar in depth and are relatively close to each other.
- Well 9 was taken out of service in November 1989 because of high concentrations of Trichloroethylene (TCE), but could be used in the future if a treatment system is installed.
- Continued pumping of well 6,7, and 8 may render them unusable without treatment if the TCE plume continues to be influenced by their pumping. These wells are currently contaminated with low levels of TCE.
- The Commons Park Treatment Plant design allows for maximum mixing of contaminated well water (wells 6,7,and 8) with uncontaminated well water (wells 2-5).
- Fridley Well 13 (not in the Commons Well Field) is contaminated with TCE, carbon tetrachloride, and cis-1,2-dichloroethylene. However, water has not exceeded any MCLs or HRLs.
- Well 13 is pumped directly into the distribution system without treatment for VOCs
- Based on discussions with the City of Fridley Water Supervisor, well 13 will be monitored for VOC contaminants before it is used and monitored weekly while in use starting in 2002.
- A comprehensive well receptor survey has not been conducted.
- It has not been determined if any notification of possible contamination has been sent to private well owners identified in within a mile of the site.

Recommendations and Public Health Action Plan

- If VOC concentrations increase above acceptable standards making blending no longer practical, either an alternate source of water needs to be located or treatment may need to be employed in order to assure that no unacceptable exposures of contamination are occurring.
- A comprehensive well receptor survey for private wells within a one mile radius of the site, identification of current well water use, and notification of well owners of possible contamination should be done.
- A discharge valve should be placed on well 13 to allow water quality monitoring without pumping directly into the distribution system.
- Well 13 should be sampled for VOCs, and results reviewed prior to pumping water into the distribution system.
- Areas in the distribution system most likely to receive undiluted well 13 water should be identified.
- A wellhead protection plan should be done for all the wells in the Fridley water system.
- Contingency plans should be made to determine how long water reservoirs/reserves will last if wells 6,7,8, and 13 are shut down because of increased contaminant levels.

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References

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GLOSSARY

Areas of Concern	(AOC)
Air Soil and Water	(A,S,W)
Agency for Toxic Substances and Disease Registry	(ATSDR)
Comprehensive Environmental Response, Compensation, and Liability Act	(CERCLA)
Contaminants of concern	(COC)
County Well Index	(CWI)
U. S. Environmental Protection Agency	(EPA)
Federal Safe Drinking Water Act	(FSDWA)
Health Risk Limits	(HRLs)
Maximum Contaminant Levels	(MCL)
Minnesota Department of Health	(MDH)
Microgram per Liter	(: g/l)
Minnesota Environmental Response And Liability Act	(MERLA)
Minnesota Pollution Control Agency	(MPCA)
Minimal Risk Levels	(MRL)
Minnesota Well Code	(MWC)
National Priority List	(NPL)
Tetrachloroethylene	(PERC)
Public Health Assessment	(PHA)
Parts Per Million	(ppm)
Resource Conservation And Recovery Act	(RCRA)
Record of Decision	(ROD)
Superfund Amendments and Reauthorization Act	(SARA 1986)
Soil Reference Values	(SRVs)
Semivolatile organic compounds	(SVOC)
Trichloroethylene	(TCE)
Volatile Organic Compounds	(VOCs)

Figures

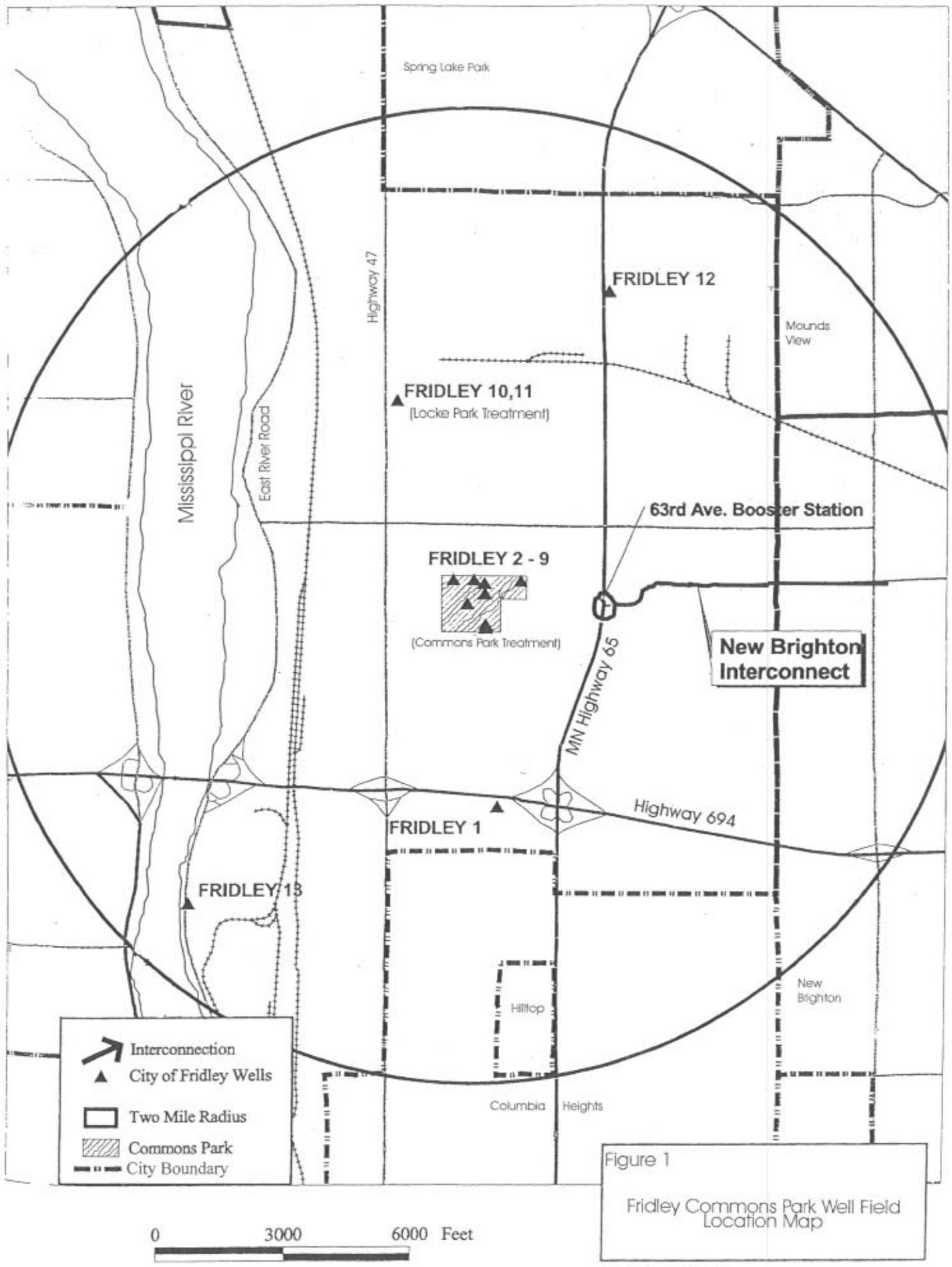


Figure 1
 Fridley Commons Park Well Field
 Location Map

Adapted From Reference 1

Figure 2 Fridley Commons Well 6 TCE Concentrations 1988-1992

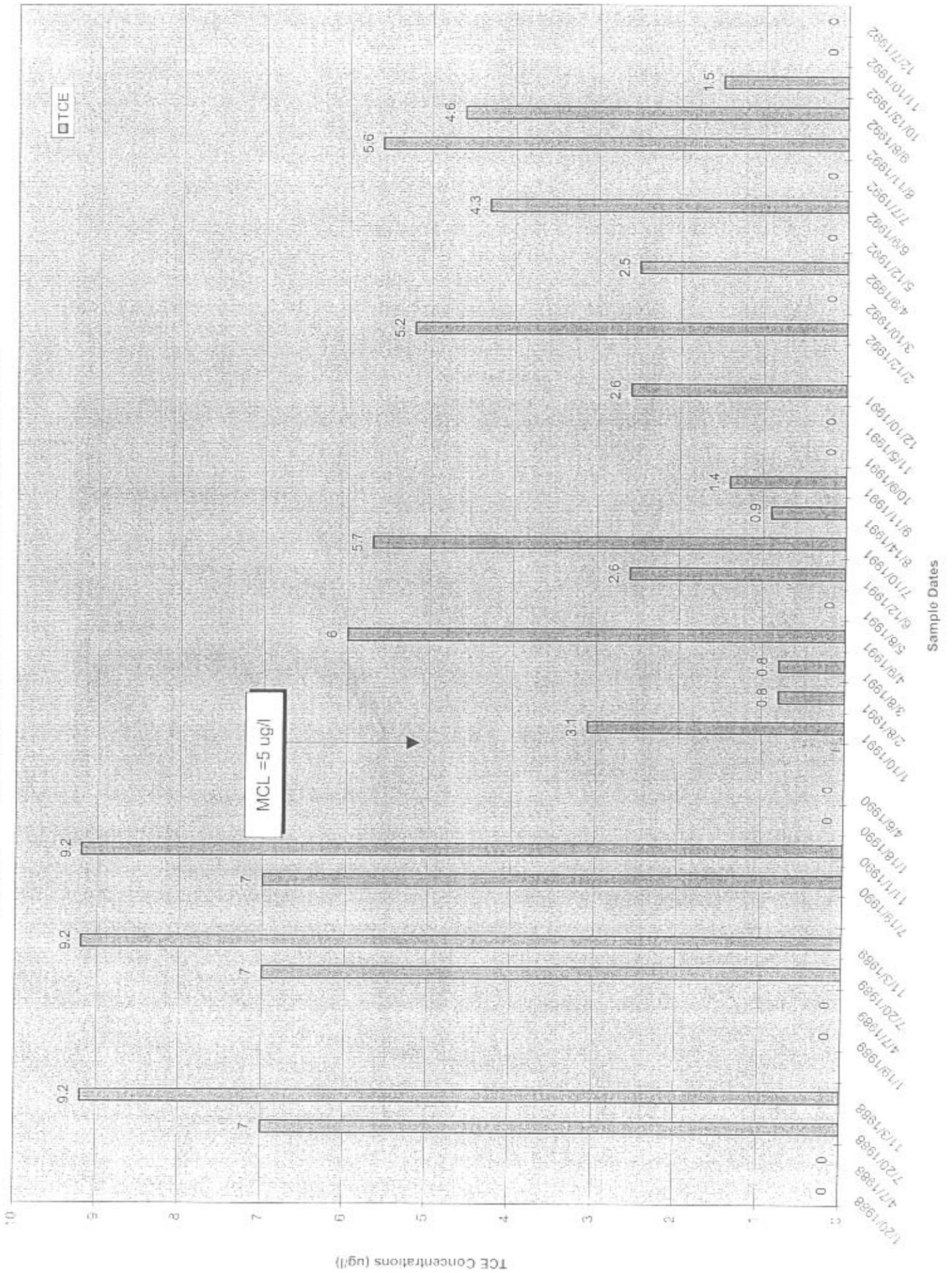


Figure 3 Fridley Commons Well 7 TCE Concentrations 1988-1992

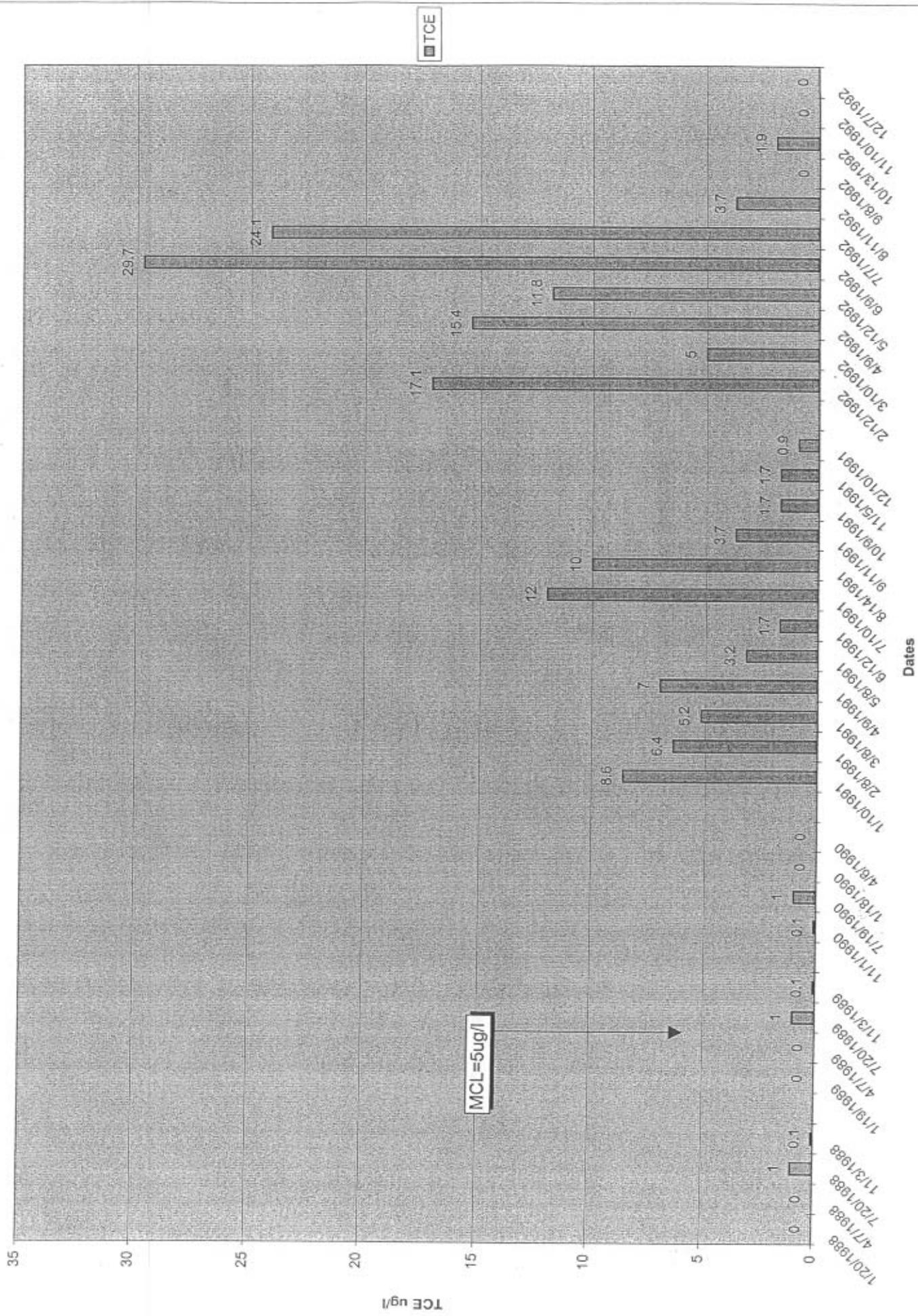


Figure 4 Fridley Commons Well 8 TCE Concentrations 1988-1992

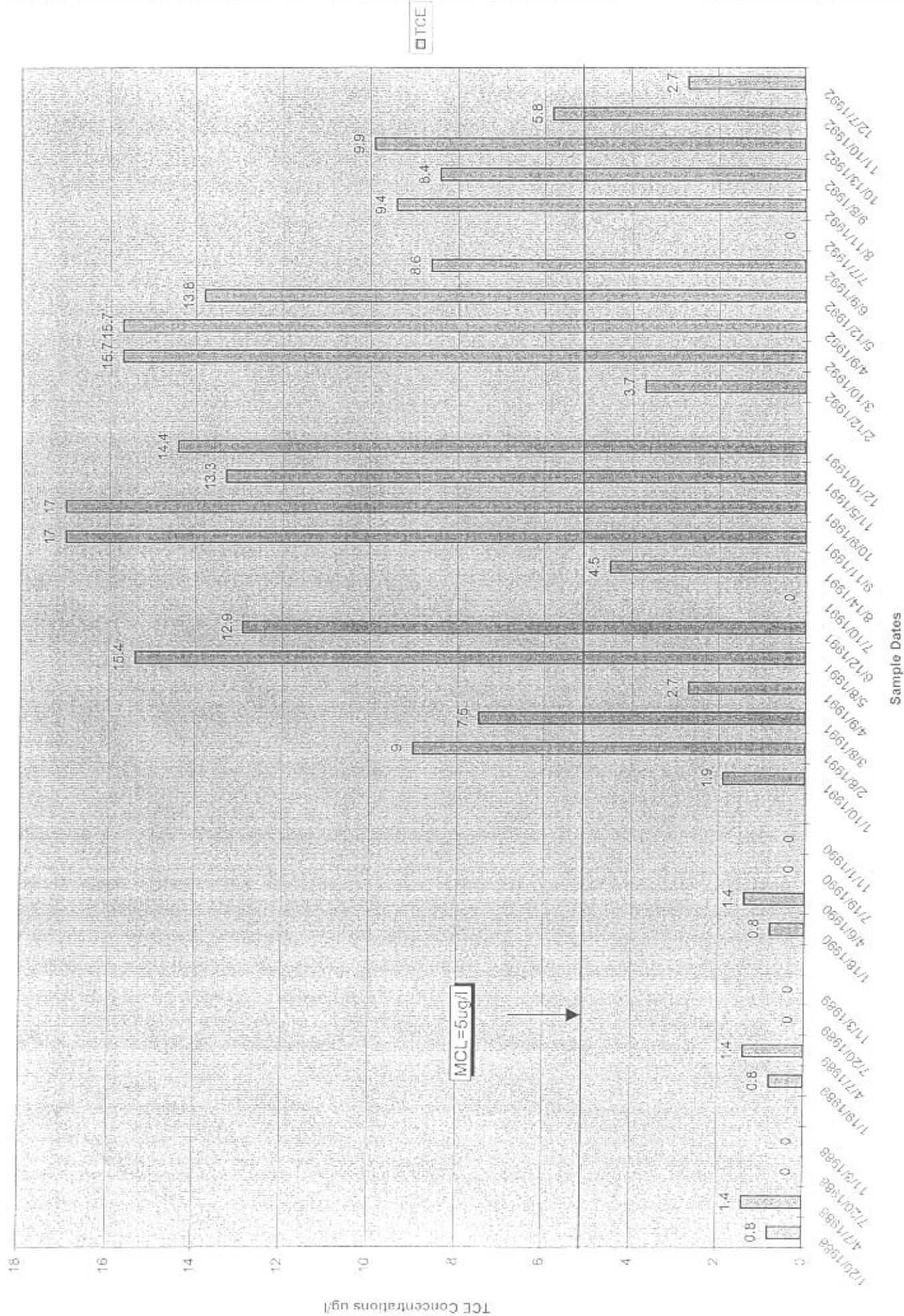
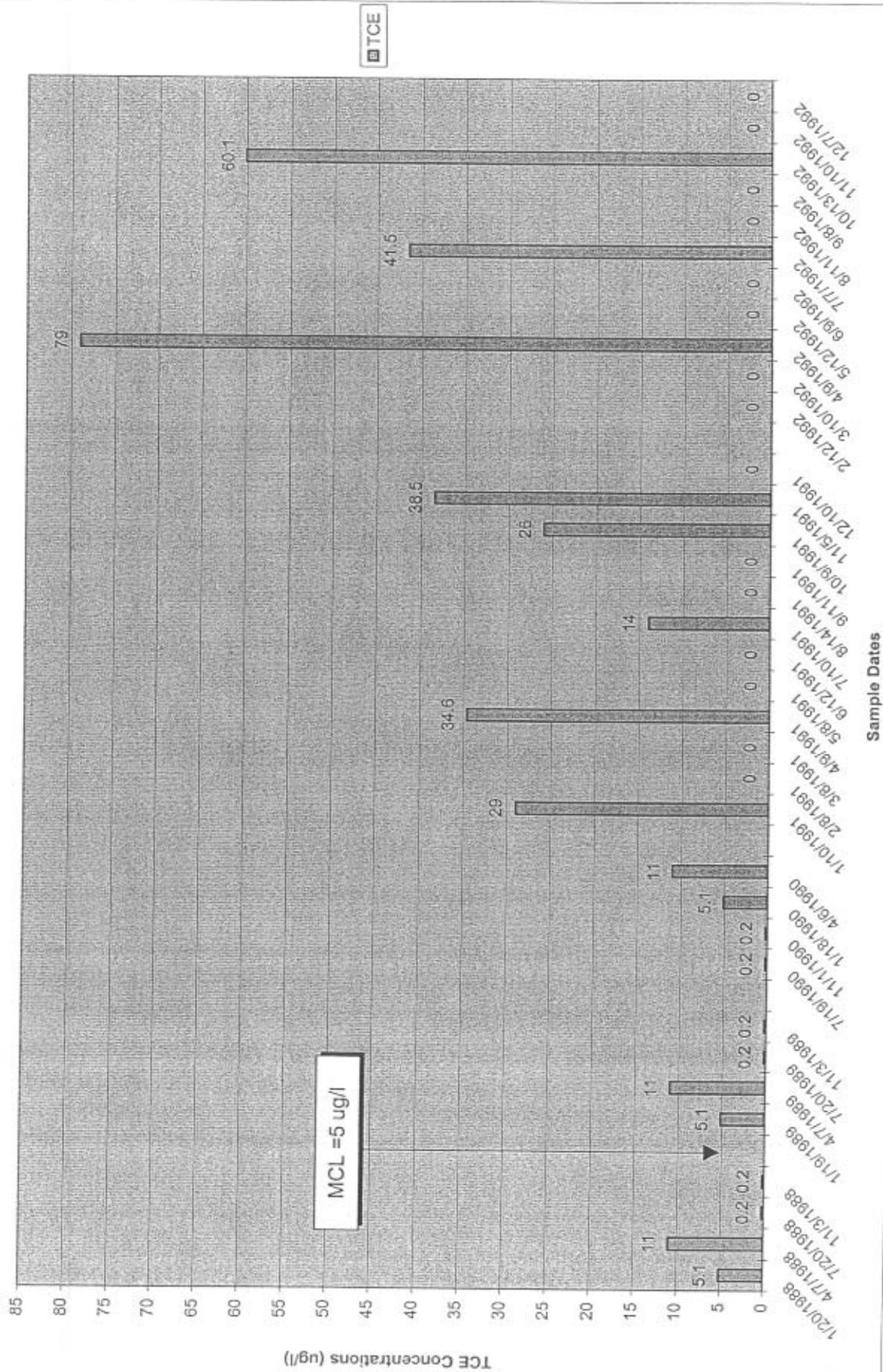
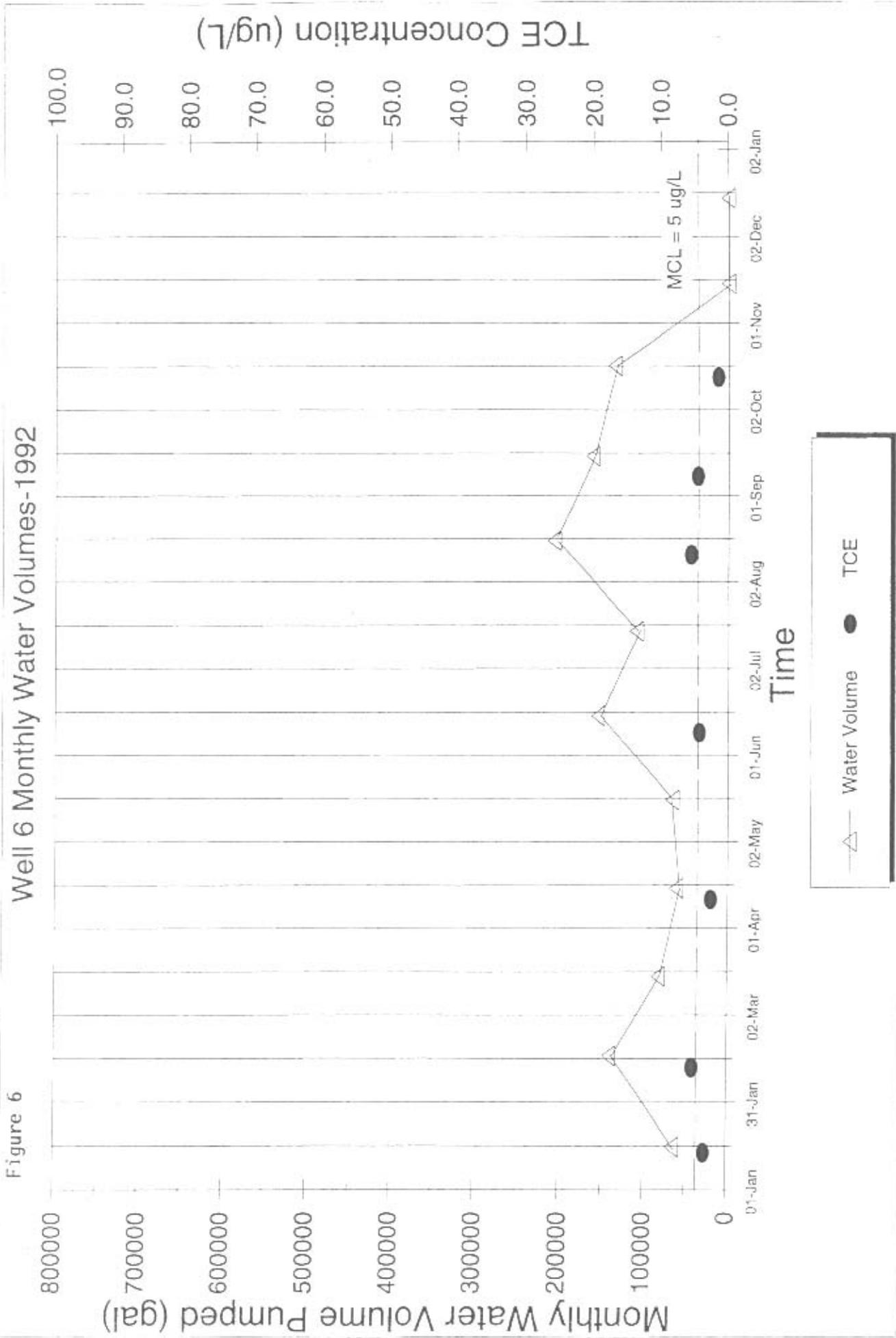


Figure 5 Fridley Commons Well 9 TCE Concentrations 1988-1992



Well 6 Monthly Water Volumes-1992



Well 7 Monthly Water Volumes-1992

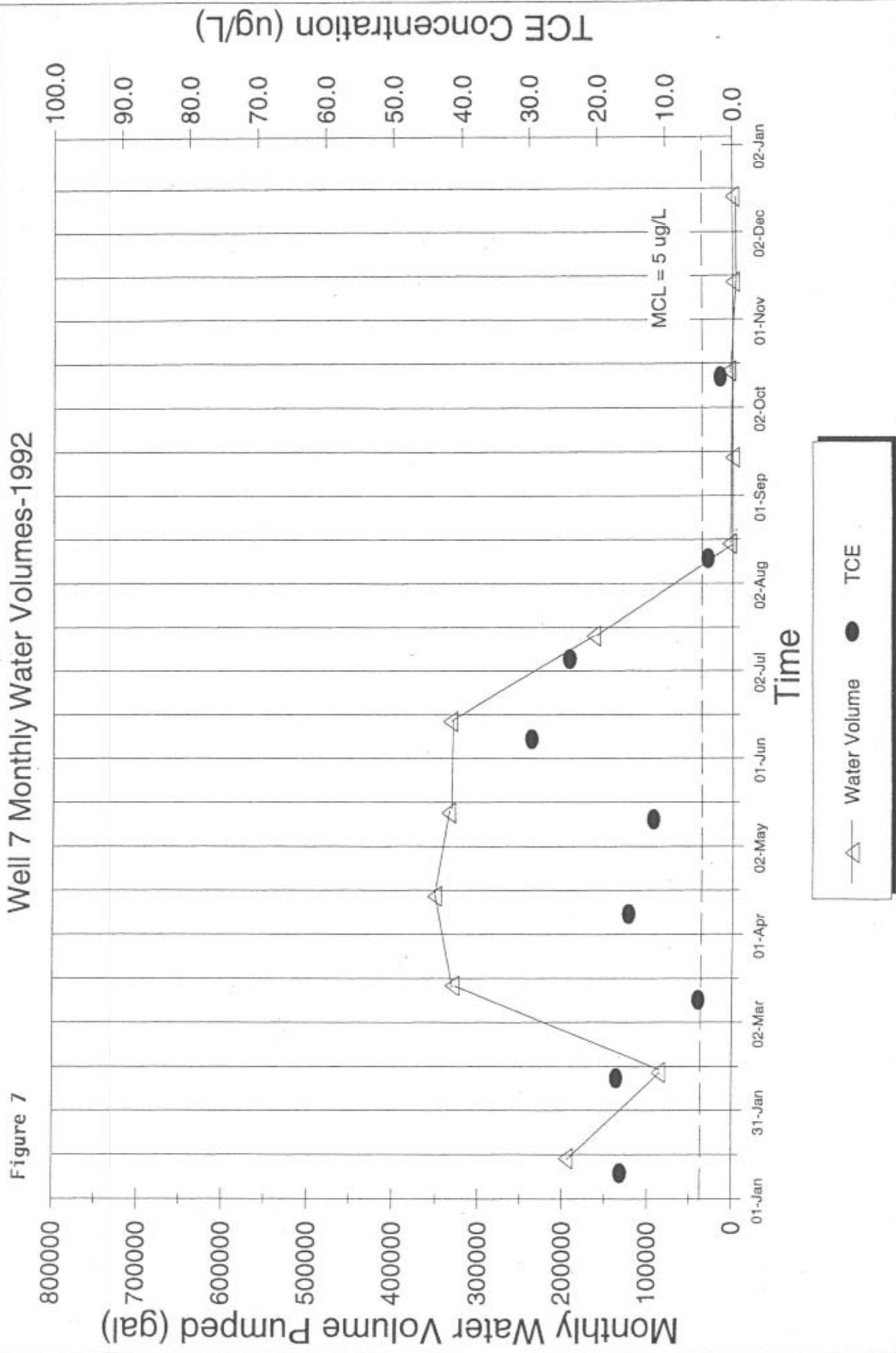
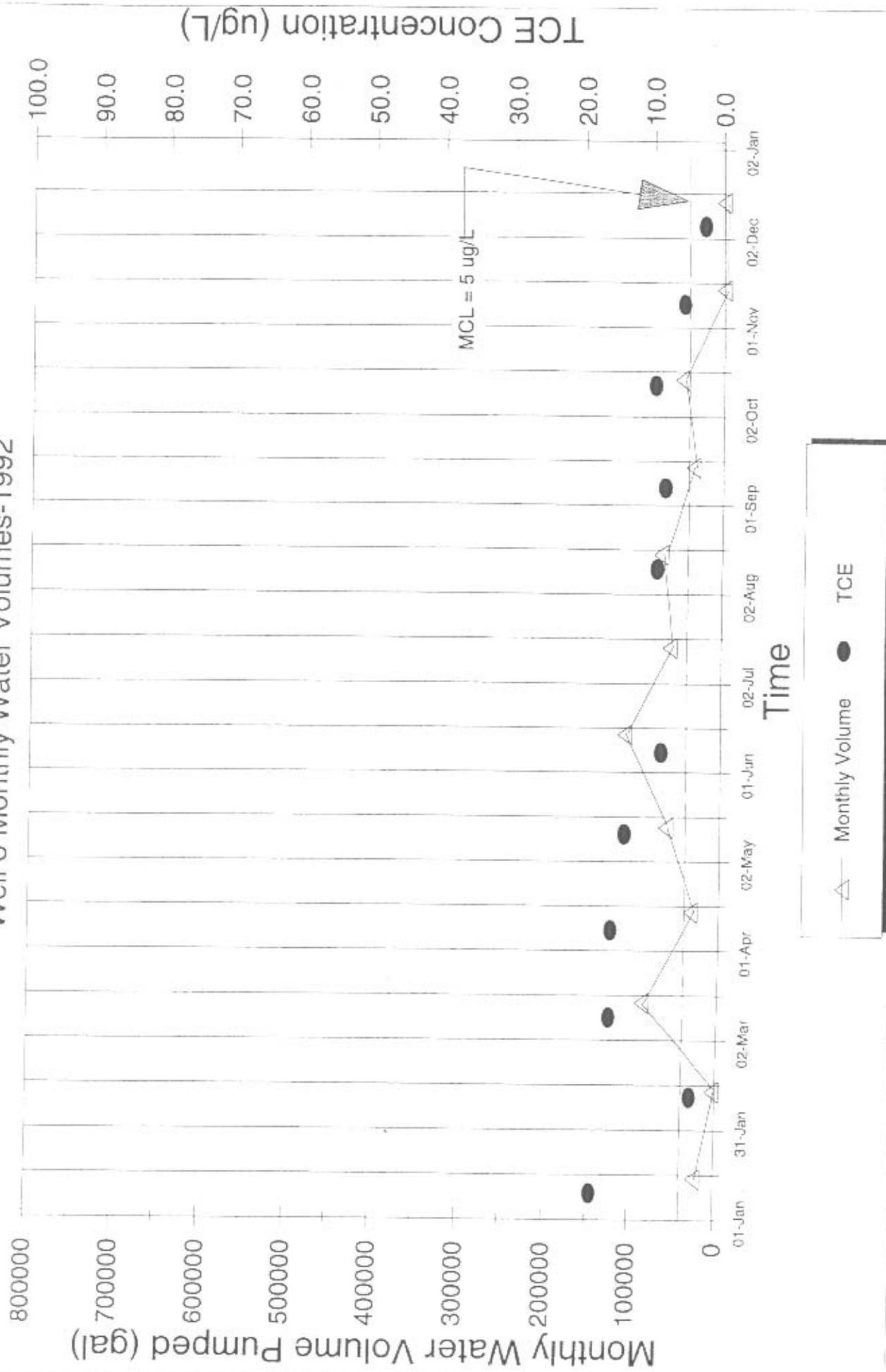


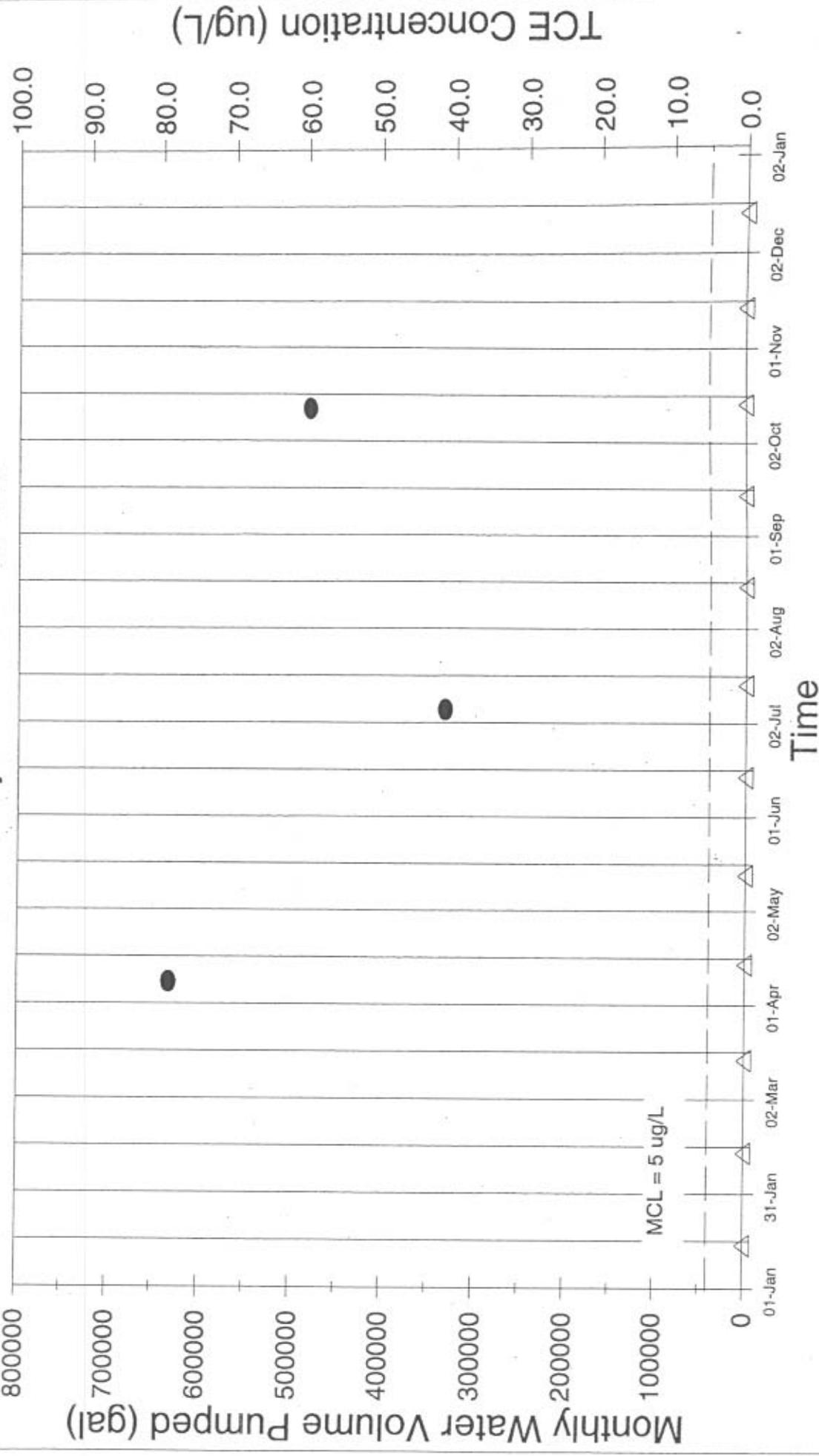
Figure 8

Well 8 Monthly Water Volumes-1992



Well 9 Monthly Water Volumes-1992

Figure 9



△ Water Volume ● TCE

Figure 10

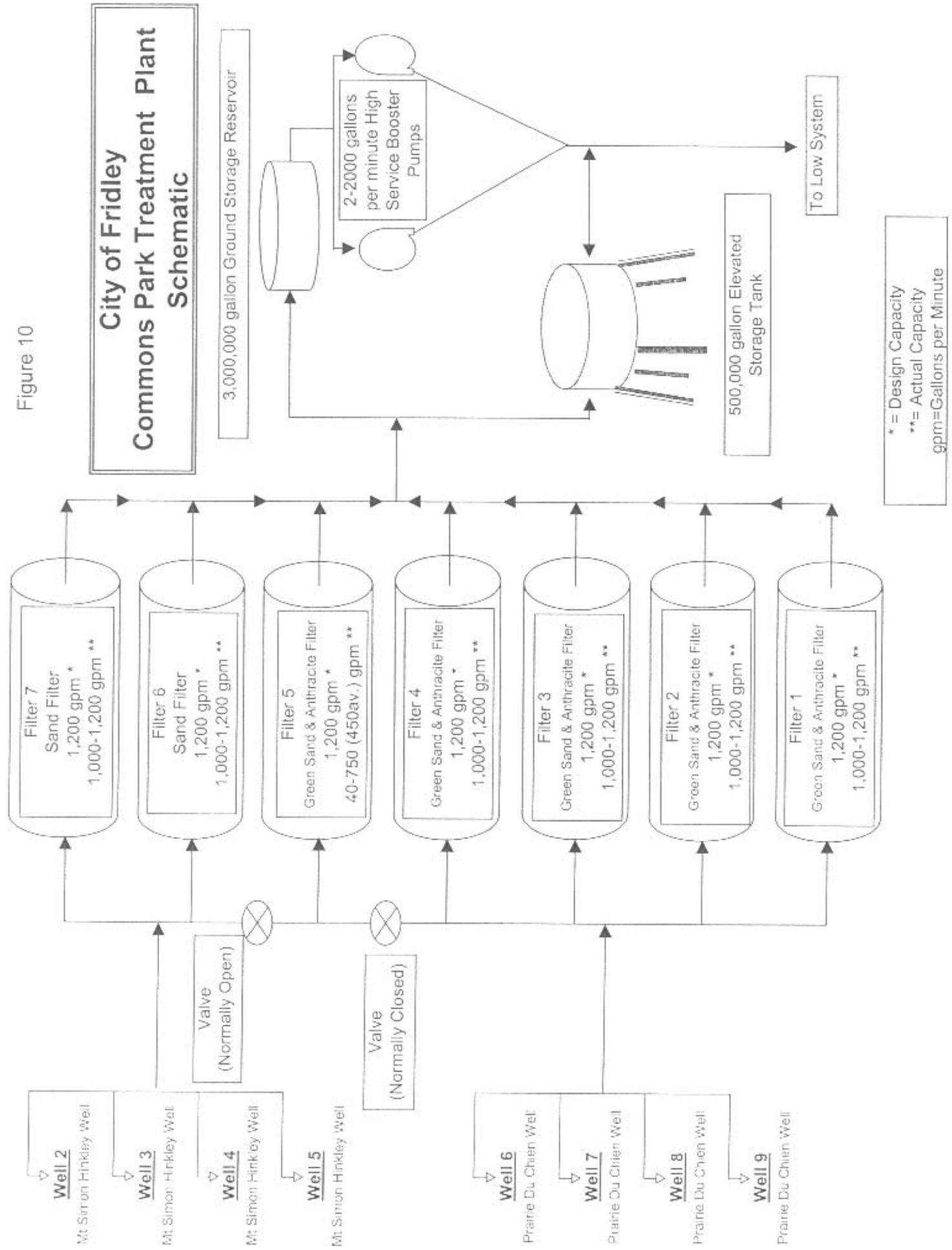


Figure 11

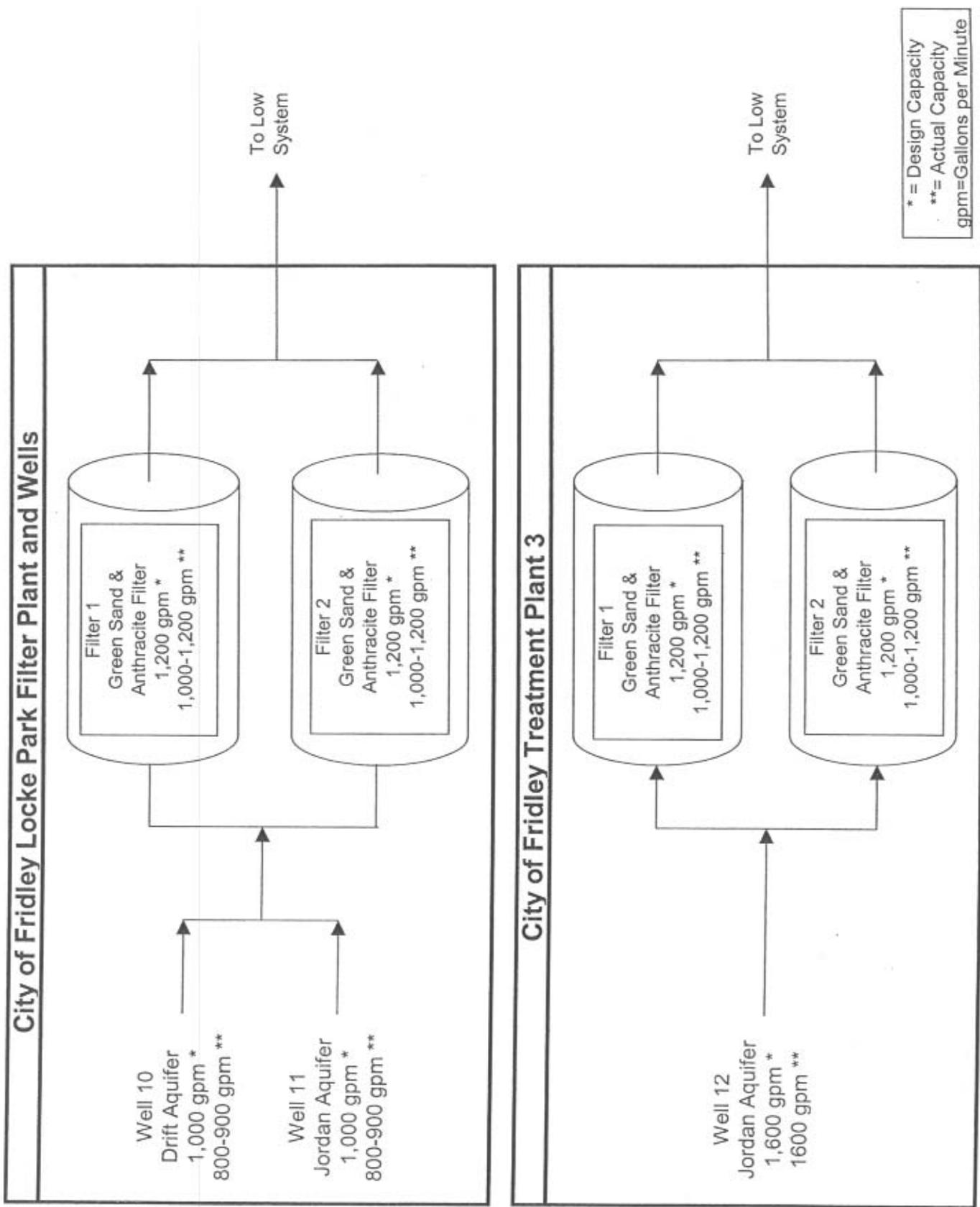
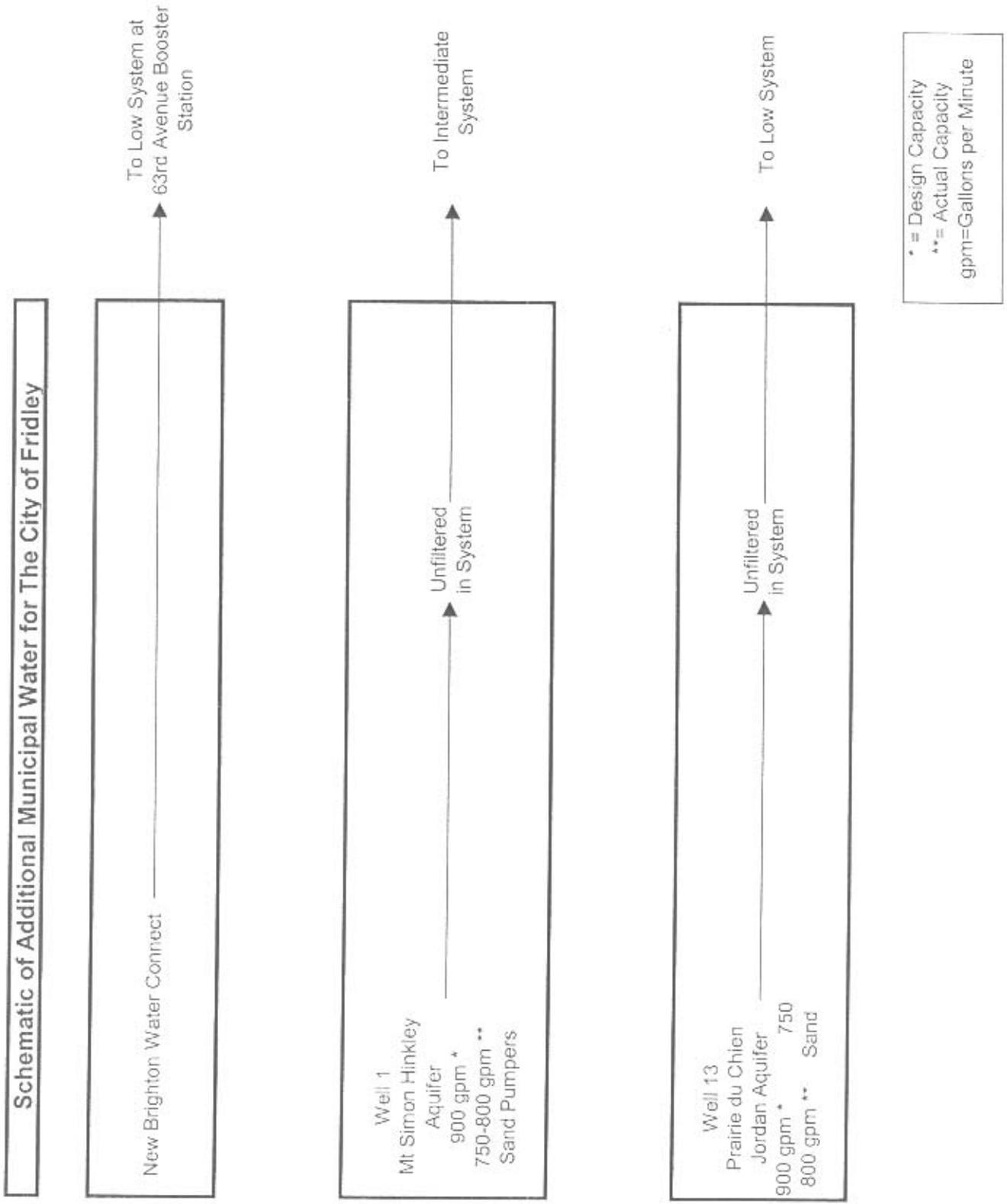


Figure 12





**CITY OF
FRIDLEY**

ZONING MAP

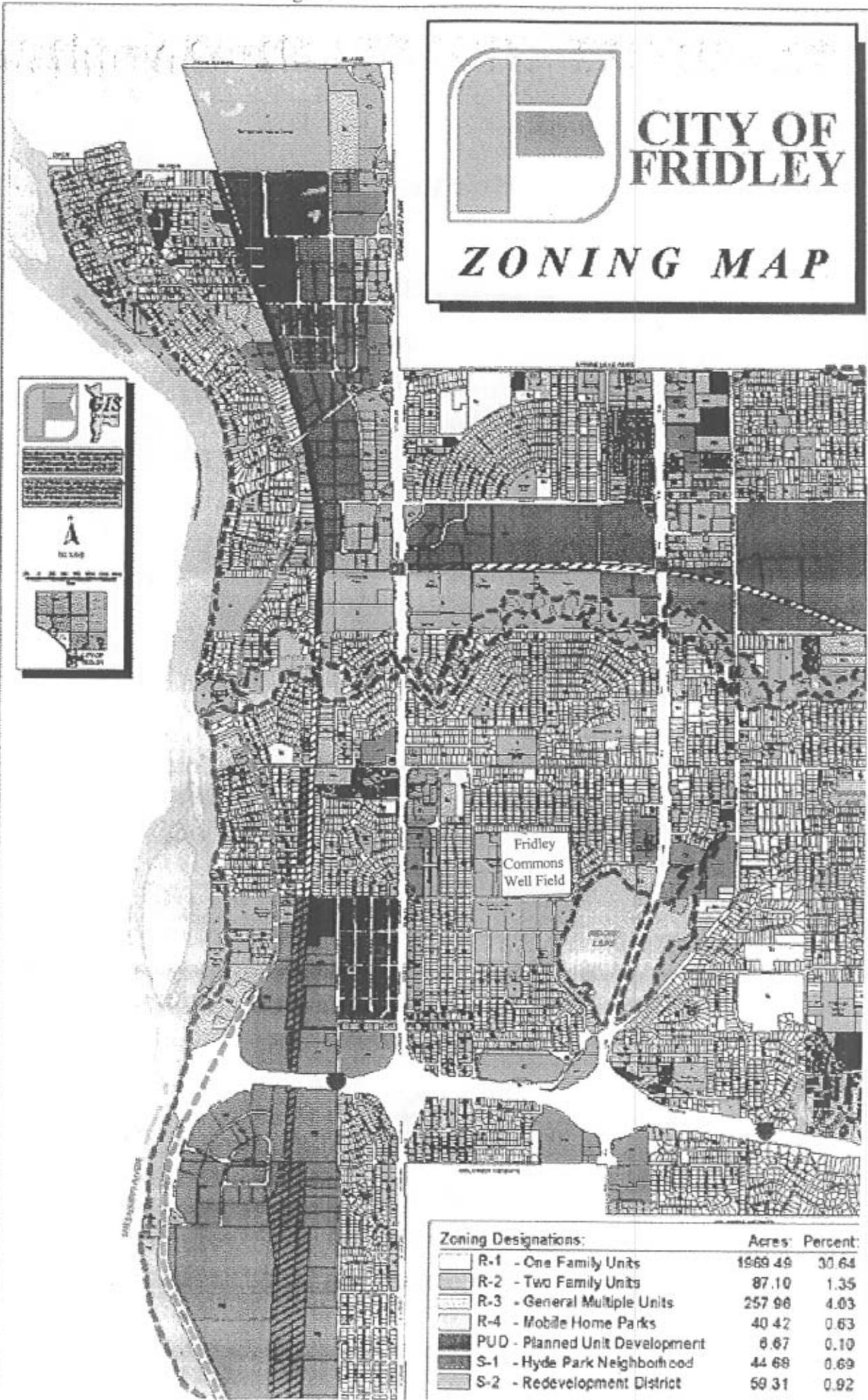


678

City of Fridley

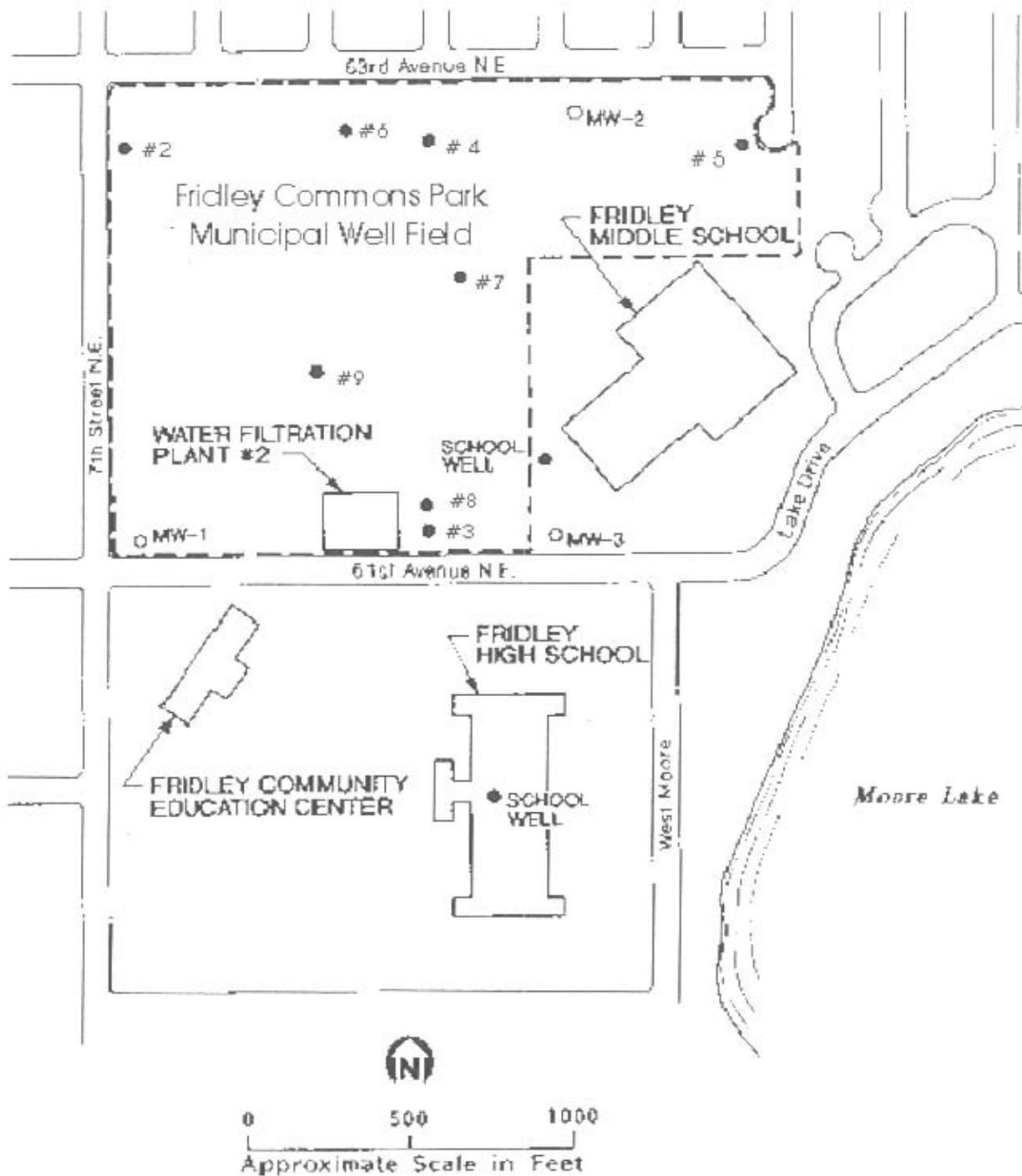
Scale: 1" = 1/2 Mile

North Arrow



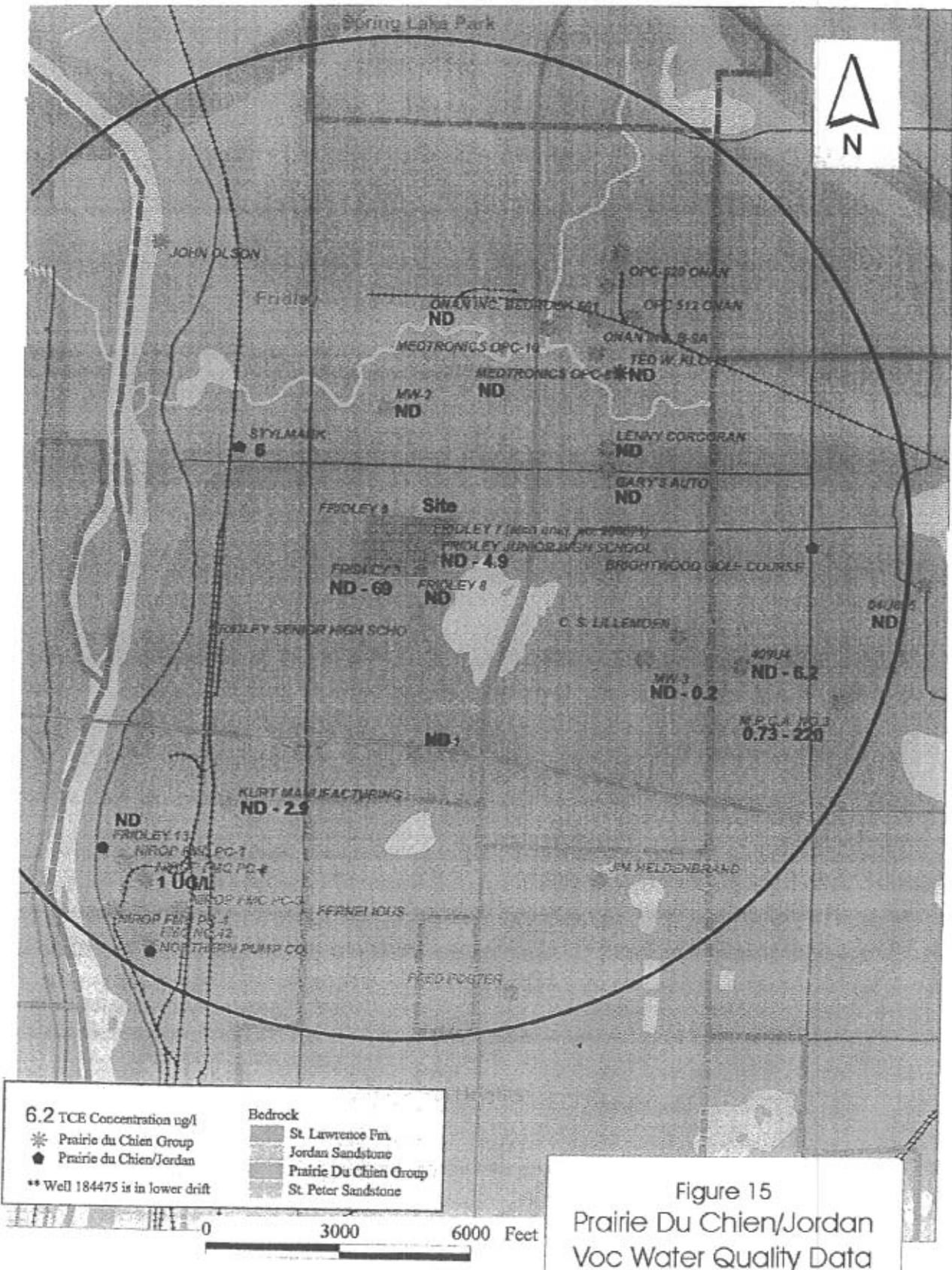
Zoning Designations:		Acres:	Percent:
	R-1 - One Family Units	1969.49	30.64
	R-2 - Two Family Units	87.10	1.35
	R-3 - General Multiple Units	257.96	4.03
	R-4 - Mobile Home Parks	40.42	0.63
	PUD - Planned Unit Development	8.67	0.10
	S-1 - Hyde Park Neighborhood	44.68	0.69
	S-2 - Redevelopment District	59.31	0.92

Figure 14
 Fridley Commons Well Field Site



#3 Municipal Well

Adapted from Ref. 1



Appendix A
Comments Received During Public Comment Period



FRIDLEY MUNICIPAL CENTER • 6431 UNIVERSITY AVE. N.E. FRIDLEY, MN 55432 • (612) 571-3450 • FAX (612) 571-1287
December 18, 2000

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PW00-129

Ms. Rita Messing, Supervisor
Site Assessment and Consultation Unit
Environmental Health Division
P O Box 64975
St Paul, MN 55164-0975

Subject: Public Health Assessment for the Fridley Commons Park Well Field

Dear Ms. Messing:

Thank you for the opportunity to comment on the above report. The report clarifies several concerns regarding the health hazard of TCE exposure. However, the report also seems to be using several incorrect assumptions and has not provided complete or realistic action items.

The report seems to assume that Fridley's well 9 has been permanently abandoned. This is not the case. Well 9 has been temporarily taken out of service due to the contamination concerns only until a method of treatment can be put in place. The report also does not take into account increase water demand due to the population and commercial/industrial growth the City is experiencing. Growth will certainly require increased pumping of the wells which in turn may lead to increased concentrations of TCE rendering these additional existing wells unusable. This will only compound the problem in the future.

There is a lot of analysis in the report regarding well 13. Well 13 is not in the Commons Park Well Field and is only used during peak summer demand periods. Treatment of the existing wells 6-9 at the Commons Park Well Field would allow increased economic production of finished water and reduce or eliminate the need for injecting the raw water from well 13 into our system.

The first public health action item states the need to find alternate sources of water. This item is unrealistic in a fully developed community such as Fridley. There is no available space to drill additional wells into the Prairie du Chien-Jordan aquifer within the Commons Park water complex with any assurance of contacting a clean source. The Mt. Simon-Hinkley formation is protected by state statute limiting its use. This leaves using surface water as the remaining local alternative. The City of Minneapolis is already using the Mississippi River downstream of Fridley as its sole source of water and the City of St. Paul uses the Mississippi River upstream of Fridley to replenish their Lake Vadnais reservoir. These two major metropolitan areas are already heavily drawing from a limited source and experiencing increased TCE in the River. In addition, the Mississippi River, as a surface body of water, has been identified as being extremely vulnerable to future contamination.

December 18, 2000

Page 2

The biggest concern the City of Fridley has with the Assessment is the lack of discussion of treatment. The BARR study (1997) identifies several alternatives including treatment. The use of granular activated carbon filters is the best alternative presented for treatment of sufficient volumes of potable water. Full well utilization may then provide partial or even total remediation benefits to the aquifer.

Please review your findings and provide a more accurate and complete conclusion to this report. I am available at your convenience to discuss the report. Please contact me at 763-572-3550.

Sincerely,

A handwritten signature in black ink, appearing to read 'Jon H. Haukaas', with a long horizontal line extending to the right.

Jon H. Haukaas
Public Works Director

JHH:cz

January 5, 2001

On December 8, 2000 the Anoka County Community Health and Environmental Services Department received the draft Public Health Assessment of Fridley Commons Park Well Field, Fridley, Anoka County, Minnesota (CERCLIS NO. MND985701309) from Rita B. Messing (Supervisor of the Site Assessment and Consultation Unit of the Minnesota Department of Health). Messing indicated that the draft is available for public comment until January 26, 2001.

To make this Public Health Assessment efficacious for local agencies, Anoka County offers the following comments and recommendations.

❖ General Comments

The Public Health Assessment (PHA) title indicates a focus on the Commons Park well field but the report addresses contamination of well #13 that is over a mile from the study site. The contaminants identified in the well indicate that it is not related to the contamination on the site. In fact, one of the five recommendations in the assessment addresses well #13 alone. RECOMMENDATION: The document's title should reflect the content such as: Public Health Assessment of Fridley Municipal Water System and Commons Park Well Field, Fridley, Anoka County, Minnesota (CERCLIS NO. MND985701309)

❖ Specific Comments

Page 1; Paragraph 1

The PHA indicates that there are eight "active" wells (2-9) in the Fridley Commons Park Well Field. In another part of the section the PHA states that well #9 was "taken out of service in November 1989." RECOMMENDATION: References to the wells should indicate that there are seven active wells (wells 2, 3, 4, 5, 6, 7, and 8) and one inactive well (well 9).

Page 1; Paragraph 2

The PHA states that the city "operates" eight wells (wells 2-9) although #9 is out of service. RECOMMENDATION: The sentence could be altered to state that eight municipal water supply wells, a water treatment plant, and a 500,000 gallon water tower tank is located on the site.

Page 3; Paragraph 1

The PHA indicates that Well #13 has been vulnerable to contamination and in Table-1 lists selected dates when contaminants were found in the well. Table-1 indicates that a contaminant was last found in the well on May 6, 1997. From the manner in which the report presents water quality information - we are led to assume that testing has not been performed for over three years. Furthermore, the PHA makes conclusions and recommendation that question current monitoring without providing information. RECOMMENDATION: Greater detail should be provided regarding the current monitoring and an "evaluation of exposure" should be performed to lay the groundwork for the PHA conclusions and recommendations regarding well #13 monitoring.

Page 4; Paragraph 7

The two irrigation wells at the school are described as "public" wells. Minnesota rules defines a public water supply as a system that is regulated under chapter 4720. RECOMMENDATION: Irrigation-only wells should not be classified as public wells. The paragraph should identify the number of public water supply wells plus the irrigation-only wells.

Page 5; Paragraph 3

The PHA states that Fridley Middle School has a well that contains TCE. The well is not identified as an irrigation well in this paragraph.

RECOMMENDATION: The reference to Fridley Middle School well should properly identify it as an irrigation well so that there is no misunderstanding regarding student exposure as a drinking water source.

Also

RECOMMENDATION: The discussion of the lack of contaminants found in the monitoring wells should include some explanation that this may be the result of construction and placement of the wells.

Page 9; Paragraph 4

The PHA makes a statement regarding the complexity of the hydrogeological setting that may make it cost prohibitive to locate the TCE source. We object to this conclusive statement included in an assessment of risk to public health. The potential to identify the source of TCE contamination is not dependent on hydrogeological investigation alone. Some investigation methods, which go into greater depth of the history of land-use and source identification (e.g., locating and evaluating abandoned wells), are cost effective. Further, the final conclusion shouldn't be needlessly pessimistic.

RECOMMENDATION: The paragraph should be deleted.

Page 9; Paragraph 5

The section title (Public Health Action Plan) implies that the PHA has determined the necessary actions to protect public health instead of recommendations as stated in the Forward section.

RECOMMENDATION: the title should be changed to represent the following items as recommendations.

Page 9; Paragraphs 6 and 10

The two bullet recommendations that alternative sources and water safety plan for wells 6, 7, 8, and 13 are compatible and should be combined. The City has prepared a mandatory Emergency and Water Conservation Plan that could be expanded to address a potential water supply shortage from the contamination. RECOMMENDATION: The two bullet recommendations should be combined to recommend that consideration be given to amending the existing Fridley Emergency and Water Conservation Plan to respond to the loss of wells 6, 7, 8, and 13 by contamination.

Page 9; Paragraph 7

The PHA recommends that a comprehensive well receptor survey for private wells and notification of owners of possible contaminated wells be performed within a 1-mile radius of the site. The Minnesota Department of Health has primary responsibility for the construction, use and safety of private water wells. And, MDH is the primary agency for the federal Safe Drinking Water Program. RECOMMENDATION: The recommendation be changed to indicate that the MDH should seek the advice and cooperation of the city utilities department and the county health department in locating private well owners within 1-mile of the site and notifying them of the possible contamination to their well.

Page 9; Paragraph 8

The PHA recommends that well #13 monitoring should be increased if it is not adequate.
RECOMMENDATION: The PHA should summarize monitoring activities that are currently taking place.
The PHA should determine whether current monitoring is adequate and recommend any changes to enhance public health protection.

Page 9; Paragraph 9

The PHA recommends that areas that receive undiluted well #13 water should be identified. The PHA does not indicate purpose of such an inventory. We believe that the intent (in part) of the recommendation is to respond to a contamination emergency. RECOMMENDATION: The bullet recommendation should be combined with paragraph 6 and 10 to recommend that consideration be given to amending the existing Fridley Emergency and Water Conservation Plan to respond to the loss of wells 6, 7, 8, and 13 by contamination.

The Department's comments were sent to:

Agency for Toxic Substances and Disease Registry
Division of Health Assessment and Consultation
Attn: Chief, Program Evaluation, Records, and Information Services Branch, E-56
1600 Clifton Road, NE
Atlanta, Georgia 30333

cc:
Community Relations Coordinator
Site Assessment and Consultation Unit
Minnesota Department of Health
121 East Seventh Place, Suite 220
St. Paul, MN 55164-0975

John Haukaas
City of Fridley
6431 University Avenue NE
Fridley, MN 55432



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF

SR-6J

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. Daniel Pena
Health Assessor
Site Assessment and Consultation Unit
Environmental Surveillance and Consultation Section
Minnesota Department of Health
121 East Seventh Place, Suite 220
P.O. Box 64975
St. Paul, MN 55164-0975

February 21, 2001

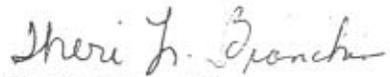
RE: Comments on the Public Release Health Assessment;
Fridley Commons Municipal Well Field, National Priorities List
Superfund Site; Fridley, Minnesota

Dear Mr. Pena:

On behalf of the United States Environmental Protection Agency (U.S. EPA), I have reviewed the Public Health Assessment Report for the Fridley Commons Well Field Park dated October 3rd, 2000, and provide the enclosed comments. Thank you for the opportunity to provide these comments, and thank you for your flexibility in providing me a time extension so that I could complete my review. Although your cover letter states that comments should be directed to Lisa Pogoff, of your agency, I was later informed that the comments should be directed to your attention.

I hope you will find these comments useful. Please call me at (312) 886-4745, if you need further clarification or would like to discuss this matter further.

Sincerely,



Sheri L. Bianchin
Remedial Project Manager
Remedial Response Section #3

cc: Nile Fellows, MPCA

ENCLOSURE

U.S. EPA's Comments to the Public Release Health Assessment - Fridley Commons Municipal Well Field

1. Page 1, Introduction.

It is recommended that the following information be included in the introduction in order to explain the reason that the Health Assessment was conducted.

As is explained further in this report, the Fridley Park Municipal Well Field site was proposed by the United States Environmental Protection Agency and the Michigan Department of Environmental Quality for the National Priorities List on September 29, 1998, and was listed on January 19, 1999. Because the site is listed on the NPL, and pursuant to the Comprehensive Environmental Response and Liability Act (CERCLA) law, this Health Assessment is being conducted.

2. Page 1, Background Site Description and History, third paragraph.

Add the following to the text. All of these wells (#6 - #9) are completed in the Prairie Du Chien Aquifer.

3. Page 1, Background, Site Description and History.

It would be more beneficial to the reader, if the discussion on top of page 3, regarding the other 5 wells that the city operates were moved up in the discussion and included in paragraph 2 which begins as follows: "The city operates 8 municipal wells" This way it will be clear that the city operates 13 municipal wells in total.

4. Page 1, Background, Site Description and History.

Please discuss the geographic location and distances of the wells in the Commons Park Well Field, and the other municipal wells.

5. Page 1, Background Site Description and History.

If known, explain the ground water monitoring sampling program utilized by the Fridley municipality, and whether it is consistent with the requirements of the Safe Drinking Water Act. Suggested language is as follows: "Because the Fridley Commons Well Field and supplemental wells are regulated under the Safe Drinking Water Act, these wells are required to be and are monitored on a regular basis. At present, the City's monitoring program consists of collection of a representative sample of water from each well on a quarterly basis and analyzed for" Additionally, it is not clear if Well #9 is still sampled. Please include this fact in the discussion if it is known.

6. Page 3, Background Site Description and History.

When Fridley Well 13 is mentioned, please mention that it is open to the Prairie Du Chien Aquifer. Although this information is available on Figure 12, it would be more useful to also include it in the text.

7. Page 3, Background, Site Description and History.

The text states that "[o]ther residence[s] may received primarily Well 13 may receive little or no dilution with the other water in the system." If it is known, state whether any treatment such as chlorine and fluorine are added to the water that is pumped directly into the distribution system. Although it is implied, this information is not readily apparent from Figure 12.

8. Page 3, Background, Site Description and History, Table 2.

If available, discuss how often Well #13 is sampled. If more recent sampling results are available, please include it in Table 2.

9. Page 4, Background, Site Description and History.

Include the following information.

The remedial investigation and subsequent remedial work necessary at the Site will be conducted by the Minnesota Pollution Control Agency (MPCA) under contract with the United States Environmental Protection Agency. The MPCA has received some federal partial funding from the U.S. EPA in order to conduct the Remedial Investigation and Feasibility Study so that a remedy can be studied and selected, if needed. The MPCA will also investigate whether any responsible parties can be identified.

10. Page 4, Demographics, Land Use, and Resources Use.

If known, state whether any of the private wells have been sampled.

11. Page 4, Site Visit.

The text states ".... during one of the quarterly monitoring events ..." Please clarify, if known, more specificity regarding the quarterly monitoring events. For example, discuss what wells are sampled, and for what they are sampled.

12. Page 5, General Regional Issues, second paragraph.

The text states that "....only a few have indications of TCE contamination." This statement appears to be somewhat contradictory to the available data. It appears from review of site information, that any ground water contamination detected has originated in the Prairie du Chien-Jordan Aquifer. If this is not true, then disregard the comment.

13. Page 6, Evaluation of Contamination and Exposure.

The text states that the Minnesota Department of Health concludes that the current contamination exposure levels from drinking water do not pose a current public health hazard. Please clarify up to what level would not be considered a public health hazard.

14. Page 6, Evaluation of Contamination and Exposure.

The text states that after the ground water is treated, it is distributed to ..." Further clarify that the ground water is treated for inorganics and then chlorine and fluorine are added. To date, no wells are tested for volatile organic compounds.

15. Page 8, Conclusions, Fifth Bullet.

Discuss when Well #13 was last sampled, if known.

16. Page 8, Conclusions, Seventh Bullet.

Add the following to the end of the statement: "...through this health assessment".

17. Page 9, Conclusions, Eighth Bullet.

Add the following to the end of the statement: "...through this health assessment".

18. Page 9, Conclusions, Last Bullet.

Add the following text to the sentence, after "prohibitive": "and technically impracticable".

19. Page 9, Public Health Action Plan, First Bullet.

The first bullet states that an alternate source of water need to be located to replace wells 6, 7, 8, and 13 if they become unusable. Clarify whether this means unusable due to VOC contamination. The following may be a better recommendation. If the VOC contamination in the wells rises above acceptable standards, then either an alternate source of water needs to be located or treatment may need to be employed in order to assure that no unacceptable exposures of contamination are occurring.

20. Page 9, Public Health Action Plan, Second Bullet.

The plan of conducting a comprehensive well receptor survey for private wells is very prudent. Within the context of the comprehensive well receptor survey, it would be wise to determine how the wells were constructed, if this information is available, and whether any sampling has occurred to date.

21. Page 9, Public Health Action Plan, Second Bullet.

Please explain further the type of notification that is discussed here, and the intention of such a notice. It may be more useful to conduct further investigation prior to issuance of a notification so that details can be included in the notice. For example, it would also be prudent to investigate and sample a representative wells to determine whether there is any contamination present. Furthermore, if contamination has only been found in wells which are located in the Prairie Du Chien Aquifer, then that should be reported in the notification since it appears that, based upon currently known information, the contamination has only been detected in the Prairie Du Chien aquifer. The notice could discuss the findings to date and the likelihood of contamination.

22. Page 9, Public Health Action Plan, Fourth Bullet.

The recommendation should be further stated that the Fridley municipality representatives will be contacted to gather further information regarding when well #13 is utilized, the frequency of sampling and sampling protocols. Furthermore, the implications of providing water which could possibly be contaminated should be discussed with city of Fridley representatives, along with assuring the safety of the citizens.

23. Page 9, Public Health Action Plan.

If the specifics of that City's monitoring program were not verified for this review, then verification may be suggested as part of the action plan. Also, please consider adding the following suggestion to the action plan. The monitoring plan of the municipal and private wells in the area should be examined to determine whether they are adequate. If they are not adequate, then the program(s) should be modified.



Minnesota Pollution Control Agency

January 25, 2001

Ms. Rita Messing, Supervisor
Site Assessment and Consultation Unit
Environmental Health Division
P.O. Box 64975
St. Paul, MN 55164-0975

RE: Public Health Assessment for the Fridley Commons Park Well Field

Dear Ms. Messing:

Staff from the Minnesota Pollution Control Agency (MPCA) have reviewed the draft Public Health Assessment Report for the Fridley Park Commons Well Field. While the report in general does a good job of summarizing the history of the site staff have some concerns regarding the report.

1. The report spends a lot of time on municipal well 13. From the MPCA perspective well 13 is not considered to be part of the Commons Park Well Field. We agree that well 13 is contaminated with Trichlorethylene (TCE) found in its water and that there are issues with how the well is connected to the water system. But because of its distance from the well field we do not believe that this should be included as part of the Well Field site.
2. Some of the possible solutions for fixing and remediating the Fridley water system may provide enough water so as to allow the city of Fridley to quit using well 13.
3. One possible solution not mentioned is that the city could possibly drill up to four new wells to replace the four currently out of service. This could be evaluated as part of the feasibility study.
4. Treatment alternatives were not mentioned. Carbon filtration and air stripping are viable alternatives that will be studied in the feasibility study. In this manner, the existing contaminated wells may still be usable.

If you have any questions concerning our comments, please feel free to contact me at (651) 296-7299.

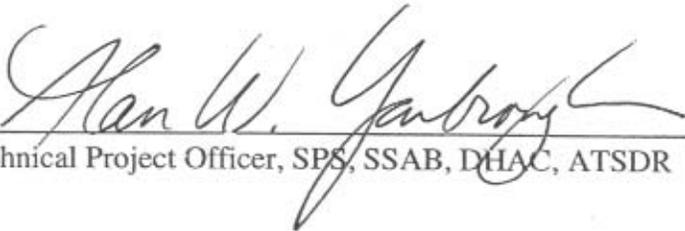
Sincerely,

Nile Fellows, Project Manager
Site Remediation Section
Metro District

NF:csa

CERTIFICATION

This Fridley Commons Well Field Public Health Assessment was prepared by the (fill in) under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR). It is in accordance with approved methodology and procedures existing at the time the public health assessment was begun.


Technical Project Officer, SPS, SSAB, DHAC, ATSDR

The Division of Health Assessment and Consultation, ATSDR, has reviewed this public health assessment and concurs with the findings.


Chief, Superfund Site Assessment Branch, DHAC, ATSDR

for DG