US EPA RECORDS CENTER REGION 5
515353

MINNESOTA POLLUTION CONTROL AGENCY
Solid and Hazardous Waste Division

Agenda Item Control Sheet

Agenda # _____

MEETING DATE: November 27, 1984 APPEARANCE REQUESTED - YES: X NO: ____
SCHEDULED TIME: _____

PREPARED BY: Stephen D. Riner DATE PREPARED: October 31, 1984
DATE MAILED : November 2, 1984

SUBJECT: Request for Issuance of a Request for Response Action to The Reilly Tar and Chemical Corporation Regarding Contamination At and Around The Reilly Tar Hazardous Waste Site In St. Louis Park, Request for Authorization to Amend the Litigation to Include Claims Under the State Superfund Law, and Request for Authorization to Expend State Superfund Monies for Litigation Costs

LOCATION: St. Louis Park (CITY) Hennepin (COUNTY)

TYPE OF ACTION:

Permit	____	Request For Hearing	____	New	____
Stipulation	____	Request for legal action	____	Modification	____
Contract	____	Variance request	____	Extension	____
Policy	____	Rulemaking	____	Revocation	____
Information	____	Administrative order	____	Other	X

RECOMMENDED ACTION:

Issuance	X	Approval	____	No action needed	____
Denial	____	Authorization	X		

ISSUE STATEMENT:

Reilly Tar and Chemical Corporation (Reilly) operated a coal tar refinery and wood treatment facility in St. Louis Park from 1917 to 1972. Releases of hazardous substances from the facility have contaminated soils and ground water in the area of the Reilly Tar Hazardous Waste site (Reilly site). This contamination has resulted in the closing of seven municipal drinking water wells in St. Louis Park and Hopkins. Remedial action is required to control the spread of contaminants in the aquifers beneath and around the Reilly site.

Litigation to compel remedy of the contamination problem is currently pending in Federal District Court. This litigation was filed prior to the enactment of the Minnesota Environmental Response and Liability Act (MERLA) in the spring of 1983.

In this board item, the Minnesota Pollution Control Agency (MPCA) staff recommend that the MPCA Board issue a Request for Response Action (RFRA) to Reilly requiring Reilly to implement and complete a remedial action plan. The MPCA staff also recommend that the MPCA Board authorize the MPCA Executive Director to request the Attorney General to amend the pending litigation to include MERLA claims and to authorize the MPCA Executive Director to expend MERLA monies to help pay for ongoing litigation expenses in an amount not to exceed $150,000.

ATTACHMENTS:

1. Definitions
2. Request for Response Action with Exhibits
3. Maps and Diagram
4.
5.

MINNESOTA POLLUTION CONTROL AGENCY
Solid and Hazardous Waste Division
Site Response Section

Request for Issuance of a Request for Response Action to The Reilly Tar and Chemical Corporation Regarding Contamination At and Around The Reilly Tar Hazardous Waste Site In St. Louis Park, Request for Authorization to Amend the Litigation to Include Claims Under the State Superfund Law, and Request for Authorization to Expend State Superfund Monies for Litigation Costs

November 27, 1984

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I. BACKGROUND

The Reilly Tar and Chemical Corporation (Reilly) operated a coal tar refinery and wood treatment facility in St. Louis Park, Minnesota, from 1917 to 1972. These operations have resulted in both water and soil contamination on and off the Reilly site. In 1973 the City acquired the site.

In 1977, the MPCA Board authorized the reactivation of the Reilly litigation because of reports of extensive ground water contamination and risks

of public exposure to carcinogens through municipal water supply. The original lawsuit was filed in 1970 by the State and the City of St. Louis Park. Since it was originally filed, the litigation has progressed through a number of significant changes:

(1) Additional facts as to the nature and scope of the contamination have been discovered _1/;

(2) Additional parties were joined _2/;

(3) Additional claims and defenses were asserted; and,

(4) Jurisdiction was transferred from state to federal court.

Trial on the litigation as it now exists is to be conducted in two phases. The first phase, on the issues of liability under federal law and remedy, is scheduled to begin in the spring of 1985. The trial date for the second phase (including liability under other claims, defenses and recovery of past government costs) will follow the first phase.

While the litigation has been progressing, several actions have been taken by the governmental plaintiffs to protect municipal water supplies and contain the spread of ground water contamination. In 1982, the MPCA and the U.S. Environmental Protection Agency (EPA) entered into a Cooperative Agreement _3/ to use

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_1/ Carcinogenic compounds were discovered in the water supply of St. Louis Park. Subsequently, the City of Hopkins detected contamination in their water supply wells. These discoveries have lead in recent years to the closure of seven municipal water wells in St. Louis Park and Hopkins.

_2/ The United States became a party-plaintiff in 1980 and the City of Hopkins became a party - plaintiff in 1981.

_3/ In November, 1983, the MPCA Board authorized the staff to negotiate an amendment to the Cooperative Agreement to fund studies of other aquifers, the contaminant containment options for the Prairie du Chien and contaminant removal at the source. At the time of the preparation of this Board item, the staff is awaiting final decision by EPA with regard to the amendment of the Cooperative Agreement and the award of additional monies.

federal superfund monies to fund investigation and clean up activities at and around the Reilly site. Using the funds provided by EPA through a grant in 1981 and the Cooperative Agreement, the following four major tasks have been largely completed: (1) the conduct of a survey to locate multi-aquifer wells that may provide pathways to spread contamination; (2) the clean out and reconstruction of two deep wells on the Reilly site (one well referred to as W23 contained large quantities of coal tar product); (3) the development of a ground water flow model in the Prairie du Chien-Jordan aquifer (a major water supply source) to be used as the basis for the design of a gradient control system (to control the spread of the contaminants); and, (4) the study of the feasibility of various methods to restore the portion of the St. Louis Park water supply lost to contamination in the Prairie-du Chien-Jordan aquifer (this study concluded that granular activated carbon (GAC) treatment is the most cost effective way of restoring this lost capacity.)

In terms of the lost water capacity for St. Louis Park, the next objective of the MPCA staff is to see that GAC treatment is implemented. EPA has proceeded through their administrative prerequisites to the expenditure of federal superfund monies and, in June 1984, issued a Record of Decision (ROD) which affirmed the results of the feasibility study for the GAC system in St. Louis Park. In addition, on August 1, 1984, EPA issued an Administrative Order which directed Reilly to either construct a GAC treatment system or face the threat of treble damages under the federal superfund law. 4/

4/ Currently, EPA is negotiating with Reilly on certain terms and conditions which Reilly has stated it would construct the GAC system. If these negotiations are successful, government funds will not need to be spent to construct the GAC system. However, the MPCA has applied for federal monies for the construction of a GAC system in the present amendment to the cooperative agreement.

Meanwhile, the litigation has continued to move forward to trial. Numerous dispositive motions have been filed by both plaintiffs and Reilly, and extensive discovery has been conducted and contested. Most recently, in mid-September, 1984, Judge Paul A. Magnuson held a pretrial conference at which the parties discussed and agreed to holding the trial in two phases. At that conference, Judge Magnuson advised the parties of his intent to appoint a Special Master to assist the Court in the management of the litigation. The Judge indicated that he intended the parties to share the cost of the Special Master. Lastly, the Judge directed the parties to meet and submit to the Court a stipulated order addressing the bifurcation of the trial in this matter and the appointment of the Special Master.

The State's share of the cost for the Special Master (and of other litigation expenses associated with the preparation of this case for trial in 1985) can be properly funded through the State Superfund. However, prior to authorizing the use of superfund monies in this litigation, the MPCA Board must comply with the procedural steps in MERLA. Thus, through this Board Item, the MPCA staff request that the MPCA Board issue a Request for Response Action (RFRA) to Reilly. This Board Item contains the information needed to justify the issuance of such a RFRA and is divided into the following sections:

A. Jurisdictional Basis for the Issuance of the RFRA to Reilly;

B. Authorization to Expend Superfund Monies in Furtherance of the Reilly Litigation; and,

C. Authorization to Amend the Litigation to Include MERLA Claims.

The staff has, over the past year, been involved in extensive negotiations with Reilly. At the urging of the court, the staff will commence additional negotiations in early November. The staff will update the Board on the progress of the negotiations at the November 27, 1984 meeting.

II. DISCUSSION

A. Jurisdictional Basis for the Issuance of the RFRA to Reilly

Under MERLA, before the MPCA can issue a RFRA, it must make several determinations 5/: it must determine (1) that there is a release; (2) that the release is from a facility; (3) that the release involves hazardous substances; and (4) that the person to whom a RFRA is proposed to be issued is a responsible party. In addition, the MPCA must conclude that the requested response actions are reasonable and necessary to protect the public health, welfare, or the environment and the time specified in the RFRA is a reasonable time for beginning and completing the actions, taking into account the urgency of the actions. The background facts supporting each of these determinations is set forth below.

1. There is a release.

As set out in Minn. Stat. §115B.02, subd. 15 (Attachment 1) "release" is defined broadly to mean, "any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injection, escaping, leaching, dumping, or disposing into the environment which occurred at a point in time or which continues to occur." (Exceptions as defined in this definition do not apply to this case. See Attachment 1.)

Documents in this case establish that there has been a release (within the meaning of Minn. Stat. §115B.02, subd. 15) from the Reilly site, including leaks and spills during the operation of the facility in St. Louis Park. Deposition testimony offered by persons familiar with the Reilly operations also supports this conclusion. Further, the presence of coal tar constituents in the swamp south of the plant site, in soil on the plant site, and in the

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5/ The MPCA Board has considered a number of RFRA's for other sites and the Board Items for those RFRA's have explained in detail the procedural background and requirements of MERLA. Those requirements are not restated here.

deep well (referred to as W23) used as a water source by the plant support the conclusion that there have been and continues to be releases into the environment.

2. The release is from the facility.

A facility is defined in Minn. Stat. § 115B.02, subd. 5 as:

> (a) Any building, structure, installation, equipment, pipe or pipeline (including any pipe into a sewer or publicly owned treatment works), well, pit, pond, lagoon, impoundment, ditch, landfill, storage container, motor vehicle, rolling stock, or aircraft;
>
> (b) Any watercraft of any description, or other artificial contrivance used or capable of being used as a means of transportation on water; or
>
> (c) Any site or area where a hazardous substance, or a pollutant or contaminant, has been deposited, stored, disposed of, or placed, or otherwise come to be located.
>
> "Facility" does not include any consumer product in consumer use.

The documents, analytical data, testimony, and pleadings in this case support the conclusion that the releases into the environment originated at the Reilly plant in St. Louis Park and came from that plant. The Reilly plant, including the pipelines, storage containers, pond, wells, the wood treatment operation, and the refinery all constitute a facility within the meaning of Minn. Stat. §115B.02, subd. 5. The releases into the environment came from this facility.

3. The release involves hazardous substances.

The term "hazardous substance" is defined in Minn. Stat. § 115B.02, subd. 8 as:

> (a) Any commercial chemical designated pursuant to the Federal Water Pollution Control Act, under 33 United States Code section 1321(b)(2)(A);
>
> (b) Any hazardous air pollutant listed pursuant to the Clean Air Act, under 42 United States Code section 7412; and
>
> (c) Any hazardous waste.

[The exceptions listed in this definition do not apply here.]

The term "hazardous waste" is defined in Minn. Stat. § 115B.02, subd. 9 as:

> (a) Any hazardous waste as defined in section 116.06, subdivision 13, and any substance identified as a hazardous waste pursuant to rules adopted by the agency under section 116.07; and
>
> (b) Any hazardous waste as defined in the Resource Conservation and Recovery Act, under 42 United States Code section 6903, which is listed or has the characteristics identified under 42 United States Code section 6921, not including any hazardous waste the regulation of which has been suspended by act of Congress.

Substances that are defined as hazardous under these definitions have been released from the Reilly site into the environment and have been found in the soils on the Reilly site, the swamp, W23, and the St. Louis Park water supply wells. These substances include creosote, which is listed as a hazardous waste in Federal hazardous waste rules (40 CFR Part 261.33) adopted under the Resource Conservation and Recovery Act and in the State hazardous waste rules adopted under Minn. Stat. § 116.07. (The constituents of creosote, including PAH, are also listed as hazardous substances in other regulations and as hazardous constituents in the Federal and State hazardous waste rules.) In addition, napthalene and quinoline, two constituents of creosote and coal tar found in the releases at the Reilly site, are listed in 40 CFR Part 116.4 (the federal regulations listing the hazardous substances designated pursuant to the Federal Water Pollution Control Act). Thus, the substances being released from the Reilly site are clearly hazardous substances within the meaning of Minn. Stat. § 115B.02, subd. 8 and subd. 9.

4. The person to whom the RFRA is directed is a responsible party.

The term "responsible person" 6/ is defined in Minn. Stat. § 115B.03 as follows:

6/ Minn. Stat. § 115B.17, refers to "responsible parties". There is, however, no definition of "responsible parties," although there is a definition of "responsible persons" in the Act. The definition should be considered to apply each time the Minnesota Superfund Act refers to either "responsible persons" or "responsible parties".

(a) Owned or operated the facility (1) when the hazardous substances, or pollutant or contaminant, was placed or came to be located in or on the facility; (2) when the hazardous substance, or pollutant or contaminant, was located in or on the facility but before the release; or (3) during the time of the release or threatened release.

(b) Owned or possessed the hazardous substance, or pollutant or contaminant, and arranged, by contract, agreement or otherwise, for the disposal, treatment or transport for disposal or treatment of the hazardous substance, or pollutant or contaminant; or

(c) Knew or reasonably should have known that waste he accepted for transport to a disposal or treatment facility contained a hazardous substance, or pollutant or contaminant, and either selected the facility to which it was transported or disposed of in a manner contrary to law.

Reilly is a responsible person under Minn. Stat. § 115B.03, subd. 1(a) because it owned and operated the facility when the hazardous substances were placed or came to be placed in or on the facility and during at least part of the time of the release and threatened release. In addition, Reilly is a responsible person under Minn. Stat. § 115B.03, subd.1(b), because it owned and possessed the hazardous substance and arranged for disposal.

5. The response actions specified in the Request for Response Action are reasonable and necessary to protect the public health, welfare and the environment.

Investigations and remedial actions at the Reilly site taken by the MPCA and Minnesota Health Department have been directed toward protection of ground water resources and actual or potential drinking water supplies, restoration of water supply lost by contamination, and containment or removal of sources of continuing contamination. A comprehensive view of the problem requires consideration of many factors, including the complex hydrogeology of the area, the presence of multi-aquifer wells which allow the spread of contamination between aquifers, and extensive and varying water use patterns in the area.

To date, the bulk of the investigative work has concerned the Prairie du Chien-Jordan aquifer, because the contamination in this aquifer has affected

the municipal water supply to thousands of persons, and because there is potential for other municipal supply wells to be affected in the future.

a. Current Understanding of the Problem

There are six major aquifer systems under the the St. Louis Park area. Figure 2 shows the geologic column under the Reilly site, while Figure 3 shows the location of wells referenced in the discussion below. In general, it can be stated that the shallow aquifers, especially those above bedrock, have been contaminated by infiltration of coal tar constituents and contaminated wastewater. Furthermore, the deep aquifer system has been contaminated by multi-aquifer wells and by direct contamination by coal tar constituents in W23 (the plant well drilled to the Mt. Simon - Hinckley aquifer by Reilly in 1917).

Starting with the deepest aquifer, the following is a discussion of each aquifer, its uses, the extent of contamination as it is currently understood, and the response actions which the MPCA staff recommend that the MPCA Board include in the RFRA.

b. Discussion of Each Aquifer

(1) MT. SIMON-HINCKLEY

Use: This aquifer is increasingly utilized as a source of municipal drinking water supplies in the Twin Cities area because it is naturally soft. There are four St. Louis Park municipal wells (SLP) finished in this aquifer: SLP 11, 12, 13, and 17.

Source of Contamination: Any contamination in this aquifer entered via W23 (the plant well) and/or W105 (another deep well located on the Reilly site). However, workers were unable to reach this aquifer in W23 or W105 during the cleanout work, so it is unknown whether the aquifer is contaminated in the vicinity of these wells. No other multi-aquifer wells open to this aquifer are known to exist in the area of contamination.

Extent and Movement of Contaminants: No contamination has been detected to date in the St. Louis Park municipal wells located one-half mile west and north of the Reilly site. If the aquifer is contaminated, movement is expected to be very slow, since there is little regional gradient and pumping stresses approximately counteract each other at the Reilly site.

Required Reponse Action: Monitoring of St. Louis Park municipal wells (SLP 11, 12, 13, and 17) to detect contamination. Install GAC drinking water treatment if any of these wells should be found to be contaminated in the future.

(2) IRONTON-GALESVILLE

Use: Due to its depth and poor yield relative to the Prairie du Chien-Jordan above it and the Mt. Simon-Hinckley below it, this aquifer is not extensively utilized in the Metropolitan area.

Source of Contamination: The plug of coal tar constituents in W23 extended to the depth of this aquifer and contaminated the aquifer.

Extent and Movement of Contaminants: The migration from the Reilly site is thought to be very slow, and there are no significant pumping stresses in the area. Consequently, the contamination is thought to be restricted to an area around W23.

Required Response Action: Periodic sampling of W105 and W38 (Milwaukee Railroad well) to measure changes in the levels of contamination in the Ironton-Galesville aquifer.

(3) PRAIRIE DU CHIEN-JORDAN

Use: This aquifer system is used extensively for both drinking and industrial uses throughout the Twin Cities area because the water quality and yield are excellent and because the water is available at a relatively shallow depth.

Source of Contamination: Contamination has occurred from contaminants directly introduced into the aquifer in W23. Furthermore, the Prairie du Chien-Jordan has been contaminated by multi-aquifer wells which allow contaminated water to flow downward from overlying aquifers.

Extent and Movement of contaminants:

Contamination from the Reilly site is known to have spread in this aquifer as far as SLP 4 and W70 (Park Theater well), both approximately one mile east and southeast of the site. In addition, pumping stresses to the north and west allowed contamination to move against the natural ground water flow gradient to SLP 10/15, SLP 5, and Hopkins 3.

Two major forces affect ground water flow, and hence contaminant movement, in this area: a natural east-southeastward gradient and a large number of pumping stresses from industrial and municipal wells. Pumping stresses tend to be more significant than the gradient in determining the direction of flow of contaminants. Furthermore, many of the pumping stresses are applied by industrial air conditioning water supply wells, and so the stresses vary greatly from summer to winter. The plume of contamination is expected to move both with the natural gradient and toward seasonally varying pumping stresses and eventually contaminate SLP 6 and the northernmost Edina municipal wells, unless gradient control measures are implemented.

Required Response Action:

Reconstruct and pump W23 to remove the highly contaminated ground water around this well.

Implement a gradient control system to prevent the continued migration of the contaminated ground water plume, The results of the USGS ground water flow modeling work indicate that pumping SLP 4 should prevent contamination from moving toward presently uncontaminated municipal wells. However, a

feasibility study is necessary to determine how to dispose of this water. The gradient control system will also include four monitoring wells to assess its effectiveness.

Either abandon or reconstruct multi-aquifer wells so each well is only open to one aquifer, thereby preventing the downward migration of contaminated water between aquifers.

Install a GAC drinking water treatment system at SLP 10/15.

Monitor other municipal water supply wells for the presence of PAH and install GAC drinking water treatment systems if the wells become contaminated.

(4) ST. PETER

Use: There is one St. Louis Park municipal well near the Reilly site, SLP 3, finished in this aquifer. Other users in this area tend to be industrial wells and private wells used for irrigation of gardens. In the past, the aquifer supplied some single household drinking water wells, but the municipal water system has eliminated this demand on the St. Peter aquifer.

Source of Contamination: The St. Peter has the opportunity to be contaminated both from direct contact with contaminants in W23 and from other multi-aquifer wells. Another potential source of contamination to this aquifer is the absence of the Glenwood Shale (see figure 2) southeast of the Reilly site which makes it possible for contaminants to move from the contaminated drift and Platteville to the underlying St. Peter. Elsewhere, the Glenwood Shale prevents the hydraulic connection with the overlying drift or Platteville aquifers.

Extent and Movement of Contaminants:

SLP 3, located one-half mile north of the Reilly site, is not contaminated. Monitoring of the aquifer close to the Reilly site will likely

show some level of contamination although its significance is difficult to predict. Ground water movement in this aquifer is probably to the southeast, and will be affected in the area of pumping stresses and multi-aquifer wells which allow inflow to the St. Peter.

Required Response Action: Install five monitoring wells to determine the extent and magnitude of contamination, if any, and the direction of ground water flow. If significant contamination is found, design and install a gradient control system and install a drinking water treatment system if any municipal wells become contaminated.

(5) PLATTEVILLE

Use: Due to the potential for contamination from surface sources, this aquifer is not generally used for drinking water purposes, except that SLP 3 is open to this aquifer in addition to the St. Peter. There are industrial and household irrigation wells in this aquifer.

Source of Contamination: Hydraulically connected in many areas to the drift, the Platteville aquifer is susceptible to contamination by leakage from contaminated areas of the drift. Consequently, the Platteville has become indirectly contaminated from the spills and drippings of coal tar derivatives, as well as from the infiltration of contaminated wastewater which was discharged during the years Reilly operated the facility.

Extent and Movement of Contaminants:

Contamination of this aquifer from the Reilly site is known to extend for several thousand feet east of the Reilly site.

The ground water flow in the aquifer is toward the southeast. Downward flow from the Platteville to deeper aquifers is generally prevented by the Glenwood Shale; however in an area southeast of the Reilly site, the Glenwood

Shale is fractured or absent and in this area there is a direct hydraulic connection between the Platteville and the St. Peter, allowing contaminated ground water to flow downward from the Platteville to the St. Peter. Another source of contamination is the multi-aquifer wells which serve as pathways for the flow of contaminated water downward from the Platteville.

Required Response Action: Monitor the aquifer to determine the extent and magnitude of contamination and the direction of flow. Design and install a gradient control system to confine the spread of contamination.

(6) DRIFT

Use: Because this aquifer is highly susceptible to contamination from the surface, it is not used for purposes other than lawn and garden irrigation.

Source of contamination: The years of spills and drippings of coal tar derivatives as well as disposal of contaminated wastewater has heavily contaminated this aquifer with phenols and PAH in the area of the Reilly site. In addition, there are other potential sources of other types of contamination in the St. Louis Park area.

Extent of Contamination: The contamination from the Reilly site has been measured several thousand feet east of the Reilly site.

Required Response Action: Monitor the aquifer to determine the extent and magnitude of contamination and the diection of flow. Design and install a gradient control system to confine the spread of contamination.

c. The response actions set forth in the RFRA are reasonable and necessary.

In the preceding section, the MPCA staff described the nature of the contamination problem presented by each aquifer and the response actions necessary for each aquifer. These solutions are reasonable and necessary

to protect the public health, welfare and environment. Implementation of the response actions will result in containment and removal of existing contamination and prevent further spread of contaminants. These response actions have been carefully studied and considered by the MPCA staff and are reasonable and necessary to protect the public health, welfare and the environment.

6. The RFRA provides a reasonable time for beginning and completing the actions.

The attached Request for Response Action (RFRA) describes the response actions that need to be taken at the Reilly site. These response actions are described above. At the same time it evaluated the solutions for the contamination at the Reilly site, the MPCA staff estimated the length of time it would reasonably take to implement these solutions. The schedule established in the attached RFRA is a reasonable schedule for completing the specified response actions.

B. Authorization to Expend Superfund Monies in Furtherance of the Reilly Litigation.

As described in the Background Section of this Board Item, there is ongoing litigation to remedy the contamination in St. Louis Park. Trial on this matter is expected to begin in approximately six months. The trial Judge has indicated his intention to appoint a Special Master to assist in case management. The expenditure of Minnesota Superfund monies can properly be used to pay for the State's share of that expense.

In addition, it is anticipated that expert testimony in addition to that already provided for by federal funds will be useful in the presentation of this case. Superfund monies can also be properly used for this purpose.

The MPCA staff recommend that the MPCA Board authorize the expenditure of a total of $150,000 for these two purposes. (Since the cost of each item is only estimated at this time, the MPCA staff recommended a total lump sum, to be divided as the costs are incurred.)

C. Authorization to Amend the Litigation to Include MERLA Claims.

The current litigation involves a variety of claims and defenses, including claims brought under the federal superfund act. The issuance of the RFRA at this time allows for the expenditure of state superfund monies and also provides a basis for amending the litigation against Reilly to cover claims under MERLA.

III. CONCLUSIONS

The Reilly site, including the pipelines, storage containers, pond, wells, the wood treatment operation, and the refinery all constitute a facility within the meaning of Minn. Stat. §115B.02, subd. 5.

The substances found surficially on and near the Reilly site and in the aquifers below the Reilly site are hazardous within the meaning of Minn. Stat. 115B.02, subd. 8 and subd. 9.

There have been one or more releases and continues to be a release (as defined in Minn. Stat. §115B.02, subd. 15) of these hazardous substances from the Reilly facility.

With respect to these releases, Reilly Tar and Chemical Corporation is a responsible person within the meaning of Minn. Stat. 115B.03, subds. 1(a) and 1(b).

The requested response actions specified in the attached Request for Response Action are reasonable and necessary to protect the public health, welfare and the environment.

The schedule for beginning and completing the requested actions in the attached proposed RFRA are reasonable, taking into account the seriousness of the situation.

Further, the expenditure of superfund monies for the purposes of furthering the litigation (in specific, paying for the State's share of a Special Master which the Federal District Court intends to employ to assist in the litigation management and the additional experts to be hired by the State) is reasonable.

IV. RECOMMENDATION

The MPCA staff recommends that the MPCA Board adopt the suggested staff resolution on the following page.

SUGGESTED STAFF RESOLUTION

BE IT RESOLVED, that the Minnesota Pollution Control Agency find that:

1. The Reilly site, including the pipelines, storage containers, pond, wells, the wood treatment operation and the refinery all constitute a facility within the meaning of Minn. Stat. §115B.02, subd. 5.

2. Substances found surficially on and near the Reilly site and in the aquifers below the Reilly site are hazardous within the meaning of Minn. Stat. 115B.02, subd. 8 and subd. 9.

3. There have been one or more releases and continues to be a release (as defined in Minn. Stat. §115B.02, subd. 15) of these hazardous substances from the Reilly facility.

4. With respect to these releases, Reilly Tar and Chemical Corporation is a responsible person within the meaning of Minn. Stat. 115B.03, subds. 1(a) and 1(b).

5. The requested response actions specified in the attached Request for Response Action in the matter of the Reilly Tar and Chemical Corporation site are reasonable and necessary to protect the public health, welfare and the environment.

6. The schedule for beginning and completing the requested actions in the Request for Response Action are reasonable, taking into account the seriousness of the situation.

BE IT FURTHER RESOLVED, that the Minnesota Pollution Control Agency issues the Request for Response Action to Reilly Tar and Chemical Corporation. The Chairperson and the Minnesota Pollution Control Agency Executive Director are authorized to execute the attached Request for Response Action on behalf of the Minnesota Pollution Control Agency.

BE IT FURTHER RESOLVED, that the Minnesota Pollution Control Agency finds that the expenditure of state superfund monies in an amount not to exceed $150,000, as the cost of the State's share of the Special Master (which the Federal District Court intends to employ to assist in the litigation management) and expert witnesses is reasonable and necessary and authorizes the the Executive Director to enter into contract(s) for the expenditure of these superfund monies.

BE IT FURTHER RESOLVED, that the Minnesota Pollution Control Agency authorizes the Executive Director to request the Attorney General's office to amend the present litigation to include claims brought under the Minnesota Environmental Response and Liability Act.

DEFINITIONS

1. RELEASE, is defined in section 2, subd. 15 of the Minnesota Superfund Act as follows:

"Release" means any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment which occurred at a point in time or which continues to occur.

"Release" does not include:

(a) Emissions from the engine exhaust of a motor vehicle, rolling stock, aircraft, watercraft, or pipeline pumping station engine;

(b) Release of source, byproduct, or special nuclear material from a nuclear incident, as those terms are defined in the Atomic Engery Act of 1954, under 42 U.S.C. Section 2014, if the release is subject to requirements with respect to financial protection established by the federal nuclear regulatory commission under 42 U.S.C. Section 2210;

(c) Release of a source, byproduct or special nuclear material from any processing site designated pursuant to the Uranium Mill Tailings Radiation Control Act of 1978, under 42 U.S.C. Section 7912(a)(1) or 7942(a); or

(d) Any release resulting from the application of fertilizer or agricultural or silvicultural chemicals, or disposal of emptied pesticide containers or residues from a pesticide as defined in section 18A.21, subdivision 25.

2. FACILITY, is defined in section 2, subd. 5 of the Minnesota Superfund Act as follows:

"Facility" means

(a) Any building, structure, installation, equipment, pipe or pipeline (including any pipe into a sewer or publicly owned treatment works), well, pit, pond, lagoon, impoundment, ditch, landfill, storage container, motor vehicle, rolling stock, or aircraft;

(b) Any watercraft of any description, or other artificial contrivance used or capable of being used as a means of transportation on water; or

(c) Any site or area where a hazardous substance, or a pollutant or contaminant, has been deposited, stored, disposed of, or placed, or otherwise come to be located.

"Facility" does not include any consumer product in consumer use.

3. POLLUTANT OR CONTAMINANT, is defined in section 2, subd. 13, of the Minnesota Superfund Act as follows:

"Pollutant or contaminant" means any element, substance, compound, mixture, or agent, other than a hazardous substance, which after release from a facility and upon exposure of, ingestion, inhalation, or assimilation into any organism, either directly from the environment or indirectly by ingestion through food chains, will or may reasonably be anticipated to cause death, disease, behavioral abnormalities, cancer, genetic mutation, physiological malfunctions (including malfunctions in reproduction) or physical deformations, in the organisms or their offspring.

"Pollutant or contaminant" does not include natural gas, natural gas liquids, liquefied natural gas, synthetic gas usable for fuel, or mixtures of such synthetic gas and natural gas.

4. HAZARDOUS SUBSTANCE" is defined is section 2, subd. 8, of the Minnesota Superfund Act as follows:

"Hazardous substance" means:

(a) Any commerical chemical designated pursuant to the Federal Water Pollution Control Act, under 33 U.S.C. Section 1321(b)(2)(A);

(b) Any hazardous air pollutant listed pursuant to the Clean Air Act, under 42 U.S.C. Section 7412; and

(c) Any hazardous waste.

"Hazardous substance" does not include natural gas, natural gas liquids, liquefied natural gas, synthetic gas usable for fuel or mixtures of such synthetic gas

and natural gas, nor does it include petroleum, including crude oil or any fraction thereof which is not otherwise a hazardous waste.

5. "HAZARDOUS WASTE" is defined in section 2, subd. 9, of the Minnesota Superfund Act as follows:

"Hazardous waste" means:

(a) Any hazardous waste as defined in section 116.06, subdivision 13, any any substance identified as a hazardous waste pursuant to rules adopted by the agency under section 116.07; and

(b) Any hazardous waste as defined in the Resource Conservation and Recovery Act, under 42 U.S.C. Section 6903, which is listed or has the characteristics identified under 42 U.S.C. Section 6921, not including any hazardous waste the regulation of which has been suspended by act of Congress.

6. "RESPONSIBLE PERSON" is defined in section 3 of the Minnesota Superfund Act as follows:

Subdivision 1. [GENERAL RULE.] For the purposes of sections 1 to 20, and except as provided in subdivisions 2 and 3, a person is responsible for a release or threatened release of a hazardous substance, or a pollutant or contaminant, from a facility if the person:

(a) Owned or operated the facility (1) when the hazardous substance, or pollutant or contaminant, was placed or came to be located in or on the facility; (2) when the hazardous substance, or pollutant or contaminant, was located in or on the facility but before the release; or (3) during the time of the release or threatened release;

(b) Owned or possessed the hazardous substance, or pollutant or contaminant, and arranged, by contract, agreement or otherwise, for the disposal, treatment or transport for disposal or treatment of the hazardous substance, or pollutant or contaminant; or

(c) Knew or reasonably should have known that waste he accepted for transport to a disposal or treatment facility contained a hazardous substance, or pollutant or contaminant, and either selected the facility to which it was transported or disposed of it in a manner contrary to law.

Subdivision 2. [EMPLOYEES AND EMPLOYERS.] When a person who is responsible for a release or threatened release as provided in subdivision 1 is an employee who is acting in the scope of his employment:

(a) The employee is subject to liability under section 4 or 5 only if his conduct with respect to the hazardous substance was negligent under circumstances in which he knew that the substance was hazardous and that his conduct, if negligent, could result in serious harm.

(b) His employer shall be considered a person responsible for the release or threatened release and is subject to liability under section 4 or 5 regardless of the degree of care exercised by the employee.

Subdivision 3. [OWNER OF REAL PROPERTY.] An owner of real property is not a person responsible for the release or threatened release of a hazardous substance from a facility in or on the property unless that person:

(a) was engaged in the business of generating, transporting, storing, treating, or disposing of a hazardous substance at the facility or disposing of waste at the facility, or knowingly permitted others to engage in such a business at the facility;

(b) knowingly permitted any person to make regular use of the facility for disposal of waste;

(c) knowingly permitted any person to use the facility for disposal of a hazardous substance;

(d) knew or reasonably should have known that a hazardous substance was located in or on the facility at the time right, title, or interest in the property was acquired by the person and engaged in conduct by which he associated himself with the release; or

(e) took action which significantly contributed to the release after he knew or reasonably should have known that a hazardous substance was located in or on the facility.

For the purpose of clause (d), a written warranty, representation, or undertaking, which is set forth in an instrument conveying any right, title or interest in the real property and which is executed by the person conveying the right, title or interest, or which is set forth in any memorandum of any such instrument executed

for the purpose of recording, is admissible as evidence of whether the person acquiring any right, title, or interest in the real property knew or reasonably should have known that a hazardous substance was located in or on the facility.

Any liability which accrues to an owner of real property under sections 1 and 15 does not accrue to any other person who is not an owner of the real property merely because the other person holds some right, title, or interest in the real property.

An owner of real property on which a public utility easement is located is not a responsible person with respect to any release caused by any act or omission of the public utility which holds the easement in carrying out the specific use for which the easement was granted.

STATE OF MINNESOTA

COUNTY OF RAMSEY

MINNESOTA POLLUTION

CONTROL AGENCY

In the matter of the
Reilly Tar and Chemical Co. site,
St. Louis Park, Minnesota

To: The Reilly Tar and Chemical Company

I. NOTIFICATION OF OBLIGATION TO TAKE RESPONSE ACTION

A. This document is issued by the Minnesota Pollution Control Agency (MPCA), and constitutes a Request for Response Action (RFRA), as authorized by Minn. Stat. §§ 115B.17 and 115B.18 (1983 supp.).

B. YOU ARE HEREBY NOTIFIED that the MPCA has made the following determinations:

1. The property located in St. Louis Park, Minnesota, known as the Reilly Tar and Chemical Corporation site, located near the intersection of Louisiana Avenue and Walker Street, constitutes a facility within the meaning of Minn. Stat. §115B.02, subd. 5. (The property is hereinafter referred to as "the Reilly site" or "the facility.");

2. Substances found, spilled, or disposed of at the Reilly site and in the ground water elsewhere in St. Louis Park are hazardous substances within the meaning of Minn. Stat. § 115B.02, subd. 8 and subd. 9;

3. there have been one or more releases and continues to be a release of these hazardous substances from the facility within the meaning of Minn. Stat. § 115B.02, subd. 15; and

4. with respect to these releases, the Reilly Tar and Chemical Co. (hereinafter "Reilly") is a responsible person within the meaning of Minn. Stat. § 115B.03, subd. 1(a) and subd. 1(b).

C. Having made these determinations, the MPCA formally requests that Reilly take the response actions described in Section II of this document. A timetable for beginning and completing the actions is set out in Section III. The reasons for the requested actions are set out in Section IV. Section V describes the intention of the MPCA to take action if Reilly fails to take the requested response action within the timetable set out in Section III. Section V also describes the consequences of failure to satisfactorily respond to this Request for Response Action. Section IV describes the requirement to reimburse the MPCA for its costs.

D. Following issuance of this Request for Response Action, Reilly has until January 4, 1985 to negotiate a Consent Order with MPCA staff.

E. If a Consent Order between Reilly and the MPCA staff is reached, the MPCA staff will present the draft Consent Order to the MPCA. The Consent Order, if approved by the MPCA and the U.S. District Court, will control the response actions taken at and around the Reilly site. If no Consent Order is reached within the allotted time period, the matter may be referred to the MPCA for a Determination of Inadequate Response.

II. REQUESTED RESPONSE ACTION

The MPCA has determined (1) that the following actions constitute removal or remedial actions within the meaning of Minn. Stat. §§ 115B.02 subds. 17 and 18 and (2) that these removal or remedial actions are reasonable and necessary to protect the public health, welfare or the environment. Therefore, the MPCA hereby formally requests that Reilly take the actions within the timetables established in Section III.

A. Remedial Investigation (RI)

Additional remedial investigation is necessary to determine the actual extent of contamination in the drift, Platteville, and St. Peter aquifers and in the subsurface soils south of the Reilly site. The purpose of the RI is to allow design of gradient control systems in the drift, Platteville, and, if necessary, St. Peter aquifers, and to assess the impact of subsurface contamination on properties to the south of the Reilly site. The requirements of the RI are described in Exhibit A to this RFRA.

B. Feasibility Study (FS)

The results of ground water modeling work performed by the United States Geological Survey (USGS) have shown that pumping St. Louis Park municipal well 4 (SLP 4) at 750 to 1000 gallons per minute will provide gradient control in the Prairie du Chien-Jordan aquifer and will provide protection to municipal wells in St. Louis Park and Edina which are not now contaminated. A feasibility study is required to determine the best method for discharging ground water pumped from the gradient control system. In addition, following the RI (A. above) for the drift, Platteville, and St. Peter aquifers, it is necessary to determine the number and configuration of pumping wells in each aquifer which will provide gradient control. The requirements of the FS are described in Exhibit A and incorporated into this RFRA.

C. Interim Remedial Measures (IRM)

The purpose of interim remedial measures (IRM) is to provide immediate removal of contaminants at the source and to prevent further migration of contamination from upper contaminated aquifers to lower, otherwise uncontaminated aquifers via multi-aquifer wells. The IRM will consist of reconstruction and pumping the deep well on the Reilly site (W23) through which contamination of deep aquifers have occurred and investigation and closure of multi-aquifer wells. The requirements of the IRM are described in Exhibit A and incorporated into this RFRA.

D. Response Action Plan (RAP) and Response Action Implementation

The purpose of the RAP is to provide a detailed design of response actions which, upon implementation, will protect the public health, welfare, and environment from the threatened or actual release of hazardous substances associated with the Reilly site, and restore part of the municipal water supply lost to contamination from the Reilly site. The requirements of the RAP and RAP implementation are described in Exhibit B and incorporated into this RFRA.

E. Routine Monitoring Program

In order to determine the effectiveness of any implemented response actions, as well as to monitor the movement of contaminants in aquifers for which no response actions are presently designated, a program of long-term sampling and analysis shall be established. A plan for long-term ground water monitoring shall be prepared for the Reilly site and surrounding area by Reilly and submitted for the MPCA Director's review and approval. The proposed plan shall specify sampling of existing and additional wells. The plan shall specify which wells are to be sampled, the frequency at which the wells are to be sampled, the chemical parameters which shall be analyzed, sampling and analytical methods, and detection limits. Reilly shall implement the monitoring plan upon approval by the MPCA Director. The requirements for the monitoring program are described in Exhibit B and incorporated into this RFRA.

F. Reports

The MPCA Director shall be provided with progress reports by the tenth day of each month. The progress reports shall describe activities conducted pursuant to this Request for Response Action during the preceding month and activities planned for the next month. The progress reports shall be addressed to:

Stephen D. Riner, Project Leader
Division of Solid and Hazardous Waste
Minnesota Pollution Control Agency
1935 West County Road B-2
Roseville, Minnesota 55113

III. TIMETABLE FOR COMPLETING THE REQUESTED RESPONSE ACTIONS

The MPCA has determined that the following timetable is necessary and reasonable. The timetable references specific elements of Exhibits A and B to this RFRA.

Notice of Intent to Comply	December 4, 1984
Consent Order Negotiation Period	Until January 4, 1985

Submit RI, QA/QC Plan, and GAC System Design	February 4, 1985
Begin RI	Thirty days after Director's approval of plan.
Submit Report on RI	180 days after beginning work
Submit Gradient Control FS Plan	February 4, 1985
Begin Gradient Control FS Study	20 days after Director's approval of plan
Submit Report on Gradient Control FS	120 days after beginning work
Submit Plan for drift-Platteville [and St. Peter] Gradient Control FS	30 days after Director's approval of RI report
Begin drift-Platteville [and St. Peter] Gradient Control FS	Twenty days after Director's approval of plan.
Complete drift-Platteville [and St. Peter] Gradient Control FS and Submit Report	90 days after beginning work.
Submit Plan to Reconstruct W23	March 5, 1985
Begin reconstruction of W23	Fifteen days after Director's approval of plan.
Pump W23	75 days after beginning work on W23
Submit Response Action Plan (RAP) for Prairie du Chien-Jordan Gradient Control	45 days after MPCA Director's approval of Prairie du Chien-Jordan Gradient Control Detailed Analysis Report.
Implement Prairie du Chien-Jordan Gradient Control	15 days after MPCA Director's approval of RAP.

Submit Response Action Plan for drift-Platteville [and St. Peter] Gradient Control	45 days after MPCA Director's approval of drift-Platteville [and St. Peter] Gradient Control Detailed Analysis Report.
Implement drift-Platteville [and St. Peter] Gradient Control	15 days after MPCA Director's approval of RAP.
Begin GAC System Construction	30 days after MPCA Director's approval of design.
Begin Testing Completed GAC System	5 days after MPCA Director's approval of completed system.
Begin Operating Completed GAC System	5 days after MPCA Director's approval of testing.
Begin Contingency Monitoring	April 4, 1985.

The MPCA Director shall be promptly notified of any anticipated or actual failure to comply with the dates or other terms of this Request for Response Action. Such notice shall include the reasons for the noncompliance and steps proposed for a return to compliance or alternative actions proposed to comply with the intent of this Request for Response Action. The MPCA Director may accept or modify the proposed compliance measures if the Director determines that such measures are adequate and that the need for the modification is not a result of failures within the control of the responsible parties.

IV. REASONS FOR THE REQUESTED ACTION

The ground water beneath and in the vicinity of the Reilly site in St. Louis Park is contaminated with hazardous substances. The ground water in this area is used as a municipal drinking water supply by the Cities of St. Louis Park, Hopkins, and Edina. The Reilly site is a source of the release of these hazardous substances.

MPCA and Minnesota Department of Health (MDH) staff and consultants to the MPCA have sampled ground water from numerous wells in the St. Louis Park area. From 1978 to 1981, six municipal wells in St. Louis Park and one in Hopkins were closed due to contamination with PAH.

The requested actions set out in Sections II and III will provide for such additional information as is necessary to fully evaluate and allow for selection, design, and implementation of appropriate response actions to prevent additional or continued releases.

V. MPCA INTENTION TO TAKE ACTION AND CONSEQUENCES OF RESPONSIBLE PERSON'S FAILURE TO TAKE REQUESTED ACTION.

A. YOU ARE HEREBY NOTIFIED that under the Minnesota Environmental Response and Liability Act, if responsible persons fail to take the requested actions in an adequate or timely fashion, the responsible persons may be subject to the following actions:

1. the MPCA may undertake or complete the requested response actions and seek reimbursement from responsible persons for all costs associated with such action; or

2. the responsible person may be subject to an action to compel performance of the requested response action or for injunctive relief to enjoin the release or threatened release.

In either case, responsible persons who fail to take the response actions requested by the MPCA in a manner which is both adequate and timely may be required to pay a civil penalty in an amount to be determined by the court of up to $20,000 per day for each day that the responsible person fails to take reasonable and necessary response actions.

B. YOU ARE HEREBY FURTHER NOTIFIED that if you fail to take the requested response action, the MPCA intends to take one or more of the actions specified in A. above.

VI. REQUIREMENT TO REIMBURSE THE MPCA

YOU ARE HEREBY FURTHER NOTIFIED that all responsible persons whether or not they complete the requested response action may be required to:

A. reimburse the MPCA for all reasonable and necessary expenses it incurs, including all response costs, and administrative and legal expenses in the investigation and/or cleanup of the facilities or in the enforcement measures necessitated by a failure to comply with this request; and

B. pay for any damages to the air, water, or wildlife resulting from the release of a hazardous substance, pollutant or contaminant.

_____ _____

Cynthia Jepsen, Chairperson Thomas J. Kalitowski, Director

DATE:_____ EFFECTIVE DATE:_____

Minnesota Pollution Control Agency

Exhibit A

REMEDIAL INVESTIGATION, FEASIBILITY STUDY, AND INTERIM REMEDIAL MEASURES

I. INTRODUCTION

Parts II.A., B. and C. of the Request for Response Action (RFRA) to which this Exhibit is appended require Reilly to conduct a Remedial Investigation and Feasibility Study (RI/FS) and Interim Remedial Measures (IRM) at and around the Reilly site. This Exhibit sets forth the requirements for completing the RI/FS and IRM and is appended to and made an enforceable part of the RFRA.

II. PREPARATION AND REVIEW OF SUBMITTALS

Reilly shall submit to the Minnesota Pollution Control Agency Director (MPCA Director) all reports, work plans, well placement, and construction plans, quality control plans, and other submittals required by this Exhibit. All plans require approval of the MPCA Director before implementation.

III. REMEDIAL INVESTIGATION

Reilly shall design and implement a Remedial Investigation (RI) which accomplishes the purposes and meets the requirements of this part. The purposes of the RI are (1) to determine the extent of contamination in the drift, Platteville, and St. Peter aquifers; (2) to determine the extent of subsurface contamination south of the Reilly site; and (3) to provide information and data needed for the selection and implementation of

remedial and removal actions (Response Actions) at and around the Reilly site.

The requirements of the RI are set forth in the tasks below.

Reilly shall identify and propose methods in the monthly reports (submitted pursuant to Part II. F. of the RFRA) for any necessary additional RI activities not included in the RI work plan as approved and shall describe in the monthly reports the impact of the additional RI activities. If any additional RI activities will adversely affect work scheduled through the end of the upcoming month or will require significant revisions to the RI work plan as approved, the MPCA project leader shall be notified immediately of the situation followed by a written explanation within ten (10) days of the initial notification.

Task A Submit a Proposed Remedial Investigation Work Plan and Quality Assurance/Quality Control Plan

Within 30 days of the effective date of the RFRA, Reilly shall submit for MPCA Director review and approval, modification, or rejection a Proposed Remedial Investigation Work Plan (RI Work Plan) and a Quality Assurance/Quality Control Plan (QA/QC Plan). At a minimum, the RI Work Plan shall include proposed methodologies to accomplish the following RI activities and shall also include proposed dates and/or time intervals for initiation and completion of the RI activities indicated below, consistent with the timetables set forth in Part III of the RFRA.

1. RI Work Plan

a. Drift, Platteville, and St. Peter Aquifers

The RI work plan shall provide for investigation of the drift,

Platteville, and St. Peter aquifers to determine the extent of contamination from the Reilly site in these aquifers. Existing wells and/or new monitoring wells or piezometers shall be sampled in order to make this determination. The water level in all wells shall be measured and recorded. The RI Work Plan shall specify the wells to be used for this purpose, or, if new wells are to be constructed, specify the locations and design of the new wells.

b. Surficial Contamination South of the Reilly Site

The RI Work Plan shall provide for a series of soil borings within the area south of Lake Street, between a line connecting the end of Monitor Street to Methodist Hospital and a straight-line southward from Taft Avenue, south to Minnehaha Creek. The locations and depths of the soil borings shall be proposed in the RI Work Plan.

2. Sampling and Quality Assurance/Quality Control Plan

Reilly shall submit to the MPCA Director for review and approval, modification, or rejection a proposed Sampling and Quality Assurance/Quality Control (QA/QC) Plan to be utilized in implementing the RI Work Plan. The proposed QA/QC plan shall be consistent with the requirement of the U.S. EPA Contract Laboratory Program. The proposed Sampling and QA/QC Plan shall specify the procedures for:

a. determining parameters to be sampled;

b. field protocol, including procedures for chain of custody, sample collection, and transportation and storage of samples;

c. calibration in terms of accuracy, precision, and references; the QA/QC plan shall also specify the number of times and intervals at which analytical equipment will be calibrated;

d. laboratory analytical methods, including methods for ensuring accurate measurements of data in terms of precision, accuracy, completeness, comparability, and lab sample storage procedures;

e. reporting;

f. internal quality control;

g. audits;

h. preventive maintenance;

i. corrective action; and

j. routine assessment of data precision, representativeness, comparability, accuracy, and completeness of specific measurement parameters involved.

Reilly shall conduct all sampling and laboratory analyses required in this exhibit in accordance with the Sampling and QA/QC Plan as approved by the MPCA Director.

Task B. Conduct Remedial Investigation

Within 30 days of notification of the MPCA Director's approval or modification of the RI Work Plan and the QA/QC plan, Reilly shall initiate the RI. Reilly shall conduct the RI in accordance with the methods and time schedules set forth in the RI Work Plan and QA/QC

plan as approved or modified by the MPCA Director. The RI shall be conducted in accordance with all Federal, State, and Local laws, rules, regulations and ordinances including, but not limited to, Minnesota Rules Parts 4250.2500 - 4250.3000 (1983) for the installation of any ground water monitoring wells.

Task C. Report Results of Remedial Investigation

Within 180 days of initiating the RI, Reilly shall prepare and submit to the MPCA Director a report (RI Final Report) detailing the data and results of the RI. The RI Final Report shall organize and present all data, analytical results, boring logs, and test results. The RI Final Report shall include maps showing contours of contamination in each of the three aquifers, and a discussion of the observed extent and direction of migration of the contaminants.

Task D. Approval of the RI Final Report

The MPCA Director shall review and approve, modify, or reject the RI Final Report. The MPCA Director shall notify Reilly of final approval or modification of the RI Final Report. If the MPCA Director rejects the RI Final Report, the MPCA Director shall specify the deficiencies and reasons for the rejection. Reilly shall correct the deficiencies and resubmit the RI Final Report to the MPCA Director within thirty (30) days of the MPCA Director's notification of rejection. The MPCA Director shall notify Reilly at the time the RI Final Report is approved as to whether the results of the study indicate that gradient control is required in the St. Peter aquifer.

IV. FEASIBILITY STUDIES

As detailed in Tasks A and B below, Reilly shall perform two feasibility studies (FS): (a) an assessment of options for disposing of water from gradient control wells in the Prairie du Chien-Jordan aquifer; and (b) an assessment of gradient control for controlling contamination in the drift, Platteville, and (if so directed by the Director) St. Peter aquifers. Reilly shall conduct the Feasibility Studies in accordance with the National Oil and Hazardous Substance Contingency Plan, 40 CFR Part 300. The feasibility studies shall contain sufficient information and analysis for the MPCA Director to make the determination of the appropriate extent of remedy as specified in 40 CFR § 300.68 (j). The FS specified in (b) above shall use and build upon the information generated by the RI.

Task A. Prairie du Chien-Jordan Gradient Control Well Discharge Feasibility Study

1. FS Plan

Within 30 days of the effective date of the RFRA, Reilly shall submit for the MPCA Director's review and approval, modification, or rejection a plan for conducting a study of the feasibility of discharging 1000 gallons of water per minute from St. Louis Park municipal well 4 (SLP 4). The plan shall provide that the study be based on alternative surface water quality criteria of ten and three micrograms per liter of total PAH, and three hundred nanograms per liter of carcinogenic PAH as a basis for determining limitations for a discharge to surface waters and thus the need for treatment of the discharge. The plan shall identify options for using and discharging water from this well which will be considered in the study, including but not limited to the following:

a. Direct discharge to storm sewer to Lake Calhoun

b. Discharge to Minnehaha Creek

c. Discharge via force main to Mississippi River

d. Treatment and use for drinking water in St. Louis Park or adjoining cities.

e. Use for industrial process or cooling purposes

f. Discharge to sanitary sewer

The plan shall provide for Reilly's participation in a working group made up of representatives of the City of St. Louis Park, other cities whose municipal water supply are considered for utilization of treated water from SLP 4, the Metropolitan Waste Control Commission, and governmental units which have jurisdiction over surface waters identified above.

2. Conduct FS

Within 20 days of approval of the Director of the FS plan, Reilly shall initiate the FS.

3. Detailed Analysis Report

Within 120 days of initiating the study, Reilly shall prepare and submit a Detailed Analysis Report to the MPCA Director on all water discharge/use options analyzed in the FS study. This Detailed Analysis Report shall include the following:

a. Detailed Description of Alternative

Reilly shall prepare and present a detailed description of

each discharge/use option analyzed in the FS study. At a minimum, this description shall include:

(1) a description of the water use and/or disposal technique;

(2) a description of the special engineering considerations required to implement the alternative (e.g. a further feasibility study, alterations to an existing water treatment plant, alterations to an industrial process);

(3) a description of operation, maintenance, and monitoring requirements;

(4) a description of how the alternative could be phased into existing industrial operations or municipal water supply systems;

(5) a summary of the effect of the influx of water into the designated receiving stream, and any limitations on the ability of the receiving stream to accept water at any time of the year;

(6) treatment, if any, required to meet both of the alternative water quality criteria for PAH specified above.

b. Environmental Assessment

Reilly shall prepare and present in the Detailed Analysis Report an environmental assessment for each evaluated water disposal/use

option considered including, at a minimum, an evaluation of each option's environmental effects, an analysis of measures to mitigate adverse effects, physical or legal constraints, and compliance with federal and State regulatory requirements.

c. Cost Analysis

Reilly shall analyze and present in the Detailed Analysis Report a detailed breakdown of the present value capital cost and annualized capital costs of implementing each option evaluated as well as the present value annual operating and maintenance costs. The costs shall be presented as both a total cost and an equivalent annual cost.

d. Recommend Disposal/Use Option

Reilly shall recommend in the Detailed Analysis Report a use/discharge option, or combination of related, compatible options, together with a conceptual design of the recommended option which Reilly determines should be implemented at SLP 4.

The conceptual design shall include:

a location map of all facilities involved in the conceptual plan;

if any major construction is involved, a conceptual plan view drawing of the project site showing general locations for project actions and facilities;

conceptual layouts (plan and cross sectional views where appropriate) for the individual facilities, other items to be installed, or actions to be implemented;

conceptual design criteria and rationale;

a description of types of equipment required, including approximate capacity, size, and materials of construction;

process flow sheets, including chemical consumption estimates and a description of the process;

a description of unique structural concepts for facilities;

a description of operation and maintenance requirements;

a discussion of potential construction problems;

right-of-way requirements;

a description of technical requirements for environmental mitigation measures;

additional engineering data required to proceed with design;

a discussion of permits that are required pursuant to other environmental statutes, rules and regulations;

order-of-magnitude implementation cost estimate and annual O&M cost estimates;

preliminary project schedule.

4. Acceptance of Recommended Use/Discharge Option and Conceptual Design

The MPCA Director will review the Detailed Analysis Report for Gradient Control water use and discharge and the water use/discharge option recommended by Reilly and will approve, modify, or reject the recommended water use/discharge option. If the MPCA Director approves or modifies the recommended alternative, and conceptual design, the MPCA Director will so notify Reilly.

If the MPCA Director rejects the recommended option and conceptual design, Reilly shall recommend for review by the MPCA Director another option and conceptual design and shall develop and submit its proposal to the MPCA Director within thirty (30) days after receiving notice that the MPCA Director has rejected the originally recommended option and conceptual design.

Task B. Drift, Platteville, and St. Peter Gradient Control Feasibility Study

1. FS Plan

Within 30 days of approval by the MPCA Director of the Remedial Investigation Report, Reilly shall submit to the MPCA Director for review and approval, modification, or rejection a plan for a feasibility study (FS) of gradient control in the drift and Platteville aquifers. In addition, if the MPCA Director has notified Reilly that the extent of contamination in the St. Peter aquifer warrants gradient control, Reilly shall include the St. Peter aquifer in this study. The plan shall provide that the study include a

determination of the number, locations, and pumping rates of gradient control wells in each aqufier. In addition, the plan shall provide that the study include a determination of the most feasible means of disposing of water from the wells similar to the study performed in the Prairie du Chien-Jordan aquifer, except that treatment for drinking water need not be considered.

2. Study

Within 20 days of approval of the MPCA Director of the plan, Reilly shall initiate the FS.

3. Detailed Analysis Report

Within 90 days of initiating the FS, Reilly shall prepare and submit a Detailed Analysis Report to the MPCA Director on all drift-Platteville (and St. Peter) gradient control alternatives analyzed in the FS. This Detailed Analysis Report shall include the following:

a. Detailed description of alternative.

Reilly shall prepare and present a detailed description of each gradient control alternative analyzed in the FS. At a minimum, this description shall include as applicable:

(1) a description of the gradient control alternative;

(2) a description of the special engineering considerations required to implement the alternative (e.g. a further feasibility study, alterations to an industrial process);

(3) a description of operation, maintenance, and monitoring requirements;

(4) a description of how the alternative could be phased into existing industrial operations;

(5) a summary of the effect of the influx of water into the designated receiving stream, and any limitations on the ability of the receiving stream to accept water at any time of the year;

(6) treatment, if any, required to meet both of the alternative water quality criteria for PAH specified above.

b. Environmental Assessment

Reilly shall prepare and present in the Detailed Analysis Report an environmental assessment for each evaluated gradient control alternative considered including, at a minimum, an evaluation of each alternative's environmental effects, an analysis of measures to mitigate adverse effects, physical or legal constraints, and compliance with federal and State regulatory requirements.

c. Cost Analysis

Reilly shall analyze and present in the Detailed Analysis Report a detailed breakdown of the present value capital cost and annualized capital costs of implementing each alternative evaluated as well as the present value annual operating and maintenance costs. The costs shall be presented as both a total cost and an equivalent annual cost.

d. Recommend Gradient Control Alternative

Reilly shall recommend in the Detailed Analysis Report a gradient control alternative, or combination of related, compatible alternatives, together with a conceptual design of the recommended alternative which Reilly determines should be implemented in the drift, Platteville, and, if so notified by the Director, the St. Peter aquifers.

The conceptual design shall include:

a location map of all facilities involved in the conceptual plan;

a conceptual plan view drawing of the project site(s) showing general locations for project actions and facilities;

conceptual layouts (plan and cross sectional views where appropriate) for the individual facilities, other items to be installed, or actions to be implemented;

conceptual design criteria and rationale;

a description of types of equipment required, including approximate capacity, size, and materials of construction;

process flow sheets, including chemical consumption estimates and a description of the process;

a description of unique structural concepts for facilities;

a description of operation and maintenance requirements;

a discussion of potential construction problems;

right-of-way requirements;

a description of technical requirements for environmental mitigation measures;

additional engineering data required to proceed with design;

a discussion of permits that are required pursuant to other environmental statutes, rules and regulations;

order-of magnitude implementation cost estimate and annual O&M cost estimates;

preliminary project schedule.

4. Acceptance of Recommended Use/Discharge Alternative(s) and Conceptual Design(s)

The MPCA Director will review the Detailed Analysis Report for drift-Platteville (and St. Peter) Gradient Control and the drift-Platteville (and St. Peter) gradient control alternative(s) recommended by Reilly and will approve, modify, or reject the recommended gradient control alternative(s). If the MPCA Director approves or modifies the recommended alternative, and conceptual design, the MPCA Director will so notify Reilly.

If the MPCA Director rejects the recommended alternative(s) and conceptual design(s), Reilly shall recommend for review by the MPCA Director another alternative(s) and conceptual design(s) and shall

develop and submit its proposal to the MPCA Director within thirty (30) days after receiving notice that the MPCA Director has rejected the originally recommended alternative and conceptual design.

V. INTERIM REMEDIAL MEASURES

Reilly shall undertake interim remedial measures (IRM) intended to remove contaminants at the source and to prevent further migration of contaminants between aquifers. The interim remedial measures shall include pumping of W23 and investigation and reconstruction or abandonment of multi-aquifer wells.

Task A. Reconstruct and Pump W23

1. IRM Plan

Within 60 days from the effective date of the RFRA, Reilly shall submit to the MPCA Director for review and approval, modification, or rejection a plan for reconstruction and pumping of W23 (the deep well used as a water supply by Reilly). The IRM Plan shall propose at a minimum removal of the existing 10 inch casing, completion of the well with a minimum casing diameter of 6 inches, and connection of the well to the sanitary sewer.

2. Conduct IRM

Within 15 days of the approval of the IRM Plan by the Director, Reilly shall begin reconstruction of the W23.

3. Pumping

Within 75 days of beginning construction, Reilly shall complete

reconstruction of W23 and shall begin pumping and continue to pump W23 at a rate of 50 gallons per minute.

Task B. Multi-aquifer Well Investigation and Reconstruction

1. IRM Plan

Within 60 days of the effective date of the RFRA, Reilly shall submit to the MPCA Director for review and approval, modification, or rejection an IRM Plan for investigation of the wells listed below to determine if they allow contaminated water to flow between aquifers in the well bore. The IRM Plan shall specify at a mimimum that the following investigative methods be used in the investigation: static water level measurements, water quality monitoring, spinner logging, caliper logging, and E- or gamma logging. Additional techniques, such as down-hole TV logging may also be proposed.

The following wells shall be investigated:

a. W29 --- Flame Industries

b. W35 --- Burdick Grain Co.

c. W40 --- Minnesota Rubber

d. W45 and 46 --- S & K Products

e. W49 --- Strom Block

f. W67 --- Blacktop Service

g. W107 --- Interior Elevator

2. IRM Investigation and Report

Within 240 days of approval by the MPCA Director of the IRM Plan,

Reilly shall complete investigation of the wells listed above, and shall submit a report to the MPCA Director for review and approval, modification, or rejection. This report shall summarize the results of the investigation. If the MPCA Director rejects the report, the MPCA Director shall specify the deficiencies and reasons for the rejection. Reilly shall correct the deficiencies and resubmit the report to the MPCA Director within thirty (30) days of the MPCA Director's notification of rejection.

3. Abandonment or Reconstruction

If the MPCA Director determines that information gathered in the investigation required by this task indicates that any of the wells investigated displays interaquifer flow of water which exceeds drinking water criteria (as referenced in Exhibit C) for PAH, the MPCA Director may notify Reilly that it must reconstruct or abandon the affected well. In making this determination, the MPCA Director will consider: the rate of multi-aquifer flow, the quality of water being leaked; the likely fate and impacts of any leaking contaminants, considering ground water flow and use patterns in the aquifer(s) of concern and the impact of any gradient control wells; and the cost of sealing or abandoning the leaking well. If Reilly abandons an active well, it shall provide an alternative water supply which provides water of equivalent or better quality and quantity at a cost to the owner of the affected well no greater than that of pumping ground water from the affected well. Upon such notification by the MPCA Director, Reilly shall complete the required reconstruction or abandonment within 90 days of the notification.

Exhibit B

RESPONSE ACTION PLAN, RESPONSE ACTION IMPLEMENTATION, AND CONTINGENCIES

I. INTRODUCTION

Part II. D. and E. of the Request for Response Action (RFRA), to which this Exhibit is attached, requires Reilly to prepare a Response Action Plan (RAP) and to implement Response Actions (RA's) and a monitoring program at and around the Reilly site. A separate RAP shall be prepared and implemented for the following: (a) gradient control in the Prairie du Chien-Jordan aquifer; (b) gradient control in the drift, Platteville, and, if required, St. Peter aquifers; (c) drinking water treatment; and (d) response action to meet any contingency described herein. This Exhibit sets forth the requirements for preparing each RAP and implementing the RA's described herein, and is appended to and made an integral and enforceable part of the RFRA. The development of the RAPs and implementation of the RA's shall be based on the Remedial Investigations and Feasibility Studies required by Exhibit A to the RFRA.

II. PREPARATION AND REVIEW OF SUBMITTALS

Reilly shall submit to the Minnesota Pollution Control Agency Director (MPCA Director) all reports, work plans, well placement, and construction plans, quality assurance/quality control plans, and other submittals required by this Exhibit. All plans require approval of the MPCA Director before implementation.

III. RESPONSE ACTION PLANS

Reilly shall prepare proposed RAP's which accomplish the purposes and meet the requirements of this part. Each RAP shall be submitted to the MPCA Director for review and approval, modification, or rejection as specified below. The purpose of each RAP is to provide a detailed design of

RA's which, upon implementation, will protect the public health, welfare, and the environment from releases of hazardous substances from the Reilly site.

Task A. Gradient Control in the Prairie du Chien-Jordan Aquifer

1. Response Action Plan

Within 45 days of approval by the MPCA Director of the Prairie du Chien-Jordan Gradient Control Detailed Analysis Report specified in Part IV of Exhibit A, Reilly shall submit to the MPCA Director for review and approval, modification, or rejection a RAP for a gradient control well system capable of maintaining an annual average flow rate of 750 gallons per minute from SLP 4. The RAP shall propose at least four new monitoring wells in the Prairie du Chien-Jordan aquifer. As part of the RAP, Reilly shall cooperate with the city of St. Louis Park in amending the city's pending application for an NPDES permit for the discharge from SLP 4 unless the MPCA Director has determined that a feasible usage for the water exists which does not require a discharge to surface waters.

The RAP shall propose a schedule for implementation of the gradient control well system.

2. Response Action Implementation

Within 15 days of receipt of approval or modification of the RAP by the MPCA Director and issuance of all necessary permits and approvals, Reilly shall begin construction of the gradient control system, including monitoring wells. The system shall be constructed in accordance with the schedule as contained in the RAP as approved or modified by the MPCA Director. Following approval of the completed

system by the MPCA Director, Reilly shall begin pumping and continue to pump the wells at the rate specified in the RAP as approved by the MPCA Director.

3. Monitoring

All monitoring required under this task shall be conducted in accordance with the Sampling and Quality Assurance/Quality Control Plan required by Task D. of this Exhibit, as approved or modified by the MPCA Director. Beginning at the end of the next calendar quarter following completion of the gradient control well system, Reilly shall sample the following wells at the indicated intervals:

a. quarterly: Methodist Hospital, SLP 6 and 7 or 9

b. semiannually: Minikahda Golf Course, E 2 and 13, H 3 and 6, SLP 14 and 16, and all monitoring wells installed in conjunction with the gradient control system.

c. annually: SLP 5, E 3 and 15, W40, W119, and W70;

In addition, water level measurements shall be taken quarterly in all wells referenced in a. through c. above, W112, W32, SLP 8 and 10, and E 4 and 7. Results of monitoring shall be included in the monthly report submitted to the MPCA as required by Part II. F. of the RFRA.

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* The following prefixes are used in this section and elsewhere in this exhibit: municipal wells, SLP=St. Louis Park, E=Edina, H=Hopkins, M=Minnetonka; other wells, W and P are project designations used by the United States Geological Survey.

Task B. Gradient Control in the Drift-Platteville [and St. Peter] Aquifer

1. RAP

Within 45 days of approval by the MPCA Director of the Drift-Platteville [and St. Peter] Gradient Control Detailed Analysis Report specified in Part IV of Exhibit A to the RFRA, Reilly shall submit to the MPCA Director for review and approval, modification, or rejection a RAP for a gradient control well system in the above aquifers. The system shall be designed to meet the pumping rates and have the number of monitoring wells specified in the Drift-Platteville [and St. Peter] Gradient Control Detailed Analysis Report as approved or modified by the MPCA Director. As part of the RAP, Reilly shall submit an application for any necessary NPDES permits for the discharges unless the MPCA Director has determined that a feasible usage for the water exists which does not require a discharge to surface waters. In addition, the RAP shall contain plans for treatment of discharged water if required to meet applicable discharge criteria, a schedule for implementation of the gradient control well system, and a monitoring plan for the first year of operation.

2. Response Action Implementation

Within 15 days of receiving approval of the plan by the MPCA Director and all necessary permits and approvals, Reilly shall begin construction of the gradient control system, including monitoring wells. The system shall be constructed in accordance with the

schedule as contained in the RAP approved or modified by the MPCA Director. Following approval of the completed system by the MPCA Director, Reilly shall begin pumping and continue to pump the wells at the rate specified in the plan as approved by the MPCA Director.

3. Monitoring

All monitoring required under this task shall be conducted in accordance with the Sampling and Quality Assurance/Quality Control Plan required by Task D. of this Exhibit, and with monitoring plans required by this part as approved or modified by the MPCA Director. By 270 days after the drift-Platteville, [and St. Peter] gradient control system is completed, Reilly shall submit to the MPCA Director for review and approval, modification, or rejection a monitoring plan for assessing the performance of the drift-Platteville [and St. Peter] gradient control system. The plan shall provide that a minimum of twenty new or existing wells in each aquifer be sampled for phenolics and PAH; of these twenty wells, five shall be located at least one and one-half miles from the site. The plan shall also provide for installation of additional wells located further downgradient of the site if monitoring wells initialy found outside the zone of contamination are found in a subsequent sampling to be contaminated. These wells must be installed and ready to sample by the next sampling event after this level of contamination is found. Beginning one year after the gradient control system is completed, Reilly shall sample in accordance with this plan as approved or modified by the MPCA Director. Results of monitoring shall be included in the monthly report submitted to the MPCA as required by Part II. F. of the RFRA.

Task C. Drinking Water Treatment at SLP 15/10

1. Response Action Plan

Within 45 days of the effective date of the RFRA, Reilly shall submit to the MPCA Director for approval, modification, or rejection a plan, including a schedule for completion of each stage of construction of the treatment system, for granular activated carbon (GAC) treatment of water from St. Louis Park municipal wells 15 and 10. The plans shall specify a GAC treatment plant with all related piping and appurtenances, and a building to house the treatment plant, in accordance with the following criteria:

- o primary feed from SLP 15, with SLP 10 as an alternative feed;
- o system capable of treating up to 1000 gallons of water per minute
- o GAC system capable of removing PAH to below 2.8 nanograms per liter (ng/l) initially, and to below drinking water criteria as defined in Exhibit C to this RFRA for a period of at least two years without carbon change;
- o building to be architecturally compatible with existing well structures at site and sized to house additional carbon columns if necessary to achieve above carbon change interval;
- o system to include minicolumns to be used to predict PAH breakthrough and to test the effectiveness of carbon from different suppliers;

2. Response Action Implementation

Within 30 days of approval by the MPCA Director of the GAC system design, Reilly shall initiate construction of the GAC system. The system shall be constructed in accordance with the schedule contained in the RAP as approved or modified by the MPCA Director.

3. Completion and System Operation

Within 5 days of approval of the completed GAC system by the MPCA Director, Reilly shall immediately commence testing of the system for a two week period with treated water from the system discharged to the sanitary sewer. During this testing period, untreated water and treated water shall be monitored in accordance with 4. below. Within 10 days of completing the test period, Reilly shall submit to the MPCA Director a report on the performance of the GAC treatment system during the period of testing. This report shall include analytical results, flow rates, pressure readings, observations of the operator, and other information as necessary for a thorough evaluation of the performance of the system. The MPCA Director will review this report and will either approve use of the GAC system or specify a further period of testing, a modification of the system, or other action as appropriate. Within 5 days of approval by the MPCA Director of the testing of the GAC system, Reilly shall connect the GAC system to the municipal water distribution system and commence operation. Reilly shall operate the GAC system at SLP 15 and SLP 10 until all samples taken at the wellhead for each of the previous five consecutive years are below all drinking water criteria for PAH and below the advisory level for each of the previous three consecutive years. At least two of these samples, or two additional samples, taken at least one year apart, must be monitored for the extended list of PAH in part V. of Exhibit C of this RFRA. A sample which yields results above any drinking water criterion or advisory level may be excluded from the determination above if a duplicate sample or all additional samples taken not more than three

weeks after the sample in question is taken yield results below any drinking water criterion or advisory level, respectively.

4. Monitoring

All monitoring required under this Task shall be conducted in accordance with the sampling and Quality Assurance/Quality Control Plan required by Task D. of this Exhibit, as approved or modified by the MPCA Director.

a. Treated water from the GAC system shall be monitored as follows:

(1) During the testing period prior to hookup, Reilly shall monitor six times.

(2) During the first month following approval of the system and connection to the municipal drinking water distribution system, Reilly shall monitor twice weekly. Following review of the analytical results, the MPCA Director may determine that the system is operating properly, and authorize Reilly to assume the routine monitoring frequency described in a.(3) below; or, if the determination is made that the results do not indicate proper operation of the system, may require Reilly to continue twice weekly monitoring for a period of time not to exceed two months or to remove the GAC system from the municipal distribution system and conduct further testing of the system, modification of the system, or other action as in 3. above.

(3) Routine monitoring shall be monthly until the carbon has been replaced twice. If advisory level or replacement level results are obtained during the first year of operation of the system, Reilly shall immediately notify the MPCA Director and shall conduct such additional monitoring, testing, modification of the system, or other action as may be required by the MPCA Director.

(4) Routine monitoring after two carbon changes shall be quarterly, unless the MPCA Director determines that the observed service life of the carbon is too short to permit this frequency, in which case the MPCA Director will notify Reilly of the required monitoring frequency.

(5) If any monthly or quarterly sample exceeds the advisory level, another sample shall be taken immediately and analyzed. If this second sample yields comparable results, the frequency of analysis shall increase to semimonthly until three consecutive results below the advisory level are obtained.

(6) If the result of monitoring any sample is found to exceed the replacement level, another sample shall be taken immediately. If the analytical result of the second sample exceeds the advisory level but is less than the replacement level, Reilly shall monitor as specified in a.(5) above. If the analytical result of the second sample exceeds the replacement level, the system shall be shut down and the carbon replaced with fresh carbon. Following replacement of carbon, treated water shall

be monitored weekly for one month, and in accordance with the monitoring requirements of a.(3) and (4) above thereafter.

b. Untreated water from SLP 10 or 15 shall be monitored at the well head at the same time treated water from the GAC system is monitored at the following intervals:

(1) During the testing period prior to hookup, untreated water shall be monitored each time treated water is monitored.

(2) During the first month after connection to distribution system, untreated water shall be monitored weekly.

(3) After the MPCA Director has approved routine monitoring of treated water, during the first two carbon fills in the GAC system, routine monitoring of untreated water shall be semi annually.

(4) After two carbon changes in the GAC system, untreated water shall be monitored annually.

(5) If the treatment system is located downstream of the sand filter, water shall also be monitored at the point of entry to the treatment system at the same intervals and at the same time as samples of untreated water are taken in accordance with b.(1) and b.(2) above.

c. When minicolumns are used to predict breakthrough of the carbon in use in the treatment system or for testing carbons from suppliers other than the supplier of the carbon in use in the treatment system,

Reilly shall monitor minicolumns monthly until breakthrough of PAH occurs. Carbon shall then be replaced in the minicolumns and again monitored monthly until breakthrough occurs.

d. At least one sample of treated water from the GAC system per year shall be monitored for the extended list of PAH in part V. of Exhibit C. of this RFRA, using gas chromatography/mass spectroscopy (GC/MS). During this extended analysis, any compounds, other than those routinely analyzed for, which are detected shall be identified and quantified if possible using a mass spectral library which contains extensive spectra of PAH compounds such as the NBS mass spectral library.

5. Excessive Carbon Consumption

If, during the first five years of operation of the GAC system, it is necessary to replace carbon due to PAH breakthrough more often than once in any two year span, the MPCA Director will notify Reilly that it must provide additional filtration at the GAC system. Within 90 days of receiving such notification, Reilly shall submit to the MPCA Director for review and approval, modification, or rejection a plan for installation of additional carbon filtration. Within 90 days following approval of the plan by the MPCA Director, Reilly shall complete installation of the additional carbon filtration in accordance with the plan as approved or modified by the MPCA Director.

Task D. Sampling and Quality Assurance/Quality Control Plan

Within 30 days of the effective date of the RFRA, Reilly shall submit to the MPCA Director for review and approval, modification, or rejection a

proposed Sampling and Quality Assurance/Quality Control (QA/QC) Plan to be utilized during implementation of the RA's, during long term monitoring of the effectiveness of the implemented RA's, and during other monitoring required by this exhibit. The proposed QA/QC plan shall be consistent with the requirement of the U.S. EPA Contract Laboratory Program. The proposed Sampling and QA/QC Plan shall specify the procedures for:

1) determining parameters to be sampled;

2) field protocol, including procedures for chain of custody, sample collection, and transportation and storage of samples;

3) calibration in terms of accuracy, precision, and references; the QA/QC plan shall also specify the number of times and intervals at which analytical equipment will be calibrated;

4) laboratory analytical methods, including methods for ensuring accurate measurements of data in terms of precision, accuracy, completeness, comparability, and lab sample storage procedures;

5) reporting;

6) internal quality control;

7) audits;

8) preventive maintenance;

9) corrective action; and

10) routine assessment of data precision, representativeness, comparability, accuracy, and completeness of specific measurement parameters involved.

Reilly shall conduct all sampling and laboratory analyses required in this Exhibit in accordance with the Sampling and QA/QC Plan as approved by the MPCA Director.

Task E. Monitoring for Contingency

All monitoring required under this task shall be conducted in accordance with the sampling and Quality Assurance/Quality Control Plan required by Task D. of this Exhibit, as approved or modified by the MPCA Director. In addition to monitoring conducted in compliance with other tasks contained in this Exhibit, Reilly shall sample and measure water levels in the following wells, beginning 90 days after the effective date of the RFRA, at the indicated intervals:

annually: SLP 11, 12, 13, 16, and W105

annually: W38 (water level only)

semiannually: SLP 3, W14, W33, W24, W133, W129, W122, P116

Task F. Contingent Actions

If any of the following occurs, the MPCA Director will notify Reilly that it must undertake the indicated contingent action. Upon such notification by the MPCA Director, Reilly shall within 90 days submit to the MPCA Director for review and approval, modification, or rejection a plan and schedule for implementing the indicated contingent action, including plans for necessary water treatment and new wells. Following approval or modification of the plan by the MPCA Director, Reilly shall

implement the plan in accordance with the schedule as approved or modified by the MPCA Director.

1. Drinking Water Treatment. If an active Prairie du Chien-Jordan, Mt. Simon-Hinckley, or St. Peter municipal drinking water well (except SLP 10/15) is found to exceed drinking water criteria for PAH specified in Exhibit C to the RFRA, Reilly shall undertake a sampling program as directed by the MPCA Director. If this monitoring indicates that the well is contaminated, Reilly shall submit plans for treatment of the water or for providing an alternative water supply. In addition, if the plan submitted by Reilly leaves the well out of service, Reilly shall assess the effect on contaminant movement within the aquifer of leaving the well out of service and submit a plan for dealing with this altered contaminant migration.

2. Ineffectiveness of gradient control well systems. If monitoring of any gradient control well system indicates that additional gradient control wells are necessary to contain the spread of contaminants, Reilly shall submit a plan for additional wells.

3. NPDES permit limitations for PAH or phenolics are exceeded. In the event monitoring of discharge from Methodist Hospital, the Methodist Hospital-Control Data Well or from any gradient control well which is discharged to surface water indicates that the concentration of PAH or phenolics exceeds limitations in the applicable NPDES permit (if any are specified), Reilly shall undertake a monitoring program as directed by the MPCA Director. If this program indicates that the well will likely continue to exceed applicable NPDES permit limitations, Reilly shall submit a plan for treatment of the discharge.

EXHIBIT C

I. Introduction

The Request for Response Action (RFRA), to which this Exhibit is attached, requires Reilly to conduct response actions at and around the Reilly site. This exhibit contains definitions of terms used in this RFRA and/or exhibits attached thereto, and lists of PAH compounds required to be analyzed pursuant to the Response Action Plans contained in Exhibit B of this RFRA.

II. Definitions

In drinking water which has been treated to remove PAH or in water from an active drinking water well which is monitored in order to determine the need to provide treatment, drinking water criteria and advisory level are defined as follows:

	Sum of concentrations of carcinogenic PAH listed in III.A. below.	Sum of concentrations of other PAH listed in III.B. below.	Sum of concentrations of benzo(a)pyrene and debenz(ah)-anthracene.
Drinking Water Criteria	28 ng/l	280 ng/l	5.6 ng/l
Advisory Level	15 ng/l	175 ng/l	3.0 ng/l or lowest quantifiable concentration for analytical method used, (but less than 5.6 ng/l) whichever is greater.

III. List of PAH to be Used for Compliance Monitoring as Required by this RFRA

A. Carcinogens:

benz(a)anthracene
dibenz(ah)anthracene
benzo(b)fluoranthene
benzo(a)pyrene
quinoline *
indeno(1,2,3,cd)pyrene
chrysene
benzo(ghi)perylene
benzo(j)fluoranthene

* When quinoline is the only carcinogen detected in a given sample analysis, it shall be regulated and limited as "other PAH."

B. Other PAH:

indene
2,3-dihydroindene
naphthalene
1-methylnaphthalene
2-methylnaphthalene
biphenyl
acenaphthylene
acenaphthene
fluorene
phenanthrene
anthracene
fluoranthene
pyrene
benzo(k)fluoranthene
benzo(e)pyrene
perylene
acridine
carbazole
2,3-benzofuran
dibenzofuran
benzo(b)thiophene
dibenzothiophene

IV. Other Carcinogenic PAH

The following PAH are known to be carcinogenic, and shall be included in the calculation of total carcinogenic PAH if they are detected in any measurement required by this RFRA:

dibenz(ae)pyrene
dibenz(ah)pyrene
dibenz(ai)pyrene
7,12-demethylbenz(a)anthracene
dibenz(ac)anthracene
3-methylcholanthrene
benzo(c)phenanthrene

V. Non-regulated Compounds

The following PAH compounds have not been detected in significant amounts during sampling at the site, and need not be routinely measured nor included in the calculation of total PAH. However, whenever extended analysis of a sample is conducted in order to scan for compounds not routinely sampled, the following compounds shall be measured and reported, although they need not be included in the measurement of total PAH in a compliance monitoring measurement:

4,5,9,10-tetrahydropyrene
triphenylene
methylbenzofuran
phenanthridine
isoquinoline

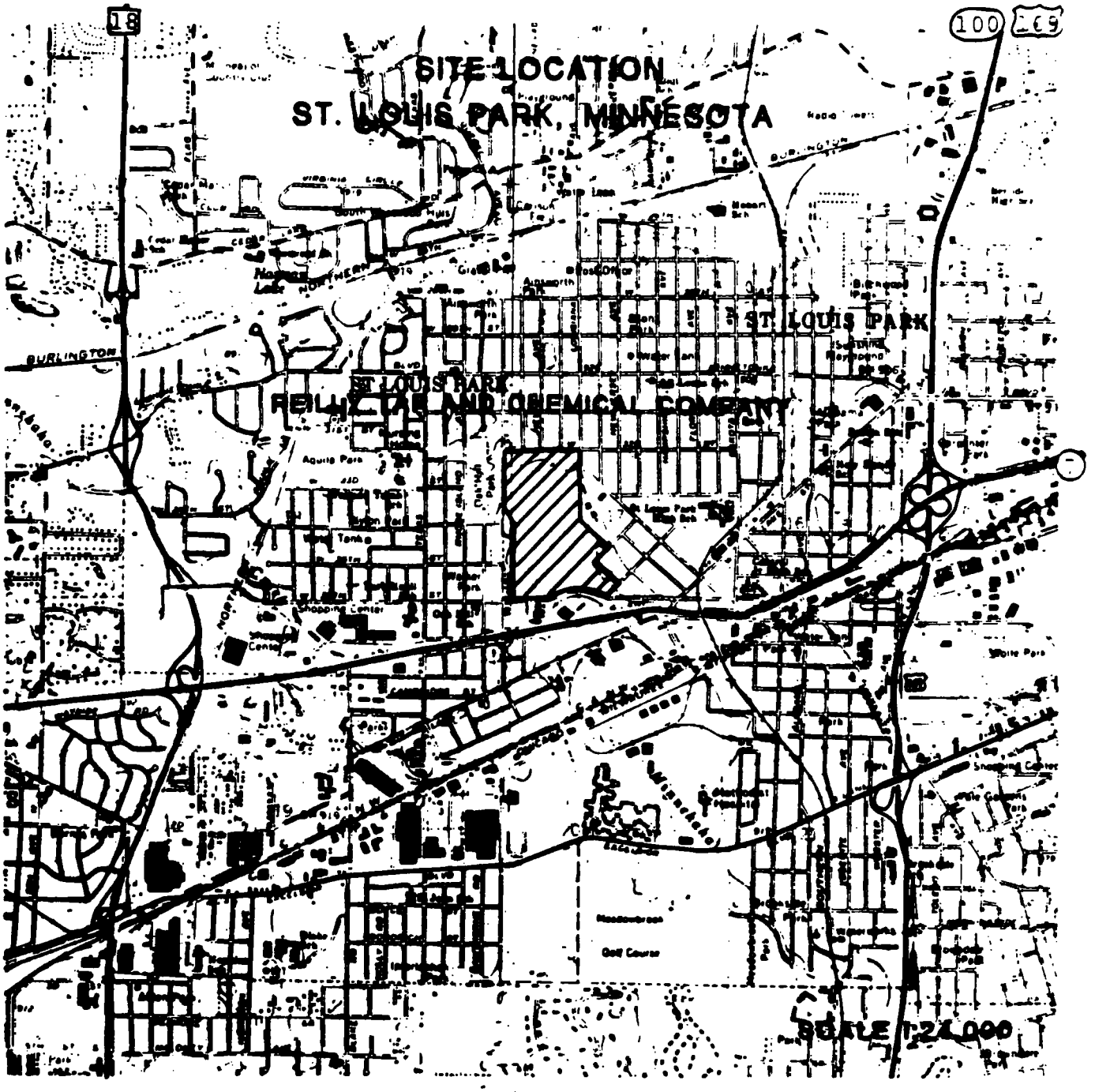
SITE LOCATION
ST. LOUIS PARK, MINNESOTA
18
100
169
BURLINGTON
ST. LOUIS PARK
ST. LOUIS PARK
REILLY TAR AND CHEMICAL COMPANY
SCALE 1:24,000

Figure 1

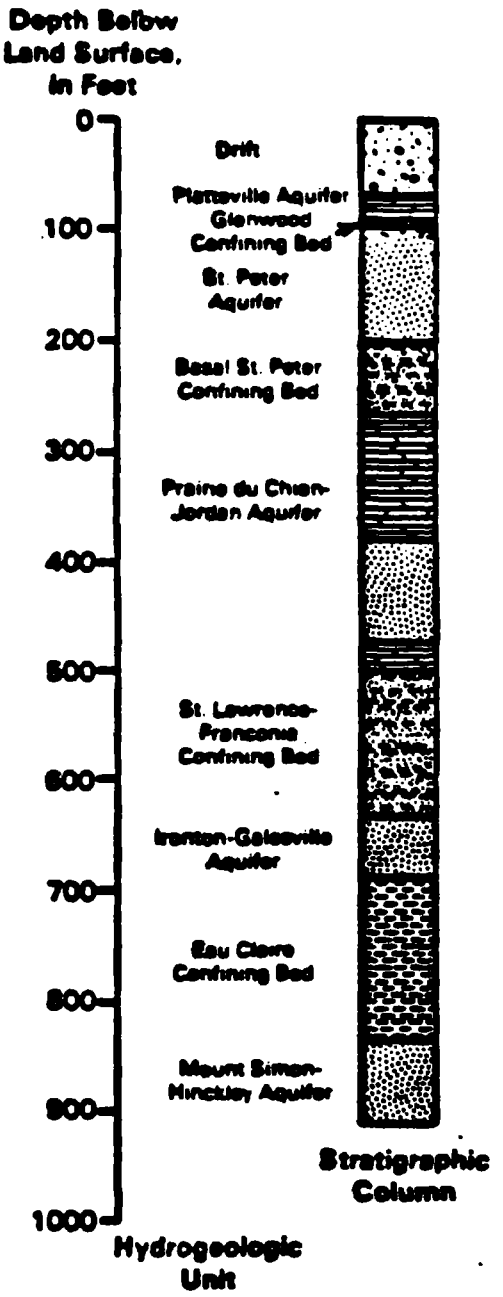

Figure 2

SUBSURFACE GEOLOGY UNDER
REILLY TAR SITE, ST. LOUIS PARK

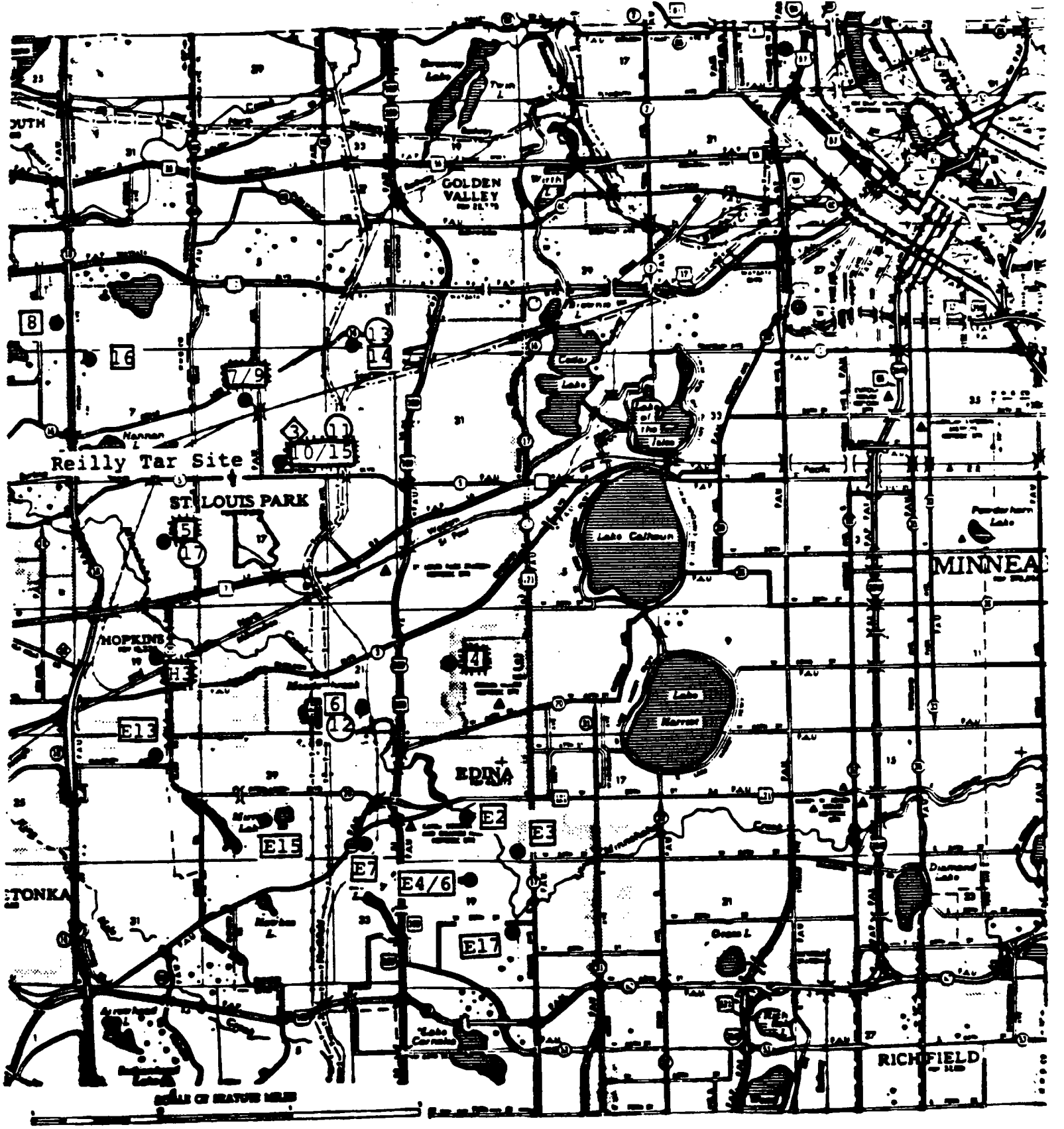

Figure 3

Locations of St. Louis Park and selected Edina (E) and Hopkins (H) municipal wells

Key

- Platteville-St. Peter well
- Prairie du Chien-Jordan well
- Mt. Simon-Hinckley well
- well closed due to contamination