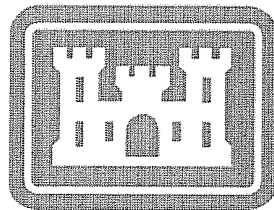


**PRELIMINARY ASSESSMENT REPORT
FINAL
1947 QUITCLAIM PROPERTY
FORMER GOPHER ORDNANCE WORKS,
ROSEMOUNT, MN**

PROJECT NUMBER E05MN0019



Prepared by U.S. Army Corps of Engineers-Omaha District

March 2006

PRELIMINARY ASSESSMENT REPORT
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EXECUTIVE SUMMARY

The purpose of this investigation was to collect information to determine if further investigation at the Former Gopher Ordnance Works (FGOW) property is warranted. The specific property included in this Preliminary Assessment (PA) is the part of Segment A that is Defense Environmental Restoration Program-Formerly Used Defense Sites (DERP-FUDS) eligible. This property is shown in Appendix S, Plate 3 as land transferred to the Regents of the University of Minnesota (UMN) in 1947 as well as lands returned to private ownership after World War II. This property is in the future described as the “1947 Quitclaim Property”.

FGOW was a government owned contractor operated (GOCO) facility. The facility was constructed and operated by the E.I. DuPont de Nemours under Contract W-ORD-642, between 1942 and September 1945 for the production of oleum and smokeless cannon and rifle powder.

FGOW was divided into four segments (Appendix S, Plate 1). Segment A (Appendix S, Plate 3) contained the manufacturing operations. The production of smokeless powder began in January 1945 and ended in September 1945. Following World War II, FGOW’s Segment A was further informally subdivided into roughly four parts (Appendix S, Plate 4) with the northwest and southeast parts transferred from the Federal Government to the Regents of the UMN by a Quitclaim Deed (QCD) dated 9 October 1947 (Appendix G, Reference 1); the industrial area in the northeast part transferred from the Federal Government to the Regents of the UMN by a QCD dated 17 March 1948 (Appendix G, Reference 2) minus a ½-mile strip along the east border that was returned to private ownership; and the southwest part returned to private ownership throughout 1947.

To evaluate certain FGOW property through a PA the U.S. Army Corps of Engineers (USACE)-Omaha District used records from the National Archives and Records Administration (NARA), copies of historical maps and aerial photographs from the

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Dakota County Environmental Management (DCEM) office and information about current tenants in the remaining buildings from UMN. After reviewing preliminary information, the PA boundary was established (all property inside Segment A not transferred to the Regents of the UMN in 1948) and the USACE-Omaha District subsequently conducted a site reconnaissance and designated six sites as AOCs (Appendix S, Plate 2).

- AOC 1: Waste Disposal Ditch, Primary and Secondary Settling Ponds
- AOC 2: Shipping/Storage Buildings South of 170th Street
- AOC 3: Miscellaneous Drainage Areas
- AOC 4: Sanitary Buildings
- AOC 5: Dinitrotoluene (DNT) Storage Bunkers
- AOC 6: 154th Street Disturbed Area

The following types of Hazardous, Toxic, and Radioactive Waste (HTRW)¹ were identified at FGOW:

- At AOC 1 the potential HTRW from past DuPont activities include nitrocellulose, VOCs (petroleum-based industrial solvents/degreasers from vehicle maintenance activities), SVOCs (diphenylamine (DPA) from powder manufacturing), metals, nitric and sulfuric acids.² Other materials that are potentially present on the site due to disposal activities after property transfer to the Regents of UMN include asbestos.³
- At AOC 2 the potential HTRW from past DuPont activities are nitrocellulose and DPA from any spill or leakage of finished product. Potential HTRW from UMN activities are fertilizer and pesticide from agriculture.
- At AOC 3 the potential HTRW from past DuPont activities are nitrocellulose, DNT, and DPA. Potential HTRW from UMN activities includes fertilizer, pesticides,

¹ HTRW is a standard acronym. There is no indication that radioactive waste was either used or generated during production at FGOW.

² DNT was detected in AOC 1 however no information has been found to show that it would have been used in the cannon powder process.

³ Asbestos is not considered HTRW. However, per Section 3-2.6.1 of ER 200-3-1, if a site is eligible for a FUDS project response action (such as remediation of HTRW), it may be possible to abate asbestos-containing materials (ACM) incidental to the completion of the eligible project response action - for instance, removal of soil containing both HTRW and ACM.

and maintenance-related chemicals. Potential HTRW from Raymond Laboratories, Inc. includes explosives.

- At AOC 4 the potential HTRW from past DuPont activities are PAHs (coal and ash), POLs (heating oil), and metals that may have been associated with the potential heating plant at the site. In addition, asbestos may have been present as a building material.

- At AOC 5 the potential HTRW from past DuPont operations are DNT residue associated with storage of DNT at the site. In addition, asbestos which was used in the construction of the bunkers may be present. Potential HTRW from UMN activities includes fertilizer, pesticides, and maintenance-related chemicals. Potential HTRW from use of the site by Raymond Laboratories, Inc. includes explosives.

- At AOC 6 the potential HTRW from past DuPont and UMN operations are unknown. HTRW may be present but there is no record of what types of materials were disposed here. In addition, asbestos may be associated with demolition debris materials observed at the site.

Because of Potentially Responsible Party (PRP) issues, no HTRW projects are warranted.

Neither Munitions and Explosives of Concern (MEC) or Munitions Constituents (MC) were present at FGOW. No MMRP projects are warranted.

There is no indication of containerized HTRW on the site. No CON/HTRW projects are warranted.

Building or structural debris are present at AOC 1 and AOC 6 and may be present at AOC 4, but none of these sites were determined as eligible for Building Demolition /Debris Removal (BD/DR) projects since the buildings were not determined to be inherently unsafe at the time of transfer to UMN.

Potentially Responsible Party (PRP) issues involving HTRW occur at all of the AOCs. DuPont is considered at PRP at all AOCs. The UMN is considered a PRP at all AOCs

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except AOC 4 (the Sanitary Buildings). Raymond Laboratories, Inc. may be a PRP at AOC 3 (the Miscellaneous Drainage Areas) and AOC 5 (the DNT Storage Bunkers).

This Preliminary Assessment recommends a PRP project for this property with three possible operators: E.I. DuPont, the University of Minnesota and Raymond Laboratories, Inc.

SECTION 1.0 - INTRODUCTION

Under the authority of the Defense Environmental Restoration Program (DERP) (10 USC §§ 2701 et seq.), and its policies and procedures relating to Formerly Used Defense Sites (DERP-FUDS), including Department of Defense (DoD) Management Guidance for DERP dated 28 September, 2001, and Engineering Regulation (ER) 200-3-1, *Environmental Quality, FUDS Program Policy* dated 10 May 2004, the USACE, Omaha District conducted a Preliminary Assessment (PA) at the Former Gopher Ordnance Works (FGOW) in Dakota County, Minnesota. This work effort was performed in accordance with the U. S. Environmental Protection Agency's (USEPA's) *Guidance for Performing Preliminary Assessments Under CERCLA* (EPA/540/G-91/013) and USACE's *Guidance for Performing Preliminary Assessments Under FUDS*. The purpose of this investigation:

“...is to: (i) eliminate from further consideration those properties that pose little or no threat to public health or the environment; (ii) determine if there is any potential need for removal action; (iii) set priorities for site inspections; and (iv) gather existing data to facilitate later evaluation of the release pursuant to the Hazard Ranking System (HRS) conducted by EPA.” (page B-2, USACE, 2004)

The PA included the following tasks: review of existing information about FGOW including the collection of information on potential targets, collection of information on potential Areas of Concern (AOCs), and preparation of a PA report including a site characterization form.

1.1 PROCESS

FGOW was a government owned contractor operated (GOCO) facility. The facility was constructed and operated by the E.I. DuPont de Nemours under Contract W-ORD-642, between 1942 and August 1945 for the production of oleum and smokeless cannon and rifle powder. FGOW was divided into four segments (Appendix S, Plate 1): Segment A (Appendix S, Plate 3) contained the manufacturing operations, Segment B provided a

path for transporting Mississippi River water to FGOW, Segment C connected the FGOW's waste disposal ditch with the Vermillion River and Segment D connected Segment C to the Mississippi River.

Following World War II, FGOW's Segment A was further informally subdivided into roughly four parts (Appendix S, Plate 4) with the northwest and southeast parts transferred from the Federal Government to the Regents of the University of Minnesota (UMN) by a Quitclaim Deed (QCD) dated 9 October 1947 (Appendix G, Reference 1); the industrial area in the northeast part transferred from the Federal Government to the Regents of the UMN by a QCD dated 17 March 1948 (Appendix G, Reference 2); and the southwest part returned to private ownership throughout 1947.

The UMN (which holds title to about 8,000 of Segment A's approximate 12,000 acres) requested through U.S. Congressional Representative John Kline a PA to evaluate the FGOW property transferred in both 1947 and in 1961¹ as well as building demolition and debris removal across the entire site (Appendix G, Reference 3). The Department of Army responded and limited this PA to that property transferred from the Federal Government to the Regents of the UMN by QCD dated 9 October 1947 (Appendix G, Reference 4)².

Except for two small areas located on private property, there are no plans at this time for a PA to address the remainder of the private property in the original FGOW Segment A 1942 acquisition.^{3,4} A scope of services (Appendix G, Reference 5) was completed in

¹ A 26-acre parcel of land surrounding the FGOW steam plant (within the industrial part of Segment A that was transferred to UMN in 1948) was transferred from the UMN to the Federal Government by QCD dated 27 June 1951 and then returned to the UMN from the Federal Government on 9 March 1961.

² This PA covers all FUDS eligible property in FGOW's Segment A including lands transferred to UMN in the 1947 QCD as well as land transferred from DoD ownership to private ownership at the end of WWII.

³ Preliminary inspection of maps obtained from the National Archives showed that the southwest part of Segment A was never developed for FGOW operations. Property in this area was transferred to private ownership after World War II. However, during site reconnaissance and inspection of maps and 1945 aerial photographs made available by the DCEM, the Sanitary Buildings (AOC 4) were identified as being on private property. The remainder of the southwest part of Segment A was unaffected by FGOW operations and will not be addressed in this PA.

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May 2005 for this work and funding was approved. During the site information search phase, the team gathered maps, articles, documents, and electronic information. Initial contacts were established where known, and a preliminary assessment form was electronically produced and completed for incorporation of data into this PA report.

After gathering historical information, five AOCs were identified within the part of the FGOW facility boundary that was transferred to the Regents of the UMN in the 1947 QCD and one AOC outside the 1947 Quitclaim property for detailed site reconnaissance. A small part of AOC 1 and all of AOC 4 are located on property that is privately owned. AOCs were identified by evaluating operational activities at buildings and on undeveloped land within the site boundary. Any FGOW activities conducted that could pose a potential environmental concern were included as an AOC.

Information regarding real estate, flood plains, wetlands, population, endangered species, sensitive environments, aerial photos, and other Geographical Information System (GIS) data were collected and reviewed for applicability.

During the development of this report, more information was available than had been anticipated. Details have been included in this report that may not be relevant to the PA itself but may be useful for any future considerations at FGOW.

Issues are addressed globally in this report wherever possible. This essentially includes regional and local geology, hydrogeology, hydrology, climate, flood-plain information, population, groundwater depth, endangered species, sensitive environments, and wetlands.

⁴ A small part of AOC 1(Waste Disposal Ditch) is located on private property on the east side of the 1948 Quitclaim property. The remainder of this band of Segment A was unaffected by FGOW operations and will not be addressed in this PA.

1.2 AREAS OF CONCERN

The area of study for the PA has been divided into six AOCs to more accurately assess the radius of influence of potential hazards on human health and the environment. See Appendix S, Plate 2 for the PA boundary.

- AOC 1: Waste Disposal Ditch, Primary and Secondary Settling Ponds
- AOC 2: Shipping/Storage Buildings South of 170th Street
- AOC 3: Miscellaneous Drainage Areas
- AOC 4: Sanitary Buildings
- AOC 5: Dinitrotoluene (DNT) Storage Bunkers
- AOC 6: 154th Street Disturbed Areas

1.3 GENERAL ORGANIZATION OF THIS PA REPORT

Section 1 presents the introduction to this report including the purpose and process description of the project. Section 2 contains a discussion of previous investigations. Section 3 includes a description of the property, acreages of the study area, and land use. Section 4 includes a historical property summary, including timeline, property ownership, DoD operations involving HTRW, and evaluation of aerial photographs. Section 5 evaluates the presence of military munitions. Section 6 evaluates the possible presence of HTRW and discusses each of the AOCs. Section 7 evaluates the possibility of containerized HTRW and building demolition/ debris removal. Section 8 discusses contamination pathways and potential environmental hazards. Section 9 presents the summary and conclusions. Five plates are included as references to this PA Report. Plate 1 is a property vicinity map and boundaries abstracted from historical drawings/documents. Plate 2 presents features of interest - FGOW boundary layout. Plate 3 presents FGOW main facility (Segment A) layout. Plate 4 presents post World War II (WW II) land usage/ownership. Plate 5 presents current land usage/ownership.

SECTION 2.0 - INVESTIGATIONS

Five investigations have been conducted for the FGOW property.

a. Findings and Determination of Eligibility (FDE), Former Gopher Ordnance Works, FUDS Property # E05MN001900, Rosemount, Dakota County, Minnesota, prepared by the Omaha District, USACE and signed by BG William Grisoli on May 24, 2005 (Appendix G, Reference 6).

b. Preliminary Environmental Investigation, Former Gopher Ordnance Works, U/More Park, Rosemount, Minnesota, prepared by Peer Engineering for the UMN and the Minnesota Pollution Control Agency (MPCA), and dated August 19, 2003. (Appendix G, Reference 7).

c. Site visit in November 2003 conducted by USACE, MPCA and UMN.

d. Preliminary Groundwater Investigation, 170th Street Dump (Coates Contamination Assessment Team) conducted by Dakota County Environmental Management (DCEM) office 1-10 July 1992 and 17 November 1992 (Appendix G, Reference 8).

e. Site Reconnaissance conducted during 18-22 July 2005 by USACE, DCEM, and UMN (Appendix L).

2.1. FINDINGS AND DETERMINATION OF ELIGIBILITY

This document examined the status of FGOW as a FUDS property and its eligibility for project funding under the Defense Environmental Restoration Program - Formerly Used Defense Sites (DERP-FUDS) program.

2.1.1. Findings of Fact

FGOW was a government owned contractor operated (GOCO) facility. The facility was constructed and operated by the E.I. DuPont de Nemours under Contract W-ORD-642,

between 1942 and September 1945. The Findings of Fact states that FGOW was built by the DuPont for the production of oleum and smokeless cannon and rifle powder on approximately 13,651 acres located near Rosemount, MN. The majority of the property was acquired through purchase, with a smaller portion acquired through easements and license to the War Department. FGOW was then divided into Segments A, B, C, and D, with each segment of land being used for different purposes by FGOW. The Findings of Fact goes on to discuss acreages in each segment, history of construction and operations at FGOW, and history of ownership of the various parcels of land. The information in the Findings of Fact is discussed in more detail in Section 3.2 of this PA.

2.1.2. Determinations

The Determinations indicate that, except for the Northeast Property of Segment A (described in more detail in the Findings of Fact and in Section 3.2 of this PA), FGOW is property eligible for the DERP-FUDS program. The Northeast Property in Segment A was transferred to the UMN in 1948 via a QCD that indemnifies the United States of America from any liability related to U.S. Government activities in connection with the property.

Because of “hold-harmless” language in the 1948 QCD that transferred the northeast property of Segment A from the federal government to the UMN, this PA does not include the 3,300 acres of the northeast part of Segment A.

2.2. PRELIMINARY ENVIRONMENTAL INVESTIGATION

The Preliminary Investigation Report prepared by Peer Engineering (Appendix G, Reference 7) for the UMN and MPCA selected six areas on FGOW for initial investigation: the Oleum Plant, the Nitric Acid Plant, the Burning Grounds, the Wastewater Treatment Plant, the Maintenance Shops, and the Primary Settling Basin. Except for the Primary Settling Basin, all of these areas are located on the property

transferred to the UMN in 1948 that USACE determined were not eligible as DERP-FUDS projects. The Primary Settling Basin is included in this PA.

Investigation activities documented in the report included excavation of test pits, collection and analysis of soil samples, Global Positioning System (GPS) mapping of test pit locations, preparation of test pit logs, and field screening soil samples for organic vapors. Two (2) test pits were excavated at the Primary Settling Basin with two (2) soil samples collected. Chemicals detected at the Primary Settling Basin included mercury, chromium, 2,4-dinitrotoluene, 2,6-dinitrotoluene, m-nitrotoluene and o-nitrotoluene. Reference 7 in Appendix G contains test results for the other five areas.

2.3. SITE VISIT

A site visit was conducted in November 2003 with representatives from CENWO (Engineering Division, Geotechnical Engineering and Service Branch and Project Management Division, Environmental Remediation Branch), MPCA and the UMN. During the site visit of the industrial part of Segment A, the steam plant smokestacks, suspected asbestos containing material (ACM) were observed and noted while the four large diameter water extraction wells (“Ranney Wells”) were discussed. Numerous unsafe structures or debris from “age/weather/trespassers” were evident. However, there was no evidence that these structures were unsafe at the time that DuPont operations ceased or that the debris resulted from DuPont’s operations.

2.4. PRELIMINARY GROUNDWATER INVESTIGATION

DCEM provided a copy of maps and results from sampling that was conducted in July and November 1992 in the Waste Disposal Ditch (AOC 1) area south of 170th Street. See Appendix G, Reference 8 for map of sample locations as well as sample results. DCEM reported finding metals, volatile organic compounds (VOCs), trichloroethylene (TCE),

tetrachloroethylene (PCE or PERC) and the SVOC phthalate but provided no tables of test results or data validation.

2.5 SITE RECONNAISSANCE

A site reconnaissance was conducted in July 2005 with representatives from CENWO (Engineering Division, Geotechnical Engineering and Service Branch), MPCA and the UMN and is reported in Appendix L. This meeting provided an opportunity to clarify that a part of AOC 1 (Waste Disposal Ditch) is located on property returned to private ownership after WW II and all of AOC 4 (Sanitary Buildings) is located on property also returned to private ownership after WW II.

SECTION 3.0 – PROPERTY DESCRIPTION, ACREAGE AND LAND USE

3.1. LOCATION

The major part (95%) of the land comprising the FGOW is located within the city limits of Rosemount in Dakota County (Minnesota) approximately 20 miles southeast of the Minneapolis/St. Paul metropolitan area (Appendix S, Plate 1). This property (also known as Segment A) is primarily located in Townships 114N and 115N in Ranges 17W, 18W and 19W. The State of Minnesota is located in U.S. Environmental Protection Agency (EPA) Region 5. Segment A provides the UMN farmland for agricultural research and also is used by some light manufacturing and service companies under the auspices of the University of Minnesota Rosemount Research Center (UMRRC). These UMN offices for the site can be reached by taking 160th Street east from Rosemount and then north on Babcock Avenue. The area addressed in this PA is located south of 145th Street, east of Biscayne Avenue, north of 190th Street and east of Clayton Avenue¹ excluding the property transferred to the UMN in the 1948 QCD. See Appendix S, Plate 4, for the PA/FGOW/Segment A boundary.

3.2. FUDS ELIGIBLE PROPERTY

FGOW was built by DuPont for the production of oleum and smokeless cannon and rifle powder on approximately 13,651 acres. Construction and production activities occurred between 1942 and 1945. The FDE (See Section 2.1 for further information) determined that, except for the Northeast portion of Segment A, FGOW is eligible for the DERP-FUDS program. The AOCs covered by this PA are all in the portion of Segment A that is FUDS-eligible, including areas outside the 1947 and the 1948 QCDs. The AOCs are also all part of the property that was transferred to the UMN in 1947, with two exceptions: a part of the AOC 1 (Waste Disposal Ditch) and AOC 4 (Sanitary Buildings) are on properties that were transferred to private ownership after the end of WWII.

¹ The area addressed by this PA includes all property transferred to the UMN in the 1947 QCD as well as Segment A property returned to private ownership after WWII. The only property not addressed by this PA is that land transferred to the UMN in the 1948 QCD.

3.3. LAND USE AND OWNERSHIP HISTORY

3.3.1 Land Use and Ownership Prior to Construction of FGOW

Prior to acquisition by the WD in 1942 and 1943, the majority of the land that became FGOW was privately owned and used primarily for agriculture.

3.3.2 Acquisition and Use of Property for Construction of FGOW

The FGOW acreage (approximately 13,651 acres) was acquired through purchase (11,987.95 acres owned by WD), through easements (1,662.10 acres easement to WD) and through license (1.40 acres license to WD) in 1942.

Some 885 buildings were constructed on Segment A between August 1942 and July 1943. (Appendix I, Map 1) The initial plans for FGOW called for the construction of two (2) plants each including three (3) production lines for the manufacture of cannon or rifle powder from either cotton linters or wood pulp -- Plant A would contain production Lines A, B and C and Plant B would contain production Lines D, E and F.

Construction work proceeded on both lines through 1942 until April 1943 when Contract W-ORD-642 was amended to provide to the elimination of smokeless powder lines D, E and F (Appendix G, Reference 9). In Change Order No. 9 (dated 11 May 1943) the Ordnance Department determined that since the production of smokeless powder at other facilities was adequate to meet requirements that operations on lines A, B and C would not commence though construction would continue (Appendix G, Reference 9). Authorization to terminate Contract W-ORD-642 (dated 19 February 1944) resulted in the cessation of all work on the FGOW as of 24 January 1944.² Contract No. W-25-066-eng-406 with Fegles Construction

² "When the A, B and C lines were ordered put in "stand-by" condition, every precaution was taken to preserve every piece of machinery so that if needed for operations, it would be in perfect running order. Machines were taken down and the moving parts were covered with a protective coating of grease and then wrapped for further protection against deterioration." Page 8 (Appendix G, Reference 9)

Company Limited for dismantling FGOW was signed on 25 January 1944 and dismantling of both buildings and production lines D, E and F began. (Appendix G, Reference 9).

A Stop Order on 17 April 1944 ended dismantling lines A, B and C. Change Order No. 15 (dated 16 August 1944) reactivated lines A, B and C with reactivation starting on 11 September 1944. Change Order No. 17 (accepted 9 January 1945) provided authority "... to proceed immediately to take all necessary steps to complete Smokeless Powder lines D, E, and F for operation based on designed capacity for the production of 450,000 lbs of single base nitrocellulose smokeless cannon powder ... per day of 24-hrs." (page 6, Appendix G, Reference 10).

Nitrocellulose "C" line started in operation 12 January 1945, Smokeless Powder "C" line started in operation 9 February 1945, Nitrocellulose "B" line started in operation 19 February 1945 and Smokeless Powder "B" line started in operation 2 March 1945 (Appendix G, Reference 10).

Work was stopped on lines D, E and F on 27 April 1945 and the close down process started the next day. Nitrocellulose "A" line started in operation 1 April 1945 and Smokeless Powder "A" line started in operation 16 April 1945. However, all remaining construction work on "A" line was deleted on 23 May 1945 (Appendix G, Reference 11).

Only the three production facilities of Plant A -- Lines A, B and C -- were completed and operational to produce approximately 24 million pounds of smokeless cannon powder during seven (7) months of operations. According to the production records in Appendix G, References 10-13 no rifle powder was produced at FGOW. Lines D, E and F of Plant B were never completed and made operational and never produced cannon or rifle powder.

On 11 August 1945, the Ordnance Department directed FGOW to cease production of smokeless cannon powder and the final production run of powder was packed for shipment in September 1945. Some 287 buildings and associated machinery had been partially or completely dismantled before production finally ceased.

Decontamination of the buildings at FGOW was well underway in August of 1945 as well as dismantling work incidental to the decontamination (Appendix G, Reference 13). Required decontamination was 99% completed by 9 May 1946 (Appendix G, Reference 14). The remaining decontamination became the responsibility of the Ordnance Department and dependent upon the Board to Recommend Destruction of Buildings and Improvements. This Board recommended no further decontamination until advised by the Board. Most of the entire FGOW facility had been transferred to the War Assets Administration on 16 May 1946 (Appendix G, Reference 14).

As described in the *Gopher Ordnance Works – Decontamination Completion Report* (Appendix G, Reference 15), a number of structures as well as production equipment were burned during the decontamination process. Other than the burning of these structures incidental to the decontamination no record of demolition, dismantlement, or removal activities by Federal Government or its contractors was found to document any additional efforts that were conducted after decontamination was completed in 1946.

3.3.3 Land Use and Ownership After Closure of FGOW

Following the closure of FGOW, 4,687 acres from Segment A were transferred to the Regents of the UMN in 1947. An additional 3,320 acres from Segment A were sold to the Regents of the UMN in 1948. The 1948 parcel (which is not eligible for DERP-FUDS) included the buildings and facilities that remained intact, along with the buildings and equipment that were demolished or dismantled by Federal Government contractors during decontamination. (Appendix I, Map1 provides building key and index of all FGOW buildings). The FUDS-eligible property transferred to the Regents of the UMN in 1947 (including most of the AOCs covered by this PA) has remained in the control and use of the UMN since that date. AOCs covered by this PA that are on privately owned property include a section of the AOC 1 (Waste Disposal Ditch) and all of AOC 4 (Sanitary Buildings).

Brief descriptions of the current use of the AOCs and FGOW structures and facilities remaining on the sites follow. Locations of the AOCs are shown in Appendix S, Plate 2.

3.3.3.1 AOC 1, Waste Disposal Ditch, Primary and Secondary Settling Ponds

This AOC begins at 160th street where the Laminex Woodbox Sewer empties into the Waste Disposal Ditch and continues south to the outfall of the Secondary Settling Pond. The Ditch captures seasonal precipitation, but is dry for a large part of the year. The Ditch south of 170th Street is heavily overgrown with brush and weeds for much of its length (Appendix L; Appendix M, Photographs 01-03). Some time since 1945, part of the ditch north and south of 170th Street was used for the disposal of building debris and other waste, though the source of debris is not known. The UMN voluntarily placed a soil cap over the debris field extending south from 170th Street in the 1990s. The Primary and Secondary Settling Ponds contain no standing water and are both used or leased out by the UMN for agriculture.

A part of the Waste Disposal Ditch (about ½ mile section south of 160th Street) is located on privately owned property.

The FGOW structures remaining on this AOC are a breached dam, a concrete weir, the structural remains of a secondary acid neutralization process, and the remains of a still-well. These structures are still in place at the outfall of the Secondary Settling Pond.

3.3.3.2 AOC 2, Shipping/Storage Buildings South of 170th Street

This area is used or leased out by the UMN for agriculture.

Aerial photographs (Appendix H, Photographs 2 and 3) show that 92 wooden Shipping/Storage Buildings were present in 1945. These structures were built on piers with a raised treated lumber floor over a gravel bed (Appendix I, Drawing 1). No debris from the buildings remains today, but the former building locations are still visible due to the rock and gravel beds still present in the soil and the lack of vegetation on the former building sites (Appendix M, Photographs 04-06). No records were found to show when or by whom the buildings were demolished or removed.

3.3.3.3 AOC 3, Miscellaneous Drainage Areas

These areas or depressions held drainage water from various storage/shipment building areas (Appendix G, Reference 16). There are three drainage areas locations shown on Plate 2: east of Annette Avenue and south of the shipping/storage buildings; south of 170th street and between the shipping/storage buildings and the Sanitary Buildings; southwest of the DNT storage bunkers (Appendix M, Photograph 11). During the site reconnaissance it was observed that the drainage areas were overgrown with bushes and trees. None of these locations is actively used by the UMN except to contain seasonal precipitation. No FGOW structures or facilities were ever present at the drainage locations.

3.3.3.4 AOC 4, Sanitary Buildings

This site has been identified on an undated USACE Building Key map (provided by DCEM) as containing Bldgs 107-T, 108-T, 109-T 110-T and 200-T (Appendix H, Photograph 6). The Index of Building Plans (Appendix I, Map1 and index) describes these buildings as a Time Office (107-T), Sanitary Building (108-T), Sanitary House (109-T), Boiler House (110-T) and Toilets (200-T). The site is now privately owned, with part of the land used for grasses and part of it overgrown with trees and bushes.

An aerial photograph shows a large building (Sanitary Building/Sanitary House) at the site with a smaller building (Boiler House) next to it (Appendix H, Photograph 6). The photograph also shows numerous large square objects stored in the area surrounding the buildings. No remaining structures or facilities are evident. No records were found to show when or by whom the buildings were demolished or removed.

3.3.3.5 AOC 5, Dinitrotoluene (DNT) Storage Bunkers

In April 1944, the land where these bunkers stand was leased to Raymond Laboratories, Inc. of St. Paul., MN for the purpose of storing explosives (Appendix G, Reference 17). No records were found to indicate how long these bunkers were used or what type of explosives may have been stored in them. There is no indication that the lease was renewed prior to the

transfer of the land from the U.S. Government to the Regents of the University of Minnesota in 1947.

This site is now owned by the UMN and is actively used as part of the University's farming and agricultural research program.

Seven of the eight original bunkers are still present and appear to be used by the University for storage of a variety of materials, including chemicals, machinery, and scrap wood and metal. Five of the bunkers have been rehabilitated, with newer metal roofs and siding. All that remains of the other two bunkers are the concrete floors and sides; these two bunkers contain the scrap wood and metal.

3.3.3.6 AOC 6, 154th Street Disturbed Areas

The UMN owns these three sites (Appendix H, Photograph 7). The primary disturbed area is a large depression mostly overgrown with grass, with some trees and bushes also present (Appendix M, Photographs 07, 09 and 10). At some time in the past the area was used for disposal of construction debris such as concrete and rebar (Appendix M, Photograph 08), which were seen in some places on the ground surface during site reconnaissance. No records were found to indicate the date the debris was placed here, the source of the debris, or who was responsible for placing it there. The depression is visible in 1945 aerial photographs. There is no indication that facilities or structures were present on the site.

The other two disturbed areas were borrow areas - one was west of the primary area and the other was to the northeast of the primary area.

3.4. PHYSICAL PROPERTY CHARACTERISTICS

Dakota County is located on the west bank of the Mississippi River and typically receives precipitation from eastward moving storm systems. The average monthly precipitation varies from less than 1 inch in February to over 4 inches in July. The annual average precipitation at Rosemount is approximately 34.6 inches. The average temperature ranges from about 7

degrees Fahrenheit in December and February to 81 degrees Fahrenheit in July. The average snowfall each winter is 45 inches.

Detailed information regarding regional geology and hydrogeology is presented in Section 8.1 Groundwater Pathway.

There are no historically significant sites located on the property covered by this PA.

There are six Federally-listed threatened, endangered, or special concern plants and animals of Dakota County (Appendix G, Reference 18): the prairie bush clover (threatened), the bald eagle (threatened), the peregrine falcon (endangered), the blue sucker (threatened), the Higgins eye mussel (endangered) and the winged mapleleaf mussel (endangered). Bald eagle nests and roosts may be located within 15 miles of FGOW. There are also a large number of species considered by the State of Minnesota to be threatened or endangered. No study of the sites in this PA has been conducted to determine whether there is a potential for any of the threatened or endangered species to be present.

SECTION 4.0 – HISTORICAL PROPERTY SUMMARY

4.1 CHRONOLOGICAL PROPERTY SUMMARY

Prior to acquisition by the War Department (WD) in 1942 and 1943, most of the land that became FGOW was privately owned and used for agriculture.

The FGOW acreage (approximately 13,651 acres) was acquired through purchase (11,987.95 acres owned by WD), through easements (1,662.10 acres easement to WD) and through license (1.40 acres license to WD) in 1942. All but 3.37 acres of the land on Segment A of FGOW were purchased and owned by the WD. All of the sites that are included in this PA are part of Segment A on FGOW. DuPont began construction of buildings on Segment A in August 1942. According to production records (Appendix G, References 10-13) DuPont operations produced smokeless cannon powder between February and September of 1945. Production operations were “shutdown” in September 1945 (Appendix G, Reference 13).

In January 1946, 11,994 acres (Owned) and 1,384 acres (Easement) of Gopher Ordnance Works were declared surplus real property through the War Department, Army Services Forces, Corps of Engineers.

In July 1946, the Regents of the UMN offered to purchase some 4,680 acres (primarily agricultural) located between the critical fence (erected to create a security boundary around the site) of FGOW and the northwest and southeast boundaries of Segment A. Some 7,986.61 acres were advertised for sale as surplus government real property in August 1946 and in November 1946, the Farm Credit Administration (FCA) accepted the Regents’ offer to purchase 4,017 acres of farmland. The acreage was increased in April 1947 when the Farm Mortgage Corporation (FMC) deeded approximately 4,680 acres (more or less) of land (Northwest/ Southeast parcels) to the Regents of the UMN for \$1.00 and real estate fees. A QCD dated 9 October 1947 (Appendix G, Reference 1) transferred 4,687 acres along the northwest side of the critical fence as well as along the south side of the critical fence (mainly outside the critical fence but encompassing some

bunkers inside the critical fence line) through the FMC to the Regents of the UMN. QCD No. 193572 was recorded on 14 October 1947.

Most of the property covered by the AOCs in this PA was part of the land transferred to the Regents of the UMN in 1947. This includes most of AOC 1, and all of AOCs 2, 3, 5, and 6. The Regents of the UMN have continuously owned these properties since October 1947.

A ½ -mile segment of the AOC 1 (Waste Disposal Ditch) and all of AOC 4 (Sanitary Buildings) are located on land that was returned to private ownership after August 1945 and have remained privately owned since that time.

4.2 MILITARY OPERATIONS

DuPont operations at FGOW included construction of facilities followed by dismantlement of many of those facilities between 1942 and 1946 and production of oleum and smokeless cannon powder between February and September 1945. The production operation was GOCO, with E.I. Dupont deNemours and Company as the contractor operator.

4.2.1 Operations Involving Military Munitions

There were no operations involving military munitions at FGOW.

4.2.2 Operations Involving HTRW

FGOW was a GOCO facility. The facility was constructed and operated by the E.I. DuPont de Nemours under Contract W-ORD-642, between 1942 and September 1945 for the production of oleum and smokeless cannon and rifle powder.

Prior to the Federal Government's acquisition of the land in 1942 and 1943 of FGOW's Segment A, most (if not all of it) was farmland. After WWII, the land was either returned to private ownership or transferred to the Regents of the UMN. All property remained for

the most part agricultural though some of the land is currently used for recreational activities or light industrial operations.

4.2.2.1 Nitrocellulose Production

The northeast part of FGOW's Segment A contained numerous facilities for nitrating cotton or wood pulp during the production of smokeless powder (nitrocellulose). A detailed explanation of the process is provided in Appendix T. Basically the raw materials and chemicals required to produce nitrocellulose – cotton or wood, sulfur, and ammonia – were delivered at the north end of the production line. Cotton or wood was cleaned and shredded/pulped, the sulfur was burned and concentrated into oleum and the ammonia converted to “weak” nitric acid. This weak nitric acid was mixed with sulfuric acid to produce a “concentrating mix” that was further processed to concentrate the nitric acid. Strong nitric acid was combined with strong sulfuric acid (oleum) to make the fortifying acid for nitrating the cotton or wood pulp to make nitrocellulose. See Table 4-1 for production records. DPA (initially to be manufactured at FGOW but the facilities were cancelled in May 1943) was added to the nitrocellulose as a stabilizer in an alcohol-ether mixture near the end of the production process.

Large quantities of fresh water were used throughout the production process to wash the nitrocellulose. This removed excess acid and stabilized and desensitized the nitrated cotton. The process water from the acid production areas as well as the nitrocellulose production facilities collected in the underground Laminex Woodbox sewers (designed to collect as much as 100,000,000-gallons-per-day (gpd) process water) (Appendix G, Reference 19) and flowed to the Waste Disposal Ditch (AOC 1) that ran from north to south along the east boundary of FGOW's Segment A.

**PRELIMINARY ASSESSMENT REPORT - FINAL - 1947 QUITCLAIM PROPERTY
FORMER GOPHER ORDNANCE WORKS, ROSEMOUNT, MN**

Table 4-1 Production Records (per 1,000 pounds)
(Appendix G, References 10-13)

	October 1944	November 1944	December 1944	January 1945	February 1945	March 1945	April 1945	May 1945	June 1945	July 1945	August 1945	September 1945
Nitric Acid	NR	2,223	2,170	2,722	3,248	6,056	8,929	7,853	6,230	2,828	753	None
Nitric Acid Concentrating	NR	1,241	1,458	2,600	3,338	8,394	8,717	10,307	7,041	4,538	3,343	493
Sulfuric Acid Concentrating	NR	1,108	2,053	3,598	4,651	19,634	24,204	22,944	16,697	7,900	6,210	3,400
Acid Mixing	NR	1,249	1,814	3,932	4,856	9,987	10,639	12,022	8,718	NR	NR	NR
Oleum	NR	9,914	14,308	15,180	11,007	11,409	12,650	10,826	13,743	2,656	None	None
Nitrocellulose Cotton	NR	No Ops	No Ops	No Ops	No Ops	No Ops	No Ops	No Ops	No Ops	NR	NR	NR
Nitrocellulose Pulp	NR	No Ops	No Ops	811	1,170	4,055	4,969	5,864	4,564	NR	NR	NR
Nitrocellulose Total	NR	No Ops	No Ops	811	1,170	4,055	4,969	5,864	4,564	3,658	871	None
First Stage Cannon Powder	NR	No Ops	No Ops	No Ops	774	3,944	5,450	6,978	6,098	NR	NR	NR
Finished Stage Cannon Powder	NR	No Ops	No Ops	No Ops	No Ops	1,335	4,332	6,266	4,305	4,093	3,788	3,586
First Stage Rifle	NR	No Ops	No Ops	No Ops	No Ops	No Ops	No Ops	No Ops	No Ops	NR	NR	NR
Finished Stage Rifle	NR	No Ops	No Ops	No Ops	No Ops	No Ops	No Ops	No Ops	No Ops	NR	NR	NR

No Ops – No Operations
NR – Not Reported

4.2.2.2 FGOW Support

Numerous other facilities were also located in FGOW's Segment A to maintain and operate FGOW. These included the steam plant, water treatment plant, sewage pump stations, sandblasting shops, paint shop and storage, carpenter shops, millwright and machine shops, garage and repair shop, car wash and grease shop, locomotive house, laundries, sheet metal shops and a gas station.

A number of these facilities – such as the repair shops and the locomotive house – would have used solvents and degreasers. The waste from sandblasting and paint shops could have contributed heavy metals (such as chromium) to the waste stream. The laundries were used to launder the clothing the workers wore that may have been contaminated with process waste, DNT and nitrocellulose. Mercury was present in the trickling filter bearings at the wastewater treatment facility.

All of these shops were connected to the sanitary sewers that were designed to collect 300,000-gpd wastewater (Appendix G, Reference 19) from laundries and personal hygiene facilities as well as shop clean-up and carried sewage to the wastewater treatment facility located in the northeast part of FGOW (Appendix I, Map 4). The sewer plant was designed to receive raw sewage, separate the sludge and then

“... chlorinate and dilute with other plant waters sufficiently to produce a total effluent well below 20 parts per million Biological Oxygen Demand (BOD) the limit desired by the State Department of Health.” (page 30, Appendix G, Reference 19).

4.2.3 Miscellaneous

Process waste was recycled throughout the production of nitrocellulose (Appendix G, Reference 16).

- Spent Acid Recovery: After nitration was completed, spent acid was recovered and fortified with a fortifying acid mix (50-55% nitric and 50-45% sulfuric). This acid

supplied all of the nitric acid for new nitration. Alcohol may also have been recovered during the solvent recovery process and then recycled.

- Alcohol Recovery: During the formation of a colloid alcohol was used to displace water and dehydrate the nitrocellulose. Spent alcohol was pumped into storage tanks and the rectified with the addition of caustic soda to decompose dissolved or suspended nitrocellulose. The alcohol was then used either in the dehydrating process or in the manufacture of ether.
- Ether Recovery: “Under normal operating conditions an appreciable portion of the ether in the solvent is lost due to exposure of the powder mass to the atmosphere unless means are provided for its recovery.” (page 30, Appendix G, Reference 16) No records were found to indicate if ether was recovered and recycled during the DuPont operations at FGOW.

No record could be found indicating the presence of ASTs or USTs on the property covered in the PA.

No record could be found reporting known or confirmed spills.

4.3 MAP ANALYSIS

Numerous maps of FGOW dating from 1945 were acquired during archival research at NARA and from DCEM. A real estate map (Appendix I, Map 3) shows original property ownership prior to acquisition by the War Department, along with size of the parcels of land. This map identifies the waste disposal ditch and the plant (critical) fence overlaid on a map showing the initial owners of the land acquired to create the FGOW. Map 1 in Appendix I shows locations and building numbers of the structures and facilities that existed during the time that FGOW was active, such as buildings (i.e., shipping and storage, sanitary), roads and fences. Disposal and drainage areas are not identified on this drawing.

4.4 AERIAL PHOTOGRAPHIC INTERPRETATION

Aerial photographs dating from 1945 were obtained just prior to site reconnaissance from the UMN and the DCEM office. See Appendix H for photographs. Aerial photos from other years were not reviewed. Aerial photographs from 2003 showing current land use can also be viewed on the Dakota County web site.

4.4.1 AOC 1, Waste Disposal Ditch, Primary and Secondary Settling Ponds

The Waste Disposal Ditch and Primary and Secondary Settling Ponds are visible in the 1945 aerial photograph (Appendix H, Photograph 2). The settling ponds appear to be open areas possibly containing water at that time. The Waste Disposal Ditch is currently filled in underneath 170th Street although it is believed that water could travel through the ditch when FGOW was active. The 1945 aerial photograph does show a road crossing the ditch at this location. It is unknown whether the ditch was filled in at the time this photo was taken. It is possible that a bridge crossed the ditch or that a culvert was present.

The aerial photograph indicates that the Waste Disposal Ditch and settling ponds were present in 1945 and apparently in use, with water flowing through the system.

4.4.2 AOC 2, Shipping/Storage Buildings South of 170th Street

The aerial photograph from 1945 shows buildings and associated roads present at this location (Appendix H, Photographs 2 and 3). The date when the buildings were demolished or removed is unknown.

4.4.3 AOC 3, Miscellaneous Drainage Pits

These three drainage areas are all visible on the 1945 aerial photograph as irregular, discolored areas (Appendix H, Photograph 3). It is unclear whether they contain any standing water in the photo.

4.4.4 AOC 4, Sanitary Buildings

An aerial photograph dating from 1945 shows a large building at the site with a smaller building next to it (Appendix H, Photograph 3). There appears to be a narrow structure, perhaps a pipe, connecting the two buildings. Building Key map and indexes name these buildings as “Sanitary” facilities. Several smaller square structures placed in rows were evident in the area surrounding the buildings. These buildings were identified as toilets on Map 1 in Appendix I. Because these smaller squares were not exactly equidistant from each other and were slightly out of line, these did not appear to be permanent structures. Roads going to the buildings and gravel parking areas were present.

4.4.5 AOC 5, Dinitrotoluene (DNT) Storage Bunkers

The 1945 aerial photographs show two rows of buildings with four structures in each line surrounded by a road (Appendix H, Photograph 4).

4.4.6 AOC 6, 154th Street Disturbed Areas

Three disturbed areas are included in this AOC. The disturbed areas are visible in 1945 aerial photographs (Appendix H, Photograph 4).

Two smaller areas are located south of 154th Street are probably borrow areas.

The area between 154th and 155th street appears to be is a large depression containing large amounts of surface and construction debris.

SECTION 5.0 **EVALUATION OF PRESENCE OF MILITARY MUNITIONS AND**
TECHNICAL DATA

There is no evidence that ammunition was produced, stored, or used anywhere on the property transferred to the Regents of the UMN in the 1947 QCD.

The following three definitions are taken from Appendix G, Reference 20.

5.1 **GENERAL EVALUATION OF CONVENTIONAL MEC PRESENCE:**

Munitions and Explosives of Concern (MEC):

“... distinguishes specific categories of military munitions that may pose unique explosives safety risks means: (A) Unexploded ordnance (UXO), as defined in 10 USC 101(e)(5); (B) Discarded military munitions (DMM), as defined in 10 USC 2710(e)(2); or (C) Munitions constituents (e.g., TNT, RDX), as defined in 10 USC 2710(e)(3), present in high enough concentrations to pose an explosive hazard.”
(page 3)

No such MEC items were present at FGOW.

5.2 **GENERAL EVALUATION OF MC PRESENCE:**

Munitions Constituents (MC) are defined as:

“[a]ny material originating from unexploded ordnance (UXO), discarded military munitions (DMM), or other military munitions, including explosive and non-explosive materials, and emission, degradation, or breakdown elements of such ordnance or munitions.” (page 3)

No such items containing MC were present at FGOW.

5.3 **GENERAL EVALUATION OF RCWM PRESENCE:**

Recovered Chemical Warfare Material (RCWM) is defined as:

“CWM used for its intended purpose or previously disposed of as waste, which has been discovered during a CWM response or by chance (e.g., accidental discovery by a member of the public), that DoD has either secured in place or

placed under DoD control, normally in a DDESB [Department of Defense Explosives Safety Board]–approved storage location or interim holding facility, pending final disposition.” (page 4)

No RCWM was ever present at the site.

5.4 PROPERTY-SPECIFIC LOCATIONS

Not Applicable

SECTION 6.0 EVALUATION OF HTRW PRESENCE AND AREAS

6.1 GENERAL EVALUATION OF HTRW PRESENCE

Sources of potential chemical releases on the sites included in this PA include the waste-streams that originated in the production area and discharged to the waste disposal ditch, the smokeless cannon powder (nitrocellulose) stored in the shipping/storage buildings, runoff from storage building areas, activities and structures at the Sanitary Buildings, DNT stored in bunkers, and construction waste that was disposed in the 154th Street Disturbed Area.

Historical aerial photographs and facility plans, along with site reconnaissance, provide evidence of the activities and structures that were associated with each of the AOCs. Very little analytical data is available relative to these sites to indicate presence or absence of contamination. Sampling and analysis of media located in these areas is necessary to determine if the potential chemicals are indeed present.

The Regents of UMN and private landowners use the surrounding land for farming. There is potential for movement of contamination (if present) from the surrounding land to the land addressed by this PA through runoff, airborne dust, and migration of any contaminated groundwater.

6.2 PROPERTY-SPECIFIC LOCATIONS

6.2.1 AOC 1 - Waste Disposal Ditch, Primary and Secondary Settling Ponds

This AOC begins at 160th Street with the Waste Disposal Ditch and continues south to the outfall of the Secondary Settling Pond. The property was privately farmed prior to acquisition by the WD and the areas surrounding the Waste Disposal Ditch, along with the settling ponds themselves, are farmed now. A segment just south of 160th Street is located on private property and another segment (from 170th Street north to the segment on private property) is on the UMN's property not included in this PA (Appendix S, Plate

2). At present, the ditch itself only contains water seasonally during rain events. The ditch is man-made, with sides up to 20 feet in height in the area south of 170th Street. The ditch enters the primary settling basin at its northeast corner. Water appears to be present in the ditch and settling pond system in 1945 aerial photographs.

During operation of FGOW, underground Laminex Woodbox sewers were designed to collect 100,000,000-gallons-per-day (gpd) process water (Appendix G, Reference 19). The process water came from the acid/oleum production areas as well as the nitrocellulose production facilities where large amounts of fresh water were used to break down cotton fibers, neutralize acid and remove impurities from the nitrated cotton. This process water was released into the Waste Disposal Ditch along the east boundary of the FGOW. The Laminex Woodbox sewers are located on property transferred to the Regents of the UMN in 1948 and are not part of this AOC. Production operations and the wastes produced are described in more detail in Appendix T, Nitrocellulose Manufacturing Process. Two acid neutralization systems were installed at FGOW: the first was located to treat the process water from the acid manufacturing area and the second at the outfall of the secondary settling basin.

The sanitary sewers were designed to collect 300,000-gpd wastewater from laundries and personal hygiene facilities as well as shop maintenance operations and also carried sewage to the wastewater treatment facility located in the northeast part of FGOW (Appendix I, Map 4). After chlorination and dilution to meet the state's BOD standard the treated wastewater was released into the Waste Disposal Ditch (Appendix G, Reference 19).

DuPont production operations in the northeast (industrial) part of FGOW's Segment A may have contributed the following potential HTRW to the Waste Disposal Ditch:

- Nitrocellulose from production operations (Wastes produced during that process are described in more detail in Appendix G, References 10 and 12; Appendix T).
- DNT from the production of rifle powder¹.

¹ Reference Flow Diagram for rifle powder (Appendix G, Reference 21) shows that DNT would be added in the "Sweetie Barrel House" where it would blend with the rifle powder. According the QHR for April – June 1945 (Appendix G, Reference 11) line A started production of smokeless rifle powder on 16 April

- Diphenylamine (DPA) that was added as a stabilizer to nitrocellulose (between 0.9 and 1.1% in the finished product).
- Industrial solvents and degreasers used to remove grease and oil during the cleaning of parts in the locomotive and railcar repair, vehicle maintenance and the production machinery shops.
- POLs from fuel storage areas as well as vehicle maintenance operations
- Mercury from leaking trickling filter bearings at the wastewater treatment facility.
- Mercury (impurity) from the coal burned at steam plant producing both smoke and ash waste streams.
- PAHs from the coal stored at the steam plant yard.
- Heavy metals (such as chromates and lead) from processes in the sandblasting shop and paint shop.
- Metals (such as brass², copper, zinc, aluminum, lead, tin and nickel) from metal forming operations in the machinery maintenance shops.
- DNT or nitrocellulose from the clothing worn by FGOW workers released during laundering.
- Oleum as well as sulfuric and nitric acids from the nitrating process.

It is not known if the Waste Disposal Ditch was used after the industrial part of Segment A was transferred to the Regents of the UMN in 1948. As noted during the site reconnaissance (Appendix L) at some time in the past a portion of the ditch to the north and south of 170th Street was used for disposal of building debris and other waste, though the timeframe and the source of the debris are not known. Therefore, this is a potential Potentially Responsible Party (PRP) area.

Media of potential concern include surface and subsurface soil, groundwater, and surface water. The UMN, DCEM and the MPCA collected soil samples in the settling basins (Appendix G, Reference 7). Mercury, chromium, 2,4-DNT, 2,6-DNT and o-nitrotoluene

1945. However there are no production records for the following reporting periods (Appendix G, References 10-13).

² Brass was used in the manufacture of the perforated plates in the preliminary blocking press, the macaroni press and the final blocking press (Appendix G, Reference 16).

were detected. DCEM collected groundwater samples in 1992 (Appendix G, Reference 8). Metals, PERC and TCE were detected.

6.2.2 AOC 2 - Shipping/Storage Buildings South of 170th Street

This area between 170th Street and Station Trail Road (which follows the perimeter road around the critical fence line of the FGOW facilities) was privately farmed prior to acquisition by the War Department and some short time following the closure of FGOW the site was returned to agriculture.

Ninety-six shipping houses, each approximately 54' by 64' in size (Appendix I, Drawing 1), were laid out in rows and used during operations at FGOW (Appendix I, Map 1). Forty-eight of the buildings were built to hold 500,000-pounds of powder; forty-eight of the buildings were built to hold 250,000-pounds of powder (Appendix G, Reference 12). During production operations at FGOW, zinc containers holding between 100 and 140-pounds of finished cannon powder were stored in these buildings to await shipment (Appendix G, Reference 16). Schematic drawings (Appendix I, Drawing 1) show that the buildings were constructed on piers over a gravel bed, and that the floors of the buildings were made from creosote-treated lumber. There are no known reports of spills or leaks of product at these locations but according to TM 9-2900, *Military Explosives*, leaky powder cans were to be expected (Appendix G, Reference 16). In addition, an inspection report dated 23 April 1947 (Appendix G, Reference 22) indicates that small quantities of smokeless powder were observed in and around these buildings, particularly in the floor joints.³ The buildings and associated roads within the area are present in 1945 aerial photos. It is not known how or when these buildings were demolished, but none of them were seen during site reconnaissance (Appendix L).

The former building locations are still visible (Appendix H, Photograph 9), probably due to the presence of substantial gravel beds and potentially poor soil quality to support vegetation.

³ There was no evidence in the report to demonstrate that this was anything other than a purely visual observation.

DuPont production operations at FGOW may have contributed the following potential HTRW at the Shipping and Storage Buildings:

- Nitrocellulose (final product).
- DNT (used during the production of rifle powder).
- DPA (added as a stabilizer to nitrocellulose).

Media of potential concern include surface and subsurface soil, and groundwater.

No sampling has been conducted in this area.

6.2.3 AOC 3 - Miscellaneous Drainage Pits

These drainage areas were part of privately owned farms prior to acquisition by the WD. The areas are now surrounded mainly by agricultural land belonging either to private owners or the UMN. The DNT storage bunkers are also still in use by the UMN for storage of various materials.

These areas or depressions apparently held drainage/runoff water from various storage and shipment building areas.⁴ There are three locations for these drainage areas (east of Annett Street, south of the storage bunkers; south of 170th Street, between the DNT storage bunkers and the Sanitary Buildings; and south of the DNT storage bunkers). No structures were placed at these drainage pits as part of FGOW operations. Vegetation observed during site reconnaissance (Appendix L) is healthy in all three areas with no signs of distress.

Shipping cases dropped either inside or outside the shipping/storage houses may have contributed the following potential HTRW at the Miscellaneous Drainage Areas:

- Nitrocellulose
- DNT was used during the production of rifle powder.
- Diphenylamine (DPA) that was added as a stabilizer to nitrocellulose.

⁴ “Magazines must be so located that good drainage of the land is possible at all times.” Page 50 (Appendix G, Reference 16)

Media of potential concern include surface and subsurface soil, groundwater, and possibly seasonal accumulations of surface water.

No sampling has been conducted in these areas.

6.2.4 AOC 4 – Sanitary Buildings

This area in the southwest part of FGOW (between 170th Street and Patrol Road) was privately farmed prior to acquisition by the WD. A short time following the closure of FGOW the site was returned to private ownership. No records were found to identify when the buildings were demolished. Site reconnaissance noted that some of the site is now used for agriculture while the remainder supports trees and shrubs (Appendix L).

A 1945 aerial photograph (Appendix H, Photograph 6) shows a large building (Bldg 108 T) at the site with a smaller building (Bldg 110 T) to the west of it. Sixty five small rectangular structures (Bldg 200 T) placed in rows were evident in the area to the northwest and north of the buildings and identified on the Building Key (Appendix I, Map 1) as toilets. The smaller building west of the Sanitary Building is identified as a Boiler House on the index with Map 1.

Documentation of activities at this AOC has not been found. DuPont operations may have generated either PAHs from coal or petroleum, oil, and lubricants (POLs) from the boiler house – no documentation was found to show the type of fuel (coal or heating oil) the boiler house used to generate heat. Asbestos⁵ may also be associated with the buildings at the site.

Media of potential concern include surface and subsurface soil and groundwater.

No sampling has been conducted in this area.

⁵ Asbestos containing materials, while not considered HTRW, may be a hazard that exists at the site as part of construction/building debris.

6.2.5 AOC 5 - DNT Storage Bunkers

This area was privately farmed prior to acquisition by the War Department. Located in the western part of FGOW and south of 160th Street, these bunkers were intended to store DNT. FGOW production records do not indicate that DNT was ever stored in the bunkers and there are no FGOW operations records that record spills or leaks of DNT at the site. In April 1944, the land where these bunkers stand was leased to Raymond Laboratories, Inc. of St. Paul, MN for the purpose of storing explosives (Appendix G, Reference 17). No records were found to indicate how long these bunkers were used or what type of explosives may have been stored in them. A letter from the Office of Real Property Disposal to the UMN dated 13 September 1946 indicates that the buildings were used to store DNT and DPA (Appendix G, Reference 23). An inspection report dated 23 April 1947 (Appendix G, Reference 22) indicates that a small quantity of smokeless powder was observed in the floor drain of one of these buildings, while small quantities of DNT were observed in the floor drain of two of the buildings.⁶

Seven of the eight original bunkers are still present and appear to be in use by the UMN for storage of a variety of materials, including chemicals (such as fertilizers, paints, and petroleum products), machinery, and scrap wood and metal. Five of the bunkers have been rehabbed by UMN, with new metal roofs and siding. All that remains of the other two bunkers are the concrete floors and sides; these bunkers contain the scrap wood and metal.

DuPont production operations at FGOW or Raymond Laboratories, Inc. storage operations may have contributed the following HTRW at the DNT Storage Bunkers⁷:

- DNT used during the production of rifle powder.
- DPA that was added as a stabilizer to nitrocellulose.
- Nitrocellulose.

Media of potential concern include surface and subsurface soil and groundwater.

⁶ There was no evidence in the report to demonstrate that this was anything other than a purely visual observation.

No sampling has been conducted in this area.

6.2.6 AOC 6 - 154th Street Disturbed Area

These areas were privately farmed prior to acquisition by the War Department. Three disturbed areas are included in this AOC. The disturbed areas are visible in 1945 aerial photographs (Appendix H, Photograph 7). All of the areas are now overgrown with weeds, brush, and trees, and are surrounded by agriculture fields.

Two smaller areas are located south of 154th Street and appear to be borrow areas. No records were found to indicate that any FGOW facility was constructed in these areas or that the areas were used for disposal (Appendix I, Map 1). The UMN uses a portion of one of these areas for open compost piles. These two smaller areas require no further investigation.

The area between 154th and 155th street is a football-field-size depression containing large amounts of surface and buried construction debris. Metal including rebar and concrete were visible on the ground surface. Asphaltic material was also observed at one location within the depression and since it is on the surface it is unlikely that it dates from the 1940s.

Although no records were found to indicate the date the debris was placed here, the site may have been in use during demolition and dismantlement activities during and immediately following the operation of FGOW. It is also possible that some debris may have been placed at the site more recently. There was no sign of distressed vegetation at the site.

DuPont operations at FGOW that may have contributed the following HTRW at the 154th Street Disturbed Area⁸:

- PAHs (asphalt and creosote).

⁷(Appendix I, Drawing 2).

- Metals (iron rebar, scrap metal).

Media of potential concern include surface and subsurface soil and groundwater.

No sampling has been conducted in this area.

No records were found to indicate the date or the source of the debris that has been placed there. Therefore, this is a potential PRP area.

⁸ Ibid

SECTION 7.0 – EVALUATION OF CON/HTRW AND BD/DR PRESENCE

According to ER 200-3-1, *Formerly Used Defense Sites (FUDS) Program Policy*, Building Demolition and Debris Removal (BD/DR) and Containerized Hazardous, Toxic and Radioactive Waste (CON/HTRW) are not regulated under CERCLA.

7.1 EVALUATION OF CON/HTRW PRESENCE AND AREAS

According to paragraph 3-2.4.2 of ER 200-3-1 “CON/HTRW projects include response actions in an area of FUDS property to address [U]nderground storage tanks (USTs), aboveground storage tanks (ASTs), transformers, hydraulic systems, investigation derived wastes (IDW), abandoned inactive monitoring wells, etc. ...” (USACE, 2004) None of these items were observed during the site reconnaissance.

7.2 EVALUATION OF BD/DR

Debris may pose safety hazards at both the Sanitary Buildings (AOC 4) and the 154th Street Disturbed Area (AOC 6) -- the former was not visited during the site reconnaissance due to lack of “right-of-entry” authorization so potential hazards are undefined and the latter contains demolition debris that is visible on the surface. No visible debris at AOC 6 presents a “clear danger” according to the definitions in Table 3-1 of ER 200-3-1.

7.2.1 BD/DR Projects

According to the definition of BD/DR projects in ER 200-3-1, the 154th Street Disturbed Area (AOC 6) does not satisfy either of the two primary conditions listed in the following:

“BD/DR projects are response actions at an area of an eligible FUDS property to address the demolition and removal of unsafe buildings and structures and the removal of unsafe debris. ... BD/DR projects are eligible if the title, deed, or other transfer document conveying the

property from DoD specifically requires DoD to undertake BD/DR activities; or, all the following conditions are met:

- Subsequent to DoD ownership, the property must have always been on lands owned by State, Local Government or Alaskan Native Corporation.
- The conditions must have been hazardous as a result of prior DoD use and must have been inherently hazardous when the property was transferred or disposed of by GSA before 17 October 1986.
- Inherently hazardous BD/DR must present a clear danger, likely to cause, or having already caused, death or serious injury to a person exercising ordinary and reasonable care.” (USACE, 2004)

The QCD that transferred the property to the Regents of the UMN did not specifically require DoD to undertake BD/DR activities. Although following the DoD’s ownership the property was deeded to the State (through the Regents of the UMN) there is no evidence to prove that the conditions at AOC 6 were inherently hazardous on 9 October 1947 when the land was deeded to UMN. Visual observation at AOC 6 during site reconnaissance failed to find inherently hazardous BD/DR .

7.2.2 Asbestos

The Regents of the UMN are concerned about the possible presence of asbestos in the 154th Street Disturbed Area (AOC 6). While the CERCLA PA may identify potential projects at eligible FUDS properties, abatement of asbestos containing material (ACM) is an ineligible project unless:

“The ACM ... is incidental to the completion of response actions at an approved project, or

“In situations where the ACM were not incorporated as an integral component of a facility but were released into the environment by DoD disposal actions resulting in an on-site CERCLA hazardous release for which DoD is responsible.” (USACE, 2004)

If “... the hazard is a result of neglect by the owner/grantee subsequent to DoD use, regardless of whether the deed or disposal document required the owner/grantee to maintain the property improvements.” (USACE, 2004) then the activity is ineligible for FUDS.

As the records for the disposal of debris at AOC 6 have not been located, there is presently no evidence to suggest that any asbestos present at AOC 6 was the result of “DoD disposal action”.

**SECTION 8.0 PATHWAY AND ENVIRONMENTAL HAZARD
ASSESSMENT**

Pathway Characteristics:

The objective of the PA is to identify the exposure routes and pathways which are a means for hazardous substances to pose a potential threat to human health and the environment. The four migration pathways are groundwater, surface water, soil, and air. The pathways and exposure routes are outlined in the Table below.

Migration Pathways and Exposure Routes

Pathway	Exposure Route
Groundwater	Hazardous substance migration to and within aquifers; potential threats to drinking water supplies.
Surface Water	Hazardous substance migration to surface water bodies; potential threats to drinking water supplies, the human food chain and sensitive environments.
Soil	Potential threat to people on or near the site who may come into contact with exposed wastes or areas of suspected contamination. This includes both soil ingestion and dermal exposure.
Air	Hazardous substance migration, in gaseous form or particulate form, through the air; potential threats to people and sensitive environments.

Target Populations:

Based on land use, there are several routes through which a receptor may encounter contamination in the environmental media. See the table below. Current land use is light industrial, agricultural, and residential with many open areas. Future land use is similar to current land use. Potential receptors under both current and future land uses include the on-site worker, the resident (adult and child), and the food-chain consumer.

Target Populations

Pathway	Target Population*
Groundwater and air	4-mile radius around the site.
Surface water	15 miles downstream from the probable point of entry.
Soil exposure	200 feet for the resident population threat.
	1 mile from the nearest population threat.

* Reference: EPA 540/G-91/013 *Guidance for Performing Preliminary Assessments under CERCLA*.

8.1 GROUNDWATER PATHWAY

The groundwater pathway is evaluated by determining if a release of a hazardous substance occurred and by identifying the depth to the aquifer.

8.1.1 Hydrogeologic Setting of Preliminary Assessment Area

8.1.1.1 Regional Physiography, Relief and Drainage

FGOW is located within Dakota County. Dakota County lies within the Central Lowland Physiographic Province. FGOW is located in the northeastern portion of Dakota County.

Dakota County is a geologically complex area. It includes several distinct geomorphic regions.

The northwestern and western parts of the county consist of complex moraines, most notably the St. Croix moraine to the north of FGOW. The topography is hilly and irregular. There are many deep depressions that are poorly drained. Most of the natural lakes in Dakota County are in this area.

A large area in the central and eastern parts of the county and parts of the extreme south are level to gently rolling outwash plains. A few short steep escarpments separate terraces along the Mississippi River. Most of these areas are well drained; however some areas in the central part of the county are poorly drained, and several have large peat bogs.

Much of the southern part of the county has gently sloping topography controlled by bedrock. In some places, bedrock buttes stand 100 feet above the surrounding areas. Thin layers of silty or loamy sediments cover most of the bedrock. Short, steep slopes of bedrock are common across much of the area; but long very steep slopes are common in the extreme southeast.

Along the Mississippi and Minnesota Rivers are extensive flood plains. Most are nearly level and poorly drained. Oxbow lakes and bogs are common.

The Mississippi and Minnesota Rivers drain the northern part of the county. The Vermillion River drains the central part. The Cannon River drains the extreme southern part of the county.

The highest elevations in the county are in the moraines in the northern and western areas. Buck Hill, the highest point in the county, has an elevation of 1,195 feet above Mean Sea Level (MSL). Most of the county slopes toward the east. It drops from an average elevation of about 1000 feet above MSL in the west and south to about 800 feet above MSL at the top of the Mississippi River Valley. The lowest elevation, about 675 feet, occurs where the Mississippi River leaves the county. (USDA, 1983)

8.1.1.2 Regional Geology

The geology of Dakota County is complex and varied. The materials that make up the geology of Dakota County can be placed in descending order into three broad groups: Quaternary deposits on the surface, with Early Paleozoic sedimentary rocks forming the upper bedrock layers, on a basement of Middle Proterozoic rocks. Quaternary deposits are further divided into Recent sediments and Pleistocene glacial deposits.

The Recent sediments consist of deposits of flood plain alluvium, along the principal stream channels, and organic deposits (peat bogs), in poorly drained isolated depressions and on flood plains, resting mostly on Pleistocene glacial deposits.

The Pleistocene deposits form much of the shallow subsurface, and consist mostly of interlayered glacial till and outwash deposits from several glacial episodes including the Wisconsinan, the Illinoian, and the Kansan. Older tills and outwash are found mostly in the southern and western portions of the county, and occasionally underlying the more recent Late Wisconsinan. The Late Wisconsinan glacial deposits occur mostly along and north of the Vermillion River. Three levels of terraces occur along the Minnesota and Mississippi Rivers, along the northern border of the county. A large buried valley is cut into the bedrock across the northeastern portion of the county, north of Pine Bend and south of Hastings.

Paleozoic rocks of the Cambrian and Ordovician periods form the upper bedrock throughout the county and crop out in a few small areas, mostly along the Minnesota and Mississippi Rivers and south of the Vermillion River. Paleozoic bedrock can occur in the shallow subsurface, mostly along and south of the Vermillion River, east of Farmington, below a residual soil cover. Elsewhere, it may be deeply buried under a hundred feet or more of glacial sediments. The formations or groups present by increasing age (and depth) are: Decorah Shale (in the northern tip of the county), Platteville and Glenwood Formations (mostly dolomite and limestone), St. Peter Sandstone, Prairie Du Chien Group (principally dolomite) Jordan Sandstone, St Lawrence Formation (dolomitic shale and siltstone), Franconia Formation (thinly bedded fine grained glauconitic sandstone and minor shale), Ironton and Galesville Sandstones, Eau Claire Formation (siltstone, very fine sandstone, and shale), and Mt. Simon Sandstone, resting on the Precambrian basement rocks.

Beneath the Paleozoic rocks are Middle Proterozoic rocks of the Precambrian, which make up the basement rocks. Proterozoic rocks consisting of the Solor Church Formation west of the Empire Fault and the Fond du Lac Formation east of that fault. Along the Empire Fault and the adjacent Vermillion Anticline, Proterozoic basaltic and rhyolitic volcanic rocks are present beneath thin layers of Solor Church Formation. The Hinckley Sandstone, which is the uppermost Proterozoic sedimentary formation in the region, is absent in most of Dakota County.

Structural features in Dakota County include the above-mentioned Empire Fault and the adjacent Vermillion Anticline that run northeast to southwest, paralleling the Vermillion River, from Farmington east. A number of other minor folds and faults also occur in this immediate area, mostly to the southeast. Dakota County is on the southeastern margin of the Twin Cities Basin, which accounts for the regional dip of the Paleozoic strata toward the west and north. The twin cities Basin developed in Middle Ordovician time over an older basin formed along a part of the Midcontinent rift. The rift is now a large geologic feature composed of thick lava flows and red clastic sedimentary rocks. Large scale block faulting in these Proterozoic rocks caused the formation of an elongated northeast-trending basin, as a down faulted block or graben, beneath what was to become the Twin Cities Metropolitan Area. The Paleozoic Twin Cities Basin, rather than a single down faulted structure, is the result of many small folds and faults in step fashion, including the folds and faults discussed above. Individually they have small displacements of about 100 feet for folds and 50 to 150 feet for faults. None are exposed in outcrop, but they are inferred from subsurface data.

8.1.1.3 Regional Hydrogeology

The Quaternary Aquifers may include Recent sediments, but are principally Pleistocene glacial deposits.

Glacial deposits of sand and gravel are a source of water for domestic and irrigation wells in Dakota County. Because of their susceptibility to pollution, they are not used for municipal or public water supply wells. Their moderate yield capacity in the northern suburbs is adequate for some non-potable industrial uses.

In addition to the Rosemount outwash plain, outwash sand and gravel occurs in the valleys of the Vermillion and Cannon Rivers and their tributaries, and is buried by till of the St. Croix moraine north of Rich Valley.

The St. Croix moraine forms a leaky confining layer. Buried sand layers may or may not be hydraulically connected as well as connected to the underlying Prairie Du Chien-Jordan, except in places where the St. Peter overlies the Prairie Du Chien.

Bedrock Aquifers include the Platteville, St. Peter, Prairie Du Chien-Jordan, Franconia-Ironton-Galesville, and Mt. Simon-Hinckley. The Glenwood Formation forms an aquitard separating the Platteville from the underlying St. Peter. A shale layer at the base of the St. Peter Sandstone forms a discontinuous aquitard between the St. Peter and the underlying Prairie Du Chien-Jordan. The St. Lawrence Formation consists of dolomitic shale that has been used as a low yield aquifer in the northeastern part of Dakota County, but also acts as a leaky aquitard between the overlying Prairie Du Chien-Jordan and the St. Lawrence-Franconia in other parts of the county. The Eau Claire Formation underlies the Galesville and forms a confining bed 200 feet thick between the Ironton-Galesville and the Mt. Simon-Hinckley aquifers.

The Platteville Aquifer is used for domestic wells in Mendota Heights, South St. Paul and Inver Grove Heights in the north part of the county. The Platteville occurs discontinuously in the Rosemount area, where several drillers' logs report the Platteville as dry. The St. Peter is widely used for domestic wells in the north part of the county. It is also used in combination with the Prairie Du Chien in high-capacity wells of less than 150 gpm, including some older public supply wells. The Prairie Du Chien-Jordan is the major high-capacity aquifer for Dakota County, and is absent only in the buried bedrock valleys north of Pine Bend, south of Hastings, and in the Mississippi River valley. In general, groundwater flows in the Prairie Du Chien-Jordan aquifer from the west-southwest to the north and east, toward the Minnesota and Mississippi River valleys, and the buried valley in the northeastern portion of the county. The Prairie Du Chien-Jordan is particularly sensitive to contamination as the Prairie Du Chien consists of a thin to thickly bedded sandy dolomite in which groundwater flows along joints, fractures, and bedding planes. The Franconia, Ironton, and Galesville (sometimes including the St. Lawrence) are low yield aquifers usually used in high-capacity multi-aquifer wells. The Mt. Simon-Hinckley aquifer is the deepest high-yield aquifer available in Dakota County. It underlies the entire county, and under natural conditions, it is isolated from the Prairie Du Chien-Jordan aquifer. In Dakota County, the potentiometric surface of the Mt. Simon slopes toward high capacity wells in Minneapolis and the suburbs of Hennepin County. Near some multi-aquifer wells in Burnsville, Pine Bend, and South St. Paul, the static

water level in the Mt. Simon has been raised to the level of the Franconia. Such artificial recharge and discharge can change flow direction locally, and modify natural water chemistry. (Balaban, 1990)

8.1.1.4 General Site Geology

FGOW is located on the southeastern portion of the Twin Cities Basin within the Central Lowland Physiographic Province in northeastern Dakota County, Minnesota, on the south edge of the Minneapolis-St. Paul metropolitan area.

FGOW sits on the Rosemount outwash plain, southeast of the St. Croix moraine. As such, the soils can be expected to be very permeable, mostly sands and gravels. A review of the Soil Survey of Dakota County indicates that the Waukegan-Wadena-Hawick soil group underlies most of FGOW. The Waukegan-Wadena-Hawick is described as level to very steep, well drained and excessively drained soils formed in silty and loamy sediments over sandy outwash: on outwash plains and terraces. Recent alluvium has been deposited along the Mississippi River in the area of the water supply wells, along the upper reach of Spring Lake, and along the Vermillion River and its tributaries, which received runoff from a disposal ditch at FGOW.

On the main FGOW Segment A property, the St. Peter Sandstone (0 to 160 feet thick) underlies about half of FGOW, elsewhere, the underlying Prairie Du Chien (dolomite, up to 308 feet thick) is the first bedrock unit encountered. The easement toward the water supply wells by Spring Lake, and the Vermillion River, cross deep bedrock valleys which cut through the Prairie Du Chien into the underlying Jordan Sandstone (up to 125 feet thick), and the St Lawrence (dolomitic shale and siltstone) and Franconia Formations (thinly bedded fine grained glauconitic sandstone and minor shale). The St. Lawrence and Franconia Formations have a combined thickness of up to 240 feet.

8.1.1.5 Hydrogeology

The overburden, as discussed above, consists principally of glacial outwash deposits on the main FGOW facility, with some alluvium along the peripheral portions that include major river valleys. At FGOW, the overburden is generally not considered a

developable aquifer, except along the Vermillion River and by Spring Lake. There may be some potential for limited water development (domestic, agricultural or livestock wells) in the outwash deposits along the northern portion of the main FGOW facility, and to the west toward Rosemount. At the main FGOW facility, groundwater elevation in the overburden is from about elevation 890 feet above MSL on the southwest corner to about 840 feet above MSL on the northeast corner. Yield in the overburden can be expected to be below 5 gpm and transmissivity usually below 500 gpd, except in the northern most portion of the main FGOW. Elsewhere, in the peripheral areas of the facility along the Mississippi and Vermillion River valleys and over the major buried bedrock valley to the east, groundwater elevation in the overburden will be lower with yield and transmissivity usually much higher.

The typical depth to water measurements between 50 and 100 feet bgs in the FGOW area

Groundwater in the Quaternary drift is of the calcium-magnesium bicarbonate type. It is hard water and high in iron content, but suitable for most purposes. In water samples from the early 1960s, most samples had nitrates greater than drinking water standards of 10 ppm (NO_3^- as N), though all chloride concentrations were less than 9 ppm. Sulfate concentrations were about 20 ppm in most wells. Studies in the 1980s documented feedlots, fertilizer and storm-sewer runoff as reasons for increased concentrations of nutrients, particularly nitrogen and phosphorous in surface water bodies. Elevated chloride concentration was attributed to use of road salt for deicing. The results are pertinent to groundwater due to the high susceptibility of the aquifers in the area to the downward migration of contaminants.

The bedrock aquifers are the principal source for groundwater in the immediate area of FGOW. Of those, the principal shallow bedrock aquifer would be the Prairie Du Chien-Jordan. The elevation of the potentiometric surface in the Prairie Du Chien-Jordan aquifer is about 890 ft Above Mean Sea Level (AMSL) in the southwest corner of the main facility to about 830 ft (AMSL) in the northeast corner, with the levels declining to the northeast. The Prairie Du Chien-Jordan aquifer has a potential yield of 1,000 to 2000 gpm and a transmissivity of 50,000 to 200,000 gpd, in the area around the main

FGOW facility, declining along the peripheral areas toward Spring Lake and along the Vermillion River east of the main FGOW facility, where the Prairie Du Chien-Jordan has been removed by erosion and replaced by alluvium or glacial outwash deposits. The Prairie Du Chien-Jordan aquifer is of concern not only because of its value as a groundwater resource, but also because of its high susceptibility to contamination. The aquifer's susceptibility relates both to the permeability of the overlying materials and the nature of the voids in the Prairie Du Chien portion of the aquifer, the reason for the high yield and transmissibility but without much ability to filter out or retard contamination. The regional aquifers above the Prairie Du Chien-Jordan are either absent or likely have inadequate saturation to be useful by them. The aquifers below the Prairie Du Chien-Jordan are usually not developed, unless needed for high capacity wells. The St. Lawrence Formation could be expected to provide some protection from downward migration of contamination that reached the Prairie Du Chien-Jordan aquifer. However, high capacity wells screened across multiple aquifers can provide pathways for downward movement of such contamination, since the piezometric levels in the lower aquifers are generally lower than in the Prairie Du Chien-Jordan.

Groundwater in all the sedimentary bedrock aquifers is of the calcium-magnesium bicarbonate type - hard to very hard - but is suitable for most uses. The groundwater chemistry is quite stable and the pH is about 7.5. Dissolved Fe and Mn content is variable, with some samples having concentration above the drinking water standards of 0.3 ppm for Fe and 0.05 ppm for Mn. Sulfate varies across the county but is around 80 ppm in immediate area of Coates/FGOW. Total dissolved solids were reported to be increasing into the 1980s, and nitrate values were reported to exceed drinking water standards of 10 ppm (NO_3^- as N) of observation wells sampled in the 1980s. Chloride concentration, which is naturally quite low (<5ppm), increased throughout the aquifer in most observation wells from 1960 to the present, were up to 120 ppm, though still below the drinking-water standard of 250 ppm. Tritium tests of the groundwater indicate that groundwater in the Prairie Du Chien-Jordan in the area of Burnsville and Apple Valley, to the west, had been recharged from precipitation within the last 35 years.

8.1.2 Groundwater Targets

The most likely groundwater pathway encountered is the Prairie Du Chien-Jordan bedrock aquifer with typical depth to water measurements between 50 and 100 feet bgs in the FGOW area. The majority of the population within a 4-mile radius of FGOW (primarily in the city of Rosemount located upgradient of FGOW) relies on drinking water supplied from municipal water provided by the city of Rosemount or from groundwater pumped from private wells. According to the 2004 City of Rosemount Drinking Water Quality Report

“[t]he City of Rosemount provides drinking water to its residents [population estimated in 2002 to be 16,262] and businesses from a groundwater source via six wells (ranging from 400 to 498 feet in depth) that draw from the Jordan aquifer.” (Appendix G, Reference 24)

The DCEM office provided a map that shows approximately 165 private domestic wells within a 4-mile radius of FGOW that could be used for drinking water (Appendix I, Map 8). Individuals relying on these private wells for drinking water represent the secondary target population. Census data for 2000 averages 2.7 persons per household for Dakota County. Assuming each well represents one household, at 2.7 persons per household, this equates to a secondary target population of 446 residents. The nearest resident relying on a private drinking water well is within 1-mile of the center of FGOW. Primary target drinking water wells are located upgradient of FGOW and would not be affected by any suspected release to groundwater caused by FGOW activities.

8.1.3 Groundwater Conclusions

During its operation, FGOW converted cellulose to nitrocellulose/guncotton through chemical processes. This process generated HTRW; there was no MEC or MC associated with the operations conducted at FGOW.

A release to of hazardous substances groundwater caused by FGOW’s Segment A activities is not suspected based upon information about FGOW activities. A release of HTRW to the alluvial aquifer and the target population is possible within the AOCs due

to activities conducted at the AOCs, the depth-to-aquifer (50 to 100 feet bgs), and the potential for high conductivity within the alluvial and bedrock aquifers. For example:

- there was the potential that large quantities of wastewater were delivered by the Laminex Woodbox and sanitary sewer to the Waste Disposal Ditch (AOC 1),
- there was a potential release of POL (if it was the boiler plant's fuel) at the Sanitary Buildings (AOC 4) and
- the depth of the 154th Street Disturbed Area (AOC 6) could provide more rapid access to the aquifer.

It is unlikely that release of HTRW at the other AOCs would impact groundwater.

If HTRW contamination exists, there is a groundwater pathway.

8.2 SURFACE WATER PATHWAY

The surface water pathway is evaluated by determining if a release of a hazardous substance occurred, by identifying the distance to surface water, and by determining the flooding frequency.

8.2.1 Hydrologic Setting

Dakota County, located on the west bank of the Mississippi River, typically receives precipitation from eastward moving storm systems. The average annual precipitation varies from less than 1 inch in February to over 4 inches in July. The annual average precipitation at Rosemount is approximately 34.6 inches. The average temperature ranges from about 10 degrees Fahrenheit in January to 71 degrees Fahrenheit in July (Appendix G, Reference 18). The average snowfall each winter is 45 inches. Overland drainage from FGOW generally flows to the southeast into the Vermillion River, about 1-mile south of the perimeter of Segment A. At this point the Vermillion River meanders approximately 12 miles to the east-northeast before merging with the Mississippi River that flows generally south. The final drainage is about 13-miles from the probable point of entry (PPE). No other significant surface waterways exist within 15 miles downstream of FGOW.

The other source of drainage in Segment A is the Waste Disposal Ditch that connects to the Primary and Secondary Settling Ponds and then into the Vermillion River. During the operation of FGOW, this ditch collected treated process and sanitary sewer water from the ordnance process and support facilities and directed the wastewater to the settling ponds where suspended solids were allowed to settle from the water before it was released to the Vermillion River. After production was halted in 1945, the flow of process water stopped and the settling ponds were allowed to dry. The Primary Settling Pond is now agricultural land while the Secondary Settling Pond may have seasonal flow though an area that aerial photography depicts as having minimum vegetation.

8.2.2 Surface Water Targets

Surface water pathway targets include a naturally reproducing population of trout and sensitive environments. Surface water pathway targets do not include intakes that supply drinking water. Targets have been identified and evaluated over a 15-mile target distance limit, which defines the “in-water segment” of the surface water migration route. For measurement purposes, the PPE for the in-water segment is defined as the point where the Waste Disposal Ditch crosses the southeastern boundary of FGOW (Appendix S, Plate 1). The Vermillion River, located within the 15-mile in-water segment, is not a drinking water source for the Cities of Vermillion and Hastings municipal supply. No drinking water intakes are located within 15 miles downstream of FGOW. Fisheries located within 15 miles downstream of FGOW include the Vermillion River. A few wetlands may be located along the riverbanks of the Vermillion River. These wetlands are not labeled and can only be assumed from mapped vegetation along the banks of the river.

8.2.3 Surface Water Conclusions

During its operation, FGOW converted cellulose to nitrocellulose/guncotton through chemical processes and may generated HTRW. There was no MEC or MC associated with the operations conducted at FGOW.

There are two surface waterways on FGOW's Segment A: the Waste Disposal Ditch and a runoff route across the shipping/storage area to the southeast toward the Secondary Settling Basin. Ultimately, drainage from FGOW's Segment A flows to the Vermillion River. The Vermillion River does not include drinking water intakes but may contain several adjacent wetlands. As noted, the average annual precipitation is about 29 inches.

A release of hazardous substances to the surface waterway caused by FGOW's Segment A activities is not suspected based upon information about FGOW activities. A release of HTRW to the surface waterway and the target population is possible within the AOCs due to activities conducted at the AOCs and the presence of the surface waterways. For example:

- the release of suspended HTRW solids in the wastewater delivered by the Laminex Woodbox and sanitary sewer to the Waste Disposal Ditch (AOC 1),
- the release of HTRW during the handling of nitrocellulose and DNT containing powder at the Shipping/Storage Buildings (AOC 2) and the Drainage Areas (AOC 3),
- the release of HTRW during operations at the Sanitary Buildings (AOC 4) and
- the release of DNT during the handling of containers at the DNT Storage Bunkers (AOC 5).

It is unlikely that release of HTRW at the other AOC would impact surface water.

If HTRW contamination exists, there is a surface waterway pathway.

8.3 SOIL EXPOSURE AND AIR PATHWAYS

The soil and air pathway is evaluated by identifying a suspected release of a hazardous substance and the quantity of waste that may have been released.

8.3.1 Physical Conditions

The 1947 Quitclaim Property of FGOW's Segment A is generally surrounded by vacant land used primarily for agricultural purposes (rangeland). DuPont's ordnance operations ceased in this area in late 1945. The city of Rosemount is located adjacent to the

northwest corner of FGOW's Segment A. The nearest residential area includes homes located in this corner. The vacant lands are covered by native vegetation. Some FGOW buildings still exist and are either vacant or being leased to occupants for light industrial and commercial activities. In addition, some of original streets of FGOW remain intact. In many places where FGOW buildings have been removed, concrete foundations remain.

There are five soil associations within Segment A of FGOW, as identified in the Soil Survey of Dakota County Minnesota (USDA, 1983; Appendix I, Map 5). The Waukegan-Wadena-Hawick association (Unit 2 on Map 5) underlies approximately 75 percent of Segment A of FGOW, mostly the northern portion. These soils are level to very steep, well drained to excessively drained, silty, loamy, and sandy soils on the glacial outwash plains and terraces. County-wide, about 36 percent are Waukegan soils, 22 percent are Wadena soils, and 8 percent are Hawick soils, the remaining 34 percent are minor soils. These soils have moderate to rapid vertical permeability (0.6 – 20 inches/hour) and are in general easily erodible. Soil thickness varies from about 21 to 42 inches thick, grading into the underlying parent material of sand and gravel (outwash).

About 15 percent of Segment A of FGOW, in the south-central to southeastern portion, is underlain by the Tallula-Port Byron-Bold soil association. These soils are nearly level to steep, well drained loamy and silty soils formed in loess on uplands. County-wide, about 38 percent are Tallula soils, 18 percent are Port Byron soils, 18 percent are Bold soils and the remaining 26 percent are minor soils. These soils have moderate vertical permeability (0.6-2.0 inches/hour) and are in general easily erodible. Soil thickness varies from about 8-inches to more than 52-inches, grading into the underlying parent material of yellowish-brown calcareous silt loam (loess).

About 5 percent of Segment A of FGOW, in the south-central portion, is underlain by the Marshan-Cylinder soil association. These soils are nearly level, poorly drained and somewhat poorly drained silty and loamy sediments over sandy outwash, on outwash plains and terraces. County-wide, about 30 percent are Marshan soils, 28 percent are Cylinder soils and the remaining 42 percent are minor soils. These soils have moderate

vertical permeability (0.6-2.0 inches/hour, 20 or greater in the parent material, below) and would be easily erodible, except for their occurrence in nearly level and mostly saturated environments. Soil thickness varies from about 28 to 32-inches, grading into the underlying parent material of yellowish or grayish-brown sand (outwash).

The remaining 5 percent of Segment A of FGOW is underlain by the Etter-Rockton-Copaston soil association on a small southeast portion, the Kingsley-Mahtomedi soil association on a small northeast portion, and the Ostrander-Klinger-Maxfield soil association along the south portion of the western boundary. The Etter-Rockton-Copaston association soils are generally shallow permeable soils formed mostly on limestone bedrock. The Kingsley-Mahtomedi association soils are generally about three-foot thick moderately slow to moderately rapid permeable soils formed on sandy loam glacial till (Kingsley soils) and sandy and gravelly outwash (Mahtomedi soils). The Ostrander-Klinger-Maxfield association soils are generally four feet thick or greater and moderately permeable, formed on silty and loamy sediments and loamy-calcareous till.

8.3.2 Soil and Air Targets

Dakota County is 539 square miles. The overall population of Dakota County is 375,642 (2003 estimate). According to the Real Estate office at the University of Minnesota Rosemount Research Center (UMRRC) there are approximately 70 workers in the area west of Akron Avenue (in the vicinity of AOC 6) and about 40 seasonal agricultural workers in the area south of 170th Street (near AOCs 1, 2 and 3). The population within 200-feet of the property lines surrounding the 1947 Quitclaim Property is approximately 70 people. Resident population residing between 200-feet and 1-mile is estimated from census data to be about 4,406 people. The population within a 4-mile radius of FGOW is approximately 17,614. This number maybe high because census tracts falling on both sides of the 4-mile radius boundary were included in the population count. No terrestrial sensitive environments existing within 200-feet of the 1947 QCD property lines. There are no schools or daycare facilities located within 200-feet of the specified property lines. The nearest daycare facility is located in the city of Rosemount and is less than 4-miles from the center of FGOW. The nearest school is located in Rosemount, approximately 4-

miles from the center of FGOW. Transient population includes visitors involved in recreational activities – individuals who use the horseback, walking, jogging, bicycle and cross-country skiing trails or the outdoor shooting range – as well as trespassers who visit the property to explore the surface and subterranean structures of FGOW¹.

Workers on the site, transient population as well as all animals could come in direct contact with potentially contaminated soil or windblown soil.

8.3.3 Soil Exposure and Air Pathway Conclusions

During its operation, FGOW converted cellulose to nitrocellulose/guncotton through chemical processes and may generated HTRW. There was no MEC or MC associated with the operations conducted at FGOW.

DuPont production activities on the land transferred to the Regents of the UMN in 1947 lasted for approximately seven months in 1945 (Appendix G, References 10-13). The soil exposure pathway is possible but the potential is limited because much of the areas were covered with asphalt, crushed gravel or paving that impede or prevent a soil exposure pathway. This includes the building foundations and roads in the area. Also because of the nature of the nitrocellulose manufacturing process, the product was kept wet through much of the process thus reducing dust that could settle on the ground.

A release of HTRW to the surface soil and the target population is possible within the AOCs due to activities conducted at the AOCs. For example:

- the release of suspended HTRW solids in the wastewater delivered by the Laminex Woodbox and sanitary sewer to the Waste Disposal Ditch (AOC 1),
- the release of HTRW to the soils during the handling of nitrocellulose and DNT containing powder at the Shipping/Storage Buildings (AOC 2) and the Drainage Areas (AOC 3),
- the release of HTRW to the soil during operations at the Sanitary Buildings (AOC 4),

¹ Numerous web sites as well as University and County personnel report the presence of trespassers in the Laminex Woodbox and sanitary sewer systems.

- the release of DNT, DPT or nitrocellulose to the soil during the handling of containers at the DNT Storage Bunkers (AOC 5) and
- the dumping of HTRW into the 154th Street Disturbed Area (AOC 7) .

The air pathway is evaluated by identifying a suspected release of a hazardous substance and the quantity of waste that may have been released. Because of rapid dispersion of released substances in the atmosphere, air releases usually can only be detected while the release is occurring. DuPont ordnance activities ceased in 1945; therefore, it is believed that airborne exposure to contaminated dust particles from DuPont activities is a negligible concern. If sufficient quantities of HTRW were present in the surface or subsurface soil their releases to the air could be a concern. However, due to the short time that FGOW was completely operational (seven months) it is unlikely that sufficient quantities of HTRW was generated. There was no evidence of stressed vegetation or reports of airborne "fallout" that could be traced to past DuPont operations. In conclusion, complete air receptor pathway to receptors is unlikely.

8.4 SUMMARY TABLE

Area of Concern	FGOW Use	Potential Contaminant ²	Pathway			
			SW	GW	Air	Soil
1. Waste Disposal Ditch, Primary and Secondary Settling Ponds	Product wastewater and sanitary wastewater disposal	volatile and semi volatile organic compounds, acids, metals, nitrocellulose and dinitrotoluene	x	x		x
2. Shipping and Storage Buildings south of 170 th Street	Storage of guncotton packed and sealed in metal shipping containers	Dinitrotoluene, nitrocellulose and DPA	x	x		x
3. Miscellaneous Drainage Areas	Collection of runoff from shipping and storage building areas	dinitrotoluene, nitrocellulose and DPA	x	x		x
4. Sanitary Buildings	Unknown	polynuclear aromatic hydrocarbons, petroleum, oils and lubricants, and asbestos	x	x		x
5. Dinitrotoluene (DNT) Storage Bunkers	Storage of DNT prior to use in the manufacture of guncotton	Dinitrotoluene, DPA, nitrocellulose and asbestos		x		x
6. 154 th Street Disturbed Area		polynuclear aromatic hydrocarbons, metals, and asbestos		x		x

² Exact chemicals are not known since comprehensive investigation of HTRW producing activities in the industrial area (transferred to UMN in the 1948 QCD) was not conducted.

SECTION 9.0 – SUMMARY AND CONCLUSIONS

The industrial part of FGOW (located in the northeast part of Segment A) requires no further DoD action because of a “hold-harmless” clause¹ inserted into the 1948 QCD that transferred the property from the US Government to the Regents of the UMN. The Findings and Determination of Eligibility determined that this area was not eligible for the DERP-FUDS program (Appendix G, Reference 6). See Sections 1 and 2 of this PA for additional information.

9.1 AREAS THAT MAY WARRANT NO FURTHER ACTION BY DOD

Areas that may warrant no further action by DoD include:

9.1.1 Southwest Part of Segment A

Inspection of maps and 1945 aerial photographs showed that, except for the small area identified as containing the Sanitary Buildings (now denoted AOC 4), the southwest part of Segment A was never developed for FGOW operations. After WWII, the land was returned to private ownership. See Section 1 of this PA for additional information.

9.1.2 Northwest/Southeast Parts of Segment A

Parts of the northwest and southeast parts of Segment A are not included in the AOCs in this PA. These parts enclosed administrative areas, undeveloped lands, or had other uses during the operation of FGOW that did not involve any HTRW or MMRP concerns. All FUDS-eligible FGOW areas with potential HTRW or MMRP concerns have been included in the AOCs in this PA. See Section 3 of this PA for additional information.

¹ This clause indemnifies the United States of America from any liability related to U.S. Government activities in connection with the property.

9.1.3 East Band of the Northeast Part of Segment A

The east part (1/2-mile wide band) of the Northeast part of Segment A is not included in the AOCs in this PA, except for the small area identified as enclosing a fragment of the Waste Disposal Ditch (now denoted AOC 1). This band was never developed for FGOW operations and enclosed undeveloped lands or had other uses during the operation of FGOW that did not involve any HTRW or MMRP concerns. All FUDS-eligible FGOW areas with potential HTRW or MMRP concerns have been included in the AOCs in this PA. See Section 3 of this PA for additional information.

9.2 POTENTIAL HAZARDS THAT MAY WARRANT FUDS PROJECTS

9.2.1 HTRW

Because of PRP issues with the 1947 property, there will be no separate HTRW Projects initiated.

9.2.2 Military Munition Response Program (MMRP)

There is no evidence that ammunition was produced, stored, or used anywhere on the FGOW property that is eligible for DERP-FUDS. There is no evidence that MEC, MC, or RCWM are present at FGOW. See Section 5 Evaluation of Presence of Military Munitions Technical Data for additional information. No FUDS projects based on MMRP are warranted.

9.2.3 PRP/HTRW Considerations

9.2.3.1 AOC 1, Waste Disposal Ditch, Primary and Secondary Settling Ponds

It is not known if the Waste Disposal Ditch was used after the industrial part of Segment A was transferred to the Regents of the UMN in 1948. During the site reconnaissance (Appendix L), the representatives from both the UMN and DCEM described the undocumented use of a portion the ditch to the north and south of 170th Street as a

disposal site for building debris and other waste. The timeframe and source of the debris are not known. Potential hazards from past activities are detailed in Section 6.2.1 and include PCBs and asbestos. Media of potential concern are surface and subsurface soil, groundwater, and surface water. This area has a potential for PRP considerations for DuPont and UMN.

9.2.3.2 AOC 2, Shipping/Storage Buildings South of 170th Street

This area is used or leased out by the UMN for agriculture. No debris from the buildings remains today. The date when the buildings were demolished or removed is unknown.

It is not known whether UMN made use of any of these buildings before they were demolished or removed from the site. Potential hazards from past activities are detailed in Section 6.2.2. Media of potential concern include surface and subsurface soil, and groundwater. This area has a potential for PRP considerations for DuPont and UMN.

9.2.3.3 AOC 3, Miscellaneous Drainage Areas

These areas could have held drainage or runoff water from various storage/shipment building areas. There are three locations for these drainage areas: east of Annett Avenue and south of the shipping/storage buildings; south of 170th street, between the shipping/storage buildings and the Sanitary Facility; and southwest of the DNT storage bunkers. No structures were placed at these drainage areas as part of FGOW operations. The UMN may have cultivated these areas and the areas receive drainage from sites that are in use by UMN, including AOC 5. Potential hazards from past activities are detailed in Section 6.2.3. The drainage areas tend to be overgrown with bushes and trees.

Media of potential concern include surface and subsurface soil, groundwater, and possibly seasonal accumulations of surface water. This area has a potential for PRP considerations for DuPont, Raymond Laboratories, Inc., and UMN.

9.2.3.4 AOC 4, Sanitary Buildings

This site is now privately owned, with part of the land used for agriculture and part of it overgrown with trees and bushes. Buildings are visible on the site in a 1945 aerial photograph and FGOW records have been used to identify former building numbers and names, including a Boiler House. No remaining structures or facilities are evident at the site.

Potential hazards from past activities are detailed in Section 6.2.4. Media of potential concern include surface and subsurface soil, and groundwater. This area has a potential for PRP considerations for DuPont.

9.2.3.5 AOC 5, Dinitrotoluene (DNT) Storage Bunkers

Seven of the eight original bunkers are still present and appear to be in use by the UMN. A potential hazard from past DuPont operations or UMN activities is the asbestos that was used in the construction or refurbishment of the bunkers. The area was leased to Raymond Laboratories, Inc. in 1944 for the purpose of storage of explosives. In addition, there may be contamination from UMN activities. Chemicals used or stored by UMN at the site are unknown. Potential hazards from past activities are detailed in Section 6.2.5. Media of potential concern include surface and subsurface soil. This area has a potential for PRP considerations for DuPont, UMN, and Raymond Laboratories, Inc.

9.2.3.6 AOC 6, 154th Street Disturbed Area

The disturbed area between 154th and 155th Streets is visible in 1945 aerial photographs. The site today contains demolition debris – concrete and rebar were visible – and there was mention during site reconnaissance that asbestos from building demolitions may have been hauled to the site for disposal. If the debris was disposed of between August 1945 (when ordnance production ceased) and October 1947 (when the land was transferred to the UMN) and the disposal was conducted through the DuPont or its contractors, clean-up of the AOC may be the responsibility of the federal government.

Any disposal that occurred after this time would require PRP consideration. Potential hazards from past activities are detailed in Section 6.2.6 and include asbestos containing materials that resulted from the disposal of demolition debris during the FGOW era or post-FGOW/pre-UMN era. Also, as an unapproved disposal site or landfill, material other than demolition debris may have been disposed there both before and after the property was transferred to the Regents of the UMN.

Media of potential concern include surface and subsurface soil and groundwater. This area has a potential for PRP considerations for DuPont, and UMN.

9.2.4 PRP/MMRP Considerations

There are no MMRP concerns identified at the site.

9.2.5 CON/HTRW

There is no indication of containerized HTRW on the site. See Section 7 of this PA for additional information. No CON/HTRW projects are warranted.

9.2.6 BD/DR

Because a PRP Project is recommended for all property covered in the 1947 Quitclaim Deed as well as property transferred to private ownership after WWII, no BD/DR Projects will be recommended. See Section 7 of this PA for additional information.

APPENDIX G
TEXTUAL REFERENCES OF SOURCE DOCUMENTS

- Reference 1: Quickclaim Deed No. 193572 between the United States of America acting through the Federal Farm Mortgage Corporation (Grantor) and the Regents of the University of Minnesota (Grantee) certified on 9 October 1947, recorded on 14 October 1947.
- Reference 2: Quickclaim Deed between the United States of America acting through the Federal Farm Mortgage Corporation (Grantor) and the Regents of the University of Minnesota (Grantee) certified on 18 March 1948.
- Reference 3: Kline, Representative John. To Raymond J. Fatz, Deputy Assistant Secretary for Environment, Safety and Occupational Health, Department of the Army. Letter, 6 April 2005.
- Reference 4: Fatz, Raymond J. To Representative John Kline, 2nd District Minnesota. Letter, 19 April 2005.
- Reference 5: FGOW PA Scope of Service, May 2005
- Reference 6: Grisoli, Brigadier General William T. Northwest Division, Department of the Army. To Commander, Omaha District. Memorandum, 24 May 2005.
- Reference 7: Peer Engineering. *Preliminary Environmental Investigation, Former Gopher Ordnance Works, UMore Park, Rosemount, MN*. August 2003
- Reference 8: Scott, Steve. To USACENWO-ED-GI. Letter, 26 August 2005.
- Reference 9: Historical Report of Gopher Ordnance Works, St. Paul Minnesota, 1 January 1944 - 30 June 1944.
- Reference 10: Historical Report of Gopher Ordnance Works, St. Paul Minnesota, 1 January 1945 - 30 March 1945.
- Reference 11: Historical Report of Gopher Ordnance Works, St. Paul Minnesota, 1 April 1945 - 30 June 1945.
- Reference 12: Historical Report of Gopher Ordnance Works, St. Paul Minnesota, 1 October 1944 - 31 December 1944.
- Reference 13: Historical Report of Gopher Ordnance Works, St. Paul Minnesota, 1 July 1945 - 30 September 1945.
- Reference 14: Historical Report of Gopher Ordnance Works, St. Paul Minnesota, 1 January 1946 - 30 June 1946.
- Reference 15: Hutchinson, E.W. *Gopher Ordnance Works – Decontamination Completion Report*. 16 August 1946

- Reference 16: War Department Technical Manual (TM) 9-2900. *Military Explosives*. 29 August 1940
- Reference 17: Secretary of War to Raymond Laboratories, Inc. of St. Paul, Minnesota, Lease, April 1, 1944
- Reference 18: Dakota County. *Environment and Natural Resource Management Policy Plan; Draft for Public Review*. April 2005. (accessed 12 August 2005)
<http://www.co.dakota.mn.us/planning/EnvNatResources/Draft%20Plan%20-%204-05.pdf>
- Reference 19: Historical Report of Gopher Ordnance Works, St. Paul Minnesota, 1 April 1942 – 1 October 1942.
- Reference 20: Fatz, Raymond J. Deputy Assistant Secretary of the Army, Environment, Safety and Occupational Health. To Assistant Chief of Staff for Installation Management. Memorandum, 21 April 2005b.
- Reference 21: Mattson, Gerald; Maureen Geraghty Bouchard and Russ Withrow. "History of the Gopher Ordnance Works - Dawning of a War-Boom Community." *Dakota County Historical Society, Volume 41, Number 1 (July 2001): 16 - 19*
- Reference 22: Jefferds, J.S., Lt. Col, Ord Department, Iowa Ordnance Plant, To War Assets Administration, Memorandum with attached Inspection Report, 28 April 1947
- Reference 23: Whittet, Robert, Office of Real Property Disposal, To Mr. W. T. Middlebrook, University of Minnesota, Letter, 13 September 1946
- Reference 24: Rosemount Public Works. *City of Rosemount 2004 Drinking Water Report*. 2004
- Reference 25: Fedoroff Basil T. and Oliver E Sheffield. *Encyclopedia of Explosives and Related Items*, volume 2, Picatinny Arsenal, 1962
- Reference 26: War Department Supply Bulletin (SB) 5-52. *Decontamination Procedures*. July 1943
- Reference 27: Agency for Toxic Substances and Disease Registry (ATSDR). *Public Health Assessment, Sunflower Army Ammunition Plant, DeSoto, Johnson County, Kansas, Community Health Concerns*. March 2004

REFERENCE 17

Lease from Secretary of War to
Raymond Laboratories, Inc.
1 Apr 1944

THIS LEASE, made between the SECRETARY OF WAR, of the first part, and the RAYMOND LABORATORIES, INC., St. Paul, Minnesota (hereinafter called the "Lessee"), of the second part, WITNESSETH:

THAT the Secretary of War, by virtue of the authority contained in Section 1 of the Act of Congress approved July 2, 1940 (54 Stat. 712), as continued in effect by Section 13 of the Act of Congress approved June 5, 1942 (56 Stat. 314), and the Act of Congress approved March 27, 1942 (56 Stat. 176), and in consideration of the observance and performance by the lessee of the covenants and conditions hereinafter set forth, hereby leases to the Lessee for a period of one year, commencing April 1, 1944, revocable at will by the Secretary of War, the following described land and the buildings, improvements, and appurtenances thereunto belonging, to be used for the purpose of storage for explosives: East one-half of East one-half of Northeast quarter (E $\frac{1}{2}$ E $\frac{1}{2}$ NE $\frac{1}{4}$), Section 4, Township 114 North, Range 19 West of the 6th Principal Meridian, GOPIER ORDNANCE WORKS MILITARY RESERVATION, Dakota County, Minnesota.

THIS LEASE is granted subject to the following provisions and conditions:

1. The Lessee shall pay to the Government as rental for the property herein leased the sum of \$1,800.00 per year. Said rental shall be payable in monthly installments of \$150.00 on the first day of each month to the Treasurer of the United States and forwarded by the Lessee to the Chief of Finance, United States Army, Washington, D. C., or to a representative designated by him.
2. That the exercise of the privileges hereby granted shall be without cost or expense to the United States, under the general supervision and subject to the approval of the officer of the Army having immediate jurisdiction over the property, and subject also to such regulations as may be prescribed by him from time to time.
3. A survey of the demised premises shall be made by a representative of the Government and a representative of the Lessee showing the physical condition of the said property at the time lessee entered into possession thereof, and a like survey shall be made upon the vacation of the property

by the Lessee. A copy of the original survey shall be attached hereto and become a part hereof, as fully as if originally incorporated herein.

4. The Government reserves the right at any time to enter the said premises for the purpose of inspection and inventory and when otherwise deemed necessary for the protection of the interests of the Government.

5. The Lessee shall pay all charges for water, heat, gas and electric current or other utility services which it may require for its use in connection with the premises hereby leased.

6. The Government shall not be responsible for damages to the property of the Lessee nor for damages to the property or injuries to the person of the Lessee's officers, agents, servants or employees or other persons on the premises as invitees or licensees of the Lessee arising from the use of the leased premises and the Lessee shall save the Government harmless from any and all such claims; provided, that nothing in this paragraph shall be deemed to affect the liability of the Government to its own employees.

7. The Lessee warrants that it has not employed any person to solicit this lease upon any agreement for a commission, percentage, brokerage or contingent fee. Breach of this warranty shall give the Government the right to annul the lease or, in its discretion, to collect from the Lessee the amount of such commission, percentage, brokerage, or contingent fee. This warranty shall not apply to commissions payable by the Lessee upon contracts or sales secured or made through bona fide established commercial or selling agencies maintained by the Lessee for the purpose of securing business.

8. The Lessee shall not construct any permanent structure on the said leased premises, and shall not construct any temporary building thereon or make any major alterations to the premises without the prior written consent of the said officer.

9. No member of or delegate to Congress or resident commissioner shall be admitted to any share or part of this lease or to any benefit to arise therefrom. Nothing, however, herein contained shall be construed to extend to any incorporated company, if the lease be for the general benefit of such corporation or company.

10. This lease may be terminated by the Lessee at any time by giving at least thirty (30) days' notice thereof in writing to the Secretary of War, through the said officer; provided that in case of such termination no refund by the United States of any rental theretofore paid shall be made.

11. The use of the premises hereinafore described shall include the use of such roads, railroads and landing facilities within the proper ordinance zone as may be needed by the Lessee provided that such use shall be subject to control and supervision of the said officer, including the determination as to when facilities may be used and as to the time when the same may be used and provided further that such use thereof shall be without cost to the United States and any expense connected with such use shall be borne entirely by the Lessee and provided further that there shall be no liability on the United States to furnish any such facilities to the Lessee which may not already exist or which for any reason may be vacated or discontinued by the United States.

12. Any property of the United States damaged or destroyed by the Lessee incident to the Lessee's use and occupation of said premises shall be promptly repaired or replaced by the Lessee to the satisfaction of the said officer, or in lieu of such repair or replacement the Lessee shall, if so required by the said officer, pay to the United States money in an amount sufficient to compensate for the loss sustained by the United States by reason of damage to or destruction of Government property.

13. The duties, responsibilities, liabilities and obligations of the Lessee with respect to the repair and maintenance of the leased property shall be, at its own expense, to operate and maintain said property in good order and condition, unless it shall be prevented therefrom by reason of extraordinary circumstances over which it has no control, and, upon the expiration or termination of this lease, to deliver the same to the Government in as good order and condition as when received, excepting ordinary wear and tear and damages by the elements or by circumstances over which the Lessee has no control.

14. Should the aforesaid premises or any substantial part thereof be destroyed or rendered unfit for occupancy or for the purpose for which leased, by fire or any other cause, then the Lessee shall, at the option of the Government or the Lessee, be terminated and the Lessee shall forthwith surrender the leased premises and all interests therein to the Government; should part of the premises covered by this lease be damaged or rendered unfit for occupancy or for the purpose for which leased, by fire or any other cause, then the obligation of the Lessee to pay rental shall be reduced proportionately until such part shall have been repaired and restored to fitness for occupancy and for the purpose for which leased, but nothing herein contained shall obligate the Government to so repair or restore the property or any part thereof. In any event the Government shall refund to the Lessee an amount equal to that part of the rental theretofore paid by the Lessee which shall be applicable to the part of the premises so damaged or rendered unfit for occupancy or for the purpose for which it was leased.

and applicable to the period of time during which such part of the premises shall be so damaged or unfit.

1. On or before the date of expiration of this lease or its termination by the Lessee, the Lessee shall vacate the premises, remove the property of the Lessee therefrom, and restore the Government property to the extent of any loss or damage for which the Lessee is liable under the terms of this lease. If, however, this lease is renewed, the Lessee shall vacate the premises, remove its property therefrom, and restore the Government property to the condition aforesaid within such time as the Secretary of War may designate. In either event, if the Lessee shall fail or neglect to remove its property and restore the Government property to the condition aforesaid, then, at the option of the Secretary of War, the Lessee's property shall either be removed and the property of the United States without compensation therefor, or the Secretary of War may cause it to be removed and the Government property to be restored to the condition aforesaid at the expense of the Lessee, and no claim for damages against the United States or its officers or agents shall be created by or made an account of such removal and restoration work.

This lease was duly heretofore set by hand and affixed the seal of the War Department by direction of the Under Secretary of War this 22nd day of May 1944.

/s/ Marion Rushton,
MARION RUSHTON,
Colonel, J.A.G.D.,
Administrative Officer.

This lease is also executed by the Lessee this 16 day of June 1944.

Witness my hand and seal, 1944.

In the presence of

/s/ Raymond E Lee
Pres

/s/ Edlyn C Carlson

/s/ Florence Vettlett

REFERENCE 18

Environment and Natural Resource Management Policy Plan

REFERENCE 19

QHR

1 April 1942 – 1 October 1942

REFERENCE 20

Memorandum, Raymond J. Fatz to
Assistant Chief of Staff for Installation Management
21 April 2005

REFERENCE 21

History of GOW
July 2001

REFERENCE 22

Memorandum from Lt. Col J.S. Jefferds to
War Assets Administration
28 April 1947

C.
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WAR DEPARTMENT
IOWA ORDNANCE PLANT
Burlington, Iowa

In Reply Refer to
CRDCW 333/48-2

GHMathes/kl/2176

28 April 1947

SUBJECT: Inspection of Decontaminated Areas Gopher Ordnance Works

TO: War Assets Administration
Gopher Ordnance Works
Minneapolis, Minnesota
Attention: Mr. E. S. Clark

Attached, hereto, is a travel report of Mr. C. J. Belger listing observations made at Gopher Ordnance Works. The cooperation shown both Mr. Belger and Mr. Topping by you and members of your office is greatly appreciated. As shown on the attached report, certain areas of Gopher Ordnance Works have not been properly decontaminated and your office is cautioned to use extreme care when entering or working in any contaminated area. The office of the Field Director of Ammunition Plants has been advised of the conditions noted and it is expected that further decontamination instructions will be forthcoming.

/s/ J. S. Jefferds
J. S. JEFFERDS
Lt Col, Ord Dept
Commanding

Incl: Travel Report

TRAVEL REPORT

CJBelger/kl
23 April 1947

SECTION I - PURPOSE OF VISIT

Inspection of decontaminated areas, Gopher Ordnance Works, in accordance with letter FDAP-ORDLY-S File; 333/12616.

SECTION II - OBSERVATIONS AND CONCLUSIONS

Inspection tour began 17 April 1947 after meeting WAA officials and obtaining an escort for the tour. Keys for opening the various buildings were obtained from WAA and University of Minnesota.

The following buildings were inspected and results listed:

Igloo (Dry Ingredient Storehouse)

260-A Small quantity of smokeless powder found in floor drain
260-B No contamination observed
260-C " " "
260-D " " "
260-E Small quantity of DNT found in drain
260-F Small quantity of DNT found in drain
260-G No contamination observed
260-H " " "

Powder Shipping Houses (Storage)

229-36 No contamination observed
229-24 " " "
229-12 " " "
229-11 Small quantity of smokeless powder found at North-west Loading Door
229-23 Small quantity of smokeless powder found at South-west Loading Door
229-35 Small quantity of smokeless powder found at West Loading Door
229-34 No contamination observed
229-22 Small quantity of smokeless powder found at North-west Loading Door and on floor of building
229-10 No contamination observed
229-9 " " "
229-21 " " "
229-33 " " "
229-32 " " "
229-20 Small quantity of smokeless powder found at North-west Loading Door
229-7 Small quantity of smokeless powder found at both West Loading Doors
229-19 Small quantity of smokeless powder found at South-west Loading Door
229-31 Small quantity of smokeless powder found at both loading doors and a large quantity (approx. 2/3 quart) of smokeless powder in building between floor joints and under floor at south foundation wall. It was impossible to determine the quantity under floor without removing floor boards.

REMARKS: In the majority of cases where smokeless powder was found inside of the 229-series buildings, the powder was found in floor joints.

SECTION II - continued

The following buildings have been removed and building site only was inspected:

229-4, -16, and -28 Small quantities of smokeless powder were found on adjacent building site area

Blending Tower and Pack House Sites (building and equipment have been removed)

240-D, 240-C, 222-A, and 222-B Building sites: Found small quantities of smokeless powder on surrounding area

Blending Tub possibly removed from Building 240-D: No evidence of explosive material observed

Air Test Building Site: Found small quantities of smokeless powder at unloading dock site and on railroad track bed near building

DNT Screening House Site:

205-A Small quantity of DNT found near building site

Air Test House:

224-A No evidence of explosive material found in building. However, small quantities were found on area outside of building

Blending Houses and Auxiliary Buildings:

240-A, 240-B No evidence of explosive material was found inside of buildings or on equipment. However, small quantities of smokeless powder were found on outside area in quantities ranging from a few grains to a large handful.

REMARKS: According to information received from WAA representative, Buildings 240-A and 240-B were never used in production of smokeless powder but were possibly used for smokeless powder storage

Railroad Equipment and Rolling Stock used in the transfer of smokeless powder: A spot check was made of the above equipment. Twenty flat cars were inspected and three were found with very small quantities of smokeless powder inbedded in floor cracks (2-4 grains). Forty railroad cars with roofs were inspected and no visible evidence of explosive material was found. Thirty railroad powder trucks, used to transfer Solvent Recovery cars, were inspected and no visible evidence of explosive material was found.

Material and Equipment stored inside and outside of Warehouse:

223-B Equipment and material consisting of sweetie barrels, new smokeless powder containers, electric motors, Jordan engines, ventilating equipment, timbers, etc., no visible evidence of explosive material was observed.

Change Houses:

707-XX, 707-X, 707-A, no visible evidence of explosive material on interior of building. However, small quantities of smokeless powder were found on area near buildings.

CJBelger/kl
23 April 1947

Travel Report

SECTION II - continued

Area Shop:

722-N No evidence of explosive material observed

Supervisor's Office:

704-E No evidence of explosive material was observed in building. However, small quantities of smokeless powder were found on area outside of building.

Rest Houses:

280-A, 280-B No evidence of explosive material was observed in or around buildings. Inspected fifty powder buggies located in these buildings and found no evidence of explosive material present.

Farm House and other buildings located on area: No evidence of explosive material was observed.

Tray Dryer Site:

237-A Site, filter housing and various pieces of pipe. No evidence of explosive material observed.

Operator's Building Office on 300 Line: No evidence of explosive material was observed.

Sulphuric Acid Concentrators:

303 Small quantity of sulphur was found on floor in building, also, small quantity of sludge found in cooler.

301-A No evidence of explosive material or acids was observed. Sulphur bins were found with large quantity of sulphur. Sulphur was also found on area near sulphur bins.

Chemical Laboratory:

706-b No evidence of explosive material or acids was observed.

612-A Acid Neutralization Plant, Limestone Storage Tank, Hopper, etc: Small quantity of limestone was found on floor.

Power House:

401-A Small quantities of the following acids were observed on floor in Line feeder and Indicator Panel Room near laboratory: Sulphuric acid, Acid Acetic Merck, Acid Acetic Glacial, Nitric Acid and Sodium Chloride.

Fire Station:

709-B No evidence of explosive material or acids was observed.

Sewage Treatment Plant:

617-A No evidence of explosive material was observed.

SECTION II - continued

Farm House and other buildings on East side of area marked: Layout E.I. DuPont: No evidence of explosive material was observed in or around these buildings.

Laboratory and Range:

223-A No evidence of explosive material was observed

Atmospheric Powder Magazine:

223-C No evidence of explosive material was observed

Constant Temperature Powder Magazine:

223-B No evidence of explosive material was observed

Ballistic Storage

223-D No evidence of explosive material was observed

Manufacturing and Storage Buildings

101-A, 104-A, 103-A, 105-A, 106-A, 108-A, 109-A, 112-A, 113-A, and Auxiliary Buildings: No evidence of explosive material was observed in the above buildings.

REMARKS: According to information received, these buildings were never used.

101-B, 123-B, 122-B, 104-B, 105-B and Auxiliary Buildings:
No evidence of explosive material was observed

108-B&C, 109-B&C, 112-B&C, and 113-B&C: Due to contamination, the aforementioned buildings were burned.

Solvent Recovery Houses:

Buildings 214-1 thru -6, 214-17 thru -20, and 214-33 thru -38 are still standing but equipment is being dismantled. Balance of buildings of this series, 214-1 thru -49, have been dismantled with only concrete wall and foundation remaining.

According to Decontamination Report prepared by E. W. Hutchinson, Gopher Ordnance Works, all filter media were removed and destroyed. However, inspection revealed several instances where the glass wool media was intact and other instances where small pieces of glass wool were attached to filter. Filter Housings appear to have been washed and are properly marked with (X) Yellow.

Solvent Recovery Cars:

Located on railroad tracks near 214 Buildings, forty cars were inspected and 65% were found with broken welds on small unloading door (Double door w/glass wool lining). Supporting trays are in 75% of cars that were inspected. According to Decontamination Report, the supporting trays were removed from the cars and were stacked at East end of 213-A. Decontamination Report also states that tops of cars were flashed. Inspection failed to reveal evidence of flashing.

Travel Report

SECTION II - continued

Supervisor's Office, Yardmaster:
704-H No contamination observed.

Change House:
707-GGG No contamination observed.

Field Canteen:
746-D No contamination observed.

Farm House, Barn, and other buildings located directly West of 746-D:
No contamination observed.

Sewage Pumping Station:
610-A No contamination observed.

Powder Sample Storage Buildings (metal)
Three buildings located near 706-A Laboratory: No evidence of
explosive material found.

Solvent Recovery Cars located in and near 234 buildings were spot checked
and no evidence of explosive material was observed. Cars marked with
(XXX).

Hydraulic and Refrigeration Building:
226-A No evidence of explosive material was observed.

Knife Grinding and Die Shop:
217-A No explosive material was observed.

Tank Farm:
207-AA, 207-AB, and AC: No explosive materials or acids were observed.

Ether and Alcohol Recovery Building:
207-A No explosive material was observed.

Press House Sites:
234-1, -2, -3, -4, -7, -E, -F. All 234 buildings have been dismantled or are in
the process of being dismantled by Rose Brothers Lumber and Supply Co.,
Minneapolis - St. Paul, Minnesota. Building sites, equipment and
supplies located in this area were inspected and no explosive
material was observed.

First Aid:
719-A No explosive material was observed

SECTION II - continued

Mix House Buildings and Building Sites:

203-1 Site - No explosive material was observed.
203-2 in process of being dismantled. No explosive material was observed.
203-3 No explosive material was observed.
203-6 in process of being dismantled. No explosive material was observed.

Dehydration Buildings and Building Sites:

202-A No explosive material was observed.
202-B No explosive material was observed.
202-SA No explosive material was observed.
202-3 No explosive material was observed, (site)
202-4 Site No explosive material was observed.
202-C, -D, -E No explosive material was observed. However, presses located in this building were marked (X) Yellow, and Powder Carts were marked (XXX). The above buildings have been dismantled or are in the process of being dismantled.

Either Mix House:

206-A, -B, -C These buildings are in the process of being dismantled. No explosive material was observed.

Field Kitchen:

746-C No explosive material was observed.

Main Laboratory:

706-A No explosive material was observed.

Stability Laboratory:

706-D No explosive material was observed.

Ether Reclamation Plant:

251-A No explosive material was observed.

Area Laundry:

723-A No explosive material was observed.

Ether Manufacturing & Alcohol Rectification Tank Farm:

207-EE Ether tanks were found with top cover attached. Slight ether fumes were present. Alcohol tanks had top cover removed and no fumes were present.

Parking Garage:

725-A, -B, -C No explosive material was observed.

Field Office Buildings:

707-H, 704-W, 704-F No explosive material was observed.

Maintenance Shop and Office:

722-D No explosive material was observed.

Rigger Shop:

722-U No explosive material was observed.

CJL Delger/kl
23 April 1947

Travel Report

SECTION II - continued

Transportation Office:

726-A No explosive material was observed.

Change House:

707-JJ No explosive material was observed.

Warehouse Supplies:

713-A No explosive material was observed.

Paint Storage:

715-B No explosive material was observed.

Burning Field:

Burning Field Area and material located at Burning Field were inspected but no evidence of explosive material was observed.

SECTION III

It is recommended that all building sites in which inspection revealed contamination be decontaminated.

All areas surrounding Igloos, Shipping Houses, Blending Towers, Pack Houses and all other buildings in which inspection revealed contamination, be decontaminated.

Remove all traces of filter media (glass wool) from filters. All solvent recovery cars with broken inner lining walls should be decontaminated. All solvent recovery cars with broken inner lining on small unloading door should have lining and door removed and flashed.

SECTION IV

Estimated man-hours to complete decontamination of Gopher Ordnance Works:

1	Inspector-Supervisor	150	man-hours
6	Laborers	720	" "
2	Truck Drivers	240	" "
1	Light Equipment Operator	120	" "

/s/ C. J. Delger
C. J. Delger, Inspector

REFERENCE 23

Correspondence from Robert Whittett
To Mr. W. T. Middlebrook
13 September 1946

In reply refer to: PIN
Gopher Ordnance Works
Rosemount, Minnesota

C
O
P
Y

September 13, 1946

Mr. W. T. Middlebrook, Vice-President
Business Administration
University of Minnesota
Minneapolis, Minn.

Attention; Mr. Frank Fuller.

Dear Mr. Middlebrook:

Confirming conversation with Mr. Frazier, of this office, the following excerpts from a memorandum from Mr. D. C. Strickler, Property Management Division, indicate the amount of decontamination work considered essential on the Gopher Ordnance Plant:

"For your information and guidance in the matter of disposing of certain parts of Gopher Ordnance Works, Rosemount, Minnesota, to the University of Minnesota, the writer has reviewed the proposal, dated July 15, of the University of Minnesota and, in this connection, the following buildings, structures, equipment and areas will probably require additional decontamination, if turned over to the university of Minnesota for the purposes as outlined in their proposal:

1. Building 302- Ammonia Oxidation House.
2. Building 301 - High Pressure Ammonia.
3. Building 612A - Acid Neutralization Plant.
4. Building 303 - ASA, and Building 303 - Ana - the Sulphuric Acid Concentrating House.
5. Building 723A - Laundry.
6. Building 240A and B - Powder Blending Towers and Pack Houses.
7. Building 251A - Recovery House.

In addition to the above buildings and, as previously pointed out to members of the University of Minnesota, this Administration would not recommend that Buildings 260A to H inclusive be used for storing or handling of food products.

September 13, 1946

which is the intended use for a number of these buildings as set forth in the proposal of the University of Minnesota. These buildings are considered safe for normal use but, in view of the fact that they have had stored in them DNT, DPA and other smokeless powder additives, it is believed that they are unsafe for storing or handling of food products, as such storage would quite probably lead to considerable food poisoning.

The University of Minnesota indicates that Buildings 715A and B, Oil and Paint Storage, and Building 726, the Acetylene Storage will be used for the same purpose for which they were originally designed and under these conditions no decontamination is considered necessary. However, should any parts of these buildings or equipment be used for a purpose other than the handling of oil, paint and acetylene, additional decontamination would be required.

It is also pointed out that the University of Minnesota is requesting practically all of the land area of Gopher Ordnance Works and, in this connection, it would be necessary for WAA to clear the land and included in this program, as far as decontamination is concerned, would be the removal and destruction of approximately 22 buildings together with the removal and back-filling of the industrial sewer lines and what is referred to as the 100 area (nitro-cotton area). Also, there are a great many other buildings housing equipment which equipment will require additional decontamination work and this work will have to be done in order to clear the area for turning over the land area to the University."

Very truly yours,

ROBERT WHITTET
Director, Institutional Division
Office of Real Property Disposal

Cc: Prof. Akerman
Mr. Lunden
Rosemont File ✓
File

REFERENCE 24

Rosemount Drinking Water Report
2004

REFERENCE 25

Nitrocellulose Article
Encyclopedia of Explosives

REFERENCE 26
SB 5-52
Decontamination Procedures

REFERENCE 27

ATSDR Report on Sunflower AAP
Preliminary Health Assessment