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Appendix F-5.9 Lake Jane, Deer Pond, and Crombie Pond Outlet Operation Plans
Appendix G-5.9 Groundwater Sampling for PFOA near the Washington County Landfill
5.9 Lake Jane Watershed Management Plan

5.9.1 General Information

Lake Jane is in the northwest corner of the City of Lake Elmo, southeast of Lakes Olson and DeMontreville. The Lake Jane local watershed includes Hedges Bog and Hedges Pond. While water from Deer Pond and Crombie Pond may back up into Lake Jane during high water conditions (due to downstream outlet restriction), they do not normally drain into Lake Jane. However, both ponds are considered to be within the local Lake Jane watershed for VBWD management purposes. Figure 5.9-1 shows the local Lake Jane watershed. The local Lake Jane watershed is entirely within the City of Lake Elmo.

Under flooding conditions, flow restrictions downstream of Lake Jane can cause water from Lake Olson to flow to Lake Jane. Therefore, the total Lake Jane watershed is much larger than its local watershed, and includes portions of eight communities.

Most of the Lake Jane watershed is developed as single-family residential development, with a smaller amount of agricultural land use. Some developable land in the watershed is located between 53rd and 51st Streets North, south of 45th Street North, and just south of T.H. 36. Future (2030) land use in the local Lake Jane watershed is anticipated to be single-family and large-lot residential. Figure 5.9-2 shows the existing (2010) and future (2030) land use of the local Lake

<table>
<thead>
<tr>
<th>Lake Jane Local Watershed Information</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Tributary Area (acres)</td>
<td>1,402 (local, 6,014 total)</td>
</tr>
<tr>
<td>MDNR-Designated Basins within Watershed</td>
<td>82-100W, 82-369W, 82-0105W (Bershen's Pond), 82-0384W (Hedges Bog), 82-0387W (Hedges Pond), 82-0385W (Deer Pond), 82-0386W (Crombie Pond), 82-0104P (Lake Jane)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Downstream Watershed</th>
<th>Beutel Pond</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Lake Jane Information</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>MDNR Designation</td>
<td>82-0104P</td>
</tr>
<tr>
<td>Surface Area (acres)</td>
<td>155.4 at El. 923.5</td>
</tr>
<tr>
<td>Approximate Mean Depth (feet)</td>
<td>12</td>
</tr>
<tr>
<td>Approximate Maximum Depth (feet)</td>
<td>38</td>
</tr>
<tr>
<td>Approximate Volume Below Discharge Elevation (acre-feet)</td>
<td>1,987</td>
</tr>
<tr>
<td>Discharge Elevation</td>
<td>922.35 (Can be lowered to 920.3)</td>
</tr>
<tr>
<td>Outlet Type</td>
<td>Stoplog Weir</td>
</tr>
<tr>
<td>MDNR Ordinary High Water Level (OHW)</td>
<td>924.0</td>
</tr>
<tr>
<td>100-Year Flood Level</td>
<td>926.0</td>
</tr>
<tr>
<td>VBWD &quot;Allowable Fill&quot; (cubic yards/lineal foot of shoreline) (See Section 4.7.)</td>
<td>2.5</td>
</tr>
<tr>
<td>VBWD Water Quality Priority Category</td>
<td>High</td>
</tr>
</tbody>
</table>

1 Elevations in NGVD29 vertical datum
Lake Jane watershed. A large amount of open space is located along the shoreline, and is expected to remain undeveloped because of wetlands. A large number of wildlife and waterfowl have made their home in this open space area. As a result, deer, ducks, and loons are frequently sighted by lake residents and lake users.

Lake Jane is very heavily used for a wide variety of recreational uses. Uses during the ice-free period include swimming, fishing, boating (speedboats, canoes, pontoons, and fishing boats), waterskiing, and aesthetic viewing by lake residents. During the winter months the lake is used for ice fishing, ice skating, and snowmobiling.

A public boat access was constructed along the south shore of Lake Jane in the fall of 1980. The number of individuals accessing the lake is limited by the 10 parking spaces in the public access. While more recent data are unavailable, a Minnesota Department of Natural Resources (MDNR) creel survey completed in 1991 indicated fishing pressure in the lake increased from 39 angler-hours per acre in 1980 to 52 angler-hours per acre, and recreational use was 24 hours per acre. Boat anglers comprised approximately two-thirds of all anglers in 1980 (likely prior to the completion of the boat access).

Although Lake Jane does not have a public swimming beach, the lake is heavily used for swimming. Residents maintain private swimming beaches, which receive heavy usage during the summer months. In the past, swimming lessons have been offered at the lake.

5.9.2 Water Quality Management Plan

Lake Jane is classified as a deep lake by the Minnesota Pollution Control Agency (MPCA). Lake Jane currently meets the MPCA’s water quality standards for shallow lakes (see Table 5.9-1) and is not included among the MPCA’s list of impaired waters in Minnesota.

The VBWD has classified Lake Jane a High Priority waterbody according to the VBWD’s waterbody classification system (see Section 4.1 – Water Quality), due to its MPCA classification as a deep lake (see Table 4.1-4). This classification is consistent with the high priority given to Lake Jane in the 1995 VBWD Plan and the 2005 VBWD Plan. Upstream waters, such as Olson Lake, can impact the water quality of Lake Jane. Likewise, Lake Jane’s water quality can impact downstream water bodies, such as Crombie Pond and Beutel Pond.

The VBWD has a non-degradation water quality policy which sets “action triggers” for all of its major waterbodies. Section 4.1 – Water Quality discusses the action triggers in more detail. Action triggers for VBWD lakes consider the following water quality parameters (summer average) relative to MPCA water quality standards and prior water quality data (i.e., trend analysis):

- Secchi disc depth
- Total phosphorus
5.9.2.1 Water Quality Implementation Plan

Specific water quality implementation tasks for Lake Jane include the following:

1. The VBWD will monitor the water quality of Lake Jane and perform the actions discussed in Section 4.1 – Water Quality for High Priority water bodies.

   The VBWD will evaluate the average summertime water quality (total phosphorus, chlorophyll a, and Secchi disc transparency) and compare it to applicable water quality standards (Table 4.1-1) and applicable action triggers (described in Section 4.1.7.5). Currently, the water quality in Lake Jane meets applicable standards for deep lakes.

2. The VBWD will continue to cooperate with other entities in the management of macrophytes (aquatic plants) in Lake Jane. Treatment of areas containing dense, monospecific growths of Eurasian watermilfoil with an aquatic herbicide (2,4-D, Triclopyr, or low concentrations of Aquathol® K) is recommended to protect Lake Jane’s native plant community. The VBWD will cooperate with the City of Lake Elmo and other entities in support of macrophyte management efforts. VBWD efforts may include:

   - point-intercept surveys of aquatic vegetation
   - preparation of lake vegetation management plans (LVMP)
   - completion of Invasive Aquatic Plant Management (IAPM) Permit applications
   - design of herbicide treatment programs
   - participation in meetings with MDNR staff
   - other technical analysis

3. The VBWD will continue to implement its Rules and Regulations (2013, as amended) in the Lake Olson watershed. The VBWD Rules address water quality performance standards for development and redevelopment projects, as well as required vegetated buffers around VBWD lakes, streams, and wetlands. The VBWD Rules and Regulations are included in this Plan as Appendix A-4.5.

5.9.2.2 Water Quality Issues and History

Lake Jane’s high water clarity is desirable but also has negative consequences. The high clarity makes the lake good for recreational use, but also allows the sun to penetrate deep into the water and encourage macrophyte and algal growth. The algal growth throughout the summer causes the water transparency to decline by late August most summers, shortening the summer recreational uses.
Algaecide treatments of Lake Jane occurred during in 1976, 1984, 1989, and 1990 to reduce algal blooms, but have not been performed on a large scale since 1990. The Minnesota Department of Natural Resources (MDNR) issued permits for the application of copper sulfate in Lake Jane to combat swimmer’s itch (caused by a parasite common to waterfowl) in 2013. While algaecide treatments may prevent or reduce the intensity of algal blooms that would otherwise interfere with recreational use of the lake, not all of the residents agree about the need for algaecide treatment of the lake. Water quality data available for Lake Jane indicates that algal blooms (as approximated by chlorophyll a concentration) have not been as prevalent since the mid-1990s (see Figure 5.9-3).

The August 2000 VBWD report, *Tri-Lakes (Lakes DeMontreville, Olson and Jane), Long, Echo, Mud (Acorn) and Silver Lakes, Watershed and Lake Management Plan, Volume I; Lake and Watershed Conditions, Water Quality Analysis, Improvement Options and Recommendations* (Tri-Lakes Watershed and Lake Management Plan) included an evaluation of full-development land use conditions and the impact on the water quality of Lake Jane. The study results indicated that the future water quality of Lake Jane would not differ substantially affected by future development, and Lake Jane would still achieve the currently applicable MPCA water quality standards. Thus, no specific improvement measures were analyzed for improving Lake Jane’s water quality in that study.

### 5.9.2.3 Water Chemistry Data

Water quality sampling has been conducted regularly on Lake Jane since 1971. The VBWD has collected some of the data, the Metropolitan Council has collected some through its Citizen-Assisted (lake) Monitoring Program (CAMP), and the Tri Lakes Improvement Association has collected some. A citizen volunteer has collected Secchi disc transparency data from the lake each summer since 1973 (except 2000 and 2001) as part of the Minnesota Pollution Control Agency’s (MPCA’s) Citizen Lake Monitoring Program (CLMP). Water quality samples are typically analyzed for total phosphorus and chlorophyll a, while Secchi disc transparency is measured in the field at the time of sampling (see Appendix A-4.1 – Water Quality Background Information).

The most recent 10-year average summer water quality data is presented relative to applicable MPCA and VBWD water quality standards in Table 5.9-1 and illustrated in Figure 5.9-3. Additional water quality information is discussed in Appendix A-5.9.

#### Table 5.9-1 Summary of Lake Jane summer average water quality

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Units</th>
<th>10-year Average (2004-2013)</th>
<th>Trend in Average</th>
<th>MPCA Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Phosphorus</td>
<td>ug/L</td>
<td>15</td>
<td>None</td>
<td>40</td>
</tr>
<tr>
<td>Chlorophyll a</td>
<td>ug/L</td>
<td>3</td>
<td>None</td>
<td>14</td>
</tr>
<tr>
<td>Secchi Disc Depth</td>
<td>m</td>
<td>4</td>
<td>None</td>
<td>1.4</td>
</tr>
</tbody>
</table>
The 10-year averages of summer average total phosphorus, chlorophyll a, and Secchi disc transparency are much better than the applicable water quality standards (see Table 5.9-1). Maximum values of observed within the last 10 years have not exceeded the applicable standards. The most recent 10-years of data identify no statistically significant trends in total phosphorus, chlorophyll a, or Secchi disc transparency.

5.9.2.4 Biological Data

Several types of biological data have been compiled and evaluated for Lake Jane, in addition to physical and chemical parameters. Macrophyte (large aquatic plant), phytoplankton (non-rooted floating plants – algae), zooplankton (microscopic aquatic animals), and fisheries data provide insight into the ecological quality of Lake Jane. Section 4.2 (Water Quality Background Information) provides more information about the importance of fisheries and other biological data.

5.9.2.4.1 Fisheries

The fishery of Lake Jane has been periodically managed by the MDNR in the past. MDNR management efforts on Jane Lake have primarily focused on largemouth bass. From 1986 to 1993, the MDNR required the release of all largemouth bass between 12 and 16 inches. The regulation was intended to reduce the harvest of largemouth bass and thereby improve the bluegill size structure through predation. No significant improvements were observed, and in 1997 the MDNR began requiring the release of all largemouth bass caught. This catch-and-release only regulation for largemouth bass was made permanent in 2006.

The MDNR has not stocked fish in Lake Jane within the last 10 years. The MDNR performed a fisheries survey of Lake Olson in 2013; the results of that survey are presented in Table 5.9-2

Table 5.9-2 Summary of 2013 MDNR Fisheries Survey for Lake Jane

<table>
<thead>
<tr>
<th>Fish Species</th>
<th>Numbers</th>
<th>Photograph (Not to Scale)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bluegill</td>
<td>346</td>
<td></td>
</tr>
<tr>
<td>Pumpkinseed Sunfish</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>Hybrid Sunfish</td>
<td>101</td>
<td></td>
</tr>
<tr>
<td>Green Sunfish</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Northern Pike</td>
<td>88</td>
<td></td>
</tr>
<tr>
<td>Yellow Bullhead</td>
<td>30</td>
<td></td>
</tr>
</tbody>
</table>
### Table 5.9-2 Summary of 2013 MDNR Fisheries Survey for Lake Jane

<table>
<thead>
<tr>
<th>Fish Species</th>
<th>Numbers</th>
<th>Photograph (Not to Scale)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black Crappie</td>
<td>16</td>
<td><img src="image" alt="Black Crappie" /></td>
</tr>
<tr>
<td>Black Bullhead</td>
<td>33</td>
<td><img src="image" alt="Black Bullhead" /></td>
</tr>
<tr>
<td>Largemouth Bass</td>
<td>4</td>
<td><img src="image" alt="Largemouth Bass" /></td>
</tr>
<tr>
<td>Yellow Perch</td>
<td>2</td>
<td><img src="image" alt="Yellow Perch" /></td>
</tr>
</tbody>
</table>

The MDNR has determined a fisheries-use classification for Lake Jane in accord with the DNR’s *An Ecological Classification of Minnesota Lakes with Associated Fish Communities (1992)*. Lake Jane is classified as a Class 24 lake. A Class 24 lake is a good permanent fish lake. This lake class indicates the lake should maintain a water transparency as measured by Secchi disc of 2 meters (6.4 feet) or greater. Poorer water transparencies will result in less than ideal water quality conditions for the lake’s fishery. Since 1992, summer average Secchi disc transparency has exceeded (i.e., was better than) 2 meters (see Figure 5.9-3). Fish consumption advisories have been issued for fish caught from Lake Jane. Pregnant women and children under age 15 should limit their meals of fish from Lake Jane to 1 meal/week for all sunfish and 1 meal/month for all bullhead and northern pike shorter than 25 inches. Individuals in these groups should not consume northern pike longer than 25 inches. The general population should limit consumption of northern pike shorter than 21 inches, all sunfish, and all bullhead to 1 meal/week, and northern pike longer than 21 inches to 1 meal/month. These advisories are for mercury.

The MDNR Lakefinder website includes the most current information on fish stocking and surveying in Lake Jane and is available at: [http://www.dnr.state.mn.us/lakefind/lake.html?id=82010400](http://www.dnr.state.mn.us/lakefind/lake.html?id=82010400)

Appendix B-5.9 presents additional information about the Lake Jane fisheries.

#### 5.9.2.4.2 Macrophytes (Large Aquatic Plants)

Macrophyte surveys were conducted in 1996, 1999, 2002, 2005, 2007, 2008, 2009, 2010, and 2011 at Lake Jane. Point intercept surveys were also performed in 2012, 2013, and 2014. The VBWD collects macrophyte data to identify the conditions of plant growth throughout the lake. Macrophytes are the primary producers in the aquatic food chain, converting the basic chemical nutrients in water...
and soil into plant matter through photosynthesis, which becomes food for all other aquatic life. While macrophytes can negatively impact the recreational use of a water body, they are critical to the ecosystem as fish and wildlife habitat. Appendix C-5.9 includes macrophyte survey information and point intercept survey results.

A healthy, diverse plant community was found along the lake’s periphery, and no aquatic plants were found in the lake where water depths exceeded approximately 18 feet. All macrophyte surveys of Lake identified a variety of submerged, floating, and emergent aquatic plants, and many species were observed in every survey, indicating a stable population. The maximum depth of plant growth and the number of species observed in Lake Jane has increased over time. Plants grew to depths of twelve to fourteen feet during 1996, thirteen to fifteen feet during 1999, fifteen to seventeen feet during 2002, and eighteen to twenty feet in 2005. From fifteen to seventeen species were observed in 1996, eighteen to twenty species in 1999, twenty two to twenty three species in 2002, and twenty four to twenty five species in 2005. The increases in maximum depth of plant growth and number of species corresponded to increases in the lake’s average summer Secchi disc water transparency. In all surveys, the lake’s macrophyte community included a clean water species, Illinois pondweed (Potamogeton illinoensis). The presence of this species indicates the lake consistently has good water transparency, since it is not able to grow in turbid water (Borman et al., 1997). The lake’s average summer Secchi disc transparency measurements provide confirming evidence of the lake’s good water transparency (see Figure 5.9-3).

Despite the favorable attributes of the lake’s plant community, the growth of three undesirable exotic (non-native) species is of concern:

- Curlyleaf pondweed (Potamogeton crispus)
- Eurasian watermilfoil (Myriophyllum spicatum)
- Purple loosestrife (Lythrum salicaria)

Curlyleaf pondweed (CLP) was not observed during the 1996 and 1999 surveys. This plant was first noted on the north side of the lake during the summer of 2002, and was found during every following survey except August 16, 2010. Its absence in this survey is probably due to the fact that CLP begins growing in late August, grows throughout the winter at a slow rate, grows rapidly in the spring, and dies in early summer. Growth densities in all the surveys after 2002 ranged from light to heavy and the plant was found all the way around the lake. Once a lake becomes infested with curlyleaf pondweed, this plant typically displaces native vegetation, thereby increasing its coverage and density. Native plants that grow from seed in the spring are unable to grow in areas already occupied by curlyleaf pondweed, and are replaced by this plant. Curlyleaf pondweed die-off in early summer releases phosphorus to the lake, causing increased algal growth for the remainder of the summer. Hence, curlyleaf pondweed density increases may degrade the lake’s water quality.

Despite its constant presence in Lake Jane, CLP is not currently “acting invasively.” It is consistently present in surveys, but its average density has been low and it has been frequently found mixed with
other aquatic plants which prevent it from dominating the lake bottom. The proposed strategy for dealing with CLP is monitoring its population and instituting active management techniques only if its density or dominance of native species becomes problematic.

Eurasian watermilfoil (EWM) was observed in Lake Jane for the first time in 2012. EWM frequency in Lake Jane has steadily increased since 2012. In 2014, EWM was observed at 19 percent of locations sampled in Lake Jane, especially along the east side of the lake. The significant increase in EWM distribution was accompanied by a significant increase in density. The VBWD is providing technical assistance to the City of Lake Elmo for a possible herbicide treatment of EWM in Lake Jane in 2015 (Barr, 2014).

Purple loosestrife was first noted along the southwest corner of the lake during June of 1999. This plant was again observed during August 1999, June 2002, August 2002, June 2005, and August 2005. In addition to the southwest corner of the lake, purple loosestrife was also noted on the south side of the lake in 2005. Purple loosestrife was observed in all the surveys conducted from 2007 to 2012, most commonly around the boat landing. Like CLP, this plant typically eventually replaces native vegetation and rapidly becomes the sole emergent species. Purple loosestrife can be effectively managed through the use of leaf-eating beetles, which reduce plant growth and seed production by feeding on the leaves and new shoots. VBWD received permission from the MDNR to release beetles at the Lake Jane boat launch in the spring of 2013; this strategy is recommended for future use if purple loosestrife continues to grow around the boat landing, or if it spreads to other areas of the lake. In 2014, the VBWD’s consultant performed hand-harvesting of purple loosestrife in Lake Jane.

The VBWD will continue to provide technical assistance to entities seeking to manage aquatic invasive species.

5.9.2.4.3 Phytoplankton (Non-Rooted, Floating Plants - Algae) and Zooplankton (Microscopic Aquatic Animals)

The VBWD collected phytoplankton and zooplankton samples from Lake Jane in 1999, 2002, and 2005. Appendix D-5.9 and Appendix E-5.9 present the survey results. Phytoplankton derive energy from sunlight and use nutrients dissolved in lake water. They provide food for several types of animals, including zooplankton, which in turn are eaten by fish. A phytoplankton population in balance with the lake’s zooplankton population is ideal for fish production. An inadequate phytoplankton population reduces the lake’s zooplankton population and adversely impacts the growth of the lake’s fishery. However, excess phytoplankton, especially blue-green algae, can interfere with recreational usage of a lake and is considered problematic.

The numbers of phytoplankton observed in Lake Jane during sampling years were adequate to support the lake’s zooplankton community, yet low enough (less than 15,000 individuals per mL at peak) to confirm the lake’s low nutrient level and excellent water transparency. The appearance of Bacillariophyta (diatoms) in mid-summer helps support the fish population, as these phytoplankton
are a preferred food source over green or blue-green algae. Lake Jane algal species, community composition, and seasonal changes are considered typical for a Minnesota lake in this region.

Lake Jane’s zooplankton community is diverse and consists of three common types: rotifera, copepoda, and cladocera. In the early season (June through August) the population is dominated by small-bodied forms, namely rotifera. While these animals provide food for the lake’s panfish community, they are unable to control the lake’s algae community due to their small size. During 1999, 2002, and 2005, two large-bodied species, Daphnia pulex and Daphnia galeata mendotae were present, comprising from 0 to 12.8 percent of the zooplankton community. The large size of these species enables them to control the lake’s algae community when sufficient numbers occur in the lake. The data suggest these species exert some limited control over the algae community during a portion of the summer. However, their numbers are generally too low to completely control the lake’s algae community. Because fish predation generally determines the numbers of large- and small-bodied zooplankters in a lake, increasing the numbers of large-bodied zooplankters is unrealistic. Because zooplankton grazing will only occasionally exert some control over the lake’s algae community, phosphorus loading generally determines Lake Jane’s algae community. Hence, phosphorus management will provide the best management measures for the lake’s phytoplankton community.

5.9.3 Water Quantity Management Plan

1. The VBWD will continue to inspect, maintain, and operate the Lake Jane, Deer Pond, and Crombie Pond outlet structures. These outlet structures are part of Project 1007 (see Section 4.7.5). As approved by the MDNR, the VBWD can lower the discharge elevation of Lake Jane and Crombie Pond by a maximum of 2 feet and 1.5 foot, respectively, by removing stoplogs. Stoplogs can only be removed between February 15 and April 15 and if the water content of the snowpack is greater than 3 inches. Details regarding the operation of Project 1007 are presented in Section 4.7.7. Appendix F-5.9 includes the operation plans for these outlets.

2. The VBWD will continue to monitor Lake Jane water levels at approximately monthly intervals and supply the information to the MDNR. The VBWD will include the water level measurements in its annual report, which is posted to the VBWD’s website.

5.9.3.1 Drainage Patterns, Water Levels and Outlet Information

An approximate 460-acre portion of the local tributary area located between Lake Jane and T.H. 36 acts as a semi-landlocked basin under normal hydrologic conditions. Land use in the area includes the Fox Fire Estates, Springborn’s Green acres, and Lake Jane Estates developments, along with undeveloped land just south of T.H. 36. During wet periods, water in this area flows south, overflowing a series of water bodies and wetlands and eventually reaching a pond north of Jane Road North, west of the extension of Jamaca Avenue North. This pond has no constructed outlet, but overflows Jane Road North at Elevation 940.2. At the time of the Fox Fire Estates and Springborn’s
Green acres developments, a pipe outlet was proposed from this pond to Lake Jane. However, VBWD did not allow the outlet to be constructed, so the road overflow is the pond outlet. During design of Project 1007, this area was considered to be tributary to Lake Jane, assuming existing outlet conditions (i.e., overtopping of the road). However, no discharge from the area has been observed, which indicates that seepage from the ponds has been enough to dissipate the runoff from the watershed. If overflow from the watershed were to occur, it could have an impact on the water quality of Lake Jane.

A 1978 plan prepared for the City of Lake Elmo proposed a storm drainage system for the area. Part of the plan included a lift station to carry water from the pond north of Jane Road North to the large MDNR-protected wetland (#82-0100W) located southwest of 55th Avenue North and Jamaca Avenue North. From there, water would discharge westerly through two ponds, eventually reaching Lake DeMontreville. The proposed system was to operate as a low-flow bypass, with higher flows discharging to Lake Jane. Such a system would preserve Lake Jane water quality by diverting runoff from developed areas under normal conditions. However, VBWD will not pursue such an option because of the potential water quantity and water quality impacts to Lakes DeMontreville and Olson.

Figure 5.9-4 shows historic Lake Jane water levels from 1968 to the present. The VBWD began monitoring lake water levels in 1969. In August, 1986, Lake Jane reached Elevation 927.4, a record high. The flooding which occurred as a result of the high water in the early to mid-eighties caused approximately a million dollars in property value reduction on Lake Jane.

18 homes were located within the floodplain of Lake Jane, Hedges Bog, Hedges Pond, Deer Pond and Crombie. Because Lake Jane had no natural outlet, large long-term fluctuations occurred in the lake level. Analyses indicated that the 100-year flood level without pumping was Elevation 932. In 1979, the Managers of VBWD installed a small pump and pipeline on the south shore of Lake Jane to alleviate high water levels. Water was pumped from Lake Jane to City Park Pond every year until 1987, with the exception of 1980. This pumping project was called Project 1005.

The construction of an outlet from Lake Jane in 1987, as part of Project 1007, lowered the VBWD 100-year flood elevation from 932.0 to 926.0 (NGVD29 datum). The Federal Emergency Management Agency (FEMA) 100-year floodplain is Elevation 925 (NAVD88 datum). The MDNR ordinary high water (OHW) level for Lake Jane is Elevation 924 (NGVD29 datum). Water from Lake Jane flows to Hedges Bog and Hedges Pond via ditches. Figure 5.9-5 presents the drainage paths. The Lake Jane outlet structure controls the water level on Lake Jane, Hedges Bog and Hedges Pond. The outlet structure is shown on Figure 5.9-6. It consists of 30-inch diameter pipes into and out of the control structure and is located approximately 20 feet north of the old outlet pipe. A 66-inch diameter manhole located in Deer Pond Trail contains the control structure, which consists of a weir and stoplogs. The top of the stoplogs is at Elevation 922.35 (NGVD29 datum). Stop logs can be removed according to an MDNR-approved operation plan, but only when snowmelt runoff greater than three inches is anticipated. The maximum allowable drawdown is to Elevation 920.3.
From Hedges Pond, water flows in a 30-inch diameter pipe in Deer Pond Trail, combines with the Deer Pond outflow near the intersection of Jack Pine Trail and Deer Pond Trail, and discharges to the northwest shore of Crombie Pond (see Figure 5.9-5). The Crombie Pond outlet includes 30-inch diameter pipes into and out of an 8-foot diameter control structure located in Lake Jane Trail (42nd Street North), west of Irish Court. The outlet structure is shown on Figure 5.9-7. A weir and stop logs control the outflow from the pond. The top of the stoplogs are at Elevation 921.5 (NGVD29 datum). According to an MDNR-approved operating plan, the stoplogs can be removed only when snowmelt runoff greater than three inches is anticipated. The maximum allowable drawdown is to Elevation 919.0.

A fish barrier was originally installed at the Crombie Pond outlet. The barrier was required by the MDNR and intended to prevent carp from swimming upstream from Eagle Point Lake. In 2002, and in other years, the barrier plugged frequently with weeds. When the barrier plugged, water would be kept about 10 inches higher than the intended outlet elevation in Crombie Pond and almost back up into Lake Jane. Residents adjacent to Crombie Pond complained frequently to the VBWD about the high water levels of the pond. The VBWD investigated carp swimming habitats and consulted with the MDNR regarding potential removal of the barrier. The DNR and VBWD concluded that it would be highly unlikely for carp to swim from south of T.H. 5, up the shallow water or deeper faster-flowing water within about a mile of pipe, and reach Lake Jane. Therefore, with permission from the MDNR, the VBWD removed the fish barrier from the Crombie Pond outlet in the fall of 2002.

### 5.9.3.2 Water Quantity Issues

Under normal conditions, Lake Olson water will flow to Deer Pond, Crombie Pond and then to Eagle Point Lake. When flow rates exceed about 13 cubic feet per second (cfs), flow in the Crombie Pond outlet becomes restricted, and water begins to back up. Under these conditions, water will flow from Deer Pond to Lake Jane, as well as to Crombie Pond. As inflow abates, the stored water on Lake Jane will again flow to Deer Pond and out of the Tri-Lakes system. Over large time scales, approximately 80 percent of the discharge from Lake Olson is estimated to bypass Lake Jane.

After the initial drop in water level resulting from construction of VBWD’s Project 1007, Lake Jane’s water level dropped even further because of drought conditions (see Figure 5.9-4). Lake Jane did not reach its discharge elevation again until the spring of 1993. Water levels in 2009 and 2010 were similarly low. In summer 2014, the water level in Lake Jane reached Elevation 923.8, the maximum observed since construction of Project 1007.

After construction of Project 1007, 7 homes in the Lake Jane area remained within the post-construction 100-year floodplain. Five of the homes were on Lake Jane, one was on Deer Pond and the other was on Crombie Pond. All of the homeowners were invited to participate in VBWD’s residual floodproofing program, but only two homeowners on Lake Jane took part in the program. One resident constructed a berm and installed a sump pump, while the other resident had the house raised. Based on the pre-Project 1007 inventory, five homes are still within the 100-year floodplain of Lake Jane, Deer Pond, and Crombie Pond. The 100-year flood elevation of Deer Pond is 926.7.
and the 100-year flood elevation of Crombie Pond is 924.9. Based on Washington County’s 2000 topography, it now appears that there are homes within the 100-year floodplain of Lake Jane, Deer Pond, and Crombie Pond. More recent LiDAR elevation data suggests fewer homes may be in the floodplains, although ground-truthed elevation data is necessary to confirm.

In 2013, the National Oceanographic and Atmospheric Administration (NOAA) published Atlas 14, Volume 8 (see Section 4.7.6). Atlas 14 contains updated precipitation data for Minnesota and supersedes data sources used to establish the VBWD and FEMA 100-year flood elevations for Lake Jane. Over the next several years, the VBWD will update its hydrologic-hydraulic modeling of major subwatersheds, including Lake Jane. Updated modeling will incorporate the most recent precipitation data (see Section 4.7.7) which may increase 100-year flood levels relative to the existing levels.

5.9.4 Other Issues

The former Washington County Landfill is partially located within the Lake Jane watershed. Appendix G-5.9 contains an August 2004 fact sheet that was produced by the MPCA and Minnesota Department of Health (MDH) regarding the site and the discovery of perfluorooctanoic acid (PFOA) in the shallow and deeper groundwater on and around the landfill property. More information is included in Section 4.2.6.3 of this Plan.

5.9.5 References


Borman, S., R. Korth, and J. Temte. 1997. Through the Looking Glass ... A Field Guide to Aquatic Plants. Wisconsin Lakes Partnership (Cooperative Extension of the University of Wisconsin—Extension and the Wisconsin Department of Natural Resources). Stevens Point, WI.

Minnesota Department of Natural Resources. Lake information report (fisheries) from website (www.dnr.state.mn.us/lakefind/showreport.html?downum=82010400).

Figure 5.9-2
LAKE JANE WATERSHED
CURRENT (2010) AND FUTURE (2030) LANDUSE

2015-2025 Watershed Management Plan
Valley Branch Watershed District

Current (2010) Land Use
- Farmstead
- Seasonal/Vacation
- Single Family Detached
- Manufactured Housing Park
- Single Family Attached
- Multifamily
- Retail and Other Commercial
- Office
- Mixed Use Residential
- Mixed Use Industrial
- Mixed Use Commercial and Other
- Industrial and Utility
- Extractive
- Institutional
- Park, Recreational or Preserve
- Other
- Undeveloped
- Water

Future (2030) Land Use
- Agricultural
- Rural or Large-Lot Residential
- Single Family Residential
- Multifamily Residential
- Commercial
- Industrial
- Institutional
- Mixed Use
- Multi-Optional Development
- Park and Recreation
- Open Space or Restrictive Use
- Rights-of-Way (i.e., Roads)
- Vacant or Unknown
- Open Water

1 inch = 2,000 feet
Figure 5.9-3

Lake Jane Water Quality
2015 - 2025 Watershed Management Plan
Valley Branch Watershed District
LAKE JANE WATER LEVELS
2015 - 2025 Watershed Management Plan
Valley Branch Watershed District

Figure 5.9-4

Elevations in NGVD29 datum

Date


Elevation (ft, MSL)

936
934
932
930
928
926
924
922
920
918

Water Level
100-Year Flood Level
Discharge Elevation

Project 1007 Completed
Spring Drawdowns
LAKE JANE OUTLET FLOW PATH

Valley Branch Watershed District
Figure 5.9-6

LAKE JANE OUTLET
Valley Branch Watershed District

T.C. ELEVATION 327.8
327.7

MnDOT 4020 COVER

NOTES:
1. STEPS NOT SHOWN
2. APPLY EPOXY BONDING AGENT TO ALL WEIR — PRECAST JOINTS

SEE 12/26

TOP OF STOPLOGS 922.35

3. #4 BARS SPACE AS SHOWN E.F.

#4 BARS AT 16" O.C.E.F.

30" RCP
INV. EL. 918.0

2" CL. (TYP)

30" RCP
OFFSET FOR CLARITY
INV. EL. 918.0

SECTION: STRUCTURE 10
SCALE: 1/2" = 1'-0"
Figure 5.9-7

CROMBIE POND OUTLET
Valley Branch Watershed District
Appendix A-5.9 Additional Water Quality Information
Appendix A-5.9 Additional Water Quality Information

MINLEAP Modeling

The Minnesota Lake Eutrophication Analysis Procedure (MINLEAP) is intended to be used as a screening tool for estimating lake conditions and for identifying “problem” lakes. MINLEAP is particularly useful for identifying lakes requiring “protection” versus those requiring “restoration” (Heiskary and Wilson, 1990). In addition, MINLEAP modeling by has been done in the past to identify Minnesota lakes which may be in better or worse condition than they “should be” based on their location, watershed area and lake basin morphometry (Heiskary and Wilson, 1990).

Results of MINLEAP modeling done for Lake Jane in 2000 by the VBWD suggest that the lake should experience “worse” water quality than is currently observed. MINLEAP predicts a growing season mean total phosphorus concentration of approximately 40 µg/L versus 9–24 µg/L (observed from 2004 to 2013); a chlorophyll a concentration of approximately 14 µg/L versus 2–5 µg/L (observed from 2004 to 2013); and summer average transparency of 1.6 meters versus 3.6–5.1 meters (observed from 2004 to 2013). The predicted phosphorus concentration has a standard error of 15 µg/L, which indicates that the MPCA’s water quality standard for total phosphorus is within the range of what is realistically attainable for Lake Jane.

Vighi and Chiaudani Method

Vighi and Chiaudani (1985) developed another method to determine the phosphorus concentration in lakes that are not affected by anthropogenic (human) inputs. As a result the phosphorus concentration in a lake resulting from natural, background phosphorus loadings can be calculated from information about the lake’s mean depth and alkalinity or conductivity. Alkalinity is considered more useful for this analysis because it is less influenced by the modifying effect of anthropogenic inputs.

Based on the method developed by Vighi and Chiaudani using the long-term average alkalinity values from the deep basin of Lake Jane, the predicted phosphorus concentration from natural, background loadings should be 21 µg/L. This predicted concentration is somewhat lower than the MPCA’s water quality standard for total phosphorus concentration in Lake Jane and indicates that this goal is attainable, and maintainable as evidenced by the water quality data collected from the last ten years.
Appendix B-5.9  Additional Fishery Information
Appendix B-5.9 Additional Fishery Information

Lake Jane is managed by the Minnesota Department of Natural Resources primarily for largemouth bass with bluegill as a secondary species. Extensive management of the lake’s fishery has been conducted since 1986. An experimental regulation requiring the release of largemouth bass between 12 and 16 inches was in effect from 1986 through 1993. The goal of this regulation was to reduce the harvest of largemouth bass and thereby improve bluegill size structure through predation. Annual trapnetting and electrofishing were conducted to evaluate the effect of the regulation. The largemouth bass and bluegill populations did not respond as anticipated and the regulation was discontinued in 1993. In 1997, a new experimental regulation took effect requiring the release of all largemouth bass. The regulation is scheduled to end, pending review, on March 1, 2006. The objective of this regulation is to maintain the catch of 16 inch or longer largemouth bass at 40 percent or higher of the spring electrofishing catch. This regulation is part of a statewide research effort. Annual spring electrofishing in conjunction with this regulation has been conducted from 1994 to 1998 and will continue.

The 1998 electrofishing catch rate was down from 1997, but was the second highest catch rate on record. A total of 76 largemouth bass were captured in 1998 at a rate of 70.2/hour. This was down from the 1997 high of 97.0/hour, and just above the pre-1997 spring range (44.3/hour to 67.6/hour; n=3). Summer electrofishing conducted from 1986 to 1991 showed an increase in catch rate from 17.3/hour to 48.0/hour.

Lengths of largemouth bass captured in 1998 ranged from 7.5 to 19 inches with an 11.4 inch average. One third of the catch was over 12 inches, but only 7 percent were over 16 inches. Size structure of the electrofishing bass sample has been declining since 1995.

The MDNR’s 1994 fishery survey identified the following:

- The fish population was dominated by largemouth bass and sunfish;
- Bluegill and hybrid sunfish numbers were very high, with most fish small in size;
- Largemouth bass were present in a variety of sizes and ages, with good numbers of larger fish available to anglers;
- Northern pike numbers were lower than in previous years, and their reduced predation on yellow perch has caused numbers to increase;
- Brown and yellow bullheads were present in good numbers, with a number of fish weighing over a pound;
- White sucker, black crappie, pumpkinseed, and green sunfish were all present in low numbers.

The MDNR’s 2013 fishery survey identified the following:
• In 2013, the gill net catch rate for Northern Pike (NOP) decreased from 24.67 fish/set in 2007 to 19.25 fish/set. The average size of gill net sampled NOP was 18.87 inches and 1.63 pounds. Only 7.69 percent of all NOP captured in both gill and trap nets measured 26.0 inches or longer, with the largest fish captured measuring 35.28 inches.

• The electrofishing catch rate for Largemouth Bass (LMB) increased from the 2007 assessment. The average size LMB captured by electrofishing was 12.37 inches and 1.20 pounds. The proportion of LMB sampled over 16.0 inches increased from 5.6 percent in 2007 to 18.5 percent in 2013.

• Bluegill (BLG) trap net abundance exceeded the median level for trap nets. The average size of BLG sampled in trap nets was 5.64 inches and 0.12 pounds.

• Black Crappies (BLC) were sampled below the median abundance levels for both gill and trap net with an average size of BLC captured measuring 7.36 inches and 0.22 pounds.
Appendix C-5.9 Additional Macrophyte Information
Aquatic Vegetation: portions of lake have been treated to kill off macrophytes. *Potamogeton crispus* was present, only dead plant observed.

- **Submerged Aquatic Plants:**
  - Illinois pondweed
  - Large-leaf pondweed
  - Clasping pondweed
  - Flatstem pondweed
  - Rubbin’s pondweed
  - Sago pondweed
  - Northern water milfoil
  - Elodea
  - Coontail
  - Muskgrass

- **Floating Leaf:**
  - White water lily
  - Water smartweed

- **Emergent:**
  - Cattail
  - Bulrush
  - Arrowhead

- **No Aquatic Vegetation Found:**

*Macrophyte Densities Estimated as Follows: 1 = light; 2 = moderate; 3 = heavy*
Aquatic Vegetation: portion of lake have been treated to kill off macrophytes. Potamogeton crispus was present, only dead plant observed.

Submerged Aquatic Plants:
- Water stargrass
- Illinois pondweed
- Large-leaf pondweed
- Clasping pondweed
- Flatstem pondweed
- Robbin’s pondweed
- Northern water milfoil
- Elodea
- Coontail
- Muskgrass

Floating Leaf:
- White water lily
- Water smartweed

Emergent:
- Spikerush
- Cattail
- Bulrush
- Arrowhead

No Aquatic Vegetation Found:

Macrophyte Densities Estimated as Follows: 1 = light; 2 = moderate; 3 = heavy

Ceratophyllum demersum 1-2
Myriophyllum sibiricum 1
Potamogeton illinoensis 1-2
Potamogeton amplifolius 1-2
Potamogeton robbinsii 1-2
Chara spp.
Zosterella dubia 1
Myriophyllum sibiricum 1
Potamogeton pectinatus 1
Potamogeton zosteriformis 1
Potamogeton robbinsii 1
Myriophyllum sibiricum 1
Nymphaea tuberosa

Approximate Scale in Feet
Aquatic Vegetation: portion of lake have been treated to kill off macrophytes. *Potamogeton crispus* was present, only dead plant observed.

### Submerged Aquatic Plants:
- **Illinois pondweed**
- **Large-leaf pondweed**
- **Clasping pondweed**
- **Flatstem pondweed**
- **Robbin's pondweed**
- **Sago pondweed**
- **Northern water milfoil**
- **Elodea**
- **Coontail**
- **Muskgrass**
- **Water stargrass**
- **Wild celery**

### Floating Leaf:
- **White water lily**
- **Water smartweed**

### Emergent:
- **Cattail**
- **Bulrush**
- **Arrowhead**
- **Purple loosestrife**

### No Aquatic Vegetation Found:

- **No Macrophytes Found in Water > 13.0’ - 15.0’**
- **Macrophyte Densities Estimated as Follows: 1 = light; 2 = moderate; 3 = heavy**

**Submerged Aquatic Plants:**
- *Potamogeton illinoensis*
- *Potamogeton amplifolius*
- *Potamogeton richardsonii*
- *Potamogeton zosteriformis*
- *Potamogeton robbinsii*
- *Potamogeton pectinatus*
- *Myriophyllum sibiricum*
- *Elodea canadensis*
- *Ceratophyllum demersum*
- *Chara spp.*
- *Vallisneria Americana*

**Floating Leaf:**
- *Nymphaea tuberosa*
- *Polygonum spp.*

**Emergent:**
- *Typha spp.*
- *Sagittaria spp.*
- *Lythrum salicaria.*

**No Aquatic Vegetation Found:**
- *Zosterella dubia*
No Macrophytes Found in Water > 13.0' - 15.0'
Macrophyte Densities Estimated as Follows: 1 = light; 2 = moderate; 3 = heavy

Submerged Aquatic Plants:
- Illinois pondweed
- Large-leaf pondweed
- Clasping pondweed
- Flattens pondweed
- Robbins' pondweed
- Sago pondweed
- Northern water milfoil
- Elodea
- Coontail
- Muskgrass
- Water stargrass
- Wild celery
- Bushy pondweed and naiad

Floating Leaf:
- White water lily
- Little yellow water lily
- Water smartweed

Emergent:
- Cattail
- Bulrush
- Arrowhead
- Purple loosestrife

No Aquatic Vegetation Found:
No Macrophytes Found in Water > 15.0 - 17.0 Feet

Macrophyte Densities Estimated as Follows: 1 = light; 2 = moderate; 3 = heavy

**Submerged Aquatic Plants:**
- Curlyleaf pondweed
- Illinois pondweed
- Large-leaf pondweed
- Clasping pondweed
- Flatstem pondweed
- Robbins' pondweed
- Sago pondweed
- Northern water milfoil
- Elodea
- Coontail
- Muskgrass
- Water stargrass
- Wild celery
- Buttercup

**Floating Leaf:**
- White water lily
- Little yellow water lily
- Nymphaea tuberosa
- Nuphar microphyllum

**Emergent:**
- Water smartweed
- Cattail
- Bulrush
- Arrowhead
- Purple loosestrife
- Spikerush

**No Aquatic Vegetation Found:**
LAKE JANE
MACROPHYTE SURVEY
AUGUST 23, 2002
- No macrophytes found in water > 18.0 - 20.0 feet
- Macrophyte densities estimated as follows: 1 = light; 2 = moderate; 3 = heavy
- Nitella sp. found at depth ~20 feet

Area marked with *sagittaria* sp. are general locations of submerged beds of growth.

### Submerged Aquatic Plants:

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Curlyleaf pondweed</td>
<td><em>Potamogeton crispus</em></td>
</tr>
<tr>
<td>Illinois pondweed</td>
<td><em>Potamogeton illinoensis</em></td>
</tr>
<tr>
<td>Large-leaf pondweed</td>
<td><em>Potamogeton amplifolius</em></td>
</tr>
<tr>
<td>Clasping pondweed</td>
<td><em>Potamogeton richardsonii</em></td>
</tr>
<tr>
<td>Flatstem pondweed</td>
<td><em>Potamogeton zosteriformis</em></td>
</tr>
<tr>
<td>Robbit's pondweed</td>
<td><em>Potamogeton robbinsii</em></td>
</tr>
<tr>
<td>Northern water milfoil</td>
<td><em>Myriophyllum sibiricum</em></td>
</tr>
<tr>
<td>Elodea</td>
<td><em>Elodea canadensis</em></td>
</tr>
<tr>
<td>Coontail</td>
<td><em>Ceratophyllum demersum</em></td>
</tr>
<tr>
<td>Muskgrass</td>
<td><em>Chara sp.</em></td>
</tr>
<tr>
<td>Water stargrass</td>
<td><em>Zosterella dubia</em></td>
</tr>
<tr>
<td>Wild celery</td>
<td>* Vallisneria americana*</td>
</tr>
<tr>
<td>Buttercup</td>
<td><em>Ranunculus sp.</em></td>
</tr>
<tr>
<td>Stonewort</td>
<td><em>Nitella sp.</em></td>
</tr>
</tbody>
</table>

### Floating Leaf:

- White water lily
- Little yellow water lily
- Water smartweed

### Emergent:

- Cattail
- Bulrush
- Arrowhead
- Purple loosestrife
- Spikerush
- Common bur-reed
- Soft stem bulrush

### No Aquatic Vegetation Found:
No macrophytes found in water > 18.0 - 20.0 feet
Macrophyte densities estimated as follows: 1 = light; 2 = moderate; 3 = heavy
Nitella sp. found at depth ~20 feet
Area marked with sagittaria sp. are general locations of submerged beds of growth.
**Legend**

- **Emergent Plants**
- **Floating Leaf Plants**
- **Submerged Aquatic Plants**
- **No Aquatic Vegetation**

**Common Name**
- **Emergent Plants**
  - arrowhead
  - bulrush
  - cattail
  - common bur-reed
  - hardstem bulrush
  - purple loosestrife
  - softstem bulrush
  - spikerush

**Scientific Name**
- Sagittaria sp.
- Carex sp.
- Scirpus sp.
- Sparganium eurycarpum
- Scirpus acutus
- Lythrum salicaria
- Scirpus validus
- Eleocharis sp.

**Common Name**
- **Floating Leaf Plants**
  - white waterlily
  - Nuphar microphyllum
  - Brasenia schreberi
  - Nymphaea tuberosa

**Scientific Name**
- Potamogeton illinoensis
- Myriophyllum sibiricum
- Potamogeton crispus
- Sparganium eurycarpum

**Common Name**
- **Submerged Aquatic Plants**
  - Canada waterweed

**Scientific Name**
- Potamogeton richardsonii
- Potamogeton robbinsii
- Potamogeton zosteriformis
- Potamogeton amplifolius
- Chara sp.

**Common Name**
- **No Aquatic Vegetation**

**Legend**
- Lake Jane Macrophyte Survey Results
- June 4, 2008
- Valley Branch Watershed District

**Field Notes:**
- Macrophyte densities estimated as follows:
  - 1=light; 2=moderate; 3=heavy
  - Densities generally not noted for emergent and floating leaf plants
  - No macrophytes found in water >18-20’
  - Areas marked with Sagittaria sp. are general locations of submerged beds of growth
  - Algal blooms are observed throughout lake

**Survey Results**

**June 4, 2008**

**Valley Branch Watershed District**
**Field Notes:**
- Potamogeton robbinsii - degraded
- Macrophyte densities estimated as follows: 1=light; 2=moderate; 3=heavy
- Densities generally not noted for emergent and floating leaf plants
- No macrophytes found in water >18-20’
- Nitella sp. found at depth ~20ft
- Areas marked with Sagittaria sp. are general locations of submerged beds of growth
- Algal blooms are observed throughout lake
- Low water level

**Legend:**
- Emergent Plants
- Floating Leaf Plants
- Submerged Aquatic Plants
- No Aquatic Vegetation

**Common Name** | **Scientific Name**
--- | ---
White-Stem pondweed | Potamogeton praelongus
Richardson’s pondweed | Potamogeton richardsonii
Robbins’ pondweed | Potamogeton robbinsii
coontail | Ceratophyllum demersum
curlyleaf pondweed | Potamogeton crispus
flatstem pondweed | Potamogeton zosteriformis
largeleaf pondweed | Potamogeton amplifolius
muskgrass | Chara sp.
northern watermilfoil | Myriophyllum sibiricum
sago pondweed | Potamogeton pectinatus
water crowfoot | Potamogeton illinoensis
water stargrass | Zosterella dubia
wild celery | Vallisneria americana
Canada waterweed | Elodea canadensis

**Legend:**
- Emergent Plants
- Floating Leaf Plants
- Submerged Aquatic Plants
- No Aquatic Vegetation

**Common Name** | **Scientific Name**
--- | ---
little yellow pondlily | Nuphar microphyllum
watershield | Brasenia schreberi
white waterlily | Nymphaea tuberosa
smartweed | Polygonum sp.
arrowhead | Sagittaria sp.
bulrush | Scirpus sp.
cattail | Typha sp.
common bur-reed | Sparganium eurycarpum
hardstem bulrush | Scirpus acutus
purple loosestrife | Lythrum salicaria
softstem bulrush | Sparganium eurycarpum
spikerush | Eleocharis sp.

**Legend:**
- Emergent Plants
- Floating Leaf Plants
- Submerged Aquatic Plants
- No Aquatic Vegetation

**Common Name** | **Scientific Name**
--- | ---
arrowhead | Sagittaria sp.
bulrush | Scirpus sp.
cattail | Typha sp.
common bur-reed | Sparganium eurycarpum
hardstem bulrush | Scirpus acutus
purple loosestrife | Lythrum salicaria
softstem bulrush | Sparganium eurycarpum
spikerush | Eleocharis sp.

**Field Notes:**
- Potamogeton robbinsii - degraded
- Macrophyte densities estimated as follows: 1=light; 2=moderate; 3=heavy
- Densities generally not noted for emergent and floating leaf plants
- No macrophytes found in water >18-20”
- Nitella sp. found at depth >20ft
- Areas marked with Sagittaria sp. are general locations of submerged beds of growth
- Algal blooms are observed throughout lake
- Low water level

**Lake Jane Macrophyte Survey Results**
May 26, 2009
Valley Branch Watershed District
Lythrum salicaria
Nymphaea tuberosa
Nuphar microphyllum
Brasenia schreberi
Typha sp.
Lythrum salicaria
Sagittaria sp.
Nuphar microphyllum
Nymphaea tuberosa
Ranunculus sp.
Elodea canadensis
Myriophyllum sibiricum
Chara sp.
Potamogeton amplifolius
Potamogeton zosteriformis
Potamogeton praelongus
Potamogeton richardsonii
Potamogeton robbinsii
Potamogeton amplifolius
Chara sp.
Potamogeton praelongus
Potamogeton crispus
Potamogeton zosteriformis
Potamogeton amplifolius
Chara sp.
Potamogeton praelongus
Potamogeton crispus
Potamogeton zosteriformis
Potamogeton amplifolius
Chara sp.
Potamogeton praelongus
Potamogeton crispus
Potamogeton zosteriformis
Potamogeton amplifolius
Chara sp.
Potamogeton praelongus
Potamogeton crispus
Potamogeton zosteriformis
Potamogeton amplifolius
Chara sp.
Potamogeton praelongus
Potamogeton crispus
Potamogeton zosteriformis
Potamogeton amplifolius
Chara sp.
Potamogeton praelongus
Potamogeton crispus
Potamogeton zosteriformis
Potamogeton amplifolius
Chara sp.
Potamogeton praelongus
Potamogeton crispus
Potamogeton zosteriformis
Potamogeton amplifolius
Chara sp.
Potamogeton praelongus
Potamogeton crispus
Potamogeton zosteriformis
Potamogeton amplifolius
Chara sp.
Potamogeton praelongus
Potamogeton crispus
Potamogeton zosteriformis
Potamogeton amplifolius
Chara sp.
Potamogeton praelongus
Potamogeton crispus
Potamogeton zosteriformis
Potamogeton amplifolius
Chara sp.
Potamogeton praelongus
Potamogeton crispus
Potamogeton zosteriformis
Potamogeton amplifolius
Chara sp.
Potamogeton praelongus
Potamogeton crispus
Potamogeton zosteriformis
Potamogeton amplifolius
Chara sp.
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Chara sp.
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Potamogeton zosteriformis
Potamogeton amplifolius
Chara sp.
Potamogeton praelongus
Potamogeton crispus
Potamogeton zosteriformis
Potamogeton amplifolius
Chara sp.
Potamogeton praelongus
Potamogeton crispus
Potamogeton zosteriformis
Potential macrophyte species include:

Common Name | Scientific Name
--- | ---
White-Stem pondweed | Potamogeton praelongus
Richardson's pondweed | Potamogeton richardsonii
Robbins' pondweed | Potamogeton robbinsii
coontail | Ceratophyllum demersum
curlyleaf pondweed | Potamogeton crispus
flatstem pondweed | Potamogeton zosteriformis
largeleaf pondweed | Potamogeton amplifolius
muskgrass | Chara sp.
northern watermilfoil | Myriophyllum sibiricum
sago pondweed | Stuckenia pectinata
illinois pondweed | Potamogeton illinoensis
water crowfoot | Ranunculus sp.
water stargrass | Zosterella dubia
wild celery | Vallisneria americana
Canada waterweed | Elodea canadensis
stonewort | Nitella sp.

*Note: Bold red name indicates extremely aggressive or invasive introduced species.

Lake Jane Macrophyte Survey Results
June 3, 2010
Valley Branch Watershed District

Legend
- Emergent Plants
- Floating Leaf Plants
- Submerged Aquatic Plants
- No Aquatic Vegetation

Submerged Aquatic Plants
Emergent Plants
Floating Leaf Plants
Legend

Imagery Source: 2009 AE

FIELD NOTES:
- Macrophyte densities estimated as follows:
  - Light = 1-2; Moderate = 3-10; Heavy >10
  - Densities generally noted for emergent and floating leaf plants
  - Potamogeton richardsonii - degraded
  - No macrophytes found in water >18-20'
  - Nitella sp. found at depth ~20 ft
  - Areas marked with Sagittaria sp. are general locations of submerged beds of growth
  - Algal blooms observed throughout lake
  - Low water level
**Lake Jane Macrophyte Survey Results**

**August 16, 2010**

Valley Branch Watershed District

---

**Legend**

- **Emergent Plants**
- **Floating Leaf Plants**
- **Submerged Aquatic Plants**
- **No Aquatic Vegetation**

---

**Common Name**

- **Arrowhead**
  - Sagittaria sp.
  - Scirpus sp.
  - Typha sp.
  - Sagittaria american

- **Cattail**
  - Typha latifolia

- **Common Bur-reed**
  - Sparganium eurycarpum
  - Schoenoplectus acutus

- **Coneflower**
  - purple loosestrife

- **Softstem Bulrush**
  - Typha sp.

- **Spike rush**
  - Eleocharis sp.

- **Water Lily**
  - Nuphar lutea

- **White Stem Pondweed**
  - Potamogeton praelongus

- **Richardson’s Pondweed**
  - Potamogeton richardsonii

- **Robbins’ Pondweed**
  - Potamogeton robbinsii

- **Cootail**
  - Callitriche stagnalis

- **Fat Stem Pondweed**
  - Potamogeton zosteriformis

- **Largae Pentweed**
  - Potamogeton amplifolius

- **Musk Grass**
  - Carex sp.

- **Northern Watermilfoil**
  - Potamogeton illinoensis

- **Sago Pondweed**
  - Potamogeton zosteriformis

- **Water Crowfoot**
  - Ranunculus aquatilis

- **Water Stargrass**
  - Carex sp.

- **Wild Celery**
  - Elodea canadensis

- **Canada Waterweed**
  - Potamogeton richardsonii

- **Bushy Pondweed**
  - Potamogeton richardsonii

- **Stonewort**
  - Nitella sp.

- **Water Starwort**
  - Nitella sp.

- **Waterweed**
  - Najas sp.

- **Wild Celery**
  - Elodea canadensis

**Scientific Name**

- **Potamogeton praelongus**
- **Potamogeton richardsonii**
- **Potamogeton robbinsii**
- **Carex sp.**
- **Potamogeton zosteriformis**
- **Potamogeton amplifolius**
- **Ranunculus aquatilis**
- **Potamogeton zosteriformis**
- **E. canadensis**

**Submerged Aquatic Plants**

- **Lythrum salicaria**
- **Nymphaea tuberosa**
- **Brasenia schreberi**
- **Potamogeton richardsonii**
- **Myriophyllum sibiricum**
- **Chara sp.**
- **Potamogeton amplifolius**
- **Zostera sp.**
- **Myriophyllum sibiricum**
- **Potamogeton amplifolius**
- **Ranunculus sp.**
- **Potamogeton richardsonii**
- **Sagittaria sp.**
- **Potamogeton praelongus**
- **Chara sp.**
- **Potamogeton amplifolius**
- **Ranunculus sp.**
- **Potamogeton praelongus**
- **Chara sp.**
- **Potamogeton praelongus**
- **Ranunculus sp.**
- **Potamogeton praelongus**
- **Najas sp.**
- **Nitella sp.**

**Floating Leaf Plants**

- **Lythrum salicaria**
- **Nymphaea tuberosa**
- **Brasenia schreberi**
- **Potamogeton richardsonii**
- **Myriophyllum sibiricum**
- **Chara sp.**
- **Potamogeton amplifolius**
- **Zostera sp.**
- **Myriophyllum sibiricum**
- **Potamogeton amplifolius**
- **Ranunculus sp.**
- **Potamogeton richardsonii**
- **Sagittaria sp.**
- **Potamogeton praelongus**
- **Chara sp.**
- **Potamogeton praelongus**
- **Ranunculus sp.**
- **Potamogeton praelongus**
- **Najas sp.**
- **Nitella sp.**

**Emergent Plants**

- **Lythrum salicaria**
- **Nymphaea tuberosa**
- **Brasenia schreberi**
- **Potamogeton richardsonii**
- **Myriophyllum sibiricum**
- **Chara sp.**
- **Potamogeton amplifolius**
- **Zostera sp.**
- **Myriophyllum sibiricum**
- **Potamogeton amplifolius**
- **Ranunculus sp.**
- **Potamogeton richardsonii**
- **Sagittaria sp.**
- **Potamogeton praelongus**
- **Chara sp.**
- **Potamogeton praelongus**
- **Ranunculus sp.**
- **Potamogeton praelongus**
- **Najas sp.**
- **Nitella sp.**

---

**Legend Notes:**

- Bold red name indicates extremely aggressive invasive introduced species.

**Survey Results:**

- Macrophyte densities estimated as follows:
  - 1-light; 2-moderate; 3-heavy
  - Densities generally not noted for emergent and floating leaf plants
  - Potamogeton richardsonii - degraded
  - No macrophytes found in water >18-20'
  - Nitella sp. found at depth ~20 ft
  - Areas marked with Sagittaria sp. are general locations of submerged beds of growth
  - Low water level
### Legend
- **Emergent Plants**
- **Floating Leaf Plants**
- **Submerged Aquatic Plants**
- **No Aquatic Vegetation**

### LAKE JANE MACROPHYTE SURVEY RESULTS
June 7, 2011
Valley Branch Watershed District

**Emergent Plants**
- *Amowhead*
- *Bulrush*
- *Cattail*
- *Common bur-reed*
- *Hardstem bulrush*
- *Purple loosestrife*
- *Softstem bulrush*

**Floating Leaf Plants**
- *Brasenia schreberi*
- *Nuphar lutea*
- *Nymphaea odorata*

**Submerged Aquatic Plants**
- *Chara sp.*
- *Myriophyllum sibiricum*
- *Potamogeton amplifolius*
- *Potamogeton crispus*
- *Ranunculus sp.*

### Field Notes:
- Macrophyte densities estimated as follows:
  - 1-light, 2-moderate, 3-heavy
- Densities generally not noted for emergent and floating leaf plants
- No macrophytes found in water >18-20'
- Areas marked with Sagittaria sp. are general locations of submerged beds of growth
- Algal blooms are observed throughout lake

**Imagery Source:** 2009 AE

*Note: Bold red name indicates extremely aggressive/invasive introduced species.*
**Submerged Aquatic Plants**

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
</tr>
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<tbody>
<tr>
<td>Long-leaf pondweed</td>
<td>Potamogeton nodosus</td>
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<tr>
<td>White-stem pondweed</td>
<td>Potamogeton paederus</td>
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<tr>
<td>Richardson’s pondweed</td>
<td>Potamogeton richardsonii</td>
</tr>
<tr>
<td>Robbins’ pondweed</td>
<td>Potamogeton robbinsii</td>
</tr>
<tr>
<td>Coontail</td>
<td>Ceratophyllum demersum</td>
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<td>Curlyleaf pondweed</td>
<td>Potamogeton crispus</td>
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<tr>
<td>Flatstem pondweed</td>
<td>Potamogeton zosteriformis</td>
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<tr>
<td>Largeleaf pondweed</td>
<td>Potamogeton amplifolius</td>
</tr>
<tr>
<td>Muskgrass</td>
<td>Chara sp.</td>
</tr>
<tr>
<td>Northern watermilfoil</td>
<td>Myriophyllum sibiricum</td>
</tr>
<tr>
<td>Sag perted weed</td>
<td>Stuckenia pectinata</td>
</tr>
<tr>
<td>Illinois pondweed</td>
<td>Potamogeton illinoensis</td>
</tr>
<tr>
<td>Water crowfoot</td>
<td>Ranunculus sp.</td>
</tr>
<tr>
<td>Water stargrass</td>
<td>Zostera sp.</td>
</tr>
<tr>
<td>Wild celery</td>
<td>Vallisneria americana</td>
</tr>
<tr>
<td>Canada waterweed</td>
<td>Elodea canadensis</td>
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<tr>
<td>Slender Naiad</td>
<td>Najas sp.</td>
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</table>

**Emergent Plants**

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<tbody>
<tr>
<td>Little yellow pond lily</td>
<td>Nuphar lutea</td>
</tr>
<tr>
<td>Watershield</td>
<td>Brasenia schreberi</td>
</tr>
<tr>
<td>White waterlily</td>
<td>Nymphaea odorata</td>
</tr>
<tr>
<td>Smartweed</td>
<td>Polygonum sp.</td>
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</tbody>
</table>

**Floating Leaf Plants**

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
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<tbody>
<tr>
<td>Arrowhead</td>
<td>Sagittaria sp.</td>
</tr>
<tr>
<td>Bulrush</td>
<td>Scirpus sp.</td>
</tr>
<tr>
<td>Cattail</td>
<td>Typha sp.</td>
</tr>
<tr>
<td>Common bur-reed</td>
<td>Sparganium eurycarpum</td>
</tr>
<tr>
<td>Hardstem bulrush</td>
<td>Schoenoplectus acutus</td>
</tr>
<tr>
<td>Purple loosestrife</td>
<td>Lythrum salicaria</td>
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<tr>
<td>Softstem bulrush</td>
<td>Schoenoplectus tabernaemontani</td>
</tr>
<tr>
<td>Spikerush</td>
<td>Eleocharis sp.</td>
</tr>
</tbody>
</table>

**Legend**

- Emergent Plants
- Floating Leaf Plants
- Submerged Aquatic Plants
- No Aquatic Vegetation

**FIELD NOTES:**

- Macrophyte densities estimated as follows:
  - 1 light, 2 moderate, 3 heavy
  - Densities generally not noted for emergent and floating leaf plants
  - No macrophytes found in water >18-20
  - Areas marked with Sagittaria sp. are general locations of submerged beds of growth
  - Algal blooms are observed throughout lake
  - High water level

**Survey Results**

LAKE JANE MACROPHYTE
August 17, 2011
Valley Branch Watershed District
Figure 19. Lake Jane Eurasian Watermilfoil: June 18, 2012
Figure 20. Lake Jane Curly-leaf Pondweed: June 18, 2012
Curly-leaf pondweed
(Potamogeton crispus)

Aquatic Macrophyte Distribution
Lake Jane
Valley Branch Watershed District
Washington County, MN
June 18, 2012

Aerial Imagery: 2010 MNGeoWMS
Appendix D-5.9 Additional Phytoplankton Information
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1999 Lake Jane
Phytoplankton Data Summary

No. Per Milliliter


CHLOROPHYTA
CHRYSOPHYTA
BACILLARIOPHYTA
CRYPTOPHYTA
CYANOPHYTA
OTHER
Appendix E-5.9 Additional Zooplankton Information
## ZOOPLANKTON IDENTIFICATION (Number per square meter)

Valley Branch Watershed District

**PROJECT #:** 23/82-207 V99 030  
**LAKE:** JANE

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<td>#/m²</td>
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2002 Lake Jane Zooplankton Data Summary

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<th>No. Per Square Meter</th>
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<td>Rotifera: 100,000, Copepoda: 200,000</td>
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Appendix F-5.9 Lake Jane, Deer Pond, and Crombie Pond Outlet Operation Plans
VALLEY BRANCH WATERSHED DISTRICT
OPERATING PLAN FOR
CROMBIE, DEER AND HEDGES' PONDS
AND LAKE JANE
May 25, 1988

INTRODUCTION

This plan is submitted by Valley Branch Watershed District in fulfillment of Condition 18 of Permit 86-6268, issued August 1, 1986. It will set an operating plan for control structures at Crombie Pond and Hedges' Pond. These structures will also control the levels of Deer Pond, Hedges' Bog and Lake Jane.

GOALS

The goals of this operating plan are as follows:

1. To reduce the threat of flooding on Lake Jane and nearby ponds.

2. To prevent Olson Lake outflow from entering Deer Pond and Crombie Pond and to divert the outflow from Deer Pond around Lake Jane.

3. To preserve the aesthetic and habitat values of the ponds.

4. To promote efficient operation of the fish screen at the Crombie Pond outlet.

PROCEDURE

The plan of operation will be adopted tentatively for a period of one year and reviewed at that time before permanent adoption. It will be reviewed thereafter on a two-year basis.

LJOP/327,0
HYDROLOGY

The tributary area of Lake Jane is 4649 acres and the area of the lake itself is 165 acres. The normal operating level of the lake is 922.5 ft. Denoting the water equivalent of the snowpack as "x" inches, the volume of water stored in the lake above Elevation 922.5 ft and in the snowpack can be expressed as inches of water over the watershed in the following manner:

Inches of water over the watershed = x + 0.4259 * (Lake Elevation - 922.5)

PROPOSED PLAN OF OPERATION

1. Except as noted below, the control elevations shall be as follows:

- Crombie Pond (82-386W) Elevation 921.5
- Deer Pond (82-385W) Elevation 921.5
- Hedges' Bog (82-384W), Elevation 922.5
- Hedges' Pond (82-387W)
- and Lake Jane (82-104)

2. During the period from February 15 to April 15 of each year the level of Lake Jane, Hedges' Pond and Crombie Pond may be lowered. Drawdown levels shall be determined from Table 1, based upon snowpack measurements and upstream lake levels. Snowpack and upstream lake levels shall be measured before drawdown and continued at weekly intervals during drawdown. Drawdown target elevations shall be adjusted according to Table 1 as snowpack and storage change. The regional hydrologist shall be notified five working days prior to initiation of drawdown.

3. If the level of Lake Jane is lower than Elevation 922.0, the control elevation of Crombie Pond may be increased to a level sufficient to cause water to flow from Deer Pond to Lake Jane. Normal control elevations shall be restored when the level of Lake Jane exceeds Elevation 922.5.

LJOP/327.0
RESPONSIBLE PARTIES

It is anticipated that operation will be relatively infrequent. The Board of Managers will direct the operation of the control structures. Actual operation will be carried out by the City of Lake Elmo crews, if available, or by a District representative.

In the event of emergency, the following persons may be contacted, in the order indicated.

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<thead>
<tr>
<th>Name</th>
<th>Address</th>
<th>Phone</th>
</tr>
</thead>
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<tr>
<td>Allen Dornfeld</td>
<td>2867 Hamlet Ave. No. Oakdale, MN 55119</td>
<td>777-5590</td>
</tr>
<tr>
<td>Russell Kirby</td>
<td>13131 40th Street No. Stillwater, MN 55082</td>
<td>439-4319</td>
</tr>
<tr>
<td>Ray Brenner</td>
<td>2525 E. 18th Ave. No. St. Paul, MN 55109</td>
<td>777-3241 (h) 540-9607 (w)</td>
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<tr>
<td>William Rohrer</td>
<td>2989 Lake Elmo Ave. No. Lake Elmo, MN 55042</td>
<td>770-2806 (h) 227-6500 (w)</td>
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<tr>
<td>Gordon Moosbrugger</td>
<td>13956 10th St. No. Stillwater, MN 55082</td>
<td>436-5522 (h) 224-3879 (w)</td>
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<td>Nels Nelson</td>
<td>Barr Engineering Co. 7803 Glenroy Road Bloomington, MN 55435</td>
<td>830-0555 (w) 926-4252 (h)</td>
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**TABLE 1**

VALLEY BRANCH WATERSHED DISTRICT
PROPOSED PLAN OF OPERATION FOR
LAKE JANE, HEDGES' POND AND HEDGES' BOG CONTROL STRUCTURE
AND CROMBIE POND CONTROL STRUCTURE
February 15 - April 15

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<th>Water Equivalent of Snow, Inches*</th>
<th>Drawdown Target Elevations**</th>
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<td>6 or more</td>
<td>920.3</td>
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<td>5</td>
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<td>4</td>
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<td>3</td>
<td>922.5</td>
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**REMINDERS OF YEAR**

The control structure for Lake Jane, Hedges' Pond and Hedges' Bog will maintain their water levels at Elevation 922.5 ft. The control structure for Crombie Pond will maintain the water level at 921.5 ft.

*To be determined in accordance with VBWD "Snowpack Monitoring Plan" dated February 2, 1988.

**All elevations are referenced to local MNDNR datum as described in permit. This may not coincide with USGS 1929 Mean Sea Level Datum.
Appendix G-5.9 Groundwater Sampling for PFOA Near the Washington County Landfill
Ground-Water Sampling for PFOA
Near the Washington Co. Landfill

This Minnesota Pollution Control Agency (MPCA) and Minnesota Department of Health (MDH) fact sheet includes some site history information and describes testing of ground water, including private wells, for perfluorooctanoic acid (PFOA) near the former Washington County Landfill. Additionally, this fact sheet discusses PFOA, and explains why state agencies tested for it, how the testing was done and what was found. Finally, the fact sheet tells citizens where they can get more information.

Site history
This 40-acre site operated from 1969 to 1975 as a sanitary landfill. Site operations were discontinued in 1975 and a clean soil cap was placed on the landfill. In 1981, ground-water monitoring indicated the presence of elevated concentrations of volatile organic compounds (VOCs) and some heavy metals in on-site monitoring wells and off-site residential wells. In 1983 and 1984, alternate drinking water supplies were provided to the affected residences. In 1983, Ramsey and Washington counties installed a pump-and-treat system to reduce any potential ground-water contamination from the landfill.

The site was added to the federal Superfund list, the National Priority List (NPL) and the state Superfund list, the Permanent List of Priorities (PLP), in 1984. After entry into the MPCA’s Closed Landfill Program (CLP), the site was delisted from both the state and federal Superfund lists in 1996.

Since 1996, the CLP has taken additional steps to address ground-water contamination by improving the landfill cover and ground-water treatment systems.

Looking at PFOA
PFOA is a man-made chemical. PFOA is used in the manufacturing of products that resist heat, oil, stains, grease and water. Common examples include non-stick surfaces on cookware, stain-resistant carpets and fabrics, and other industrial applications.

Why did the MPCA and MDH test ground water for PFOA?
As scientific studies and testing methods improve, chemicals that could not be detected before are now detectable at low concentrations and are emerging as potential health and environmental concerns. The U.S. Environmental Protection Agency (EPA) performed a preliminary risk assessment on PFOA in 2003 indicating that PFOA is widely distributed, even occurring in the arctic, and lasts for a long time in the environment. Lab animal studies have found that exposure to high levels of PFOA can have adverse developmental impacts, may be toxic to the liver, and could be associated with an increased risk of certain cancer types.

Following the EPA risk assessment, the MDH and other laboratories developed sampling and testing methods to measure PFOA in ground water. During recent routine ground-water sampling at the former Washington County Sanitary Landfill, the MPCA checked for PFOA for the first time. It was detected at low levels in monitoring wells on the landfill property in both the shallow and deeper ground water.

The MPCA and MDH sampled ground
water in the areas south and southeast of the landfill. These areas are downgradient (i.e., in the direction of ground-water flow) from the landfill. The two agencies focused on private wells around 31st St. North and Stillwater Blvd., to the south of the landfill, and Stillwater Ln. and Kelvin Ave., southeast of the landfill.

How did PFOA get into the ground water?

During its years of operation, the Washington County Sanitary Landfill accepted both municipal and industrial solid waste. Based on recent monitoring results, the MPCA has concluded that some of the waste disposed of at this landfill contained PFOA.

The PFOA has leached into the ground water and moved with the ground-water flow. It has also moved deeper, affecting the bedrock aquifer where it was found at low levels. The simplified map on Page 3 of this fact sheet shows where monitoring wells are located around this landfill.

At what level does PFOA pose a risk if consumed in drinking water?

The MDH has proposed a Health Based Value (HBV) for PFOA of 7 parts per billion (ppb) in ground water. This is a preliminary health-based risk number used to evaluate the potential impact of the chemical on public health. In the landfill monitoring wells in which PFOA was found, the levels ranged from 70 ppb at the landfill itself to 1.3 ppb downgradient from the landfill.

The agencies collected water samples from 32 private wells; some wells were sampled twice. Low levels of PFOA (less than 1 ppb) were detected in 7 wells. The other 25 wells did not show any detection of PFOA.

Volatile organic compounds (VOCs) were also tested at the residences where PFOA was initially detected. These compounds are commonly associated with landfill contamination. Low levels of two VOCs were found in four of the seven wells. All of the impacted wells are located along 31st Street North and are believed to draw their water from the bedrock aquifer.

It is important for citizens to know that:

- The concentrations of PFOA and VOCs were well below MDH health-based risk numbers.
- Health-based criteria are designed to protect people’s health. They represent the concentration of a contaminant in water that can be safely consumed over a lifetime.
- PFOA was not detected in the monitoring wells north of the landfill (which is in the opposite direction to the ground-water flow).
- Many residences and businesses in the area are hooked up to the Oakdale municipal water supply and are not affected.
- The MPCA and MDH are working cooperatively with the city of Lake Elmo and Washington County to assess any potential problems with PFOA in ground water.

What’s Next?

The MPCA will continue to sample ground water at the landfill for PFOA, and will continue to monitor private wells that have been impacted on an annual basis. Households where well testing took place have received the results (along with an explanation of the results) and this fact sheet. Additional studies may be planned. If you receive this fact sheet or live in the area of interest, and have any questions please contact:

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Where can I go to find out more?

- The EPA’s draft health risk assessment for PFOA can be found at [www.epa.gov/opptintr/pfoa/pfoafacts.pdf](http://www.epa.gov/opptintr/pfoa/pfoafacts.pdf).
- The MDH Web site includes basic information about health risk and exposure at [www.health.state.mn.us/divs/eh/hazardous/index.html](http://www.health.state.mn.us/divs/eh/hazardous/index.html)
Groundwater Monitoring Network around Washington County Landfill

Monitoring Wells
streets
Landfill outlined in red

900 Meters