FEASIBILITY STUDY

WATER TREATMENT PLANT

CITY OF LINO LAKES | ANOKA COUNTY | MINNESOTA

June 29, 2020

Prepared for:
City of Lino Lakes
600 Town Center Parkway
Lino Lakes, MN 55014

WSB PROJECT NO. 015822-000

FEASIBILITY STUDY

WATER TREATMENT PLANT

FOR THE

CITY OF LINO LAKES
ANOKA COUNTY, MINNESOTA

June 29, 2020

Prepared By:

June 29, 2020

Michael Grochala
City of Lino Lakes
600 Town Center Parkway
Lino Lakes, MN 55014

Re: Water Treatment Plant Feasibility Study
City of Lino Lakes, MN
WSB Project No. 015822-000

Dear Mr. Grochala:

Transmitted herewith is the feasibility study report for the above-referenced project. The report includes options to address the City's elevated manganese levels in its drinking water in addition to other contaminants. An opinion of probable cost is presented for the recommended option including potential funding alternatives.

We would be happy to discuss this report with you at your convenience. If you have any questions, please do not hesitate to call me at 651-286-8466.

Sincerely,

WSB

Greg Johnson, PE
Director of Water/Wastewater

C: Rick DeGardner, City of Lino Lakes
Justin Williams, City of Lino Lakes
Diane Hankee, WSB

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CERTIFICATION

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Greg Johnson, PE

Date: June 29, 2020 License No. 26430

Quality Assurance/Quality Control:

Jon Christensen, PE

Date: June 29, 2020 License No. 57814

TITLE SHEET
LETTER OF TRANSMITTAL
CERTIFICATION SHEET
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EXECUTIVE SUMMARY

WSB was authorized to complete this Water Treatment Plant Feasibility Study for the City of Lino Lakes. The Minnesota Department of Health recently tested the City's manganese levels in each of the City's wells as part of the EPA Unregulated Contaminant Monitoring Rule 4 (UCMR4). The water quality testing data from MDH indicates that five of the City's six wells exceed the maximum recommended manganese level for infants, and three of the wells exceeds the maximum recommend level for adults and children. The purpose of this feasibility study was to evaluate alternative water supply options to address the high manganese levels in the City's drinking water to provide acceptable water quality that meets current and proposed drinking water standards. These options include drilling new wells, purchasing treated water from another community or water system, and implementing treatment.

The option to implement treatment was the primary focus of this study. Based on the City's water demand projections, initial and future plant capacities were determined for treating the City's central well field and future wells. A property located near the intersection of Birch Street and 12th Avenue South was evaluated as a potential site for a water treatment facility.

Water samples were obtained and analyzed for other health related compounds that are currently being monitored by MDH to plan for additional treatment beyond manganese, iron, and ammonia if needed. Based on all of the water quality data obtained from each of the City's wells, WSB reviewed the available treatment technologies and recommended the most feasible option to treat the City's water. A preliminary conceptual site plan was developed and used to determine the acreage needed for the plant.

After determining the plant size, recommended location, conceptual site plan layout, and acreage needed, cost estimates were developed for the proposed water treatment plant. Included in these cost estimates are the raw watermains from the wells located in the central well field and the treated water distribution mains for the recommended site. An approximate water rate increase, funding options, and final recommendations for the proposed water treatment facility are also presented in this report. This project is feasible, necessary, and cost effective from an engineering standpoint and should be constructed as proposed herein.

1. INTRODUCTION

1.1 Purpose of Study

WSB was authorized to complete this Water Treatment Plant Feasibility Study for the City of Lino Lakes. The Minnesota Department of Health recently tested the City's manganese levels in each of the City's wells as part of the EPA Unregulated Contaminant Monitoring Rule 4 (UCMR4). The water quality testing data from MDH indicates that five of the City's six wells exceed the maximum recommended manganese level for infants, and three of the wells exceeds the maximum recommend level for adults and children. The purpose of this feasibility study was to evaluate alternative water supply options to address the high manganese levels in the City's drinking water to provide acceptable water quality that meets current and proposed drinking water standards. These options include drilling new wells, purchasing treated water from another community or water system, and implementing treatment.

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1.2 Manganese Health Effects

Manganese is a common, naturally-occurring mineral found in rocks, soil, groundwater, and surface water. Manganese is a natural component of most foods. Manganese is an essential nutrient and eating a small amount of it each day is important to stay healthy. The majority of manganese exposure in the general population comes from the food. Grains, beans, nuts and teas are rich in manganese and it is also found in infant formula. A normal, balanced diet typically provides adequate manganese intake. The principal source of exposure to manganese is from food, but in situations where manganese levels in drinking water are elevated, the contribution from drinking water can increase the overall intake of manganese. Adults and children get enough manganese from the foods we eat. For example, EPA's drinking water health advisory for manganese states:

- food at 3.5 to 7 mg manganese/day is the greatest source of manganese exposure to the general population,
- an average intake from Western and vegetarian diets is 0.7 to 10.9 mg manganese/day,
- an average cup of tea may contain 0.4 to 1.3 mg of manganese, and
- 12% of the population takes manganese supplements that have a median concentration of 2.4 mg/day.

Manganese is not currently regulated as a national primary drinking water standard which means there is no enforceable limit for manganese in drinking water. However, EPA is in the process of determining whether to regulate manganese due to updated health effects information and additional occurrence data. EPA has included manganese in the fourth Unregulated Contaminant Monitoring Rule (UCMR4), which requires all public drinking water systems serving over 10,000 people and selected small systems to monitor for manganese. EPA will also consider the health effects in their regulatory determination and evaluate potential risks to adults, children, and infants based on recent studies.

The Minnesota Department of Health (MDH), in conjunction with studies conducted by others, has determined that children and adults who drink water with high levels of manganese for an extended period of time may have problems with memory, attention, and motor skills. Infants (babies under one year old) may develop learning and behavior problems if they drink water with too much manganese in it. Therefore, MDH has established a maximum recommended manganese level for infants of 100 parts per billion (ppb) and 300 parts per billion (ppb) for adults and children.

In addition to health effects, EPA's Secondary Drinking Water Standards identify manganese as having technical (staining) and aesthetic effects (taste, color). Manganese in water can stain laundry, cause scaling on plumbing, and cause water to look, smell, or taste bad. Manganese can also create a brownish-black or black stain on toilets, showers, bathtubs, and sinks.

2. EXISTING WATER SUPPLY SYSTEM

2.1 Sources

The City of Lino Lakes currently has six (6) groundwater production wells. A test well and study has been completed for proposed Well No. 7. The existing well information is summarized in **Table 2-1**. The City is currently operating Well Nos. 5 and 6 at a lower pumping rates to improve operational efficiency for these wells.

Table 2-1. Production Wells

Well No.	Unique Well ID	Year Installed	Depth (feet)	Aquifer	Rated Capacity (gpm)	Current Pumping Rate (gpm)
1	240171	1971	306	Prairie du Chien - Jordan	675	590
2	110471	1986	258	Jordan - St. Lawrence	625	693
3	559373	1995	283	Prairie du Chien - Jordan	1,800	1,187
4	554207	1995	338	Prairie du Chien - Jordan	750	644
5	722629	2005	273	Prairie du Chien - Jordan	1,600	810
6	767887	2016	295	Prairie du Chien - Jordan	1,200	953
Total Capacity					**6,650**	**4,877**
Firm Capacity (largest well out of service)					**4,850**	**3,690**

2.2 Treatment

The City of Lino Lakes does not have a water treatment facility. Instead, chemicals are applied at each of the individual well houses. Chlorine is applied for disinfection, fluoride to prevent tooth decay, and polyphosphate to sequester manganese and iron. Polyphosphate does not remove manganese from the City's drinking water, it only prevents very small amounts of manganese from precipitating to help reduce the staining of plumbing fixtures and laundry.

2.3 Storage

The City has two existing water towers, and a third water tower is currently under construction. All three water towers share a common high water elevation of 1,054.5 feet. All three towers have altitude valves that automatically stop the flow of water into the tower when it is full, thereby forcing the water to flow to and fill the other parts of the system.

Table 2-2. Water Towers

Tower No.	Status	Year Constructed	Volume (MG)	High Water Level (ft)
1	Existing	1992	1.0	1,054.5
2	Existing	1996	1.0	1,054.5
3	Under Construction	2021	1.5	1,054.5
Total			**3.5**	**1,054.5**

2.4 Distribution

The distribution watermains range in diameter from 6-inch to 16-inch and are shown in **Figure 1 in Appendix A**. The pipe materials include ductile iron pipe (DIP), polyvinyl chloride (PVC), and high density polyethylene (HDPE). The 16-inch trunk watermains run between the City's three water towers.

2.5 Booster Station

The City has one booster station that increases the pressures within the Clearwater Creek development at the southeastern extents of the system, south of Well No. 4.

2.6 Interconnections

The City of Lino Lakes water distribution system has seven interconnections with five neighboring communities, as well as two interconnections with the Minnesota Correctional Facility located within Lino Lakes, as shown on **Figure 2 in Appendix A**. The Lino Lakes water towers share a common high water level (HWL) of 1,054.5 feet. The HWLs of the neighboring systems are listed in **Table 2-3**.

Table 2-3. Interconnection HWL Elevations

City	Quantity	Water Tower No. 1 (feet)	Water Tower No. 2 (feet)	Water Tower No. 3 (feet)
Blaine	1	1,053.37	1,053.70	1,063.70
Shoreview	1	1,092.5	1,092.5	N/A
Circle Pines	1	1,060	N/A	N/A
Centerville	2	1,054.58	N/A	N/A
Hugo	2	N/A*	1,055.5	1,084.0

3. WATER QUALITY ANALYSIS

3.1 Raw Water Supply

Sampling and testing completed by the Minnesota Department of Health (MDH) in December 2019 indicated the presence of manganese in the raw water from the City's production wells in excess of MDH guidance values. The results from that analysis are shown in **Table 3-1**. The MDH manganese guidance value for infants (under one year old) is 100 ppb and for children and adults is 300 ppb. All of the City's wells, except for Well No. 4, exceed the recommended manganese level for infants. Well Nos. 2, 3, and 6 exceed the recommended level for children and adults.

Table 3-1. UCMR Manganese Results

Parameter	Unit	Well No. 1	Well No. 2	Well No. 3	Well No. 4	Well No. 5	Well No. 6
Manganese	ppb	158	527	322	84	143	408

In order to evaluate the feasibility of implementing water treatment for the removal of manganese, the City's wells were sampled and tested for a variety of water quality parameters. The full results are included in **Appendix B**, and the notable results are summarized in **Table 3-2** below.

Table 3-2. Raw Water Quality Results

Parameter	Unit	Well No. 2	Well No. 3	Well No. 4	Well No. 5	Well No. 6
Iron Bacteria	Absent/Present	Present Day 8	Present Day 10	Present Day 10	Absent	Present Day 4
Dissolved Iron	ppb	323	ND	84.3	290	ND
Total Iron	ppb	181	ND	105	310	50.1
Dissolved Manganese	ppb	256	395	92.8	172	357
Total Manganese	ppb	249	383	86.4	152	376
Turbidity	NTU	0.94	< 0.5	< 0.5	3.5	< 0.5
Field pH		7.65	7.7	7.9	7.7	7.7

3.2 Drinking Water Rules and Standards

The City of Lino Lakes' drinking water should meet or exceed the rules and standards established by EPA and MDH. The following sections summarizes these rules and standards to provide a basis for establishing water quality and treatment goals for the City.

3.2.1 Primary and Secondary Drinking Water Standards

Since 1974, the United States Environmental Protection Agency (EPA) has been responsible for regulating the nation's public water supply systems (PWS) under the provisions of the federal Safe Drinking Water Act. However, almost all states, including Minnesota, have now assumed responsibility for enforcing the act within their own borders. EPA established the Public Water System Supervision Program under authority of the 1974 Safe Drinking Water Act (SDWA), which was most recently amended in 1996. To ensure the water is safe for human consumption, EPA sets national limits on allowable contaminant levels in public water supply systems. These limits are known as maximum contaminant levels or MCLs. Because certain contaminants are difficult to measure, EPA establishes treatment techniques or action levels in lieu of a maximum contaminant level to control unacceptable levels of those specific contaminants in public drinking water.

3.2.2 *Maximum Contaminant Levels (MCLs)*

Maximum Contaminant Levels (MCLs) are set by the United States Environmental Protection Agency (US EPA) and enforced by MDH. All public water supplies in Minnesota must meet these standards. MCLs are established through a scientific process that evaluates the health impacts of the contaminant and the technology and cost required for prevention, monitoring, and/or treatment. States are allowed to enforce lower (more strict) standards than MCLs, but are not allowed to enforce higher (less strict) standards. New MCLs or changes to existing MCLs are rarely made.

3.2.3 *Health-Based Values (HBVs) and Health Risk Limits (HRLs)*

Health-Based Values (HBVs) and Health Risk Limits (HRLs) are developed by toxicologists at MDH using the best peer-reviewed science and public health policies available at the time of their development. An HBV or HRL is the level of a contaminant that can be present in water and pose little or no health risk to a person drinking that water. HBVs and HRLs are developed to protect sensitive or highly exposed populations. HBVs and HRLs are guidance used by the public, risk managers, and other stakeholders to make decisions about managing the health risks of contaminants in groundwater and drinking water. HRLs are guidance values that have been through the Minnesota rulemaking process, which includes at least one public comment period for stakeholders to provide feedback on the proposed guidance values.

3.2.4 *Primary Drinking Water Contaminants*

Primary drinking water contaminants are regulated contaminants that may pose an immediate, or acute, risk to human health if they are found in drinking water. Primary Contaminants include the following main categories of contaminants:

Bacteriological -Total coliform bacteria are common in the environment and are generally not harmful themselves. The presence of fecal coliform bacteria and E. coli in drinking water is serious because the bacteria are usually associated with sewage or animal waste. The presence of these bacteria in drinking water generally is a result of a problem with water treatment or the pipes which distribute the water and indicates that the water may be contaminated with organisms that can cause disease (pathogens).

Nitrates - Nitrate is a man-made contaminant and also occurs naturally in the environment, but elevated nitrate levels in drinking water are usually associated with the use of fertilizer, or the breakdown of human and animal waste. It is a health concern primarily for infants under the age of six months. If the federal standard for nitrate is exceeded, an advisory is issued regarding consumption of the water by infants. The advisory remains in effect until steps can be taken to correct the problem. Nitrates have not been detected at significant concentrations in Lino Lakes' water supply.

Disinfection Byproducts - Disinfection rids drinking water of microbiological organisms, such as bacteria, viruses, and protozoa, that can cause and spread disease. The most common method of disinfection is the addition of chlorine to drinking water supplies. However, chlorine can combine with organic materials in the raw water to create contaminants called trihalomethanes (THMs) and haloacetic acids (HAAs). Repeated exposure to elevated levels of THMs over a long period of time could increase a person's risk of cancer. All community water systems that add a disinfectant to the water must regularly test their treated water to determine if THMs and HAAs are present. If the THMs or HAAs exceed the limits set by the U. S. Environmental Protection Agency (EPA), the water system must take action to correct the problem. The corrective actions include notifying all residents served by the water system. Disinfection byproducts have been detected in Lino Lakes' water supply but at concentrations that are significantly lower than the MCLs for haloacetic acids and total trihalomethanes.

Inorganic Chemicals - Inorganic contaminants can leach into drinking water after dissolving from naturally-occurring minerals in the ground, or from runoff from industrial sources or landfills. Inorganic chemicals have not been detected at significant concentrations in Lino Lakes' water supply. Barium has been detected in Lino Lakes' water supply at 0.13 parts per million but is significantly lower than the MCL of 2 parts per million. Barium can be removed via precipitative softening, ion exchange, and reverse osmosis.

Organic Chemicals - Organic chemicals are classified as a volatile organic chemical [VOC] or a synthetic organic chemical [SOC]. Organic contaminants come from petroleum solvents, paint removers, degreasers, cleaning fluids, pesticides, gasoline, electrical transformers, manufacturing processes, chemical production, byproducts from disinfection, and the production of plastics. Agricultural runoff, improper waste disposal, and improper handling and storage techniques contribute to drinking water contamination via percolation of the contaminant through the soil into the groundwater. Organic chemicals have not been detected in Lino Lakes' water supply.

Radionuclides - Radionuclides are alpha emitters, which include radium and uranium, occur naturally in certain groundwaters in the state due to the geological formations, particularly in the deeper aquifers. Beta emitters are usually the result of manmade sources or activities. Radionuclides have not been detected in Lino Lakes' water supply.

Lead and Copper - Community water supply systems have participated in efforts to reduce lead and copper contamination in drinking water. Lead and copper are not typically present in the water when it leaves the treatment plant. Lead and copper differ from other contaminants in that they are rarely present in source waters. Rather, they enter the water through contact with plumbing components, usually in individual homes. If more than 10 percent of the homes in a community exceed the federal "action level" for lead or copper, based on the results of community-wide monitoring, the water system must do additional testing and take steps to reduce levels. Systems that exceed the action level for lead must also perform an ongoing program of public education. Lead and Copper have not been detected at significant concentrations in Lino Lakes' water distribution system.

3.2.5 Proposed Future Drinking Water Regulations

The proposed future drinking water regulations proposed by EPA include the following regulations:

<u>Perchlorate Rule</u>
Perchlorate is both a naturally occurring and man-made chemical that is used to produce rocket fuel, fireworks, flares and explosives. Perchlorate can also be present in bleach and in some fertilizers. Perchlorate may have adverse health effects because scientific research indicates that this contaminant can disrupt the thyroid's ability to produce hormones needed for normal growth and development. EPA is developing a proposed national primary drinking water regulation for perchlorate. EPA is using peer reviewed science and data to develop the perchlorate drinking water regulation. EPA is evaluating the available science on perchlorate health effects and exposure. EPA is also evaluating laboratory methods for measuring and treatment technologies for removing perchlorate in drinking water. Treatment processes currently considered effective include ion exchange, biological treatment, tailored granular activated carbon, and membrane separation. EPA is also evaluating costs and benefits of potential regulatory options for perchlorate. The proposed Perchlorate Rule is not expected to affect Lino Lakes.

Lead and Copper Rule (LCR)

Lead and copper enter drinking water primarily through plumbing materials. Exposure to lead and copper may cause health problems ranging from stomach distress to brain damage. On June 7, 1991, EPA published a regulation to control lead and copper in drinking water. This regulation is known as the Lead and Copper Rule (also referred to as the LCR or 1991 Rule). The treatment technique for the rule requires systems to monitor drinking water at customer taps. If lead concentrations exceed an action level of 15 ppb or copper concentrations exceed an action level of 1.3 ppm in more than 10% of customer taps sampled, the system must undertake a number of additional actions to control corrosion. If the action level for lead is exceeded, the system must also inform the public about steps they should take to protect their health and may have to replace lead service lines under their control.

EPA's proposed Lead and Copper Rule (LCR) includes a suite of actions to reduce lead exposure in drinking water where it is needed the most. The proposed rule will identify the most at-risk communities and ensure systems have plans in place to rapidly respond by taking actions to reduce elevated levels of lead in drinking water.

The agency's proposal takes a proactive and holistic approach to improving the current rule—from testing to treatment to telling the public about the levels and risks of lead in drinking water. This approach focuses on six key areas:

1. Identifying the areas most impacted
2. Strengthening drinking water treatment requirements
3. Replacing lead service lines
4. Increasing sampling reliability
5. Improving risk communication
6. Protecting children in schools and childcare facilities

Based on Lino Lakes' relatively low lead and copper levels in the distribution system, the proposed LCR should have minor impact on Lino Lakes.

Chromium

Chromium is a heavy metal that occurs throughout the environment. The trivalent form is a required nutrient and has very low toxicity. The hexavalent form, also commonly known as "chromium 6," is more toxic and has been known to cause cancer when inhaled. In recent scientific studies in laboratory animals, hexavalent chromium has also been linked to cancer when ingested.

Chromium found in drinking water is naturally occurring but has been detected from the manufacturing of textile dyes, wood preservation, leather tanning, and anti-corrosion coatings, where hexavalent chromium contaminated waste has migrated into the underlying groundwater. The federal MCL of hexavalent chromium is 100 ppb federal MCL. The total chromium MCL was established in 1977 to address the noncancer toxic effects of hexavalent chromium. EPA could propose a new MCL for hexavalent chromium. Treatment processes currently considered effective for chromium removal include adsorption, granular activated carbon, and ion exchange. Chromium has not been detected in Lino Lakes' raw water supply, so this proposed rule should not affect Lino Lakes.

3.2.6 *Secondary Drinking Water Contaminants*

In addition to Primary Drinking Water Contaminants, EPA has established National Secondary Drinking Water Regulations that set non-mandatory water quality standards for 15 contaminants. EPA does not enforce these "secondary maximum contaminant levels" or "SMCLs." They are established only as guidelines to assist public water systems in managing their drinking water for aesthetic considerations, such as taste, color and odor. These contaminants are not considered to present a risk to human health at the SMCL. Since these contaminants are not health threatening at the SMCL, and public water systems only need test for them on a *voluntary* basis. EPA believes that if these contaminants are present in your water at levels above these standards, the contaminants may cause the water to appear cloudy or colored, or to taste or smell bad. This may cause a great number of people to stop using water from their public water system even though the water is actually safe to drink. Secondary standards are set to give public water systems some guidance on removing these chemicals to levels that are below what most people will find to be noticeable.

There are a wide variety of problems related to secondary contaminants. These problems can be grouped into three categories: *Aesthetic effects* -- undesirable tastes or odors; *Cosmetic effects* -- effects which do not damage the body but are still undesirable; and *Technical effects* -- damage to water equipment or reduced effectiveness of treatment for other contaminants.

<u>Aesthetic Effects</u>
Odor and Taste are useful indicators of water quality even though odor-free water is not necessarily safe to drink. Odor is also an indicator of the effectiveness of different kinds of treatment. However, present methods of measuring taste and odor are still fairly subjective and the task of identifying an unacceptable level for each chemical in different waters requires more study. Also, some contaminant odors are noticeable even when present in extremely small amounts. It is usually very expensive and often impossible to identify, much less remove, the odor-producing substance. Standards related to odor and taste include: Chloride, Copper, Foaming Agents, Iron, Manganese pH, Sulfate, Threshold Odor Number (TON), Total Dissolved Solids, and Zinc.

Color may be indicative of dissolved organic material, inadequate treatment, high disinfectant demand and the potential for the production of excess amounts of disinfectant by-products. Inorganic contaminants such as metals are also common causes of color. In general, the point of consumer complaint is variable over a range from 5 to 30 color units, though most people find color objectionable over 15 color units. Rapid changes in color levels may provoke more citizen complaints than a relatively high, constant color level. Standards related to color include: Aluminum, Color, Copper, Foaming Agents, Iron, Manganese, and Total Dissolved Solids.

Foaming is usually caused by detergents and similar substances when water has been agitated or aerated as in many faucets. An off-taste described as oily, fishy, or perfume-like is commonly associated with foaming. However, these tastes and odors may be due to the breakdown of waste products rather than the detergents themselves. Standards related to foaming include Foaming Agents.

<u>Cosmetic Effects</u>
Skin discoloration is a cosmetic effect related to silver ingestion. This effect, called argyria, does not impair body function, and has never been found to be caused by drinking water in the United States. A standard has been set, however, because silver is used as an antibacterial agent in many home water treatment devices, and so presents a potential problem which deserves attention. The standard related to this effect includes Silver.

Tooth discoloration and/or pitting is caused by excess fluoride exposures during the formative period prior to eruption of the teeth in children. The secondary standard of 2.0 mg/L is intended as a guideline for an upper boundary level in areas which have high levels of *naturally occurring* fluoride. The level of the SMCL was set based upon a balancing of the beneficial effects of protection from tooth decay and the undesirable effects of excessive exposures leading to discoloration. The standard related to this effect includes Fluoride.

Technical Effects

Corrosivity and *staining* related to corrosion not only affect the aesthetic quality of water but may also have significant economic implications. Other effects of corrosive water, such as the corrosion of iron and copper, may stain household fixtures, and impart objectionable metallic taste and red or blue-green color to the water supply as well. Corrosion of distribution system pipes can reduce water flow. Standards related to corrosion and staining include: Chloride, Copper, Corrosivity, Iron, Manganese, pH, Total Dissolved Solids, and Zinc.

Scaling and *sedimentation* are other processes which have economic impacts. Scale is a mineral deposit which builds up on the insides of hot water pipes, boilers, and heat exchangers, restricting or even blocking water flow. Sediments are loose deposits in the distribution system or home plumbing.

The EPA recommended Secondary Maximum Contaminant Levels are summarized in Table 3-1. Lino Lakes' water currently complies with all of the recommended Secondary Maximum Contaminant Levels except for manganese, iron, and total hardness. Producing effluent water quality below these levels should be a treatment goal for Lino Lakes in addition to complying with the Primary Drinking Water Standards, Health-Based Values (HBVs), and Health Risk Limits (HRLs). Many of Lino Lakes' customers are already treating hardness with in-home water softeners.

Table 3-1 Secondary Maximum Contaminant Levels

Contaminant	Secondary MCL	Noticeable Effects above the Secondary MCL
Aluminum	0.05 to 0.2 mg/L*	colored water
Chloride	250 mg/L	salty taste
Color	15 color units	visible tint
Copper	1.0 mg/L	metallic taste; blue-green staining
Corrosivity	Non-corrosive	metallic taste; corroded pipes/ fixtures staining
Fluoride	2.0 mg/L	tooth discoloration
Foaming agents	0.5 mg/L	frothy, cloudy; bitter taste; odor
Iron	0.3 mg/L	rusty color; sediment; metallic taste; reddish or orange staining
Manganese	0.05 mg/L	black to brown color; black staining; bitter metallic taste
Odor	3 TON (threshold odor number)	"rotten-egg", musty or chemical smell
pH	6.5 - 8.5	*low pH:* bitter metallic taste; corrosion *high pH:* slippery feel; soda taste; deposits
Silver	0.1 mg/L	skin discoloration; graying of the white part of the eye
Sulfate	250 mg/L	salty taste
Total Dissolved Solids (TDS)	500 mg/L	hardness; deposits; colored water; staining; salty taste
Total Hardness	150 mg/L	hardness; scale deposits on plumbing fixtures;
Zinc	5 mg/L	metallic taste
** mg/L is milligrams of substance per liter of water*		

3.3 Emerging Contaminants

Every five years, the U.S. Environmental Protection Agency (EPA) reviews contaminants that may be present in drinking water but are not yet regulated. Thirty (30) unregulated contaminants are monitored each cycle under the Unregulated Contaminant Monitoring Rule (UCMR). The current cycle is UCMR 4, and the City of Lino Lakes was randomly selected for sampling this cycle. The notable unregulated contaminants in UCMR 4 include manganese, cadmium, and boron. The City of Lino Lakes water supply has no detection of cadmium or boron. However, manganese has been detected as discussed previously in this report.

In the upcoming UCMR 5, one notable focus will be the family of chemicals referred to as per- and polyfluoroalkyl substances (PFAS), formerly known as PFCs. These contaminants are present in the East Metro Area and were the subject of the 3M Settlement. MDH has developed health-based guidance values for five PFAS compounds. The City's wells were sampled and tested for thirty-three types of PFAS compounds at the time of this report. PFOA was detected in one well and PFBA in three wells. All concentrations were below the MDH health-based guidance values for PFOA and PFBA.

4. WATER DEMANDS

4.1 Historical Water Use

The City of Lino Lakes historical water demands for the last ten years are summarized in **Table 4-1** below.

Table 4-1. Historical Water Use Data

Year	Population Served	Water Pumped (MGY)	Average Day Demand (MGD)	Max. Day Demand (MGD)	Max. Day Peaking Factor	Total Per Capita Water Demand (GPCD)
2010	14,980	498	1.36	5.65	4.1	91
2011	14,985	492	1.35	5.37	4.0	90
2012	15,119	609	1.67	6.73	4.0	110
2013	15,201	536	1.47	4.35	3.0	97
2014	15,346	445	1.22	3.89	3.2	79
2015	15,411	449	1.23	3.55	2.9	80
2016	16,111	452	1.24	3.36	2.7	77
2017	16,823	494	1.35	3.67	2.7	81
2018	17,974	509	1.39	3.53	2.5	78
2019	18,000	493	1.35	3.31	2.4	75
Average 2010-2019	**N/A**	**498**	**1.36**	**4.34**	**3.2**	**86**

MGY = million gallons per year, MGD = million gallons per day, GPCD = gallons per capita per day

4.2 Per Capita Water Demand

The total per capita water demand has shown a decreasing trend over the last ten years. The demand within a given year is sensitive to the climate behavior in that year. Therefore, even though total per capita water demand has been less in recent years, the average total per capita water demand from 2010 to 2019 of 86 gallons per capita per day was used for the projections in this report in order to be conservative for planning purposes.

4.3 Future Water Demand Projections

The City of Lino Lakes' water demand projections are summarized in **Table 4-2** below. The projected population growth is based on the City's Draft 2040 Comprehensive Plan Update. The total per capita water demand is the average demand from 2010 to 2019. The maximum day peaking factor is the average peaking factor from 2010 to 2019, except for the ultimate projection which uses the DNR's recommended target of 2.6. The City's peaking factor has shown a decreasing trend in the last ten years, and the City could possibly meet the DNR's target before reaching ultimate development with additional conservation efforts and education.

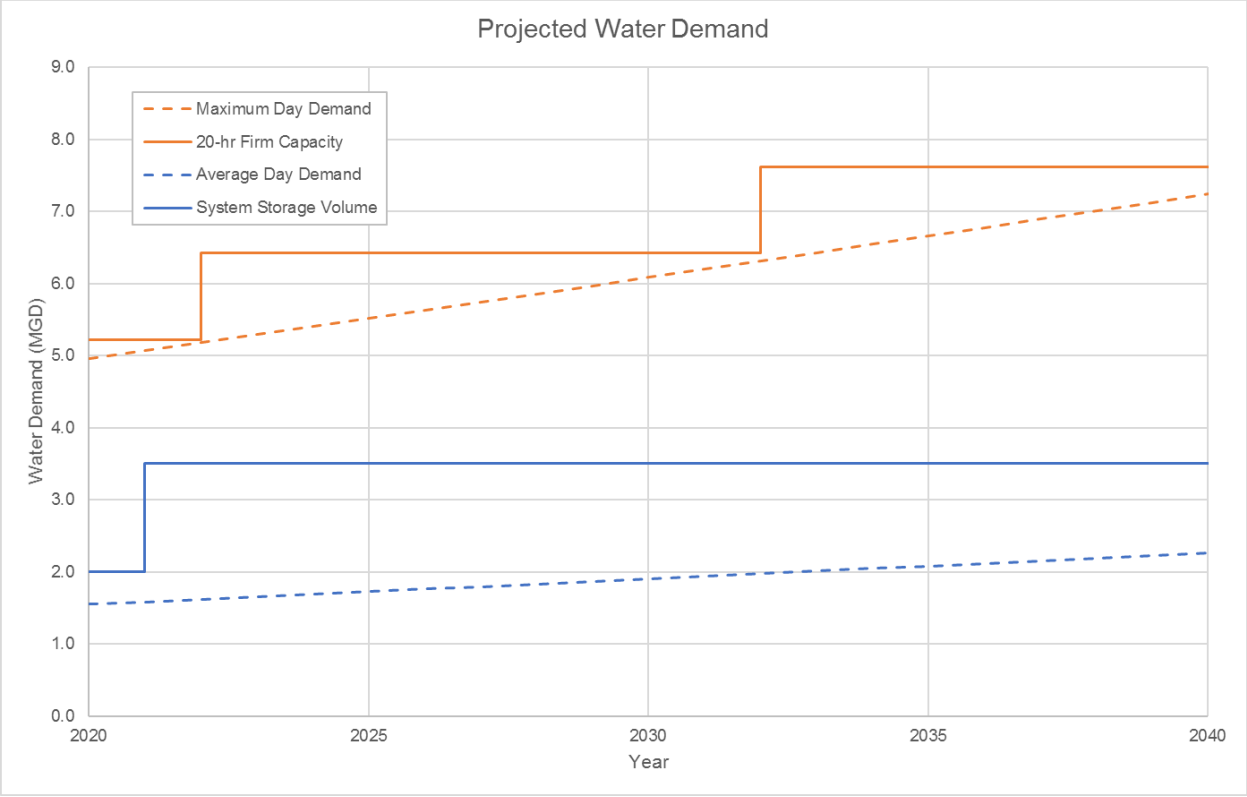
Table 4-2. Future Water Demand Projections

Year	Projected Population Served	Total Per Capita Water Demand (GPCD)	Average Day Demand (MGD)	Max. Day Peaking Factor	Max. Day Demand (MGD)
2020	18,000	86	1.55	3.2	4.95
2030	22,100	86	1.90	3.2	6.08
2040	26,300	86	2.26	3.2	7.24
Ultimate	55,700	86	4.79	2.6	12.45

GPCD = gallons per capita per day, MGD = million gallons per day

The average and maximum day water demand projections from **Table 4-2** are shown graphically in **Figure 4-1** below. The system firm capacity and total storage volume are also shown, including approximate timing of system improvements. Tower No. 3 is currently under construction and will be complete in 2021. Well Nos. 7 and 8 are projected to be needed prior to years 2023 and 2033, respectively. The anticipated capacity of future wells was assumed to be 1,000 gpm on average. Six additional wells, for a total of twelve wells, are projected to be needed to satisfy the City's ultimate water demands.

Figure 4-1. Projected Water Demand Trigger Chart



5. WATER SUPPLY OPTIONS

The primary purpose of this feasibility study was to evaluate alternative water supply options to address the high manganese levels in the City's drinking water and provide the City with acceptable water quality. These options include drilling new wells, purchasing treated water from another community or water system, and implementing treatment.

5.1 Drill New Wells

The first option analyzed is to construct and utilize deeper Tunnel City-Wonewoc (CTCW) or Mt. Simon–Hinckley (CMSH) wells instead of the Prairie du Chien-Jordan (OPCJ) wells that are currently being used by the City. For example, the City of Blaine's Well Nos. 19 and 21 and City of Columbus' Well No. 3 are developed into the Tunnel City-Wonewoc Aquifer, and the City of Spring Lake Park's Well No. 5 and City of New Brighton's Well No. 8 are developed into the Mt. Simon-Hinckley Aquifer.

Drilling new Prairie du Chien-Jordan wells at a similar depth as existing wells was not considered feasible because there is no guarantee that the new wells would have lower, acceptable manganese concentrations.

The Tunnel City-Wonewoc Aquifer is the next deeper aquifer below the Prairie du Chien-Jordan Aquifer and St. Lawrence Aquitard. Based on the Anoka County Geologic Atlas hydrogeologic cross sections in **Appendix C**, this aquifer is approximately 250 to 450 feet below ground level depending on the location within the City. Because the static water levels in this aquifer would be lower than in the existing wells, larger well pumps would be required, and the City's electrical utility costs would increase. The Minnesota Ground Water Association's *Manganese in Minnesota's Groundwaters* report from September 2015 notes that, "higher dissolved manganese concentrations commonly are found in groundwater that has low amounts of oxygen such as deep, isolated aquifers." Therefore, deeper aquifers are likely to contain equal, if not greater, concentrations of manganese compared to the Prairie du Chien-Jordan Aquifer and would likely still require treatment for manganese.

The Mt. Simon-Hinckley Aquifer is the deepest bedrock formation in the Twin Cities and is significantly deeper than the Prairie du Chien-Jordan Aquifer. Based on the Anoka County Geologic Atlas, this aquifer is at least 550 feet below ground level. This aquifer is only shown in the southern portion of Lino Lakes in the Anoka County Geologic Atlas (see cross section H-H') due to deep wells being located along the same cross section to the west in Blaine and Coon Rapids. New Mt. Simon-Hinckley wells can potentially be drilled, although it is very uncommon for the DNR to approve them. The State of Minnesota currently has a moratorium that restricts the use of this aquifer in the Twin Cities Metropolitan Area. In addition, the Mt. Simon-Hinckley Aquifer is likely to contain high concentrations of natural Radium 226/228 that exceed the EPA MCL of 5.0 pCi/L. Therefore, this source would likely require a treatment process such as greensand filtration, ion exchange, reverse osmosis, or lime softening to treat radium. The DNR does not issue appropriation permits to public water systems to pump groundwater from this protected aquifer when alternative water sources or interconnections with nearby public water systems are available.

5.2 Purchase Treated Water

The second option analyzed was to purchase treated water on a wholesale basis from St. Paul Regional Water Services (SPRWS). The SPRWS system is supplied by a combination of surface water from the Mississippi River and Northeast Metro lakes and groundwater from ten wells. SPRWS water is treated at the McCarrons Water Treatment Plant.

The costs associated with this option were analyzed in detail by the Metropolitan Council in the *Feasibility Assessment of Approaches to Water Sustainability in the Northeast Metro* report from December 2014. The report considered expansion of the SPRWS supply, treatment, and distribution systems to serve Northeast Metro communities. To serve the City of Lino Lakes, significant transmission watermain and a booster station would need to be installed in the City of Shoreview, in addition to upgrading SPRWS' supply and treatment capacity. This service would likely only be feasible in the context of providing regional water supply to multiple cities in the northeast metro area. The total cost to serve the communities between SPRWS and Lino Lakes (Phase 1) and the communities neighboring Lino Lakes (Phase 2) was estimated to be $576 million in this report.

Although this option would relieve the City of obtaining groundwater appropriations, operating its well houses, and implementing treatment, it has several disadvantages. The City would relinquish control of its water quality to others, the City would relinquish control of a portion of its water rates to others, and the SPRWS surface water sources may be impacted by emerging contaminants or hazardous material spills in the future. Most notably, the City's existing water rates would increase in order to cover the costs of both purchasing wholesale water from SPRWS and maintaining the existing water distribution system (such as the water towers, watermains, hydrants, and meters) within the City. Although this option could provide benefits to the City of Lino Lakes, the extremely high estimated cost to extend service to the northeast metro area from SPRWS is not feasible at the time of this study and would likely take many years to implement. It would also require several Northeast Metro Area communities to agree and collaborate on this option to make it even remotely feasible.

Purchasing treated water from the neighboring cities of Blaine, Shoreview, or Circle Pines or untreated water from Hugo, White Bear Township, or Centerville was not evaluated as a feasible option for this study. These cities' systems are designed for their water demands alone, and they do not have the sufficient water supply and treatment capacity to supply Lino Lakes' current and future water demands.

5.3 Implement Treatment

The third option analyzed was to implement municipal treatment to treat the City's wells for manganese and iron. A municipal water treatment plant would be constructed with sufficient capacity to meet the City's water demands through at least Year 2040 and designed for future expansion if needed. In addition to the health effects caused by manganese, the ongoing maintenance problems associated with manganese and iron will continue until these contaminants are properly treated and removed from the City's raw water supply. Manganese and iron will continue to stain laundry and plumbing fixtures. Manganese and iron will continue to precipitate inside the City's elevated water storage tanks and dead-end watermains and require ongoing maintenance. The City will need to continue spending approximately $50,000 per year or more on polyphosphate which does not physically remove manganese and iron from the raw water supply. Delaying treatment of manganese will result in continued consumption of manganese that exceeds the recommended levels for infants, children, and adults in addition to continued inefficiencies and wasting of resources (examples: excessive use of chemicals and water used for flushing watermains). Constructing a municipal water treatment plant would address the City's manganese issue.

6. WATER TREATMENT OPTIONS

6.1 Current Water Treatment Capacity Needs

The Year 2020 projected maximum day demand for the City of Lino Lakes is 4.95 MGD (see Section 4.3). Therefore, an initial treatment plant capacity of 4,125 gpm is needed to supply 4.95 MGD over a 20-hour period to account for the cycling of pumps and filter backwashing throughout the day. The plant should be designed, however, with adequate capacity to treat at least the Year 2040 projected maximum day demand of 7.24 MGD or 6,034 gallons per minute over a 20-hour period. A plant constructed near the City's central well field with this capacity could initially treat Well Nos. 1, 3, 5, 6 and provide additional capacity to treat future Well Nos. 7 and 8 if needed. Well Nos. 2 and 4 could then be used as non-treated peaking wells during maximum day demands or as back-up wells if any of the treated wells need to be removed from service for maintenance.

6.2 Future Water Treatment Capacity Needs

The plant should be designed to allow for a future plant expansion or additional treatment processes. Prior to Year 2040, the regional hydrogeology should be studied in detail to determine if an adequate number of future wells can be constructed within one mile of the plant to justify a plant expansion in the future, or if a new well field will need to be developed in another area of the City in addition to a second water treatment plant. The City's ultimate development will require a total treatment capacity of 12.45 MGD, or 10,375 gpm, over a 20-hour period. Therefore, the original design of the plant should allow space on site to add approximately 5 MGD of additional treatment capacity for a future plant expansion.

6.3 Water Treatment Needs

The City's raw water system has high concentrations of manganese and iron that should be treated. Customers with water softeners should continue to soften their water to remove hardness as municipal water softening would likely double to cost of a treatment plant if softening was added as an additional treatment process. A conventional or biological filtration water treatment plant with greensand or silica sand filter media will effectively treat the high concentrations of manganese and iron in the City's raw water.

The water quality testing data for the emerging contaminants do not require any additional treatment processes at this time. Most organic chemicals, if detected in the future, can be treated with granular activated carbon filter media. Volatile organic compounds (VOCs) from petroleum products can be removed with aeration. Greensand filter media can remove radionuclides (radium, gross alpha, etc.) if this natural contaminant is detected in future wells. Arsenic should easily be removed with conventional or biological filtration if detected. Filter membranes such as reverse osmosis can also be installed downstream of conventional or biological filters to remove most contaminants that cannot be removed by a conventional gravity or biological water treatment plant.

6.4 Water Treatment Options

The City's water treatment needs described in the previous section can be achieved with either Conventional Gravity Filtration, Biological Gravity Filtration, or Pressure Filtration as described as follows.

6.4.1 Conventional Gravity Filtration

For a Conventional Gravity Filtration system, raw water from the City's wells would be pumped to a gravity filtration treatment filtration where it is either aerated or injected with chemicals such as chlorine and potassium permanganate to oxidize the manganese and iron to solids that can be filtered out of the water. Following aeration or chemical injection, the water flows by gravity into a detention tank to complete the oxidation of manganese and iron. From the detention tank, the water continues to flow by gravity into multiple concrete filter cells where the insoluble manganese and iron are removed by anthracite and greensand or silica sand filter media. During the filtration process, manganese and iron solids will accumulate on the filter media and restrict the flow of water to create headloss. When the headloss has increased to a maximum level, the filter media is backwashed and cleaned to remove the accumulated solids from the media. After the solids have been removed from the media, the clean filter cells are put back into service for another filtration cycle. The backwash wastewater is discharged into an underground holding tank where the clean backwash wastewater (supernatant) is recycled back to the head of the plant for additional treatment and the settled solids are discharged into the sanitary sewer system. The filtered water ultimately flows into an underground clearwell tank before it is pumped into the distribution system with high service pumps. Fluoride, chlorine and possibly ortho-phosphate would be added to the finished water. In Minnesota, the vast majority of water treatment plants over 2,000 gpm in capacity have been constructed with gravity filters and not pressure filters in the past two decades.

The advantages of a Conventional Gravity Filtration system include:

1.) Odors in drinking water can easily be removed.

2.) Gravity filters are open to view and access. This is very advantageous in which it enhances the observation, operation, and maintenance of the filter cells and associated components.

3.) The walls of a concrete gravity system are integral and part of the exterior walls of the building structure. This reduces the cost of the facility since the exterior walls have a dual purpose.

4.) There are several filter equipment manufacturers having proven track records of success ensuring quality equipment and competitive bid prices.

5.) Gravity filters are considered to be the standard of the industry for municipal water filtrations. In Minnesota alone, there are many such facilities in existence having capacities equal to or greater than identified in Lino Lakes.

6.) The existing well pumping capacities will possibly increase if the wells only need to pump to the elevation of the aerator or detention tank of a gravity filtration plant rather than to the water tower levels.

The disadvantages of a Conventional Gravity Filtration system include:

1.) Typically requires the facility to be constructed on two floor levels based on the hydraulic profile of the aeration, detention tank, and filters. However, parts of the plant can be constructed underground when the site has ten feet or more of topographic relief.

6.4.2 *Biological Gravity Filtration*

The manganese and iron that exist in the City's well water could be treated without chlorine and potassium permanganate chemicals with Biological Gravity Filtration. In addition, the disinfection byproducts (Total Trihalomethanes and Total Haloacetic Acids) that are formed in the City's water when chlorine reacts with the natural organic matter could be totally eliminated with biological filtration. Biological filtration is commonly practiced in the United States and Europe and is endorsed by the Minnesota Department of Health (MDH) as an efficient and effective method for treating manganese, iron, ammonia, and other contaminants. A Biological Gravity Filtration plant is basically a Conventional Gravity Filtration plant but with a modified aeration process and without chemicals added prior to the filtration process. Fluoride, chlorine and possibly ortho-phosphate would be added to the finished water just like a conventional gravity filtration plant.

In addition to the advantages described above for a Conventional Gravity Filtration system, the advantages of a Biological Gravity Filtration system include:

1.) Higher filtration rates.

2.) Longer filter runs (reduces backwash supply and wastewater volumes).

3.) Significant savings in chemical costs (chlorine is needed for disinfection only and no potassium permanganate is needed).

4.) Reduction in disinfection byproducts.

5.) The design of a conventional gravity filtration process with detention and aeration can easily be modified to accommodate biological filtration after the successful completion of a biological filtration study as required by MDH.

The disadvantages of Biological Gravity Filtration System include:

1.) Additional monitoring required with inhouse laboratory equipment for dissolved oxygen levels, etc. These tests are relatively easy to do, however, and automatic dissolved oxygen sensors are available to provide continuous monitoring.

6.4.3 *Pressure Filtration*

For a pressure filtration system, raw water from the City's wells would be pumped directly through multiple horizontal steel pressure filters with anthracite and greensand or silica sand filter media. The raw water would be pumped under pressure from the well pumps, through the filters, and into the water distribution system with no intermediate pumping steps. The oxidation of manganese and iron would occur inside the pipelines located downstream of the plant chemical feed systems and above the filter media. Similar to gravity filtration, as the water passes through the filter media, the insoluble solids of manganese and iron are removed from the water and create filter headloss. When the headloss has increased to a maximum level, the filter media is backwashed and cleaned with distribution system water to remove the accumulated solids from the filter media. After the solids have been removed from the media, the clean filter cells are placed back into service for another filtration cycle. The backwash wastewater is discharged into an underground holding tank where the clean backwash wastewater (supernatant) is recycled back to the head of the plant for additional treatment and the settled solids are discharged into the sanitary sewer system. Fluoride, chlorine and possibly ortho-phosphate would be added to the finished water.

The advantages of a Pressure Filtration system include:

1.) Can be constructed on one floor level.

The disadvantages of a Pressure Filtration system include:

1.) Pressure filters are not open to view and difficult to access internally. This reduces the observation, operation, and maintenance of the filter cells and associated components.

2.) Usually does not have an upstream detention tank to effectively oxidize and treat manganese and iron.

3.) Odors in drinking water are more difficult to remove without a full aeration process.

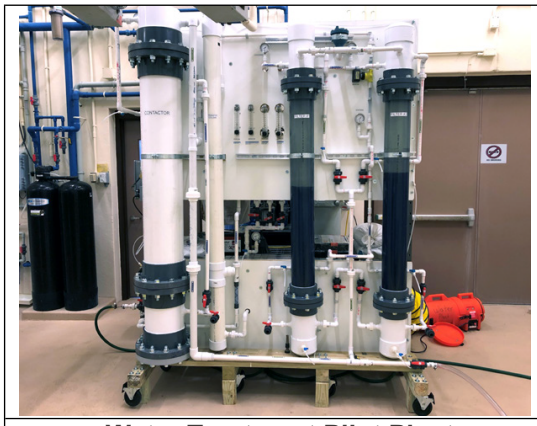
4.) Strong dehumidification is needed to reduce corrosion of the filters due to high humidity and sweating of the pressure filters.

5.) Steel filters need to be sand blasted and repainted every 20 years like a water tower.

6.) Less flexibility when disruption to normal operation occurs during routine maintenance procedures.

6.4.4 Recommended Filtration Option

A Conventional Gravity Filtration system that is modified to provide for biological filtration with an initial treatment capacity of approximately 6,000 gpm is recommended for the City of Lino Lakes. A gravity filtration system offers many more advantages over a pressure filtration system while biological filtration will significantly reduce chemical costs, provide longer filter runs, and save many millions of gallons of water each year for the City. A water treatment pilot study should be conducted as the first step to verify the effectiveness of the full scale treatment process. Ten States Standards requires filtration rates from 2 to 4 gpm per square foot (ft2) of filter media when determining the size of a filtration system. A typical filtration rate is 2 to 3 gpm/ft2 for manganese and iron removal. For a filtration rate of 6,000 gpm under normal operating conditions, the facility will require 3,000 ft2 of filter media at a filter loading rate of 2 gpm/ ft2 or 2,000 ft2 of filter media at a loading rate of 3 gpm/ft2. To allow each filter to be thoroughly backwashed and to provide operational flexibility, four to six filter cells will be required depending on the results of the pilot study and the filter loading rate needed to provide efficient treatment of manganese and iron.



Water Treatment Pilot Plant

Pilot Plant-Laboratory Trailer

7. WATER TREATMENT PLANT SITE EVALUATION

7.1 Potential Sites and Land Acquisition

A potential site has been identified for the water treatment plant at the southwest intersection of Birch Street and 12th Avenue South, as shown on **Figure 3** and **Figure 4 in Appendix A**. The site is located just east of Well No. 3 and is also within a mile of Well Nos. 1, 3. 5, and 6. Therefore, raw watermain can be installed efficiently to treat these four wells at this central location. A portion of the raw watermain is already in place from Well Nos. 1 and 6. The new raw watermain that will be required for existing Well Nos. 1, 3, 5, and 6 and future Well Nos. 7 and 8, if treated, is shown on **Figure 5 in Appendix A**.

The site is located within a 35-acre parcel that is currently privately owned. The City would need to acquire 4 acres of land at a minimum for the construction of the water treatment plant. Vehicle access to the site would be from 12th Avenue South, as shown in **Figure 7 in Appendix A**. The chemical rooms would be located on the east side of the building with exterior doors for chemical deliveries.

The site is located within the Rice Creek Watershed District. There are existing wetlands to the west and south of the site. Surface water from the site drains west to the public ditch located between the site and Well No. 3, which drains north to Wards Lake then west through the Rice Creek Chain of Lakes. A stormwater retention pond and low maintenance landscaping should be included in the site design to contain the additional stormwater produced from this site.

7.2 Water Treatment Plant Building

The proposed water treatment plant should include, at a minimum, the following features:

7.2.1 Architecture

The building architecture for the plant should include cost-effective sustainable design features and provide an attractive appearance since the building will be highly visible to the public. The water treatment processes within the building should be constructed of cast-in-place concrete foundations and double wythe walls concrete block and brick masonry or insulated load bearing precast concrete wall panels as shown below. The roof structures should include precast concrete double ‘T’ roof beams to allow wider spans without internal support columns.

WTP with Concrete Block and Brick Masonry Walls	**WTP with Precast Concrete Wall Panels**

The sustainable architectural features of the building should include natural daylighting throughout, low maintenance materials, and building materials that meet or exceed the current energy code.

7.2.2 *Detention*

A cast-in-place concrete detention tank to enhance the oxidation and treatment of manganese and iron. The tank will be sized with a detention time of 10 to 30 minutes depending on the treatment results obtained from the water treatment pilot study.

7.2.3 *Filters*

The upper level of the plant may consist of an aerator on top of the detention tank, splitter box, and filters. The upper level will also contain walkways around the filters and control panels to allow the operators to manually initiate backwashes from this level, if needed.

7.2.4 *High Service Pump Room*

A high service pump room in close proximity to the electrical room and generator room.

7.2.5 *Chemical Rooms*

Chemical rooms for chlorine gas, sodium permanganate, fluoride, orthophosphate, and polymer to aid in backwash settling.

7.2.6 *Electrical Room*

An electrical room in close proximity to the high service pump room and generator room. The service entrance and automatic transfer switch would also be located in this room.

7.2.7 *Generator Room*

A generator room to house a standby generator that is capable of running the water treatment plant and selected nearby wells in the event of a power outage or possibly for peak shaving.

7.2.8 *Mechanical/Blower Room*

A mechanical room that contains the make-up air, dehumidification, HVAC equipment, and an air-wash blower for filter backwashing. This room may also contain the air compressor for process valves and building compressed air.

7.2.9 *Storage Room*

A storage room to store miscellaneous parts and materials.

7.2.10 *Office/Control Room/Laboratory*

A combined office/control room/laboratory for record drawings and Operation and Maintenance manuals, plant controls and SCADA system, and laboratory equipment to analyze water quality parameters.

7.2.11 *Clearwell*

A 250,000-gallon underground clearwell tank located under the filters and high service pump room.

7.2.12 *Backwash Tank*

Below grade concrete backwash tank with two cells to allow for more than one filter to be backwashed in one day.

7.3 Conceptual Site Plan

A conceptual site plan for the proposed water treatment facility is shown on **Figure 4 in Appendix A**. Site access is shown on 12th Avenue South to avoid disruption to traffic on Birch Street. An underground backwash tank would be constructed on the south side of the plant and be mostly non-visible to the public. A stormwater retention pond would be constructed in the lower area of the site to collect stormwater runoff from the impervious surfaces (plant roof, paved areas, etc.). The site would be graded as needed to cover the lower level of the plant.

7.4 Public Utilities

The existing public utilities at the potential site are summarized below and shown on **Figure 6 in Appendix A**.

- Water – An existing 16-inch ductile iron pipe (DIP) watermain crosses through the site, including a hydrant assembly at the eastern right-of-way line on 12th Avenue South and a 16-inch butterfly valve at the northern right-of-way line on Birch Street. This main would need to be relocated around the plant building.

- Sanitary Sewer – An existing 12-inch PVC sanitary sewer crosses through the site at a depth of 15 to 25 feet, including a sanitary sewer manhole at the change in direction. This approximately 412 feet long 12-inch PVC sanitary sewer and one sanitary sewer manhole would need to be relocated around the plant building.

- Storm Sewer – An existing stormsewer gravity main located approximately 500 feet south of the intersection of Birch Street and 12th Avenue South on the east side of the site crosses 12th Avenue South and would need to be rerouted around the site. This sewer outfalls into a private ditch that crosses the site from east to west. This ditch may need to be realigned as part of the plant construction.

7.5 Private Utilities

The existing private utilities in the area include the following and will possibly need to be relocated during the plant construction:

- CenturyLink – An existing line is located outside the curb in the right of way south of Birch Street and west of 12th Avenue South.

- CenterPoint Energy – An existing 4” PE CL-6 gas line is located approximately 29 feet north of the centerline in Birch Street. No conflicts are anticipated with this line.

- Xcel Energy Gas – An existing gas main is located near the centerline of 12th Avenue South. An unidentified line crosses the site east-west just south of Buckthorn Lane.

- Xcel Energy Electric – Existing overhead lines are located in the right of way south of Birch Street and west of 12th Avenue South. Several poles are located along the right of way boundary.

- Comcast – No mapping data was provided by Comcast at the time of this study, although this private utility does exist in this area.

7.6 Water Treatment Facility Impacts

The water treatment plant is expected to have very minimal impacts to the surrounding area in terms of traffic, noise, and pollution. Monthly chemical deliveries and daily stops by the City's operations staff would provide very minimal traffic. The plant would generate very low sound levels, if any at all, from the plant's ventilation systems. If sound from the ventilation systems is a concern to any neighboring properties, the ventilation systems can be designed with sound attenuation devices to reduce or eliminate these sounds. The emergency generator would be stored inside a room with acoustical walls and attenuation devices to significantly reduce the sound of the generator when it runs on an infrequent basis. The storage of chlorine gas inside the plant would include emergency shutoff valves to prevent any chlorine vapors from leaving the plant. In summary, the water treatment plant is expected to have very minimal traffic, noise, and pollution impacts to the area, if any at all.

8. WATER DISTRIBUTION SYSTEM MODELING

8.1 Existing System Impacts

The City's existing WaterCAD model was expanded to evaluate the impact of a central water treatment plant location with plant capacities that increase over time. Extended period simulations (EPS) were modeled to observe the filling and emptying patterns of the water towers as the system experiences variable water demands and the well pumps turn on and off throughout the day. All scenarios used maximum days demands. A series of additional demands were added at the extents of the system, where expansion will occur, in order for the total maximum day demand to equal the treatment capacity of the water treatment plant for each scenario. This was done in order to simulate the system hydraulics as additional wells are connected to the plant to meet water demand increases over time.

The hydraulic conditions in the existing trunk watermains near the potential plant location were analyzed for conformance with AWWA standards. AWWA Manual M32 Computer Modeling of Water Distribution Systems recommends a maximum headloss gradient of 10 feet per 1,000 feet and a maximum flow velocity of 5 feet per second in distribution watermains. The headloss gradients, velocities, and pressure changes in the existing watermains in the vicinity of the potential plant location are shown in **Table 8-1** for a various plant flow rates into the distribution system.

Table 8-1. WaterCAD Results with Existing Watermain

WTP Flow (gpm)*	Low Pressure (psi)	High Pressure (psi)	Pressure Change (psi)**	Max. Headloss Gradient (ft/1,000ft)***	Max. Velocity (ft/s)****
4,000	62 - 69	73 - 80	11	3.5	4.0
5,000	62 - 70	76 - 84	14	5.0	4.8
6,000	62 - 70	94 - 101	31 - 32	6.2	5.6
7,000	62 - 70	100 - 106	36 - 38	8.1	6.4
8,000	62 - 70	103 - 110	40 - 41	15.0	8.8
9,000	62 - 70	114 - 121	51 - 52	18.5	10.0
10,000	62 - 71	115 - 122	51 - 53	27.0	12.0

**System max day demands increased to necessitate WTP flow rate.*
***AWWA does not prescribe a particular maximum pressure change. However, pressure changes greater than 20 psi could be noticeable and objectionable to water users.*
****AWWA M32 recommends a maximum headloss gradient of 10 ft per 1,000 ft.*
*****AWWA M32 recommends a maximum velocity of 5 ft/s.*

The existing trunk watermains in the City distribution system can accommodate a water treatment plant capacity of 5,000 gpm without exceeding the maximum recommended flow velocity of 5 ft/s. The four wells located near the potential plant location (Well Nos. 1, 3, 5, and 6) have a combined total pumping rate of 4,175 gpm. Beyond 5,000 gpm, the velocities, pressure changes, and headloss gradients become prohibitive (in that order). Therefore, if additional wells and treatment capacity are added to the plant beyond 5,000 gpm, the trunk watermains will need to be upsized or additional parallel trunk watermains will need to be installed to provide acceptable water pressures for all customers. Based on the layout of the existing trunk watermains, it is recommended that additional parallel trunk watermains be installed in order to provide redundant trunk watermains along Birch Street.

8.2 Proposed Watermain Phasing

The water treatment plant capacity was incrementally increased from 5,000 gpm to 10,000 gpm with the model in order to determine which segments of parallel trunk watermain(s) will be needed at various phases as development progresses. The incremental plant capacities were compared with the future water demand projections to determine approximately when the watermain improvements are anticipated to be needed. The necessary trunk watermain improvements corresponding with each phase, and the resulting hydraulic conditions in the watermains in the vicinity of the potential plant site, are shown in **Figure 7 in Appendix A** and summarized in **Table 8-2**.

Table 8-2. Proposed Watermain Phasing

Phase	WTP Flow (gpm)*	Approx. Year**	Watermain Description	Watermain Dimensions	Max. Headloss Gradient (ft/1,000ft)***	Max. Velocity (ft/s)****
1	5,000	2021	Upsize 6-inch to 12-inch in Black Duck Dr from E Shadow Lake Dr to Mallard Ln	575 LF (12”)	5.1	5.0
2	6,000	2030	Parallel 16-inch WM in Birch St from Black Duck Dr to White Oak Rd, Upsize 6-inch to 12-inch in Black Duck Dr from Birch St to Lantern Ln and from Well No. 1 to E Shadow Lake Dr	3,300 LF (16”) 1,475 LF (12”)	5.1	5.0
3	7,000 to 8,000	2040	Parallel 16-inch WM in Birch St from White Oak Rd to 20th Ave S, Upsize 8-inch and 10-inch to 12-inch in Black Duck Dr at Partridge Pl and at Crystal Ct	11,500 LF (16”) 1,440 LF (12”)	4.0 to 5.1	4.3 to 5.0
4	9,000 to 10,000	Post-2040	N/A – Velocities exceed 5 ft/s with two parallel 16-inch trunk watermains	N/A	7.6 to 8.8	6.1 to 6.6

**System max day demands increased to necessitate WTP flow rate.*
***Approximate year that the WTP capacity will need to be increased to meet maximum day demand, based on a 20-hour supply period.*
****AWWA M32 recommends a maximum headloss gradient of 10 ft per 1,000 ft.*
*****AWWA M32 recommends a maximum velocity of 5 ft/s.*

As shown in **Table 8-2**, the maximum flow velocity is more constraining than the maximum headloss gradient. The existing 16-inch trunk watermain reaches a velocity of 5 ft/s at a flow rate of 3,150 gpm. Because the potential plant site is centrally located in the water distribution system, a total flow rate of 6,000 gpm results in approximately 3,000 gpm flowing outward in either direction in the 16-inch trunk watermain, which satisfies the velocity constraint. A plant capacity of 6,000 gpm only requires trunk watermain improvements in the immediate vicinity of the plant site. However, increasing to 7,000 gpm (resulting in approx. 3,500 gpm flowing in each direction) will require parallel trunk watermains alongside the existing 16-inch trunk watermains in Birch Street as shown in **Figure 7 in Appendix A**.

Watermain phasing was also reviewed along Black Duck Drive north of Birch Street. The existing watermains in Black Duck Drive include a mixture of 6-inch, 8-inch, 10-inch, and 12-inch diameter watermains. A 12-inch trunk watermain has been installed in Aqua Lane to the northwest to improve transmission to the northwest portion of the system, and the watermain in Black Duck Drive should be upsized to 12-inch to complete a uniform, continuous loop. The phases at which particular segments of this watermain need to be upsized to 12-inch diameter to meet the AWWA recommended hydraulics are shown in **Figure 7 in Appendix A**. These improvements could also be completed all at once in Phase 1.

9. ESTIMATED COSTS AND FUNDING OPTIONS

This section provides a financial analysis for the proposed water treatment facility and the future trunk watermain improvements. Preliminary water rate and Water Availability Charge (WAC) increases were calculated for funding the proposed improvements. All capital cost estimates are provided as present worth costs. The estimated costs for the water treatment facility and trunk watermain improvements are presented separately because the implementation of the trunk watermain improvements will occur in the future. The timing of the trunk watermain improvements will be dependent on the actual rate of development for the next 20 years and beyond. A portion of the recommended trunk watermain improvements may not be required in the future if a future wellfield and second water treatment plant need to be constructed in a remote area of the City due to the limited capacity of the Jordan Sandstone Aquifer in the general area of the central well field.

The operation and maintenance (O&M) costs for the water treatment facility were also estimated for the first 20 years of plant operation and included in the preliminary water rate and WAC increases as follows:

Plant Operations - The number of operating hours at water treatment facilities can be subjective to actual need versus personal preference. In one national survey of water operators, the number of operating hours at water treatment facilities varied from as little as ten (10) hours per week to as high as forty (40) hours per week. For this analysis, the estimated annual cost to add one additional full-time equivalent (FTE) or licensed water operator to assist and operate the proposed water treatment facility was included in the estimated O&M costs.

Equipment Maintenance - The estimated O&M costs include 1.0 percent of the capital cost of the treatment and electrical equipment to cover the cost of ongoing maintenance that is necessary to keep these equipment items functional over their useful life. This annual replacement value is consistent with EPA protocol for comparative economic analysis of water treatment facilities.

Chemical Costs – The addition of a water treatment facility may require slightly more chlorine to be fed than what is currently being fed at the City's well houses for oxidizing iron to a filterable form. In addition, sodium permanganate may be needed to oxidize manganese to a filterable form. The additional chlorine and sodium permanganate costs could possibly be eliminated altogether, however, with a biological filtration gravity filtration system. For these calculations, it was assumed that additional chlorine and sodium permanganate will be needed at the water treatment facility.

Heating, Cooling, and Dehumidification - Estimated O&M costs are included for the plant building heating, cooling, and dehumidification.

Electricity – The additional electricity costs for the proposed water treatment facility will be minimal for the HVAC systems, lights, small pumping systems, etc. The additional electricity costs for pumping the treated water into the distribution system will be minimal since the City's current wells are already pumping water into the distribution system and up into the water towers. A gravity filtration plant would add only about 25 to 30 feet of additional pumping head, at most, to the City's current pumping heads at the wells.

Property Insurance - The estimated O&M costs include an annual cost of $10,000 per year to amend the City's current insurance policy to include property insurance coverage for the proposed water treatment facility.

Building Maintenance – The estimated O&M costs include an estimated $500 per month for general building maintenance.

9.1 Water Treatment Plant Financial Analysis

The estimated costs for the recommended gravity filtration water treatment plant option analyzed in this report are summarized in **Table 9-1** below and are broken out in greater detail in **Appendix E**. The 20-year total costs include both the initial capital costs and the annual operations and maintenance (O&M) costs for the first twenty years of plant operation. The capital costs include a 10 percent construction contingency and 15 percent indirect costs (engineering, legal, administrative, etc.). The annual operation and maintenance (O&M) costs are based on a 3.5 percent inflation rate. Funding this project through an adjustment to the City's water rates, water availability charge (WAC), or trunk watermain charges, or a combination that uses all of these funding methods, should be evaluated as part of a detailed water utility rate study.

Table 9-1. Estimated Cost Summary for Water Treatment Plant

20-Year Capital Cost	$20,032,155.40
20-Year Loan Interest (1.5%)	$3,303,597.25
20-Year Operation and Maintenance Cost	$3,323,438.80
20-Year Total Cost Including Loan Interest	**$26,659,191.45**

9.2 Future Trunk Watermain Improvements Financial Analysis

The estimated costs for the Phase 1 trunk watermain improvements were not included in this financial analysis because this project is already proceeding and being funded by other means. The estimated costs for the future Phase 2, 3, and 4 trunk watermain improvements analyzed in this report are summarized in **Tables 9-2, 9-3, and 9-4** and are broken out in greater detail in **Appendix E.** The capital costs include a 10 percent construction contingency and variable indirect costs (engineering, legal, administrative, etc.) depending on the size of the project. Funding these trunk watermain projects through an adjustment to the City's trunk watermain charge should be evaluated as part of a detailed water utility rate study.

Table 9-2. Estimated Cost Summary for Phase 2 Trunk Watermain Improvements

20-Year Capital Cost	$178,571.25
20-Year Loan Interest (1.5%)	$29,449.03
20-Year Total Cost Including Loan Interest	**$208,020.28**

Table 9-3. Estimated Cost Summary for Phase 3 Trunk Watermain Improvements

20-Year Capital Cost	$1,646,346.90
20-Year Loan Interest (1.5%)	$271,506.83
20-Year Total Cost Including Loan Interest	**$1,917,853.73**

Table 9-4. Estimated Cost Summary for Phase 4 Trunk Watermain Improvements

20-Year Capital Cost	$3,921,500.00
20-Year Loan Interest (1.5%)	$646,713.06
20-Year Total Cost Including Loan Interest	**$4,568,213.06**

9.3 Future Well Nos. 7 and 8 Raw Watermain Improvements Financial Analysis

Estimated costs for constructing raw water mains from future Well Nos. 7 and 8 are summarized in **Table 9-5** if the City decides to treat these wells at the water treatment plant versus pumping them directly into the distribution system without treatment. These costs are broken out in greater detail in **Appendix E**. The capital costs include a 10 percent construction contingency and 15 percent indirect costs (engineering, legal, administrative, etc.). Funding these raw watermain improvements through an adjustment to the City's water rates, water availability charge (WAC), or trunk watermain charges, or a combination that uses all of these funding methods, should be evaluated as part of a detailed water utility rate study.

Table 9-5. Estimated Cost Summary for Future Well Nos. 7 and 8 Raw Watermain Improvements

20-Year Capital Cost	$3,058,770.00
20-Year Loan Interest (1.5%)	$504,436.19
20-Year Total Cost Including Loan Interest	**$3,563,206.19**

10. RECOMMENDATIONS

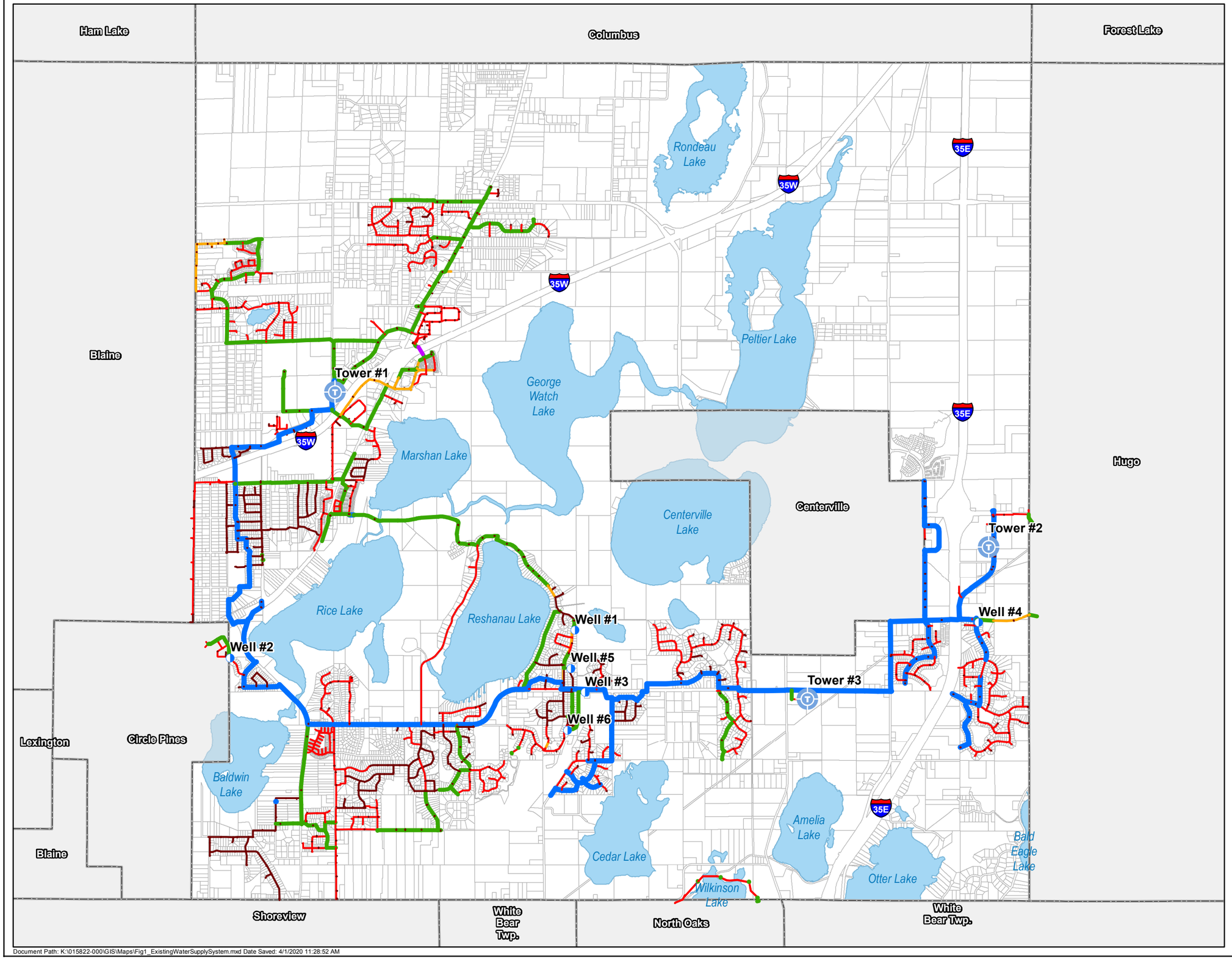
A Conventional Gravity Filtration Water Treatment Plant that is designed to provide for biological filtration is recommended to treat the City's central well field. The initial treatment capacity should be 6,000 gallons per minute (gpm) to supply the City's maximum day demands until Year 2040. The plant would initially treat manganese and iron in Well Nos. 1, 3, 5, 6, and future Well Nos. 7 and 8 if needed. The plant should also be designed to allow for a future plant expansion (beyond Year 2040) as additional wells are constructed near the central well field. Removing manganese and iron from the City's raw water will provide major benefits to the City and its customers. In addition to providing drinking water that is treated for manganese, the City's overall water quality will be greatly improved. Staining of laundry and plumbing fixtures will no longer be an issue for customers, and the City's water distribution system will need less maintenance with cleaner watermains that require less flushing of settled manganese and iron from the mains. A water treatment pilot study should be conducted as the next step to pilot the proposed water treatment process with the City's raw water to verify its effectiveness for a full scale water treatment plant.

The following implementation schedule is recommended for this project to ensure that treated water is provided to all City customers by Year 2023:

Task	Date
City Council accepts the Water Treatment Plant Feasibility Study	July 6, 2020
City Council authorizes Water Treatment Pilot Study	July 13, 2020
completes Water Treatment Pilot Study	November 13, 2020
City council authorizes design and bidding services for Water Treatment Plant	November 23, 2020
completes bidding documents for Water Treatment Plant	March 31, 2021
Water Treatment Plant construction bid opening	April 29, 2021
City Council awards construction contract for Water Treatment Plant	May 10, 2021
Complete construction of Water Treatment Plant	October 17, 2022
Water Treatment Plant start-up	October 28, 2022

APPENDIX A

Figures



CITY OF LINO LAKES

Figure 1
Existing Water Supply System

Water Treatment Plant
Feasibility Study
City of Lino Lakes, MN

Legend

- Water Tower
- Well
- Watermain
  - Diameter
  - 6"
  - 8"
  - 10"
  - 12"
  - 14"
  - 16"
- City Boundary

N

0 3,500 Feet
1 inch = 3,500 feet

wsb

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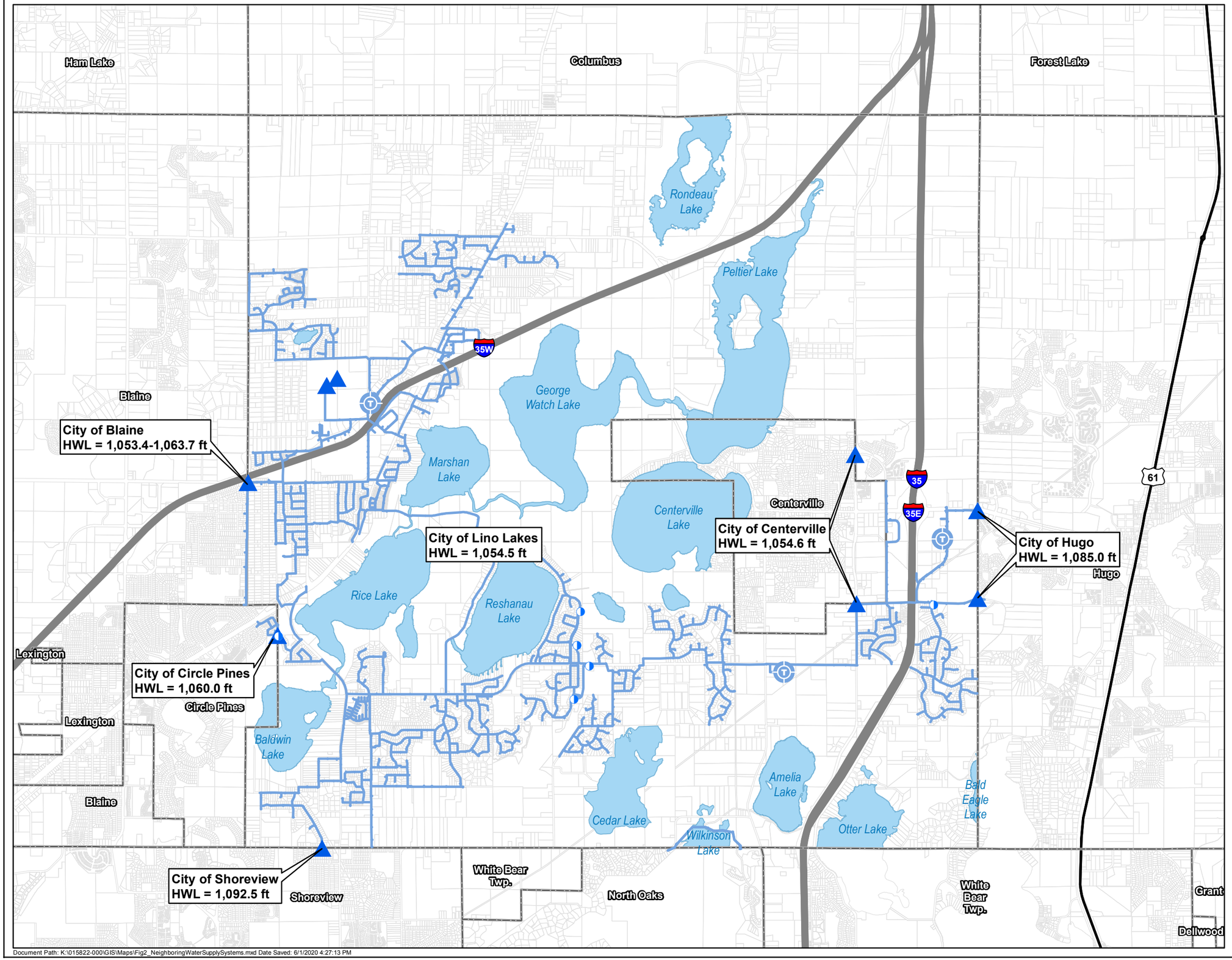

CITY OF LINO LAKES

Figure 2
Neighboring Water Supply Systems

Water Treatment Plant
Feasibility Study
City of Lino Lakes, MN

Legend

- Existing Interconnection
- Water Tower
- Well
- Watermain
- Interstate Highway
- U.S. Highway
- MN Highway
- Other Trunk Highway
- City Boundary

N

0 4,000 Feet
1 inch = 4,000 feet

wsb

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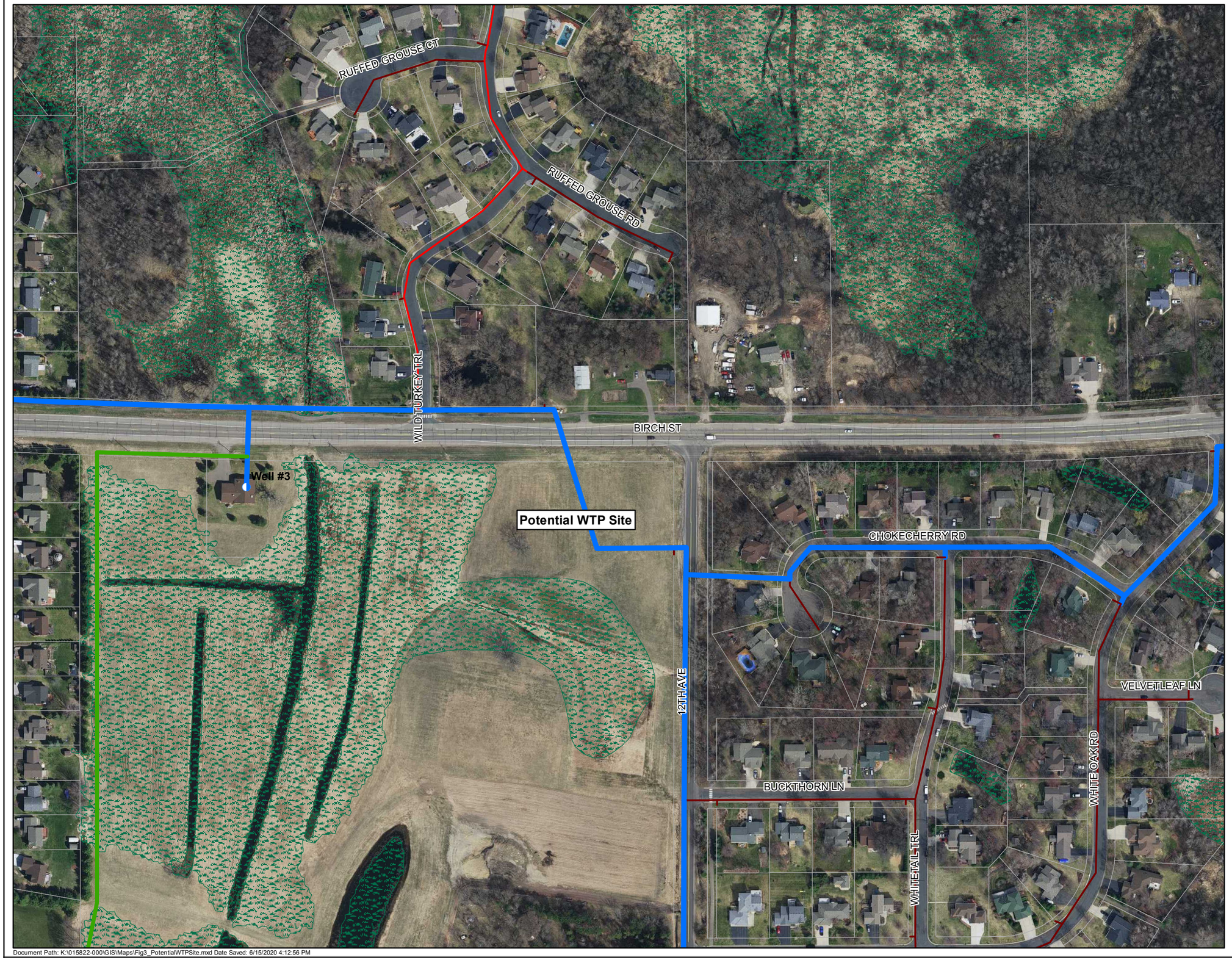

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CITY OF LINO LAKES

Figure 3
Potential WTP Site
Water Treatment Plant
Feasibility Study
City of Lino Lakes, MN

Legend

- **Water Tower**
- **Well**
- **Watermain**
  Diameter
  - 6"
  - 8"
  - 10"
  - 12"
  - 16"
  - Unknown
- **Wetlands**
- **City Boundary**

N

0 200 Feet
1 inch = 200 feet

wsb

Figure 4 - Conceptual Site Plan

Lino Lakes, Minnesota

June 25, 2020 | WSB Project number: 015822-000

0′ 20′ 40′ 80′ 160′

Scale in Feet

wsb

K:\015822-000\Graphics\Concept\015822_Concept_6_11_20

CITY OF LINO LAKES

Figure 5
Existing Public Utilities
Water Treatment Plant
Feasibility Study
City of Lino Lakes, MN

Legend

- Water Valve
- Water Hydrant
- Watermain
- Sanitary Lift Station
- Sanitary Manhole
- Sanitary Forcemain
- Sanitary Gravity Main
- Storm Inlet
- Storm Manhole
- Storm Gravity Main
- RCWD Ditch
- RCWD Culvert
- Storm Detention Pond
- **Wetlands**
- **City Boundary**

N

0 100 Feet
1 inch = 100 feet

wsb

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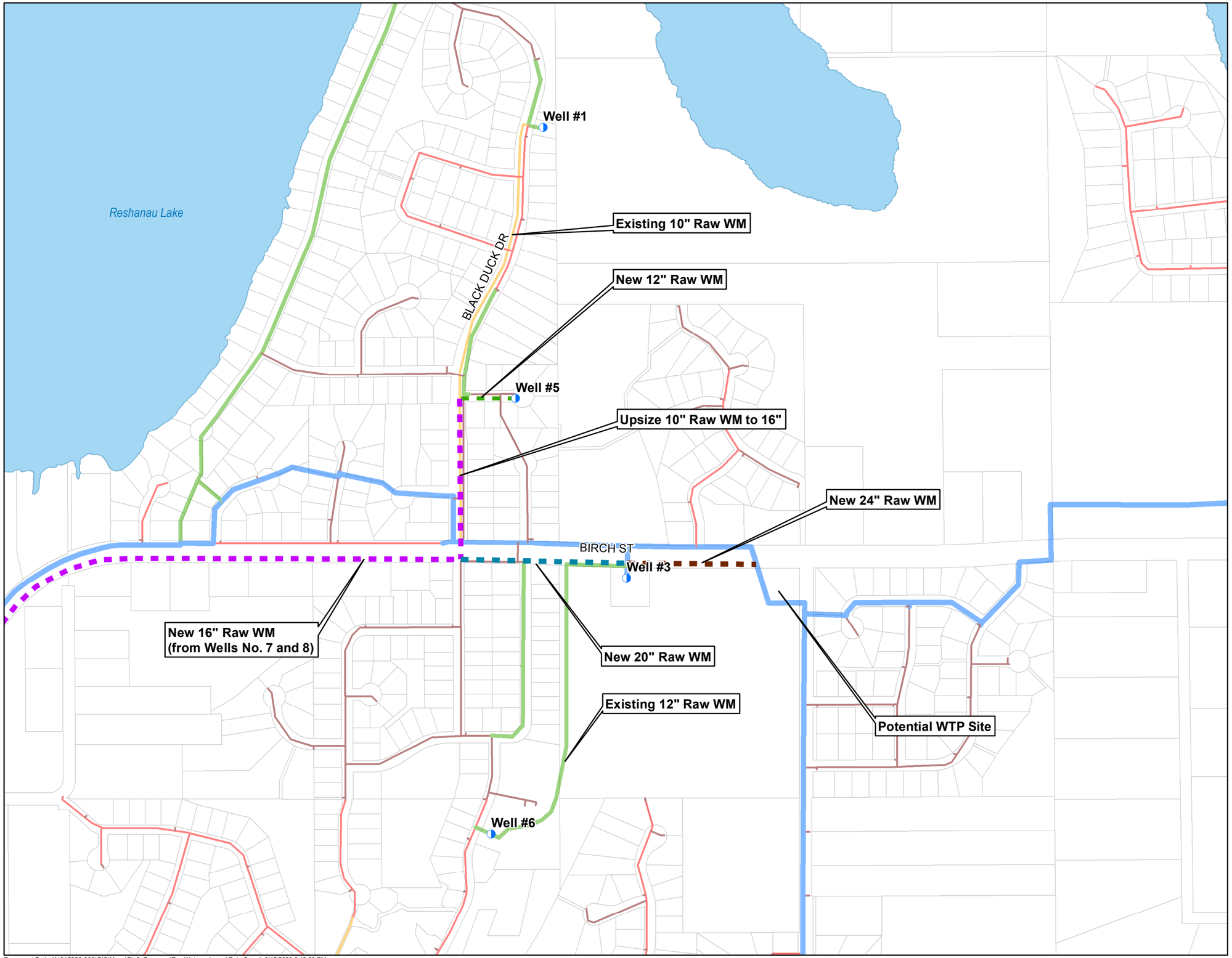

CITY OF LINO LAKES

Figure 6
Proposed Raw Watermain

Water Treatment Plant
Feasibility Study
City of Lino Lakes, MN

Legend

- Water Tower
- Well

Proposed Raw Watermain

Diameter

- 10"
- 12"
- 16"
- 20"
- 24"

Existing Watermain

Diameter

- 6"
- 8"
- 10"
- 12"
- 14"
- 16"
- City Boundary

N

0 500 Feet
1 inch = 500 feet

wsb

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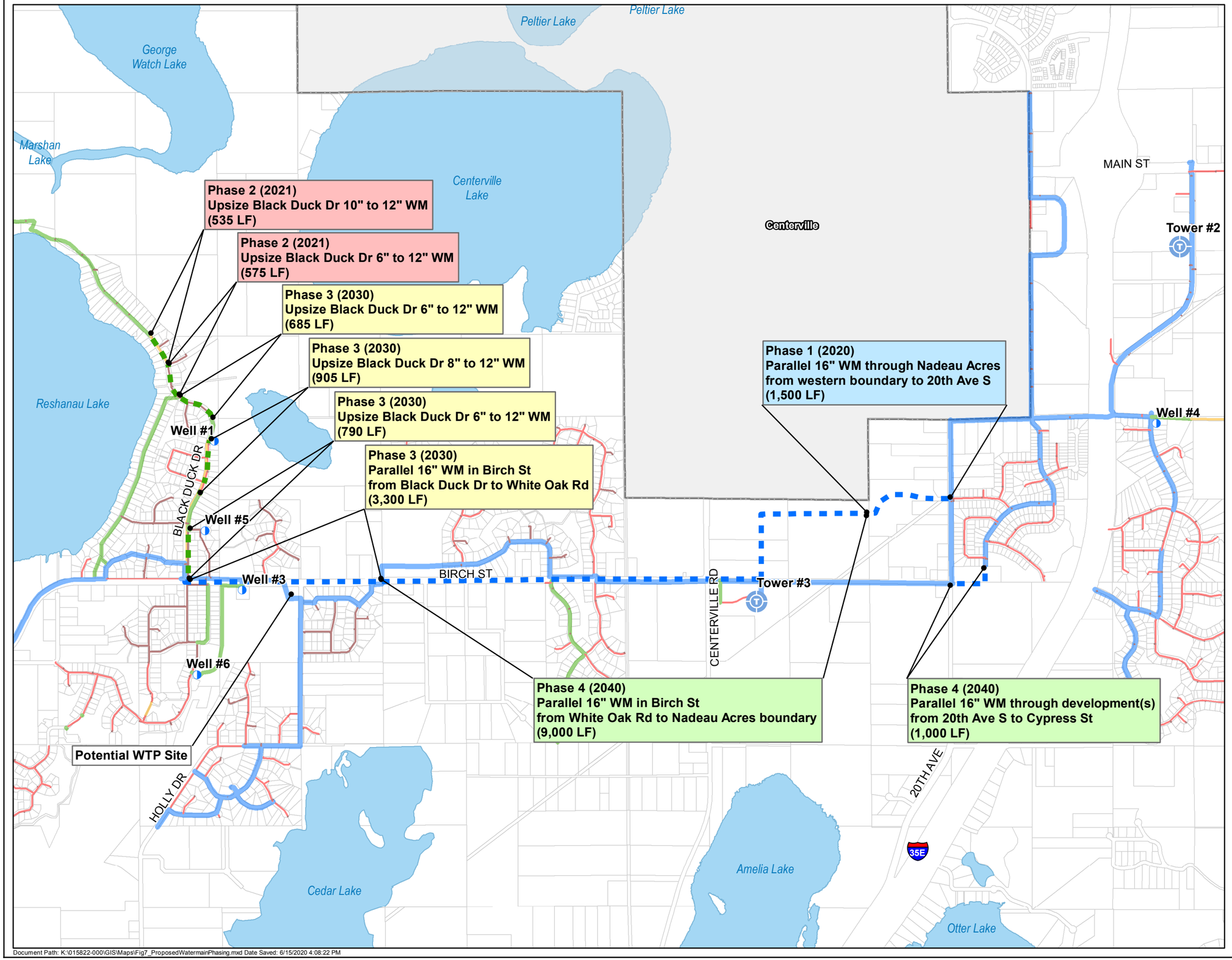

CITY OF LINO LAKES

Figure 7
Proposed Watermain Phasing

Water Treatment Plant
Feasibility Study
City of Lino Lakes, MN

Legend

- Water Tower
- Well

Proposed Watermain

Diameter

- 12"
- 16"

Existing Watermain

Diameter

- 6"
- 8"
- 10"
- 12"
- 14"
- 16"
- City Boundary

N

0 1,500 Feet

1 inch = 1,500 feet

wsb

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APPENDIX B

Water Quality Analysis Results

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

June 22, 2020

Justin WIlliams
City of Lino Lakes
600 Town Center Parkway
Circle Pines, MN 55014

RE: Project: 20-03427 LINO LAKES DW 2020
Pace Project No.: 10520924

Dear Justin WIlliams:

Enclosed are the analytical results for sample(s) received by the laboratory on June 09, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

Some analyses were subcontracted outside of the Pace Network. The test report from the external subcontractor is attached to this report in its entirety.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Duluth
- Pace Analytical Services - Minneapolis

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jared Dickinson
jared.dickinson@pacelabs.com
(612)607-1700
Project Manager

Enclosures

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Minneapolis, MN 55414
(612)607-1700

CERTIFICATIONS

Project: 20-03427 LINO LAKES DW 2020
Pace Project No.: 10520924

Pace Analytical Services Minneapolis

A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas DW Certification #: MN00064
Arkansas WW Certification #: 88-0680
California Certification #: 2929
CNMI Saipan Certification #: MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Massachusetts DWP Certification #: via MN 027-053-137
Michigan Certification #: 9909
Minnesota Certification #: 027-053-137
Minnesota Dept of Ag Certifcation #: via MN 027-053-137
Minnesota Petrofund Certification #: 1240
Mississippi Certification #: MN00064
Missouri Certification #: 10100
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon Primary Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #:74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Vermont Certification #: VT-027053137
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DEP Certification #: 382
West Virginia DW Certification #: 9952 C
Wisconsin Certification #: 999407970
Wyoming UST Certification #: via A2LA 2926.01

Pace Analytical Services Duluth Minnesota

4730 Oneota St., Duluth, MN 55807
Montana DHHS Certification #: CERT0102
Minnesota Dept of Health Certification #: 1733125
Minnesota Dept of Ag Certification #: Via MN Dept of Health 027-137-152
Wisconsin Dept of Agriculture Certification #: 480341
Wisconsin DNR Certification # : 999446800
North Dakota Certification #: R-105
Nevada DCNR Certification #: MN000372019-1

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1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

SAMPLE SUMMARY

Project: 20-03427 LINO LAKES DW 2020
Pace Project No.: 10520924

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10520924001	**WELL HOUSE 2**	Water	06/09/20 09:00	06/09/20 12:15
10520924002	**WELL HOUSE 5**	Water	06/09/20 09:45	06/09/20 12:15
10520924003	**WELL HOUSE 6**	Water	06/09/20 10:15	06/09/20 12:15
10520924004	**WELL HOUSE 3**	Water	06/09/20 10:55	06/09/20 12:15
10520924005	**WELL HOUSE 4**	Water	06/09/20 11:35	06/09/20 12:15

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SAMPLE ANALYTE COUNT

Project: 20-03427 LINO LAKES DW 2020
Pace Project No.: 10520924

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10520924001	**WELL HOUSE 2**	SM 2120 B-2011	BT1	2	PASI-DUL
		EPA 200.7	DM	5	PASI-M
		EPA 200.7	IP	1	PASI-M
		EPA 200.8	BWB	15	PASI-M
		EPA 200.8	BWB	1	PASI-M
		EPA 180.1	SH4	1	PASI-M
		SM 2540C	EPT	1	PASI-M
		SM 2540D	EPT	1	PASI-M
		SM 4500-H+B	SH4	1	PASI-M
		SM 9223B	DCL	1	PASI-M
		EPA 300.0	KEO	5	PASI-M
		EPA 350.1	JFP	1	PASI-M
		EPA 353.2	JFP	1	PASI-M
10520924002	**WELL HOUSE 5**	SM 2120 B-2011	BT1	2	PASI-DUL
		EPA 200.7	DM	5	PASI-M
		EPA 200.7	IP	1	PASI-M
		EPA 200.8	BWB	15	PASI-M
		EPA 200.8	BWB	1	PASI-M
		EPA 180.1	SH4	1	PASI-M
		SM 2540C	EPT	1	PASI-M
		SM 2540D	EPT	1	PASI-M
		SM 4500-H+B	SH4	1	PASI-M
		SM 9223B	DCL	1	PASI-M
		EPA 300.0	KEO	5	PASI-M
		EPA 350.1	JFP	1	PASI-M
		EPA 353.2	JFP	1	PASI-M
10520924003	**WELL HOUSE 6**	SM 2120 B-2011	BT1	2	PASI-DUL
		EPA 200.7	DM	5	PASI-M
		EPA 200.7	IP	1	PASI-M
		EPA 200.8	BWB	15	PASI-M
		EPA 200.8	BWB	1	PASI-M
		EPA 180.1	SH4	1	PASI-M
		SM 2540C	EPT	1	PASI-M
		SM 2540D	EPT	1	PASI-M
		SM 9223B	DCL	1	PASI-M
		EPA 300.0	KEO	5	PASI-M
		EPA 350.1	JFP	1	PASI-M

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1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

SAMPLE ANALYTE COUNT

Project: 20-03427 LINO LAKES DW 2020
Pace Project No.: 10520924

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 353.2	JFP	1	PASI-M
10520924004	**WELL HOUSE 3**	SM 2120 B-2011	BT1	2	PASI-DUL
		EPA 200.7	DM	5	PASI-M
		EPA 200.7	IP	1	PASI-M
		EPA 200.8	BWB	15	PASI-M
		EPA 200.8	BWB	1	PASI-M
		EPA 180.1	SH4	1	PASI-M
		SM 2540D	EPT	1	PASI-M
		SM 9223B	DCL	1	PASI-M
		EPA 300.0	KEO	5	PASI-M
		EPA 350.1	JFP	1	PASI-M
		EPA 353.2	JFP	1	PASI-M
10520924005	**WELL HOUSE 4**	SM 2120 B-2011	BT1	2	PASI-DUL
		EPA 200.7	DM	5	PASI-M
		EPA 200.7	IP	1	PASI-M
		EPA 200.8	BWB	15	PASI-M
		EPA 200.8	BWB	1	PASI-M
		EPA 180.1	SH4	1	PASI-M
		SM 2540D	EPT	1	PASI-M
		SM 9223B	DCL	1	PASI-M
		EPA 300.0	KEO	5	PASI-M
		EPA 350.1	JFP	1	PASI-M
		EPA 353.2	JFP	1	PASI-M

PASI-DUL = Pace Analytical Services - Duluth
PASI-M = Pace Analytical Services - Minneapolis

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(612)607-1700

ANALYTICAL RESULTS

Project: 20-03427 LINO LAKES DW 2020
Pace Project No.: 10520924

Sample: WELL HOUSE 2 **Lab ID: 10520924001** Collected: 06/09/20 09:00 Received: 06/09/20 12:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
2120B True Color	Analytical Method: SM 2120 B-2011							
	Pace Analytical Services - Duluth							
pH at 25 Degrees C	**7.5**	Std. Units		1		06/11/20 11:13		H3
True Color	ND	units	10.0	1		06/11/20 11:13		H3
Field Data	Analytical Method:							
	Pace Analytical Services - Minneapolis							
Field pH	**7.65**	Std. Units		1		06/09/20 09:00		
Field Temperature	**15.0**	deg C		1		06/09/20 09:00		
200.7 MET ICP	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
	Pace Analytical Services - Minneapolis							
Calcium	**62000**	ug/L	500	1	06/12/20 06:26	06/15/20 12:35	7440-70-2	
Iron	**181**	ug/L	50.0	1	06/12/20 06:26	06/15/20 12:35	7439-89-6	
Magnesium	**24000**	ug/L	500	1	06/12/20 06:26	06/15/20 12:35	7439-95-4	
Potassium	ND	ug/L	2500	1	06/12/20 06:26	06/15/20 12:35	7440-09-7	
Sodium	**5810**	ug/L	1000	1	06/12/20 06:26	06/15/20 12:35	7440-23-5	
200.7 MET ICP, Dissolved	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
	Pace Analytical Services - Minneapolis							
Iron, Dissolved	**323**	ug/L	50.0	1	06/12/20 06:26	06/14/20 13:54	7439-89-6	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
	Pace Analytical Services - Minneapolis							
Aluminum	ND	ug/L	20.0	1	06/12/20 06:45	06/15/20 12:47	7429-90-5	
Antimony	ND	ug/L	0.50	1	06/12/20 06:45	06/15/20 12:47	7440-36-0	
Arsenic	**2.1**	ug/L	0.50	1	06/12/20 06:45	06/15/20 12:47	7440-38-2	
Barium	**40.0**	ug/L	0.30	1	06/12/20 06:45	06/15/20 12:47	7440-39-3	
Beryllium	ND	ug/L	0.20	1	06/12/20 06:45	06/15/20 12:47	7440-41-7	
Cadmium	ND	ug/L	0.080	1	06/12/20 06:45	06/15/20 12:47	7440-43-9	
Chromium	ND	ug/L	0.50	1	06/12/20 06:45	06/15/20 12:47	7440-47-3	
Copper	**4.7**	ug/L	1.0	1	06/12/20 06:45	06/15/20 12:47	7440-50-8	
Lead	**0.18**	ug/L	0.10	1	06/12/20 06:45	06/15/20 12:47	7439-92-1	
Manganese	**249**	ug/L	0.50	1	06/12/20 06:45	06/15/20 12:47	7439-96-5	
Nickel	ND	ug/L	0.50	1	06/12/20 06:45	06/15/20 12:47	7440-02-0	
Selenium	ND	ug/L	0.50	1	06/12/20 06:45	06/15/20 12:47	7782-49-2	
Thallium	ND	ug/L	0.10	1	06/12/20 06:45	06/15/20 12:47	7440-28-0	
Total Hardness by 2340B	**271000**	ug/L	2820	20	06/12/20 06:45	06/15/20 12:53		
Zinc	ND	ug/L	5.0	1	06/12/20 06:45	06/15/20 12:47	7440-66-6	
200.8 MET ICPMS, Dissolved	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
	Pace Analytical Services - Minneapolis							
Manganese, Dissolved	**256**	ug/L	0.50	1	06/12/20 06:05	06/12/20 21:29	7439-96-5	
180.1 Turbidity	Analytical Method: EPA 180.1							
	Pace Analytical Services - Minneapolis							
Turbidity	**0.94**	NTU	0.50	1		06/10/20 20:33		

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(612)607-1700

ANALYTICAL RESULTS

Project: 20-03427 LINO LAKES DW 2020
Pace Project No.: 10520924

Sample: WELL HOUSE 2 **Lab ID: 10520924001** Collected: 06/09/20 09:00 Received: 06/09/20 12:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Minneapolis							
Total Dissolved Solids	**251**	mg/L	10.0	1		06/16/20 10:49		
2540D Total Suspended Solids	Analytical Method: SM 2540D Pace Analytical Services - Minneapolis							
Total Suspended Solids	ND	mg/L	10.0	1		06/16/20 14:26		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B Pace Analytical Services - Minneapolis							
pH at 25 Degrees C	**7.8**	Std. Units	0.10	1		06/17/20 11:28		H6
MBIO Total Coliform	Analytical Method: SM 9223B Preparation Method: SM 9223B Pace Analytical Services - Minneapolis							
Total Coliforms	**Absent**		1.0	1	06/10/20 13:43	06/11/20 13:43		
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Minneapolis							
Chloride	**4.5**	mg/L	1.2	1		06/10/20 23:30	16887-00-6	M1
Fluoride	**0.39**	mg/L	0.050	1		06/10/20 23:30	16984-48-8	M1
Nitrate as N	ND	mg/L	0.10	1		06/10/20 23:30	14797-55-8	M1
Nitrite as N	ND	mg/L	0.10	1		06/10/20 23:30	14797-65-0	M1
Sulfate	**4.2**	mg/L	1.2	1		06/10/20 23:30	14808-79-8	M1
350.1 Ammonia	Analytical Method: EPA 350.1 Pace Analytical Services - Minneapolis							
Nitrogen, Ammonia	ND	mg/L	0.10	1		06/16/20 11:04	7664-41-7	
353.2 Nitrate + Nitrite	Analytical Method: EPA 353.2 Pace Analytical Services - Minneapolis							
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	1		06/12/20 13:23		

Sample: WELL HOUSE 5 **Lab ID: 10520924002** Collected: 06/09/20 09:45 Received: 06/09/20 12:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
2120B True Color	Analytical Method: SM 2120 B-2011 Pace Analytical Services - Duluth							
pH at 25 Degrees C	**7.6**	Std. Units		1		06/11/20 11:17		H3
True Color	ND	units	10.0	1		06/11/20 11:17		H3
Field Data	Analytical Method: Pace Analytical Services - Minneapolis							
Field pH	**7.70**	Std. Units		1		06/09/20 09:45		
Field Temperature	**13.0**	deg C		1		06/09/20 09:45		

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ANALYTICAL RESULTS

Project: 20-03427 LINO LAKES DW 2020
Pace Project No.: 10520924

Sample: WELL HOUSE 5 **Lab ID: 10520924002** Collected: 06/09/20 09:45 Received: 06/09/20 12:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
	Pace Analytical Services - Minneapolis							
Calcium	**59100**	ug/L	500	1	06/12/20 06:26	06/15/20 12:37	7440-70-2	
Iron	**310**	ug/L	50.0	1	06/12/20 06:26	06/15/20 12:37	7439-89-6	
Magnesium	**24900**	ug/L	500	1	06/12/20 06:26	06/15/20 12:37	7439-95-4	
Potassium	ND	ug/L	2500	1	06/12/20 06:26	06/15/20 12:37	7440-09-7	
Sodium	**4890**	ug/L	1000	1	06/12/20 06:26	06/15/20 12:37	7440-23-5	
200.7 MET ICP, Dissolved	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
	Pace Analytical Services - Minneapolis							
Iron, Dissolved	**290**	ug/L	50.0	1	06/12/20 06:26	06/14/20 13:57	7439-89-6	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
	Pace Analytical Services - Minneapolis							
Aluminum	ND	ug/L	20.0	1	06/12/20 06:45	06/15/20 13:06	7429-90-5	
Antimony	ND	ug/L	0.50	1	06/12/20 06:45	06/15/20 13:06	7440-36-0	
Arsenic	**0.77**	ug/L	0.50	1	06/12/20 06:45	06/15/20 13:06	7440-38-2	
Barium	**29.8**	ug/L	0.30	1	06/12/20 06:45	06/15/20 13:06	7440-39-3	
Beryllium	ND	ug/L	0.20	1	06/12/20 06:45	06/15/20 13:06	7440-41-7	
Cadmium	ND	ug/L	0.080	1	06/12/20 06:45	06/15/20 13:06	7440-43-9	
Chromium	ND	ug/L	0.50	1	06/12/20 06:45	06/15/20 13:06	7440-47-3	
Copper	ND	ug/L	1.0	1	06/12/20 06:45	06/15/20 13:06	7440-50-8	
Lead	ND	ug/L	0.10	1	06/12/20 06:45	06/15/20 13:06	7439-92-1	
Manganese	**152**	ug/L	0.50	1	06/12/20 06:45	06/15/20 13:06	7439-96-5	
Nickel	ND	ug/L	0.50	1	06/12/20 06:45	06/15/20 13:06	7440-02-0	
Selenium	ND	ug/L	0.50	1	06/12/20 06:45	06/15/20 13:06	7782-49-2	
Thallium	ND	ug/L	0.10	1	06/12/20 06:45	06/15/20 13:06	7440-28-0	
Total Hardness by 2340B	**276000**	ug/L	2820	20	06/12/20 06:45	06/15/20 13:10		
Zinc	**5.5**	ug/L	5.0	1	06/12/20 06:45	06/15/20 13:06	7440-66-6	
200.8 MET ICPMS, Dissolved	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
	Pace Analytical Services - Minneapolis							
Manganese, Dissolved	**172**	ug/L	0.50	1	06/12/20 06:05	06/12/20 21:33	7439-96-5	
180.1 Turbidity	Analytical Method: EPA 180.1							
	Pace Analytical Services - Minneapolis							
Turbidity	**3.5**	NTU	0.50	1		06/10/20 20:34		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
	Pace Analytical Services - Minneapolis							
Total Dissolved Solids	**245**	mg/L	10.0	1		06/16/20 10:49		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
	Pace Analytical Services - Minneapolis							
Total Suspended Solids	ND	mg/L	10.0	1		06/16/20 14:26		

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ANALYTICAL RESULTS

Project: 20-03427 LINO LAKES DW 2020
Pace Project No.: 10520924

Sample: WELL HOUSE 5 **Lab ID: 10520924002** Collected: 06/09/20 09:45 Received: 06/09/20 12:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B Pace Analytical Services - Minneapolis							
pH at 25 Degrees C	**7.8**	Std. Units	0.10	1		06/17/20 11:30		H6
MBIO Total Coliform	Analytical Method: SM 9223B Preparation Method: SM 9223B Pace Analytical Services - Minneapolis							
Total Coliforms	**Absent**		1.0	1	06/10/20 13:43	06/11/20 13:43		
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Minneapolis							
Chloride	**3.1**	mg/L	1.2	1		06/11/20 00:49	16887-00-6	
Fluoride	**0.18**	mg/L	0.050	1		06/11/20 00:49	16984-48-8	
Nitrate as N	ND	mg/L	0.10	1		06/11/20 00:49	14797-55-8	
Nitrite as N	ND	mg/L	0.10	1		06/11/20 00:49	14797-65-0	
Sulfate	**5.1**	mg/L	1.2	1		06/11/20 00:49	14808-79-8	
350.1 Ammonia	Analytical Method: EPA 350.1 Pace Analytical Services - Minneapolis							
Nitrogen, Ammonia	**0.14**	mg/L	0.10	1		06/16/20 11:08	7664-41-7	
353.2 Nitrate + Nitrite	Analytical Method: EPA 353.2 Pace Analytical Services - Minneapolis							
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	1		06/12/20 13:24		

Sample: WELL HOUSE 6 **Lab ID: 10520924003** Collected: 06/09/20 10:15 Received: 06/09/20 12:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
2120B True Color	Analytical Method: SM 2120 B-2011 Pace Analytical Services - Duluth							
pH at 25 Degrees C	**7.9**	Std. Units		1		06/11/20 11:19		H3
True Color	ND	units	10.0	1		06/11/20 11:19		H3
Field Data	Analytical Method: Pace Analytical Services - Minneapolis							
Field pH	**7.70**	Std. Units		1		06/09/20 10:15		
Field Temperature	**13.5**	deg C		1		06/09/20 10:15		
200.7 MET ICP	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Minneapolis							
Calcium	**64000**	ug/L	500	1	06/12/20 06:26	06/15/20 12:42	7440-70-2	
Iron	**50.1**	ug/L	50.0	1	06/12/20 06:26	06/15/20 12:42	7439-89-6	
Magnesium	**28700**	ug/L	500	1	06/12/20 06:26	06/15/20 12:42	7439-95-4	
Potassium	ND	ug/L	2500	1	06/12/20 06:26	06/15/20 12:42	7440-09-7	
Sodium	**6750**	ug/L	1000	1	06/12/20 06:26	06/15/20 12:42	7440-23-5	

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ANALYTICAL RESULTS

Project: 20-03427 LINO LAKES DW 2020
Pace Project No.: 10520924

Sample: WELL HOUSE 6 **Lab ID: 10520924003** Collected: 06/09/20 10:15 Received: 06/09/20 12:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP, Dissolved	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
	Pace Analytical Services - Minneapolis							
Iron, Dissolved	ND	ug/L	50.0	1	06/12/20 06:26	06/14/20 14:06	7439-89-6	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
	Pace Analytical Services - Minneapolis							
Aluminum	ND	ug/L	20.0	1	06/12/20 06:45	06/15/20 13:20	7429-90-5	
Antimony	ND	ug/L	0.50	1	06/12/20 06:45	06/15/20 13:20	7440-36-0	
Arsenic	ND	ug/L	0.50	1	06/12/20 06:45	06/15/20 13:20	7440-38-2	
Barium	**83.3**	ug/L	0.30	1	06/12/20 06:45	06/15/20 13:20	7440-39-3	
Beryllium	ND	ug/L	0.20	1	06/12/20 06:45	06/15/20 13:20	7440-41-7	
Cadmium	ND	ug/L	0.080	1	06/12/20 06:45	06/15/20 13:20	7440-43-9	
Chromium	ND	ug/L	0.50	1	06/12/20 06:45	06/15/20 13:20	7440-47-3	
Copper	**24.1**	ug/L	1.0	1	06/12/20 06:45	06/15/20 13:20	7440-50-8	
Lead	ND	ug/L	0.10	1	06/12/20 06:45	06/15/20 13:20	7439-92-1	
Manganese	**376**	ug/L	0.50	1	06/12/20 06:45	06/15/20 13:20	7439-96-5	
Nickel	**3.7**	ug/L	0.50	1	06/12/20 06:45	06/15/20 13:20	7440-02-0	
Selenium	ND	ug/L	0.50	1	06/12/20 06:45	06/15/20 13:20	7782-49-2	
Thallium	**0.14**	ug/L	0.10	1	06/12/20 06:45	06/15/20 13:20	7440-28-0	
Total Hardness by 2340B	**308000**	ug/L	2820	20	06/12/20 06:45	06/15/20 13:23		
Zinc	**12.1**	ug/L	5.0	1	06/12/20 06:45	06/15/20 13:20	7440-66-6	
200.8 MET ICPMS, Dissolved	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
	Pace Analytical Services - Minneapolis							
Manganese, Dissolved	**357**	ug/L	0.50	1	06/12/20 06:05	06/12/20 21:36	7439-96-5	
180.1 Turbidity	Analytical Method: EPA 180.1							
	Pace Analytical Services - Minneapolis							
Turbidity	ND	NTU	0.50	1		06/10/20 20:35		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
	Pace Analytical Services - Minneapolis							
Total Dissolved Solids	**291**	mg/L	10.0	1		06/16/20 10:49		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
	Pace Analytical Services - Minneapolis							
Total Suspended Solids	ND	mg/L	10.0	1		06/16/20 14:26		
MBIO Total Coliform	Analytical Method: SM 9223B Preparation Method: SM 9223B							
	Pace Analytical Services - Minneapolis							
Total Coliforms	**Absent**		1.0	1	06/10/20 13:43	06/11/20 13:43		
300.0 IC Anions	Analytical Method: EPA 300.0							
	Pace Analytical Services - Minneapolis							
Chloride	**12.5**	mg/L	1.2	1		06/11/20 02:05	16887-00-6	
Fluoride	**0.52**	mg/L	0.050	1		06/11/20 02:05	16984-48-8	
Nitrate as N	ND	mg/L	0.10	1		06/11/20 02:05	14797-55-8	

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ANALYTICAL RESULTS

Project: 20-03427 LINO LAKES DW 2020
Pace Project No.: 10520924

Sample: WELL HOUSE 6 **Lab ID: 10520924003** Collected: 06/09/20 10:15 Received: 06/09/20 12:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
300.0 IC Anions	Analytical Method: EPA 300.0							
	Pace Analytical Services - Minneapolis							
Nitrite as N	ND	mg/L	0.10	1		06/11/20 02:05	14797-65-0	
Sulfate	**7.7**	mg/L	1.2	1		06/11/20 02:05	14808-79-8	
350.1 Ammonia	Analytical Method: EPA 350.1							
	Pace Analytical Services - Minneapolis							
Nitrogen, Ammonia	**0.21**	mg/L	0.10	1		06/16/20 11:09	7664-41-7	
353.2 Nitrate + Nitrite	Analytical Method: EPA 353.2							
	Pace Analytical Services - Minneapolis							
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	1		06/12/20 13:25		

Sample: WELL HOUSE 3 **Lab ID: 10520924004** Collected: 06/09/20 10:55 Received: 06/09/20 12:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
2120B True Color	Analytical Method: SM 2120 B-2011							
	Pace Analytical Services - Duluth							
pH at 25 Degrees C	**7.8**	Std. Units		1		06/11/20 11:20		H3
True Color	ND	units	10.0	1		06/11/20 11:20		H3
Field Data	Analytical Method:							
	Pace Analytical Services - Minneapolis							
Field pH	**7.7**	Std. Units		1		06/09/20 10:55		
Field Temperature	**13.0**	deg C		1		06/09/20 10:55		
200.7 MET ICP	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
	Pace Analytical Services - Minneapolis							
Calcium	**63900**	ug/L	500	1	06/12/20 06:26	06/15/20 12:44	7440-70-2	
Iron	ND	ug/L	50.0	1	06/12/20 06:26	06/15/20 12:44	7439-89-6	
Magnesium	**28900**	ug/L	500	1	06/12/20 06:26	06/15/20 12:44	7439-95-4	
Potassium	ND	ug/L	2500	1	06/12/20 06:26	06/15/20 12:44	7440-09-7	
Sodium	**6220**	ug/L	1000	1	06/12/20 06:26	06/15/20 12:44	7440-23-5	
200.7 MET ICP, Dissolved	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
	Pace Analytical Services - Minneapolis							
Iron, Dissolved	ND	ug/L	50.0	1	06/12/20 06:26	06/14/20 14:09	7439-89-6	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
	Pace Analytical Services - Minneapolis							
Aluminum	ND	ug/L	20.0	1	06/12/20 06:45	06/15/20 13:26	7429-90-5	
Antimony	ND	ug/L	0.50	1	06/12/20 06:45	06/15/20 13:26	7440-36-0	
Arsenic	ND	ug/L	0.50	1	06/12/20 06:45	06/15/20 13:26	7440-38-2	
Barium	**87.1**	ug/L	0.30	1	06/12/20 06:45	06/15/20 13:26	7440-39-3	
Beryllium	ND	ug/L	0.20	1	06/12/20 06:45	06/15/20 13:26	7440-41-7	

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ANALYTICAL RESULTS

Project: 20-03427 LINO LAKES DW 2020
Pace Project No.: 10520924

Sample: WELL HOUSE 3 **Lab ID: 10520924004** Collected: 06/09/20 10:55 Received: 06/09/20 12:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
	Pace Analytical Services - Minneapolis							
Cadmium	ND	ug/L	0.080	1	06/12/20 06:45	06/15/20 13:26	7440-43-9	
Chromium	ND	ug/L	0.50	1	06/12/20 06:45	06/15/20 13:26	7440-47-3	
Copper	ND	ug/L	1.0	1	06/12/20 06:45	06/15/20 13:26	7440-50-8	
Lead	ND	ug/L	0.10	1	06/12/20 06:45	06/15/20 13:26	7439-92-1	
Manganese	**383**	ug/L	0.50	1	06/12/20 06:45	06/15/20 13:26	7439-96-5	
Nickel	**0.50**	ug/L	0.50	1	06/12/20 06:45	06/15/20 13:26	7440-02-0	
Selenium	ND	ug/L	0.50	1	06/12/20 06:45	06/15/20 13:26	7782-49-2	
Thallium	**0.13**	ug/L	0.10	1	06/12/20 06:45	06/15/20 13:26	7440-28-0	
Total Hardness by 2340B	**313000**	ug/L	2820	20	06/12/20 06:45	06/15/20 13:30		
Zinc	ND	ug/L	5.0	1	06/12/20 06:45	06/15/20 13:26	7440-66-6	
200.8 MET ICPMS, Dissolved	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
	Pace Analytical Services - Minneapolis							
Manganese, Dissolved	**395**	ug/L	0.50	1	06/12/20 06:05	06/12/20 21:39	7439-96-5	
180.1 Turbidity	Analytical Method: EPA 180.1							
	Pace Analytical Services - Minneapolis							
Turbidity	ND	NTU	0.50	1		06/10/20 20:36		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
	Pace Analytical Services - Minneapolis							
Total Suspended Solids	ND	mg/L	10.0	1		06/16/20 14:55		
MBIO Total Coliform	Analytical Method: SM 9223B Preparation Method: SM 9223B							
	Pace Analytical Services - Minneapolis							
Total Coliforms	**Absent**		1.0	1	06/10/20 13:43	06/11/20 13:43		
300.0 IC Anions	Analytical Method: EPA 300.0							
	Pace Analytical Services - Minneapolis							
Chloride	**12.5**	mg/L	1.2	1		06/11/20 02:20	16887-00-6	
Fluoride	**0.17**	mg/L	0.050	1		06/11/20 02:20	16984-48-8	
Nitrate as N	ND	mg/L	0.10	1		06/11/20 02:20	14797-55-8	
Nitrite as N	ND	mg/L	0.10	1		06/11/20 02:20	14797-65-0	
Sulfate	**8.2**	mg/L	1.2	1		06/11/20 02:20	14808-79-8	
350.1 Ammonia	Analytical Method: EPA 350.1							
	Pace Analytical Services - Minneapolis							
Nitrogen, Ammonia	**0.28**	mg/L	0.10	1		06/16/20 11:11	7664-41-7	
353.2 Nitrate + Nitrite	Analytical Method: EPA 353.2							
	Pace Analytical Services - Minneapolis							
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	1		06/12/20 13:26		

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ANALYTICAL RESULTS

Project: 20-03427 LINO LAKES DW 2020
Pace Project No.: 10520924

Sample: WELL HOUSE 4 **Lab ID: 10520924005** Collected: 06/09/20 11:35 Received: 06/09/20 12:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
2120B True Color	Analytical Method: SM 2120 B-2011							
	Pace Analytical Services - Duluth							
pH at 25 Degrees C	**7.8**	Std. Units		1		06/11/20 11:24		H3
True Color	ND	units	10.0	1		06/11/20 11:24		H3
Field Data	Analytical Method:							
	Pace Analytical Services - Minneapolis							
Field pH	**7.9**	Std. Units		1		06/09/20 11:35		
Field Temperature	**12.0**	deg C		1		06/09/20 11:35		
200.7 MET ICP	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
	Pace Analytical Services - Minneapolis							
Calcium	**48100**	ug/L	500	1	06/12/20 06:26	06/15/20 12:45	7440-70-2	
Iron	**105**	ug/L	50.0	1	06/12/20 06:26	06/15/20 12:45	7439-89-6	
Magnesium	**19900**	ug/L	500	1	06/12/20 06:26	06/15/20 12:45	7439-95-4	
Potassium	ND	ug/L	2500	1	06/12/20 06:26	06/15/20 12:45	7440-09-7	
Sodium	**3600**	ug/L	1000	1	06/12/20 06:26	06/15/20 12:45	7440-23-5	
200.7 MET ICP, Dissolved	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
	Pace Analytical Services - Minneapolis							
Iron, Dissolved	**84.3**	ug/L	50.0	1	06/12/20 06:26	06/14/20 14:12	7439-89-6	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
	Pace Analytical Services - Minneapolis							
Aluminum	ND	ug/L	20.0	1	06/12/20 06:45	06/15/20 13:33	7429-90-5	
Antimony	ND	ug/L	0.50	1	06/12/20 06:45	06/15/20 13:33	7440-36-0	
Arsenic	ND	ug/L	0.50	1	06/12/20 06:45	06/15/20 13:33	7440-38-2	
Barium	**11.9**	ug/L	0.30	1	06/12/20 06:45	06/15/20 13:33	7440-39-3	
Beryllium	ND	ug/L	0.20	1	06/12/20 06:45	06/15/20 13:33	7440-41-7	
Cadmium	ND	ug/L	0.080	1	06/12/20 06:45	06/15/20 13:33	7440-43-9	
Chromium	ND	ug/L	0.50	1	06/12/20 06:45	06/15/20 13:33	7440-47-3	
Copper	**5.0**	ug/L	1.0	1	06/12/20 06:45	06/15/20 13:33	7440-50-8	
Lead	**0.17**	ug/L	0.10	1	06/12/20 06:45	06/15/20 13:33	7439-92-1	
Manganese	**86.4**	ug/L	0.50	1	06/12/20 06:45	06/15/20 13:33	7439-96-5	
Nickel	ND	ug/L	0.50	1	06/12/20 06:45	06/15/20 13:33	7440-02-0	
Selenium	ND	ug/L	0.50	1	06/12/20 06:45	06/15/20 13:33	7782-49-2	
Thallium	ND	ug/L	0.10	1	06/12/20 06:45	06/15/20 13:33	7440-28-0	
Total Hardness by 2340B	**209000**	ug/L	2820	20	06/12/20 06:45	06/15/20 13:36		
Zinc	**20.6**	ug/L	5.0	1	06/12/20 06:45	06/15/20 13:33	7440-66-6	
200.8 MET ICPMS, Dissolved	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
	Pace Analytical Services - Minneapolis							
Manganese, Dissolved	**92.8**	ug/L	0.50	1	06/12/20 06:05	06/12/20 21:43	7439-96-5	
180.1 Turbidity	Analytical Method: EPA 180.1							
	Pace Analytical Services - Minneapolis							
Turbidity	ND	NTU	0.50	1		06/10/20 20:37		

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ANALYTICAL RESULTS

Project: 20-03427 LINO LAKES DW 2020
Pace Project No.: 10520924

Sample: WELL HOUSE 4 **Lab ID: 10520924005** Collected: 06/09/20 11:35 Received: 06/09/20 12:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
2540D Total Suspended Solids	Analytical Method: SM 2540D Pace Analytical Services - Minneapolis							
Total Suspended Solids	ND	mg/L	10.0	1		06/16/20 14:55		
MBIO Total Coliform	Analytical Method: SM 9223B Preparation Method: SM 9223B Pace Analytical Services - Minneapolis							
Total Coliforms	**Absent**		1.0	1	06/10/20 13:43	06/11/20 13:43		
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Minneapolis							
Chloride	ND	mg/L	1.2	1		06/11/20 02:35	16887-00-6	
Fluoride	**0.33**	mg/L	0.050	1		06/11/20 02:35	16984-48-8	
Nitrate as N	ND	mg/L	0.10	1		06/11/20 02:35	14797-55-8	
Nitrite as N	ND	mg/L	0.10	1		06/11/20 02:35	14797-65-0	
Sulfate	ND	mg/L	1.2	1		06/11/20 02:35	14808-79-8	
350.1 Ammonia	Analytical Method: EPA 350.1 Pace Analytical Services - Minneapolis							
Nitrogen, Ammonia	**0.21**	mg/L	0.10	1		06/16/20 11:15	7664-41-7	
353.2 Nitrate + Nitrite	Analytical Method: EPA 353.2 Pace Analytical Services - Minneapolis							
Nitrogen, NO2 plus NO3	ND	mg/L	0.10	1		06/12/20 13:30		

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QUALITY CONTROL DATA

Project: 20-03427 LINO LAKES DW 2020
Pace Project No.: 10520924

QC Batch: 191032
QC Batch Method: SM 2120 B-2011
Analysis Method: SM 2120 B-2011
Analysis Description: 2120B True Color
Laboratory: Pace Analytical Services - Duluth
Associated Lab Samples: 10520924001, 10520924002, 10520924003, 10520924004, 10520924005

METHOD BLANK: 751849
Matrix: Water
Associated Lab Samples: 10520924001, 10520924002, 10520924003, 10520924004, 10520924005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
True Color	units	ND	10.0	06/11/20 11:10	

LABORATORY CONTROL SAMPLE: 751850

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
True Color	units	70	70.0	100	90-110	

SAMPLE DUPLICATE: 751851

Parameter	Units	10520924001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.5	7.5	0		H3
True Color	units	ND	ND		10	H3

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QUALITY CONTROL DATA

Project: 20-03427 LINO LAKES DW 2020
Pace Project No.: 10520924

QC Batch: 680553 | Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 | Analysis Description: 200.7 MET
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10520924001, 10520924002, 10520924003, 10520924004, 10520924005

METHOD BLANK: 3641555 | Matrix: Water
Associated Lab Samples: 10520924001, 10520924002, 10520924003, 10520924004, 10520924005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Calcium	ug/L	ND	500	06/15/20 12:22	
Iron	ug/L	ND	50.0	06/15/20 12:22	
Magnesium	ug/L	ND	500	06/15/20 12:22	
Potassium	ug/L	ND	2500	06/15/20 12:22	
Sodium	ug/L	ND	1000	06/15/20 12:22	

LABORATORY CONTROL SAMPLE: 3641556

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Calcium	ug/L	20000	19400	97	85-115	
Iron	ug/L	20000	19500	97	85-115	
Magnesium	ug/L	20000	19600	98	85-115	
Potassium	ug/L	20000	19100	96	85-115	
Sodium	ug/L	20000	18900	95	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3641557 3641558

Parameter	Units	10520267001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Calcium	ug/L	193000	20000	20000	219000	223000	127	148	70-130	2	20	P6
Iron	ug/L	2530	20000	20000	21600	22600	95	100	70-130	5	20	
Magnesium	ug/L	85000	20000	20000	108000	111000	117	129	70-130	2	20	
Potassium	ug/L	280000	20000	20000	303000	317000	114	186	70-130	5	20	P6
Sodium	ug/L	742000	20000	20000	778000	814000	180	360	70-130	5	20	P6

MATRIX SPIKE SAMPLE: 3641559

Parameter	Units	10521070009 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Calcium	ug/L	53000	20000	73500	102	70-130	
Iron	ug/L	ND	20000	19700	98	70-130	
Magnesium	ug/L	18000	20000	38500	102	70-130	
Potassium	ug/L	ND	20000	21100	100	70-130	
Sodium	ug/L	12200	20000	31500	97	70-130	

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QUALITY CONTROL DATA

Project: 20-03427 LINO LAKES DW 2020
Pace Project No.: 10520924

QC Batch: 680550 | Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 | Analysis Description: 200.7 MET Dissolved
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10520924001, 10520924002, 10520924003, 10520924004, 10520924005

METHOD BLANK: 3641541 | Matrix: Water
Associated Lab Samples: 10520924001, 10520924002, 10520924003, 10520924004, 10520924005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Iron, Dissolved	ug/L	ND	50.0	06/14/20 13:39	

LABORATORY CONTROL SAMPLE: 3641542

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Iron, Dissolved	ug/L	20000	19600	98	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3641543 3641544

Parameter	Units	10520551001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Iron, Dissolved	ug/L	474	20000	20000	20900	20400	102	100	70-130	2	20	

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QUALITY CONTROL DATA

Project: 20-03427 LINO LAKES DW 2020
Pace Project No.: 10520924

QC Batch: 680558
QC Batch Method: EPA 200.8
Analysis Method: EPA 200.8
Analysis Description: 200.8 MET
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10520924001, 10520924002, 10520924003, 10520924004, 10520924005

METHOD BLANK: 3641580
Matrix: Water
Associated Lab Samples: 10520924001, 10520924002, 10520924003, 10520924004, 10520924005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum	ug/L	ND	20.0	06/15/20 12:40	
Antimony	ug/L	ND	0.50	06/15/20 12:40	
Arsenic	ug/L	ND	0.50	06/15/20 12:40	
Barium	ug/L	ND	0.30	06/15/20 12:40	
Beryllium	ug/L	ND	0.20	06/15/20 12:40	
Cadmium	ug/L	ND	0.080	06/15/20 12:40	
Chromium	ug/L	ND	0.50	06/15/20 12:40	
Copper	ug/L	ND	1.0	06/15/20 12:40	
Lead	ug/L	ND	0.10	06/15/20 12:40	
Manganese	ug/L	ND	0.50	06/15/20 12:40	
Nickel	ug/L	ND	0.50	06/15/20 12:40	
Selenium	ug/L	ND	0.50	06/15/20 12:40	
Thallium	ug/L	ND	0.10	06/15/20 12:40	
Zinc	ug/L	ND	5.0	06/15/20 12:40	

LABORATORY CONTROL SAMPLE: 3641581

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum	ug/L	2000	1780	89	85-115	
Antimony	ug/L	100	91.0	91	85-115	
Arsenic	ug/L	100	90.2	90	85-115	
Barium	ug/L	100	95.8	96	85-115	
Beryllium	ug/L	100	91.0	91	85-115	
Cadmium	ug/L	100	89.5	90	85-115	
Chromium	ug/L	100	97.1	97	85-115	
Copper	ug/L	100	92.5	92	85-115	
Lead	ug/L	100	93.4	93	85-115	
Manganese	ug/L	100	94.0	94	85-115	
Nickel	ug/L	100	96.3	96	85-115	
Selenium	ug/L	100	93.2	93	85-115	
Thallium	ug/L	100	91.4	91	85-115	
Zinc	ug/L	100	97.3	97	85-115	

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QUALITY CONTROL DATA

Project: 20-03427 LINO LAKES DW 2020
Pace Project No.: 10520924

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3641582 3641583

Parameter	Units	10520924001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Aluminum	ug/L	ND	2000	2000	1790	1780	90	89	70-130	1	20	
Antimony	ug/L	ND	100	100	93.2	91.9	93	92	70-130	1	20	
Arsenic	ug/L	2.1	100	100	93.9	93.6	92	92	70-130	0	20	
Barium	ug/L	40.0	100	100	135	134	95	94	70-130	1	20	
Beryllium	ug/L	ND	100	100	91.1	91.9	91	92	70-130	1	20	
Cadmium	ug/L	ND	100	100	89.9	89.5	90	90	70-130	0	20	
Chromium	ug/L	ND	100	100	98.6	97.5	98	97	70-130	1	20	
Copper	ug/L	4.7	100	100	94.2	94.5	89	90	70-130	0	20	
Lead	ug/L	0.18	100	100	96.7	95.2	97	95	70-130	2	20	
Manganese	ug/L	249	100	100	346	331	96	82	70-130	4	20	
Nickel	ug/L	ND	100	100	94.4	94.2	94	94	70-130	0	20	
Selenium	ug/L	ND	100	100	92.2	92.6	92	93	70-130	1	20	
Thallium	ug/L	ND	100	100	93.5	92.2	93	92	70-130	1	20	
Zinc	ug/L	ND	100	100	97.6	98.2	93	94	70-130	1	20	

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QUALITY CONTROL DATA

Project: 20-03427 LINO LAKES DW 2020
Pace Project No.: 10520924

QC Batch: 680549
QC Batch Method: EPA 200.8
Analysis Method: EPA 200.8
Analysis Description: 200.8 MET Dissolved
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10520924001, 10520924002, 10520924003, 10520924004, 10520924005

METHOD BLANK: 3641537
Matrix: Water
Associated Lab Samples: 10520924001, 10520924002, 10520924003, 10520924004, 10520924005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Manganese, Dissolved	ug/L	ND	0.50	06/12/20 20:43	

LABORATORY CONTROL SAMPLE: 3641538

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Manganese, Dissolved	ug/L	100	96.6	97	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3641539 3641540

Parameter	Units	10520044004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Manganese, Dissolved	ug/L	451	100	100	547	539	96	88	70-130	1	20	

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QUALITY CONTROL DATA

Project: 20-03427 LINO LAKES DW 2020
Pace Project No.: 10520924

QC Batch: 680456
QC Batch Method: EPA 180.1
Analysis Method: EPA 180.1
Analysis Description: 180.1 Turbidity
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10520924001, 10520924002, 10520924003, 10520924004, 10520924005

METHOD BLANK: 3641044
Matrix: Water
Associated Lab Samples: 10520924001, 10520924002, 10520924003, 10520924004, 10520924005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Turbidity	NTU	ND	0.50	06/10/20 20:32	

LABORATORY CONTROL SAMPLE: 3641045

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Turbidity	NTU	10	9.7	97	90-110	

SAMPLE DUPLICATE: 3641047

Parameter	Units	10520924001 Result	Dup Result	RPD	Max RPD	Qualifiers
Turbidity	NTU	0.94	1.0	9	20	

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QUALITY CONTROL DATA

Project: 20-03427 LINO LAKES DW 2020
Pace Project No.: 10520924

QC Batch: 681305
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10520924001, 10520924002, 10520924003

METHOD BLANK: 3645750
Matrix: Water
Associated Lab Samples: 10520924001, 10520924002, 10520924003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	10.0	06/16/20 10:49	

LABORATORY CONTROL SAMPLE: 3645751

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	954	95	80-120	

SAMPLE DUPLICATE: 3645752

Parameter	Units	10520920005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1540	1530	1	5	

SAMPLE DUPLICATE: 3645753

Parameter	Units	10520920006 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	990	985	1	5	

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QUALITY CONTROL DATA

Project: 20-03427 LINO LAKES DW 2020
Pace Project No.: 10520924

QC Batch: 681307
QC Batch Method: SM 2540D
Analysis Method: SM 2540D
Analysis Description: 2540D Total Suspended Solids
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10520924001, 10520924002, 10520924003

METHOD BLANK: 3645758
Matrix: Water
Associated Lab Samples: 10520924001, 10520924002, 10520924003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solids	mg/L	ND	10.0	06/16/20 14:26	

LABORATORY CONTROL SAMPLE: 3645759

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solids	mg/L	100	88.0	88	80-120	

SAMPLE DUPLICATE: 3645760

Parameter	Units	10520924002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	ND	ND		5	

SAMPLE DUPLICATE: 3645761

Parameter	Units	10520924003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	ND	ND		5	

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QUALITY CONTROL DATA

Project: 20-03427 LINO LAKES DW 2020
Pace Project No.: 10520924

QC Batch: 681309
QC Batch Method: SM 2540D
Analysis Method: SM 2540D
Analysis Description: 2540D Total Suspended Solids
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10520924004, 10520924005

METHOD BLANK: 3645766
Matrix: Water
Associated Lab Samples: 10520924004, 10520924005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solids	mg/L	ND	10.0	06/16/20 14:55	

LABORATORY CONTROL SAMPLE: 3645767

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solids	mg/L	100	80.0	80	80-120	

SAMPLE DUPLICATE: 3645768

Parameter	Units	10520924004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	ND	ND		5	

SAMPLE DUPLICATE: 3645769

Parameter	Units	10520924005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	ND	ND		5	

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QUALITY CONTROL DATA

Project: 20-03427 LINO LAKES DW 2020
Pace Project No.: 10520924

QC Batch: 681548
QC Batch Method: SM 4500-H+B
Analysis Method: SM 4500-H+B
Analysis Description: 4500H+B pH
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10520924001, 10520924002

LABORATORY CONTROL SAMPLE: 3647251

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
pH at 25 Degrees C	Std. Units	5	5.0	101	98-102	H6

SAMPLE DUPLICATE: 3647252

Parameter	Units	10520627002 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.4	7.4	0	3	H6

SAMPLE DUPLICATE: 3647253

Parameter	Units	10520705001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.0	7.0	0	3	H6

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QUALITY CONTROL DATA

Project: 20-03427 LINO LAKES DW 2020
Pace Project No.: 10520924

QC Batch: 680258
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10520924001, 10520924002, 10520924003, 10520924004, 10520924005

METHOD BLANK: 3640014
Matrix: Water
Associated Lab Samples: 10520924001, 10520924002, 10520924003, 10520924004, 10520924005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.2	06/10/20 22:12	
Fluoride	mg/L	ND	0.050	06/10/20 22:12	
Nitrate as N	mg/L	ND	0.10	06/10/20 22:12	
Nitrite as N	mg/L	ND	0.10	06/10/20 22:12	
Sulfate	mg/L	ND	1.2	06/10/20 22:12	

LABORATORY CONTROL SAMPLE: 3640015

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.5	12.5	100	90-110	
Fluoride	mg/L	1	0.94	94	90-110	
Nitrate as N	mg/L	1	0.94	94	90-110	
Nitrite as N	mg/L	1	0.98	98	90-110	
Sulfate	mg/L	12.5	13.1	105	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3640016 3640017

Parameter	Units	10520924001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	4.5	12.5	12.5	13.6	13.5	73	72	90-110	1	20	M1
Fluoride	mg/L	0.39	1	1	0.93	1.0	54	64	90-110	10	20	M1
Nitrate as N	mg/L	ND	1	1	0.70	0.70	70	70	90-110	1	20	M1
Nitrite as N	mg/L	ND	1	1	0.70	0.69	70	69	90-110	2	20	M1
Sulfate	mg/L	4.2	12.5	12.5	14.0	13.9	79	78	90-110	0	20	M1

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QUALITY CONTROL DATA

Project: 20-03427 LINO LAKES DW 2020
Pace Project No.: 10520924

QC Batch: 681354 | Analysis Method: EPA 350.1
QC Batch Method: EPA 350.1 | Analysis Description: 350.1 Ammonia
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10520924001, 10520924002, 10520924003, 10520924004, 10520924005

METHOD BLANK: 3645959 | Matrix: Water
Associated Lab Samples: 10520924001, 10520924002, 10520924003, 10520924004, 10520924005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.10	06/16/20 10:51	

LABORATORY CONTROL SAMPLE: 3645960

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	2.5	2.5	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3645961 3645962

Parameter	Units	10520924004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	0.28	2.5	2.5	2.8	2.8	100	103	90-110	2	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3645963 3645964

Parameter	Units	10520924005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	0.21	2.5	2.5	2.7	2.7	100	100	90-110	0	20	

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QUALITY CONTROL DATA

Project: 20-03427 LINO LAKES DW 2020
Pace Project No.: 10520924

QC Batch: 680813 | Analysis Method: EPA 353.2
QC Batch Method: EPA 353.2 | Analysis Description: 353.2 Nitrate + Nitrite, preserved
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10520924001, 10520924002, 10520924003, 10520924004, 10520924005

METHOD BLANK: 3643174 | Matrix: Water
Associated Lab Samples: 10520924001, 10520924002, 10520924003, 10520924004, 10520924005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	ND	0.10	06/12/20 13:43	FS

LABORATORY CONTROL SAMPLE: 3643175

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	1	0.92	92	90-110	FS

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3643176 3643177

Parameter	Units	10520400001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	0.033	1	1	1.1	1.1	109	109	90-110	0	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3643178 3643179

Parameter	Units	10520551001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	ND	1	1	1.1	1.1	106	106	90-110	0	20	

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QUALIFIERS

Project: 20-03427 LINO LAKES DW 2020
Pace Project No.: 10520924

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

FS	The sample was filtered in the laboratory prior to analysis.
H3	Sample was received or analysis requested beyond the recognized method holding time.
H6	Analysis initiated outside of the 15 minute EPA required holding time.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
P6	Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 20-03427 LINO LAKES DW 2020
Pace Project No.: 10520924

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10520924001	**WELL HOUSE 2**	SM 2120 B-2011	191032		
10520924002	**WELL HOUSE 5**	SM 2120 B-2011	191032		
10520924003	**WELL HOUSE 6**	SM 2120 B-2011	191032		
10520924004	**WELL HOUSE 3**	SM 2120 B-2011	191032		
10520924005	**WELL HOUSE 4**	SM 2120 B-2011	191032		
10520924001	**WELL HOUSE 2**				
10520924002	**WELL HOUSE 5**				
10520924003	**WELL HOUSE 6**				
10520924004	**WELL HOUSE 3**				
10520924005	**WELL HOUSE 4**				
10520924001	**WELL HOUSE 2**	EPA 200.7	680553	EPA 200.7	680859
10520924002	**WELL HOUSE 5**	EPA 200.7	680553	EPA 200.7	680859
10520924003	**WELL HOUSE 6**	EPA 200.7	680553	EPA 200.7	680859
10520924004	**WELL HOUSE 3**	EPA 200.7	680553	EPA 200.7	680859
10520924005	**WELL HOUSE 4**	EPA 200.7	680553	EPA 200.7	680859
10520924001	**WELL HOUSE 2**	EPA 200.7	680550	EPA 200.7	680862
10520924002	**WELL HOUSE 5**	EPA 200.7	680550	EPA 200.7	680862
10520924003	**WELL HOUSE 6**	EPA 200.7	680550	EPA 200.7	680862
10520924004	**WELL HOUSE 3**	EPA 200.7	680550	EPA 200.7	680862
10520924005	**WELL HOUSE 4**	EPA 200.7	680550	EPA 200.7	680862
10520924001	**WELL HOUSE 2**	EPA 200.8	680558	EPA 200.8	680866
10520924002	**WELL HOUSE 5**	EPA 200.8	680558	EPA 200.8	680866
10520924003	**WELL HOUSE 6**	EPA 200.8	680558	EPA 200.8	680866
10520924004	**WELL HOUSE 3**	EPA 200.8	680558	EPA 200.8	680866
10520924005	**WELL HOUSE 4**	EPA 200.8	680558	EPA 200.8	680866
10520924001	**WELL HOUSE 2**	EPA 200.8	680549	EPA 200.8	680867
10520924002	**WELL HOUSE 5**	EPA 200.8	680549	EPA 200.8	680867
10520924003	**WELL HOUSE 6**	EPA 200.8	680549	EPA 200.8	680867
10520924004	**WELL HOUSE 3**	EPA 200.8	680549	EPA 200.8	680867
10520924005	**WELL HOUSE 4**	EPA 200.8	680549	EPA 200.8	680867
10520924001	**WELL HOUSE 2**	EPA 180.1	680456		
10520924002	**WELL HOUSE 5**	EPA 180.1	680456		
10520924003	**WELL HOUSE 6**	EPA 180.1	680456		
10520924004	**WELL HOUSE 3**	EPA 180.1	680456		
10520924005	**WELL HOUSE 4**	EPA 180.1	680456		
10520924001	**WELL HOUSE 2**	SM 2540C	681305		
10520924002	**WELL HOUSE 5**	SM 2540C	681305		
10520924003	**WELL HOUSE 6**	SM 2540C	681305		
10520924001	**WELL HOUSE 2**	SM 2540D	681307		
10520924002	**WELL HOUSE 5**	SM 2540D	681307		
10520924003	**WELL HOUSE 6**	SM 2540D	681307		
10520924004	**WELL HOUSE 3**	SM 2540D	681309		
10520924005	**WELL HOUSE 4**	SM 2540D	681309		
10520924001	**WELL HOUSE 2**	SM 4500-H+B	681548		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 20-03427 LINO LAKES DW 2020
Pace Project No.: 10520924

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10520924002	**WELL HOUSE 5**	SM 4500-H+B	681548		
10520924001	**WELL HOUSE 2**	SM 9223B	680392	SM 9223B	680400
10520924002	**WELL HOUSE 5**	SM 9223B	680392	SM 9223B	680400
10520924003	**WELL HOUSE 6**	SM 9223B	680392	SM 9223B	680400
10520924004	**WELL HOUSE 3**	SM 9223B	680392	SM 9223B	680400
10520924005	**WELL HOUSE 4**	SM 9223B	680392	SM 9223B	680400
10520924001	**WELL HOUSE 2**	EPA 300.0	680258		
10520924002	**WELL HOUSE 5**	EPA 300.0	680258		
10520924003	**WELL HOUSE 6**	EPA 300.0	680258		
10520924004	**WELL HOUSE 3**	EPA 300.0	680258		
10520924005	**WELL HOUSE 4**	EPA 300.0	680258		
10520924001	**WELL HOUSE 2**	EPA 350.1	681354		
10520924002	**WELL HOUSE 5**	EPA 350.1	681354		
10520924003	**WELL HOUSE 6**	EPA 350.1	681354		
10520924004	**WELL HOUSE 3**	EPA 350.1	681354		
10520924005	**WELL HOUSE 4**	EPA 350.1	681354		
10520924001	**WELL HOUSE 2**	EPA 353.2	680813		
10520924002	**WELL HOUSE 5**	EPA 353.2	680813		
10520924003	**WELL HOUSE 6**	EPA 353.2	680813		
10520924004	**WELL HOUSE 3**	EPA 353.2	680813		
10520924005	**WELL HOUSE 4**	EPA 353.2	680813		

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1201 Lincoln Highway ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885
www.mvtl.com

MEMBER ACIL

CERTIFICATE OF ANALYSIS

JARED DICKINSON
PACE ANALYTICAL SERVICES INC
1700 ELM ST STE 200
MINNEAPOLIS MN 55414

Report Date: 22 Jun 2020
Work Order #: 21794
Account #: 013980

Date Received: 11 Jun 2020
Time Received: 10:00
Date Submitted: 11 Jun 2020
Temperature at Receipt: 0.2 C

	As Received Result		Method Reference	Date Analyzed
20-A26531	**1 WELL HOUSE 2 LAB ID: 10520924001 WATER**			**Date Sampled: 9 Jun 20 Time Sampled: 9:00**
Iron Related Bacteria Day 1	Absent		HACH	11 Jun 20
Iron Related Bacteria Day 2	Absent		HACH	11 Jun 20
Iron Related Bacteria Day 3	Absent		HACH	11 Jun 20
Iron Related Bacteria Day 4	Absent		HACH	11 Jun 20
Iron Related Bacteria Day 5	Absent		HACH	11 Jun 20
Iron Related Bacteria Day 6	Absent		HACH	11 Jun 20
Iron Related Bacteria Day 7	Absent		HACH	11 Jun 20
Iron Related Bacteria Day 8	Present		HACH	11 Jun 20
Iron Related Bacteria Day 9	Present		HACH	11 Jun 20
Iron Related Bacteria Day 10	Present		HACH	11 Jun 20

APPROXIMATE IRON RELATED BACTERIA POPULATION = 25 CFU/mL

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MINNEAPOLIS MN 55414

Report Date: 22 Jun 2020
Work Order #: 21794
Account #: 013980

Date Received: 11 Jun 2020
Time Received: 10:00
Date Submitted: 10 Jun 2020
Temperature at Receipt: 0.2 C

		As Received Result		Method Reference	Date Analyzed
20-A26540	**2 WELL HOUSE 5 LAB ID:10520924002 WATER**				**Date Sampled: 9 Jun 20 Time Sampled: 9:45**
Iron Related Bacteria Day 1		Absent		HACH	11 Jun 20
Iron Related Bacteria Day 2		Absent		HACH	11 Jun 20
Iron Related Bacteria Day 3		Absent		HACH	11 Jun 20
Iron Related Bacteria Day 4		Absent		HACH	11 Jun 20
Iron Related Bacteria Day 5		Absent		HACH	11 Jun 20
Iron Related Bacteria Day 6		Absent		HACH	11 Jun 20
Iron Related Bacteria Day 7		Absent		HACH	11 Jun 20
Iron Related Bacteria Day 8		Absent		HACH	11 Jun 20
Iron Related Bacteria Day 9		Absent		HACH	11 Jun 20
Iron Related Bacteria Day 10		Absent		HACH	11 Jun 20

APPROXIMATE IRON RELATED BACTERIA POPULATION = <1 CFU/mL

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JARED DICKINSON
PACE ANALYTICAL SERVICES INC
1700 ELM ST STE 200
MINNEAPOLIS MN 55414

Report Date: 22 Jun 2020
Work Order #: 21794
Account #: 013980

Date Received: 11 Jun 2020
Time Received: 10:00
Date Submitted: 10 Jun 2020
Temperature at Receipt: 0.2 C

	As Received Result		Method Reference	Date Analyzed
20-A26541	**3 WELL HOUSE 6 LAB ID:10520924003 WATER**			**Date Sampled: 9 Jun 20 Time Sampled: 10:15**
Iron Related Bacteria Day 1	Absent		HACH	11 Jun 20
Iron Related Bacteria Day 2	Absent		HACH	11 Jun 20
Iron Related Bacteria Day 3	Absent		HACH	11 Jun 20
Iron Related Bacteria Day 4	Present		HACH	11 Jun 20
Iron Related Bacteria Day 5	Present		HACH	11 Jun 20
Iron Related Bacteria Day 6	Present		HACH	11 Jun 20
Iron Related Bacteria Day 7	Present		HACH	11 Jun 20
Iron Related Bacteria Day 8	Present		HACH	11 Jun 20
Iron Related Bacteria Day 9	Present		HACH	11 Jun 20
Iron Related Bacteria Day 10	Present		HACH	11 Jun 20

APPROXIMATE IRON RELATED BACTERIA POPULATION = 9,000 CFU/mL

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JARED DICKINSON
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1700 ELM ST STE 200
MINNEAPOLIS MN 55414

Report Date: 22 Jun 2020
Work Order #: 21794
Account #: 013980

Date Received: 11 Jun 2020
Time Received: 10:00
Date Submitted: 10 Jun 2020
Temperature at Receipt: 0.2 C

		As Received Result		Method Reference	Date Analyzed
20-A26542	**4 WELL HOUSE 3 LAB ID:10520924004 WATER**				**Date Sampled: 9 Jun 20 Time Sampled: 10:55**
Iron Related Bacteria Day 1		Absent		HACH	11 Jun 20
Iron Related Bacteria Day 2		Absent		HACH	11 Jun 20
Iron Related Bacteria Day 3		Absent		HACH	11 Jun 20
Iron Related Bacteria Day 4		Absent		HACH	11 Jun 20
Iron Related Bacteria Day 5		Absent		HACH	11 Jun 20
Iron Related Bacteria Day 6		Absent		HACH	11 Jun 20
Iron Related Bacteria Day 7		Absent		HACH	11 Jun 20
Iron Related Bacteria Day 8		Absent		HACH	11 Jun 20
Iron Related Bacteria Day 9		Absent		HACH	11 Jun 20
Iron Related Bacteria Day 10		Present		HACH	11 Jun 20

APPROXIMATE IRON RELATED BACTERIA POPULATION = <1 CFU/mL

MVTL guarantees the accuracy of the analysis done on the sample submitted for testing. It is not possible for MVTL to guarantee that a test result obtained on a particular sample will be the same on any other sample unless all conditions affecting the sample are the same, including sampling by MVTL. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.

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2616 E. Broadway Ave. ~ Bismarck, ND 58501 ~ 800-279-6885 ~ Fax 701-258-9724
1201 Lincoln Highway ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885
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MEMBER ACIL

CERTIFICATE OF ANALYSIS

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Temperature at Receipt: 0.2 C

	As Received Result		Method Reference	Date Analyzed
20-A26543	**5 WELL HOUSE 4 LAB ID:10520924005 WATER**			**Date Sampled: 9 Jun 20 Time Sampled: 11:35**
Iron Related Bacteria Day 1	Absent		HACH	11 Jun 20
Iron Related Bacteria Day 2	Absent		HACH	11 Jun 20
Iron Related Bacteria Day 3	Absent		HACH	11 Jun 20
Iron Related Bacteria Day 4	Absent		HACH	11 Jun 20
Iron Related Bacteria Day 5	Absent		HACH	11 Jun 20
Iron Related Bacteria Day 6	Absent		HACH	11 Jun 20
Iron Related Bacteria Day 7	Absent		HACH	11 Jun 20
Iron Related Bacteria Day 8	Absent		HACH	11 Jun 20
Iron Related Bacteria Day 9	Absent		HACH	11 Jun 20
Iron Related Bacteria Day 10	Present		HACH	11 Jun 20

APPROXIMATE IRON RELATED BACTERIA POPULATION = <1 CFU/mL

Approved by: Sarah Garza

Sarah Garza, Microbiology Lab Manager New Ulm, MN

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AN EQUAL OPPORTUNITY EMPLOYER

EMSL Analytical, Inc.
3410 Winnetka Avenue North New Hope, MN 55427
Phone/Fax: (763) 449-4922 / (763) 449-4924
http://www.EMSL.com / minneapolislab@emsl.com

EMSL Order ID: 352005620
Customer ID: PACE52
Customer PO: 10520924
Project ID:

Attn: Jared Dickinson
Pace Analytical Services, LLC
1700 Elm Street SE
Suite #200
Minneapolis, MN 55414
Proj: 20-03427 LINO LAKES DW 2020

Phone: (612) 607-6364
Fax: (612) 607-6444
Received: 06/11/2020
Analyzed: 06/23/2020

Test Report: Determination of Asbestos Structures >10µm in Drinking Water Performed by the 100.2 Method (EPA 600/R-94/134)

Sample ID Client / EMSL	Sample Filtration Date/Time	Original Sample Vol. Filtered (ml)	Effective Filter Area (mm²)	Area Analyzed (mm²)	ASBESTOS: Asbestos Types	Fibers Detected	Analytical Sensitivity	Concentration	Confidence Limits
							MFL (million fibers per liter)		
1 352005620-0001	6/16/2020 03:24 AM	25	1320	0.2600	None Detected	ND	0.20	<0.20	0.00 - 0.75
Collection Date/Time:	*06/09/2020 09:00 AM*								
Sample ozonated prior to analysis due to lab receipt time exceeding 48hr method hold time.									
2 352005620-0002	6/16/2020 03:24 AM	25	1320	0.2600	None Detected	ND	0.20	<0.20	0.00 - 0.75
Collection Date/Time:	*06/09/2020 09:45 AM*								
Sample ozonated prior to analysis due to lab receipt time exceeding 48hr method hold time.									
3 352005620-0003	6/16/2020 04:26 AM	10	1320	0.2600	None Detected	ND	0.51	<0.51	0.00 - 1.90
Collection Date/Time:	*06/09/2020 10:15 AM*								
Due to excessive particulate the analytical sensitivity of 0.2 MFL as required by the method was not reached. Sample was ozonated prior to analysis.									
4 352005620-0004	6/16/2020 04:26 AM	10	1320	0.2600	None Detected	ND	0.51	<0.51	0.00 - 1.90
Collection Date/Time:	*06/09/2020 10:55 AM*								
Due to excessive particulate the analytical sensitivity of 0.2 MFL as required by the method was not reached. Sample was ozonated prior to analysis.									

Analyst(s)
Steve Felton (5)

Rachel Travis, Laboratory Manager
or Other Approved Signatory

Any questions please contact Rachel Travis.

Initial report from: 06/23/2020 16:02:33

Sample collection and containers provided by the client, acceptable bottle blank level is defined as ≤0.01MFL>10um. ND=None Detected. This report may not be reproduced, except in full, without written permission by EMSL Analytical, Inc. The test results contained within this report meet the requirements of NELAC unless otherwise noted. This report relates only to the samples reported above. Samples received in good condition unless otherwise noted.

Samples analyzed by EMSL Analytical, Inc. New Hope, MN MN ELAP 1511379; Florida E871121; Iowa 411; Louisiana LA1800002; Nebraska NE-05-31-16; Oklahoma 2017-005

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1700 Elm Street SE
Suite #200
Minneapolis, MN 55414
Proj: 20-03427 LINO LAKES DW 2020

Phone: (612) 607-6364
Fax: (612) 607-6444
Received: 06/11/2020
Analyzed: 06/23/2020

Test Report: Determination of Asbestos Structures >10µm in Drinking Water Performed by the 100.2 Method (EPA 600/R-94/134)

Sample ID Client / EMSL	Sample Filtration Date/Time	Original Sample Vol. Filtered (ml)	Effective Filter Area (mm²)	Area Analyzed (mm²)	ASBESTOS Asbestos Types	Fibers Detected	Analytical Sensitivity	Concentration	Confidence Limits
							MFL (million fibers per liter)		
5 352005620-0005	6/16/2020 05:28 AM	50	1320	0.1300	None Detected	ND	0.20	<0.20	0.00 - 0.75

Collection Date/Time: 06/09/2020 11:35 AM

Sample ozonated prior to analysis due to lab receipt time exceeding 48hr method hold time.

Analyst(s)
Steve Felton (5)

Rachel Travis, Laboratory Manager
or Other Approved Signatory

Any questions please contact Rachel Travis.

Initial report from: 06/23/2020 16:02:33

Sample collection and containers provided by the client, acceptable bottle blank level is defined as ≤0.01MFL>10um. ND=None Detected. This report may not be reproduced, except in full, without written permission by EMSL Analytical, Inc. The test results contained within this report meet the requirements of NELAC unless otherwise noted. This report relates only to the samples reported above. Samples received in good condition unless otherwise noted.

Samples analyzed by EMSL Analytical, Inc. New Hope, MN MN ELAP 1511379; Florida E871121; Iowa 411; Louisiana LA1800002; Nebraska NE-05-31-16; Oklahoma 2017-005

(RL) = Reporting Limit.
See below for definitions of possible flags and labels in the database (sheet tab 'DATA').
There may be additional flags associated with these data; please see individual hard copy reports for a c

FLAG	=	DEFINITION
B	=	analyte found in the associated blank and concentration in sample is less than 1(
J	=	estimated concentration less than RL
N	=	authentic recovery is not within method/contract control limits
U	=	not detected at RL
V	=	surrogate recovery is not within method/contract control limits

complete list of flags and definitions.

0X the concentration in the associated blank

CLIENT_ID	Lino Lakes Well No.4		
Axys ID	L33032-1		
Method	SGS AXYS METHOD MLA-110 Rev 02		
WORKGROUP	WG72387		
Sample Size	0.547L		
UNITS	flag	ng/L	ng/L (RL)
PFBA	U		2.92
PFPeA	U		1.46
PFHxA	U		0.731
PFHpA	U		0.731
PFOA	U		0.731
PFNA	U		0.731
PFDA	U		0.731
PFUnA	U		0.731
PFDoA	U		0.731
PFTrDA	U		0.731
PFTeDA	U		0.731
PFBS	U		0.731
PFPeS	U		0.731
PFHxS	U		0.731
PFHpS	U		0.731
PFOS	U		0.731
PFNS	U		0.731
PFDS	U		0.731
PFDoS	U		0.731
4:2 FTS	U		2.92
6:2 FTS	B J	5.45	2.63
8:2 FTS	U		2.92
PFOSA	U		0.731
N-MeFOSA	U		0.84
N-EtFOSA	U		1.83
MeFOSAA	U		0.731
EtFOSAA	U		0.731
N-MeFOSE	U		7.31
N-EtFOSE	U		5.48
HFPO-DA	U		2.78
ADONA	U		2.92
9Cl-PF3ONS	U		2.92
11Cl-PF3OUdS	U		2.92
13C4-PFBA (% Recovery)		82.5	
13C5-PFPeA (% Recovery)		88.2	
13C5-PFHxA (% Recovery)		86.3	
13C4-PFHpA (% Recovery)		91.4	
13C8-PFOA (% Recovery)		85	
13C9-PFNA (% Recovery)		78.4	
13C6-PFDA (% Recovery)		92.1	
13C7-PFUnA (% Recovery)		85.5	
13C2-PFDoA (% Recovery)		83.2	

13C2-PFTeDA (% Recovery)	74.8
13C3-PFBS (% Recovery)	84.3
13C3-PFHxS (% Recovery)	83.7
13C8-PFOS (% Recovery)	88.3
13C2-4:2 FTS (% Recovery)	63.5
13C2-6:2 FTS (% Recovery)	62.3
13C2-8:2 FTS (% Recovery)	65.6
13C8-PFOSA (% Recovery)	87.5
D3-N-MeFOSA (% Recovery)	77.6
D5-N-EtFOSA (% Recovery)	69.3
D3-MeFOSAA (% Recovery)	56
D5-EtFOSAA (% Recovery)	52.9
d7-NMe-FOSE (% Recovery)	69.9
d9-NEt-FOSE (% Recovery)	63.6
13C3-HFPO-DA (% Recovery)	79.8

Lino Lakes Well No.3
L33032-2
SGS AXYS METHOD MLA-110 Rev 02
WG72387
0.547L

flag	ng/L	ng/L (RL)
	10.2	2.93
U		1.46
U		0.732
U		0.732
U		0.732
U		0.732
U		0.732
U		0.732
U		0.732
U		0.732
U		0.732
U		0.732
U		0.732
U		0.732
U		0.732
U		0.732
U		0.732
U		0.732
U		0.732
U		0.732
U		2.93
B J	4.55	2.63
U		2.93
U		0.732
U		0.841
U		1.83
U		0.732
U		0.732
U		7.32
U		5.49
U		2.78
U		2.93
U		2.93
U		2.93
	64.9	
	90	
	90.1	
	85.6	
	84.9	
	79.6	
	83.6	
	80.2	
	80.6	

Lino Lakes Well No.6
L33032-3
SGS AXYS METHOD MLA-110 Rev 02
WG72387
0.550L

flag	ng/L
	39.2
U	
U	
U	
U	
U	
U	
U	
U	
U	
U	
U	
U	
U	
U	
U	
U	
U	
U	
U	
U	
B J	3.88
U	
U	
U	
U	
U	
U	
U	
U	
U	
U	
U	
	81.7
	85.8
	86.4
	85.4
	83.8
	82.1
	91.1
	84.3
	84

	62.8	69.4
	89.9	90
	83.4	81.5
	87.8	90.2
	62.1	58
	60.6	60.4
	64.9	64.7
	88.4	90.7
	86	72
	76.5	72.1
	56.7	60.6
V	47.1	55.2
	70.7	71.2
	65.2	66
	83.6	79.1

Lino Lakes Well No.5			Lino Lakes Well No.2	
L33032-4			L33032-5	
SGS AXYS METHOD MLA-110 Rev 02			SGS AXYS METHOD MLA-110 F	
WG72387			WG72387	
0.546L			0.552L	
ng/L (RL)	flag	ng/L	ng/L (RL)	flag
2.91	J	3.8	2.93	U
1.45	U		1.46	U
0.727	U		0.732	U
0.727	U		0.732	U
0.727	U		0.732	
0.727	U		0.732	U
0.727	U		0.732	U
0.727	U		0.732	U
0.727	U		0.732	U
0.727	U		0.732	U
0.727	U		0.732	U
0.727	U		0.732	U
0.727	U		0.732	U
0.727	U		0.732	U
0.727	U		0.732	U
0.727	U		0.732	U
0.727	U		0.732	U
0.727	U		0.732	U
0.727	U		0.732	U
0.727	U		0.732	U
2.91	U		2.93	U
2.62	B J	4	2.64	B J
2.91	U		2.93	U
0.727	U		0.732	U
0.837	U		0.842	U
1.82	U		1.83	U
0.727	U		0.732	U
0.727	U		0.732	U
7.27	U		7.32	U
5.46	U		5.49	U
2.76	U		2.78	U
2.91	U		2.93	U
2.91	U		2.93	U
2.91	U		2.93	U
		82.4		
		90		
		90.7		
		88.5		
		83.8		
		80.3		
		105		
		98.5		
		93.3		

84.6
85.9
82.2
88
64.2
59.2
68.1
89.4
71.8
69.7
57.7
58
71
67.1
83.2

Lab Blank (101)
WG72387-101
Rev 02 SGS AXYS METHOD MLA-110 Rev 02
WG72387
0.500L

ng/L	ng/L (RL)	flag	ng/L	ng/L (RL)
	2.9	U		3.2
	1.45	U		1.6
	0.725	U		0.8
	0.725	U		0.8
5.19	0.725	U		0.8
	0.725	U		0.8
	0.725	U		0.8
	0.725	U		0.8
	0.725	U		0.8
	0.725	U		0.8
	0.725	U		0.8
	0.725	U		0.8
	0.725	U		0.8
	0.725	U		0.8
	0.725	U		0.8
	0.725	U		0.8
	0.725	U		0.8
	0.725	U		0.8
	0.725	U		0.8
	2.9	U		3.2
5.77	2.61	J	29.2	2.88
	2.9	U		3.2
	0.725	U		0.8
	0.833	U		0.92
	1.81	U		2
	0.725	U		0.8
	0.725	U		0.8
	7.25	U		8
	5.44	U		6
	2.75	U		3.04
	2.9	U		3.2
	2.9	U		3.2
	2.9	U		3.2
82.8			81.2	
90			86.4	
90.6			83.5	
86.6			85	
84.1			81.8	
80.8			78.5	
86.9			86.3	
85.1			86.2	
78.6			85	

72.5	59
86.9	87.4
84.2	83.1
88.5	86.1
62.6	64.2
58.3	60.1
64.1	63.7
91.2	80.9
78	66.6
76	62
57.1	52.1
51.1	53.7
73.1	65.1
68.4	56.6
84.8	77.5

Spiked Matrix (102)
WG72387-102 (A)
SGS AXYS METHOD MLA-110 Rev 02
WG72387

flag	% Recovery
	96.6
	95.1
	91.8
	93.6
	89.7
	102
	91.3
	98.4
	96.6
	83.4
	103
	98.7
	103
	95.7
	91.2
	89
	98.6
	86.4
N	77.2
	110
N	121
	95.1
	96.7
	104
	89.3
	99.6
	99.8
	100
	101
	92.7
	99.7
	107
	90.2
	83.3
	96.3
	94.5
	85.5
	84
	81.2
	93
	88.9
	89

Spiked Matrix (Duplicate) (103)
WG72387-103 (DUP WG72387-102)
SGS AXYS METHOD MLA-110 Rev 02
WG72387

flag	% Recovery
	96.5
	97.6
	97.8
	92.7
	90.1
	98
	96.3
	96.7
	104
	86.6
	102
	95.8
	102
	97.2
	91
	88.3
	103
	82.6
N	78.9
	108
	113
	102
	98.3
	102
	88.4
N	78.1
	83.4
	99.6
	101
	95.8
	108
	118
	100
	82.2
	88.2
	84.5
	87.1
	81
	77
	88.2
	85
	79.4

74.9	73.2
84.2	88
82.8	82.6
90.6	93.3
59.2	62.2
58.2	58.8
60	58.5
84.8	85.1
70.6	70.1
67.3	67.5
58.3	59
56.1	54.9
70.2	68.2
64.2	62.3
90.6	76.1

-

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SGS AXYS Client No.: 5036

Client Address: WSB & Associates, Inc.
701 Xenia Ave. S., Suite 300
Golden Valley, MN, US, 55416

The SGS AXYS contact for these data is Dale Robinson.

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PERFLUORINATED ORGANIC & FTS ANALYSIS

AQUEOUS SAMPLES

PROJECT NAME: LINO LAKES WTP FEASIBILITY 015822-000

Contract: 5036
Data Package Identification: DPWG72695

Analysis WG72387

24 June 2020

WSB & ASSOCIATES
AQUEOUS SAMPLES

PER- AND POLYFLUOROALKYL SUBSTANCES ANALYSIS
SGS AXYS METHOD: MLA-110
5036: L33032-1 to -5

Project name: Lino Lakes WTP Feasibility 015822-000

24 June 2020

NARRATIVE

This narrative describes the analysis of five aqueous samples for the determination of per- and polyfluoroalkyl organic compounds by ultra-high performance liquid chromatography/tandem mass spectrometry (UHPLC-MS/MS).

SAMPLE RECEIPT AND STORAGE

The sample was received at SGS AXYS on the 6th of May, 2020. The temperature of the samples upon receipt was 2.2˚C, meeting the method recommended arrival temperature of 0-4°C. The samples were stored at -20˚C in the dark prior to extraction and analysis.

SAMPLE EXTRACTION AND ANALYSIS

The field and QC samples were analyzed in one analysis batch designated as WG72387; the composition of the batch is shown on the Correlation Table included with this data package. The QC samples consisted of a procedural blank, a lab-generated reference sample known as the Ongoing Precision and Recovery (OPR) sample and a duplicate OPR. The lab blank and OPRs were prepared using Canadian Springs water as the matrix.

Sample extraction, instrumental analysis, and analyte quantification procedures were done in accordance with SGS AXYS Method MLA-110: ***Analytical Procedure for the Analysis of Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous Samples, Solids and Solvent Extracts by LC-MS/MS***. A method summary (MSU-110) of SGS AXYS Method MLA-110 is included with the data package.

Approximately 500 mL of sample was accurately weighed and spiked with isotopically labeled quantification standards and extracted and cleaned up by solid phase extraction (SPE) using a disposable cartridge containing a weak anion exchange sorbent. After spiking each sample with labeled recovery (internal) standards, the extracts were analyzed by LC-MS/MS. Analyte concentrations were determined by isotope dilution/internal standard method, comparing the area of the quantification ion to that of the isotopically labeled standard.

The reporting limit (RL) was defined as the concentration equivalent to the lowest calibration standard (CS1) or the sample specific detection limit (SDL), whichever was greater.

REPORTING CONVENTIONS

The SGS AXYS contract number assigned for internal tracking was 5036. The samples were assigned a unique laboratory identifier L33032-X; where X is a numeral; all data reports reference this unique SGS AXYS ID plus the client sample identifier. To assist in locating data, a table correlating the SGS AXYS ID with the client sample numbers is included with this data package. The report forms were generated using Laboratory Information Management Systems (LIMS) software.

Any extra work required and performed after the initial instrumental analysis of the sample extract was given an extra “test suffix” code. The single letter code per extra work performed was added to the SGS AXYS sample ID as a suffix, and was combined with any other applicable test suffix codes. The extra work code used to report data in this package include:

(A) = parent sample for a duplicate pair

The laboratory qualifiers used to report results were as follows:

J = indicates an estimated value where the concentration of the analyte is less than the concentration at which test accuracy has been demonstrated (LOQ) but greater than the reporting limit (RDL)
N = authentic recovery in the OPR is not within method or contract control limits
U = identifies a compound that was not detected
B = analyte found in the associated blank
V = surrogate recovery was not within method specifications

Results were reported with concentration units of nanograms per litre (ng/L). Concentration and detection limits were reported to three significant figures. Analysis results for each sample are provided on Analysis Report forms 1A and 2.

QA/QC NOTES

The samples and QC samples were analyzed in one analysis batch and was carried intact through the entire analytical process. The sample data were reviewed and evaluated in relation to the batch QC samples.

- Sample analyte concentrations are not blank corrected and should be evaluated with the laboratory procedural blank results considered.
- By virtue of the isotope dilution/internal standard quantification procedures, data are recovery corrected for possible losses during extraction and clean up.
- All linearity, calibration verification, OPR, precision, laboratory procedural blank, and labeled compound recovery specifications were met with the following exceptions:

The analyte 6:2 FTS was detected in the Lab Blank (SGS AXYS ID: WG72387-101). Data are not blank corrected. Blank data should be taken into consideration when evaluating sample data.

Percent recovery of several analytes in the OPR and OPR duplicate (SGS AXYS ID: WG72387-102 and -103, respectively) were outside the contract nominal limits but within the SGS AXYS method limit. The analytes were flagged with an 'N'.

The Relative Percent Difference (RPD) value of above 20% was observed for analyte MeFOSAA between the OPR and OPR duplicate (SGS AXYS ID: WG72387-102 and -103, respectively). Overall, there was good agreement in target analyte concentrations between the samples.

Percent recovery of labeled compound D_5-EtFOSAA in the sample Lino Lakes Well No. 3 (SGS AXYS ID: L33032-2) was below the contract nominal limit and was flagged with a 'V'. As the isotope dilution method of quantification produces data that are recovery corrected, the variances from the method acceptance criteria are deemed not to affect the quantification of the analytes. Percent labeled compound recoveries are used as a general method performance indicator only.

ANALYTICAL DISCUSSION

No analytical difficulty was encountered.

DATA PACKAGE

This data package was assigned a unique data package identification workgroup: DPWG72695. This ID is shown on the front page of the data package. Included in the data package following this narrative report are the following documents:

- Method summary
- Sample 'Correlation Table'
- Sample receiving documentation
- Sample data reports (in order of SGS AXYS Sample ID)
- Laboratory QC data reports
- Instrumental QC data reports (organized by analysis date)

- Accreditation Scope

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, except for the conditions detailed above. In addition, I certify, that to the best of my knowledge and belief, the data as reported are true and accurate. The following signature, on behalf of SGS AXYS Analytical Services Ltd, authorizes the release of the data contained in this data package.

Bryan Alonzo 24-Jun-20

Signed: Bryan Alonzo, B. Sc., Data Validation Chemist Date Signed

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SUMMARY OF SGS AXYS METHOD MLA-110 REV. 02 VER. 07

Analytical Procedure for the Analysis of Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous Samples, Solids, Tissues, AFFF Products, Blood/ Serums and Solvent Extracts by LC-MS/MS

This method describes the analysis of per- and polyfluoroalkyl substances (PFAS) in aqueous, solid, biosolid, tissue, blood/serum, AFFF product samples and solvent extracts, determined as the total of linear and branched isomers. After spiking with isotopically labeled surrogate standards samples are extracted and cleaned up by Solid Phase Extraction (SPE). The extracts are then analyzed by liquid chromatography/mass spectrometry (LC-MS/MS). Final sample concentrations are determined by isotope dilution/internal standard quantification.

Typical reporting limits are shown below, for the method default sample sizes:

Analyte groups	Aqueous sample	Extract [1]	Solid [2]	Biosolid [3]	Tissues [4]	AFFF Products[5]	Blood, Serum
Typical sample size	0.5 L	0.75 mL	5 g	2.5 g	2.0 g	0.02 g	2 mL
Units	ng/L	ng/mL	ng/g	ng/g	ng/g	ng/g	ng/mL
Perfluoroalkyl carboxylates	0.8-3.2	0.53-2.1	0.08-0.32	0.16-0.64	0.2-0.8	10-40	0.2-0.8
Perfluoroalkyl sulfonates	0.8	0.53	0.08	0.16	0.2	10	0.2
Fluorotelomer sulfonates	3.2	2.1	0.32	0.64	0.8	40	0.8
Perfluorooctane sulfonamides	0.8	0.53	0.08	0.16	0.2	10	0.2
Perfluorooctane sulfonamidoacetic acids	0.8	0.53	0.08	0.16	0.2	10	0.2
Perfluorooctane sulfonamide ethanols	8	5.3	0.8	1.6	2.0	100	2.0
Per- and polyfluoroether carboxylates	3.2	2.1	0.32	0.64	0.8	N/A	0.8
Ether sulfonates	3.2	2.1	0.32	0.64	0.8	N/A	0.8

1 Detection limits for extract samples depend on the samples size processed. The reporting limits provided here are based on the typical extract sample size listed above.

2 A maximum of 10 g wet, or 5 g dry, solid may be analyzed.

3 A maximum of 5 g wet, or 0.5 g dry, biosolid may be analyzed.

4 A maximum of 2 g of tissue may be analyzed.

5 A maximum of 0.02 g of AFFF Product is analyzed. Reporting limits are based on the calibration A point. The method is not currently validated for ether carboxylates/sulfonates in AFFF samples. Only Class B aqueous film forming foams (AFFF) or alcohol-resistant AFFF (AR-AFFF) samples are part of this scope. All samples will be logged in under an “AQIP” (Aqueous Industrial Product) matrix code in LIMS. Other AFFF products such as fluoroprotein foams may be analyzed using this method but need special

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handling. See PFAS product manager for handling instructions. Consult product Safety Data Sheets (SDS) and other information before confirming. Log these samples into LIMS as a Q Product.

Refer to Appendix B for sample storage conditions.

PFAS Target Analytes

Perfluoroalkyl carboxylates

Perfluorobutanoic acid (PFBA, Perfluorobutanoate)
Perfluoropentanoic acid (PFPeA, Perfluoropentanoate)
Perfluorohexanoic acid (PFHxA, Perfluorohexanoate)
Perfluoroheptanoic acid (PFHpA, Perfluoroheptanoate)
Perfluorooctanoic acid (PFOA, Perfluorooctanoate)
Perfluorononanoic acid (PFNA, Perfluorononanoate)
Perfluorodecanoic acid (PFDA, Perfluorodecanoate)
Perfluoroundecanoic acid (PFUnA, Perfluoroundecanoate)
Perfluorododecanoic acid (PFDoA, Perfluorododecanoate)
Perfluorotridecanoic acid (PFTrDA, Perfluorotridecanoate)
Perfluorotetradecanoic acid (PFTeDA, Perfluorotetradecanoate)

Perfluoroalkyl sulfonates

Perfluorobutanesulfonic acid (PFBS, Perfluorobutanesulfonate)
Perfluoropentanesulfonic acid (PFPeS, Perfluoropentanesulfonate)
Perfluorohexanesulfonic acid (PFHxS, Perfluorohexanesulfonate)
Perfluoroheptanesulfonic acid (PFHpS, Perfluoroheptanesulfonate)
Perfluorooctanesulfonic acid (PFOS, Perfluorooctanesulfonate)
Perfluorononanesulfonic acid (PFNS, Perfluorononanesulfonate)
Perfluorodecanesulfonic acid (PFDS, Perfluorodecanesulfonate)
Perfluorododecanesulfonic acid (PFDoS, Perfluorododecanesulfonate)

Fluorotelomer sulfonates

1H, 1H, 2H, 2H-perfluorohexane sulfonic acid (4:2 FTS, 1H, 1H, 2H, 2H-perfluorohexane sulfonate)
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS, 1H, 1H, 2H, 2H-perfluorooctane sulfonate)
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS, 1H, 1H, 2H, 2H-perfluorodecane sulfonate)

Perfluorooctane sulfonamides

Perfluorooctanesulfonamide (PFOSA) [1]
N-Methylperfluorooctanesulfonamide (N-MeFOSA)
N-Ethylperfluorooctanesulfonamide (N-EtFOSA)

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Perfluorooctane sulfonamidoacetic acids

N-Methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA, N-Methylperfluoro-1-octanesulfonamidoacetate)
N-Ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA, N-Ethylperfluoro-1-octanesulfonamidoacetate)

Perfluorooctane sulfonamidoethanols

N-Methylperfluoro-1-octanesulfonamidoethanol (N-MeFOSE)

N-Ethylperfluoro-1-octanesulfonamidoethanol (N-EtFOSE)

Ether carboxylates

2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)propionic acid (HFPO-DA, 2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)propionoate)
Decafluoro-3H-4,8-dioxanonoate (ADONA, DONA, Decafluoro-3H-4,8-dioxanonoic acid)

Ether sulfonates

9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS, 9-chlorohexadecafluoro-3-oxanonane-1-sulfonate)
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS, 11-chloroeicosafluoro-3-oxaundecane-1-sulfonate)

[1] PFOSA also called FOSA

The carboxylic and sulfonic acid analyte concentrations can be reported as either the acid or the anion forms. The anion and corresponding acid forms and their CAS Registry Numbers are shown in Appendix A of this summary.

1.0 EXTRACTION AND CLEANUP PROCEDURES

Aqueous samples size may be up to 1000 mL for aqueous samples analyzed by this method, and up to 0.75 mL for extracts/solvents. Samples are stored in HDPE (high density polyethylene) containers. All samples are spiked with surrogate standards. Aqueous samples are extracted by solid phase extraction (SPE) using weak anion exchange cartridges; wash and elution procedures are chosen to meet various analysis requirements. Sample extracts are then treated with carbon powder, spiked with recovery standards and analyzed by LC-MS/MS.

Extract/solvent samples don't undergo solid phase extraction. The samples are spiked with surrogate and recovery standards, and analyzed by LC-MS/MS.

Solid and biosolid sample size may be up to 5 g dry weight for solid samples or up to 5 g wet weight (max. 0.5 g dry weight) for biosolid samples. After addition of isotopically labelled surrogate standards the sample is extracted by shaking three times with methanolic ammonium hydroxide solution, each time collecting the supernatants. The supernatants are combined, treated with ultra pure carbon powder and evaporated to remove methanol. The resulting solution is diluted with water and cleaned up by solid phase extraction (SPE) using disposable cartridges containing a weak anion exchange sorbent. The eluate is spiked with recovery standards and analyzed by LC-MS/MS.

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Tissue sample size may be up to 2 g. After addition of isotopically labelled surrogate standards the sample is extracted with methanolic potassium hydroxide solution, with acetonitrile, and finally with methanolic potassium hydroxide solution, each time collecting the supernatants. The supernatants are combined, treated with ultra pure carbon powder and evaporated to remove methanol. The resulting solution is diluted with water and cleaned up by solid phase extraction (SPE) on a weak anion exchange sorbent. The eluate is spiked with recovery standards and analyzed by LC-MS/MS.

All AFFF samples are pre-screened before analysis to determine the appropriate amount of sample to analyze. A suitable subsample is dissolved in water, spiked with surrogate standards and extracted by solid phase extraction (SPE). The extracts are treated with carbon powder, spiked with recovery standards and analyzed by LC-MS/MS.

Blood, Serum sample size may be up to 2 mL. After the addition of isotopically labelled surrogate standards the sample is extracted with 50% formic acid. The resulting solution is cleaned up by solid phase extraction (SPE) on a weak anion exchange sorbent. The eluent tubes are spiked with recovery standards and then eluent collected and analyzed by LC-MS/MS.

2.0 INSTRUMENTATION

Analysis of the sample extract is performed on a UPLC (ultrahigh performance liquid chromatography) reversed phase C18 column using a solvent gradient. The column is coupled to a triple quadrupole mass spectrometer run at unit mass resolution in the Multiple Reaction Monitoring (MRM) in negative electrospray ionization mode.

3.0 CALIBRATION

Initial calibration of the LC-MS/MS instrument is performed by the analysis of five or more calibration solutions. A mid-level calibration standard is analyzed to verify the initial calibration and injected after:

- at least every 12 hours.
- For DoD accredited work after every 10 client samples or every 12 hours, whichever occurs first, and at the end of the instrumental run sequence.

Nominal Concentrations of Calibration Solutions (ng/mL)

	CAL A*	CAL B	CAL C	CAL D	CAL E (CAL-VER)	CAL F	CAL G	CAL H
Perfluoroalkyl carboxylates								
PFBA	0.2	0.4	0.8	2	**10**	50	250	1000
PFPeA	0.1	0.2	0.4	1	**5**	25	125	500
PFHxA	0.05	0.1	0.2	0.5	**2.5**	12.5	62.5	250
PFHpA	0.05	0.1	0.2	0.5	**2.5**	12.5	62.5	250

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	CAL A*	CAL B	CAL C	CAL D	CAL E (CAL-VER)	CAL F	CAL G	CAL H
PFOA	0.05	0.1	0.2	0.5	**2.5**	12.5	62.5	250
PFNA	0.05	0.1	0.2	0.5	**2.5**	12.5	62.5	250
PFDA	0.05	0.1	0.2	0.5	**2.5**	12.5	62.5	250
PFUnA	0.05	0.1	0.2	0.5	**2.5**	12.5	62.5	250
PFDoA	0.05	0.1	0.2	0.5	**2.5**	12.5	62.5	250
PFTrDA	0.05	0.1	0.2	0.5	**2.5**	12.5	62.5	250
PFTeDA	0.05	0.1	0.2	0.5	**2.5**	12.5	62.5	250
Perfluoroalkyl sulfonates								
PFBS	0.05	0.1	0.2	0.5	**2.5**	12.5	62.5	250
PFPeS	0.05	0.1	0.2	0.5	**2.5**	12.5	62.5	250
PFHxS	0.05	0.1	0.2	0.5	**2.5**	12.5	62.5	250
PFHpS	0.05	0.1	0.2	0.5	**2.5**	12.5	62.5	250
PFOS	0.05	0.1	0.2	0.5	**2.5**	12.5	62.5	250
PFNS	0.05	0.1	0.2	0.5	**2.5**	12.5	62.5	250
PFDS	0.05	0.1	0.2	0.5	**2.5**	12.5	62.5	250
PFDoS	0.05	0.1	0.2	0.5	**2.5**	12.5	62.5	250
Flurorotelomer sulfonates								
4:2 FTS	0.2	0.4	0.8	2	**10**	50	250	1000
6:2 FTS	0.2	0.4	0.8	2	**10**	50	250	1000
8:2 FTS	0.2	0.4	0.8	2	**10**	50	250	1000
Perfluorooctane sulfonamides								
PFOSA	0.05	0.1	0.2	0.5	**2.5**	12.5	62.5	250
N-MeFOSA	0.05	0.1	0.2	0.5	**2.5**	12.5	62.5	250
N-EtFOSA	0.05	0.1	0.2	0.5	**2.5**	12.5	62.5	250
Perfluorooctane sulfonamidoacetic acids								
N-MeFOSAA	0.05	0.1	0.2	0.5	**2.5**	12.5	62.5	250
N-EtFOSAA	0.05	0.1	0.2	0.5	**2.5**	12.5	62.5	250
Perfluorooctane sulfonamide ethanols								
N-MeFOSE	0.5	1	2	5	**25**	125	625	2500
N-EtFOSE	0.5	1	2	5	**25**	125	625	2500

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	CAL A*	CAL B	CAL C	CAL D	CAL E (CAL-VER)	CAL F	CAL G	CAL H
Per- and polyfluoroether carboxylates								
HFPO-DA	0.2	0.4	0.8	2	**10**	50	250	1000
ADONA	0.2	0.4	0.8	2	**10**	50	250	1000
Ether sulfonates								
9Cl-PF3ONS	0.2	0.4	0.8	2	**10**	50	250	1000
11Cl-PF3OUdS	0.2	0.4	0.8	2	**10**	50	250	1000
Surrogate Standards								
$^{13}C_4$-PFBA	10	10	10	10	**10**	10	10	10
$^{13}C_5$-PFPeA	5	5	5	5	**5**	5	5	5
$^{13}C_5$-PFHxA	2.5	2.5	2.5	2.5	**2.5**	2.5	2.5	2.5
$^{13}C_4$-PFHpA	2.5	2.5	2.5	2.5	**2.5**	2.5	2.5	2.5
$^{13}C_8$-PFOA	2.5	2.5	2.5	2.5	**2.5**	2.5	2.5	2.5
$^{13}C_9$-PFNA	1.25	1.25	1.25	1.25	**1.25**	1.25	1.25	1.25
$^{13}C_6$-PFDA	1.25	1.25	1.25	1.25	**1.25**	1.25	1.25	1.25
$^{13}C_7$-PFUnA	1.25	1.25	1.25	1.25	**1.25**	1.25	1.25	1.25
$^{13}C_2$-PFDoA	1.25	1.25	1.25	1.25	**1.25**	1.25	1.25	1.25
$^{13}C_2$-PFTeDA	1.25	1.25	1.25	1.25	**1.25**	1.25	1.25	1.25
$^{13}C_3$-PFBS	2.5	2.5	2.5	2.5	**2.5**	2.5	2.5	2.5
$^{13}C_3$-PFHxS	2.5	2.5	2.5	2.5	**2.5**	2.5	2.5	2.5
$^{13}C_8$-PFOS	2.5	2.5	2.5	2.5	**2.5**	2.5	2.5	2.5
$^{13}C_2$-4:2 FTS	5	5	5	5	**5**	5	5	5
$^{13}C_2$-6:2 FTS	5	5	5	5	**5**	5	5	5
$^{13}C_2$-8:2 FTS	5	5	5	5	**5**	5	5	5
$^{13}C_8$-PFOSA	2.5	2.5	2.5	2.5	**2.5**	2.5	2.5	2.5
D_3-N-MeFOSA	2.5	2.5	2.5	2.5	**2.5**	2.5	2.5	2.5
D_5-N-EtFOSA	2.5	2.5	2.5	2.5	**2.5**	2.5	2.5	2.5
D_3-N-MeFOSAA	5	5	5	5	**5**	5	5	5
D_5-N-EtFOSAA	5	5	5	5	**5**	5	5	5

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	CAL A*	CAL B	CAL C	CAL D	CAL E (CAL-VER)	CAL F	CAL G	CAL H
D_7-N-MeFOSE	25	25	25	25	**25**	25	25	25
D_9-N-EtFOSE	25	25	25	25	**25**	25	25	25
$^{13}C_3$-HFPO-DA	10	10	10	10	**10**	10	10	10
Recovery standards								
$^{13}C_3$-PFBA	5	5	5	5	**5**	5	5	5
$^{13}C_2$-PFHxA	2.5	2.5	2.5	2.5	**2.5**	2.5	2.5	2.5
$^{13}C_4$-PFOA	2.5	2.5	2.5	2.5	**2.5**	2.5	2.5	2.5
$^{13}C_5$-PFNA	1.25	1.25	1.25	1.25	**1.25**	1.25	1.25	1.25
$^{13}C_2$-PFDA	1.25	1.25	1.25	1.25	**1.25**	1.25	1.25	1.25
$^{18}O_2$-PFHxS	2.5	2.5	2.5	2.5	**2.5**	2.5	2.5	2.5
$^{13}C_4$-PFOS	2.5	2.5	2.5	2.5	**2.5**	2.5	2.5	2.5

* CAL A is an Instrument Sensitivity Check. It may be used as an optional calibration level with prior approval, for all matrices.

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4.0 QUANTIFICATION PROCEDURES

Calculations

Target compounds are quantified using the isotope dilution/internal standard method, comparing the area of the primary (quantifying) transition product ion of the target compound to that of the ^{13}C-labelled or deuterium labeled standard and correcting for response factors. Mean relative response factors (RRF), determined from the multi-level initial calibration series are used to convert raw peak areas in sample chromatograms to final concentrations as follows:

$$\text{Concentration of Target} = \left(\frac{\text{area of Target}}{\text{area of Qt Std}}\right) \times \left(\frac{\text{weight of Qt Std}}{\text{RRF}}\right) \times \left(\frac{1}{\text{weight of sample}}\right)$$

where $$\text{RRF} = \left(\frac{\text{area of Target}}{\text{area of Qt Std}}\right) \times \left(\frac{\text{weight of Qt Std}}{\text{weight of Target}}\right)$$

and the Qt Std is either the surrogate or the internal standard

The isotopically labeled analog of an analyte (surrogate) is used for quantitation (Isotope Dilution Quantitation). If a labeled analog is not commercially available, a surrogate with chemical similarity and close retention time is used for quantitation (internal standard quantitation). Final target concentrations are recovery corrected by this method of quantification.

4.1 Reporting Limits

Sample Specific Detection Limits (SDL) are determined by converting the area equivalent to 3.0 times the estimated chromatographic noise height to a concentration in the same manner that target peak responses are converted to final concentrations. The SDL accounts for any effect of matrix on the detection system and for recovery achieved through the analytical work-up.

Results are reported to the greater of the SDL or the concentration equivalent to the lowest calibration standard analyzed.

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Analytes, Transition Ions and Quantification References

	Typical Retention Time [1]	Precursor Ion m/z	Quantification Product Ion m/z[4]	Confirmation Product Ion m/z [2,4]	Typical Ion Ratio Quant./Conf.[3]	Quantified using
Target analytes						
PFBA	1.96	212.8	168.9	n.a.	n.a. (weak confirmation ion)	$^{13}C_4$-PFBA
PFPeA	4.18	263.0	219.0	68.9	n.a. (weak confirmation ion)	$^{13}C_5$-PFPeA
PFHxA	4.81	313.0	269.0	118.9	7.2	$^{13}C_5$-PFHxA
PFHpA	5.32	363.1	319.0	169.0	2.6	$^{13}C_4$-PFHpA
PFOA	6.16	413.0	369.0	169.0	see Table 12	$^{13}C_8$-PFOA
PFNA	6.99	463.0	419.0	219.0	see Table 12	$^{13}C_9$-PFNA
PFDA	7.47	512.9	469.0	219.0	3.6	$^{13}C_6$-PFDA
PFUnA	7.81	563.1	519.0	269.1	4.0	$^{13}C_7$-PFUnA
PFDoA	8.13	613.1	569.0	319.0	9.3	$^{13}C_2$-PFDoA
PFTrDA	8.53	663.0	619.0	168.9	5.4	$^{13}C_2$-PFTeDA
PFTeDA	8.96	713.1	669.0	168.9	4.2	$^{13}C_2$-PFTeDA
PFBS	4.79	298.7	79.9	98.8	2.0	$^{13}C_3$-PFBS [5]
PFPeS	5.38	349.1	79.9	98.9	1.8	$^{13}C_3$-PFHxS
PFHxS	6.31	398.7	79.9	98.9	see Table 12	$^{13}C_3$-PFHxS
PFHpS	7.11	449.0	79.9	98.8	1.7	$^{13}C_8$-PFOS
PFOS	7.59	498.9	79.9	98.8	see Table 12	$^{13}C_8$-PFOS
PFNS	7.92	548.8	79.9	98.8	1.7	$^{13}C_8$-PFOS
PFDS	8.28	599.0	79.9	98.8	1.8	$^{13}C_8$-PFOS
PFDoS	9.14	699.1	79.9	98.8	1.7	$^{13}C_8$-PFOS
4:2 FTS	4.67	327.1	307.0	80.9	1.3	$^{13}C_2$-4:2 FTS
6:2 FTS	5.81	427.1	407.0	80.9	1.5	$^{13}C_2$-6:2 FTS
8:2 FTS	7.28	527.1	507.0	80.8	1.9	$^{13}C_2$-8:2 FTS
PFOSA	8.41	498.1	77.9	478.0	n.a.	$^{13}C_8$-PFOSA

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	Typical Retention Time [1]	Precursor Ion m/z	Quantification Product Ion m/z[4]	Confirmation Product Ion m/z [2,4]	Typical Ion Ratio Quant./Conf.[3]	Quantified using
N-MeFOSA	9.70	511.9	219.0	169.0	see Table 12	D_3-N-MeFOSA
N-EtFOSA	9.94	526.0	219.0	169.0	see Table 12	D_5-N-EtFOSA
N-MeFOSAA	7.51	570.1	419.0	483.0	see Table 12	D_3-N-MeFOSAA
N-EtFOSAA	7.65	584.2	419.1	526.0	see Table 12	D_5-N-EtFOSAA
N-MeFOSE	9.57	616.1	58.9	n.a.	n.a. (weak confirmation ion)	D_7-N-MeFOSE
N-EtFOSE	9.85	630.0	58.9	n.a.	n.a. (weak confirmation ion)	D_9-N-EtFOSE
HFPO-DA	4.97	284.9	168.9	184.9	2.1	$^{13}C_3$-HFPO-DA
ADONA	5.79	376.9	250.9	84.8	2.6	$^{13}C_3$-HFPO-DA
9Cl-PF3ONS	7.82	530.8	351.0	532.8 → 353.0	3.0	$^{13}C_3$-HFPO-DA
11Cl-PF3OUdS	8.62	630.9	450.9	632.9 → 452.9	3.2	$^{13}C_3$-HFPO-DA
Surrogate standards						
$^{13}C_4$-PFBA	1.95	216.8	171.9	n.a.		$^{13}C_3$-PFBA
$^{13}C_5$-PFPeA	4.18	268.3	223.0	n.a.		$^{13}C_2$-PFHxA
$^{13}C_5$-PFHxA	4.80	318.0	273.0	120.3		$^{13}C_2$-PFHxA
$^{13}C_4$-PFHpA	5.32	367.1	322.0	n.a.		$^{13}C_4$-PFOA ($^{13}C_2$-PFHxA for AFFF products)
$^{13}C_8$-PFOA	6.16	421.1	376.0	n.a.		$^{13}C_4$-PFOA
$^{13}C_9$-PFNA	6.99	472.1	427.0	n.a.		$^{13}C_5$-PFNA
$^{13}C_6$-PFDA	7.47	519.1	474.1	n.a.		$^{13}C_2$-PFDA
$^{13}C_7$-PFUnA	7.81	570.0	525.1	n.a.		$^{13}C_2$-PFDA
$^{13}C_2$-PFDoA	8.13	615.1	570.0	n.a.		$^{13}C_2$-PFDA
$^{13}C_2$-PFTeDA	8.96	715.1	670.0	n.a.		$^{13}C_2$-PFDA
$^{13}C_3$-PFBS	4.78	302.1	79.9	98.9		$^{18}O_2$-PFHxS
$^{13}C_3$-PFHxS	6.30	402.1	79.9	98.8		$^{18}O_2$-PFHxS
$^{13}C_8$-PFOS	7.59	507.1	79.9	98.9		$^{13}C_4$-PFOS

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	Typical Retention Time [1]	Precursor Ion m/z	Quantification Product Ion m/z[4]	Confirmation Product Ion m/z [2,4]	Typical Ion Ratio Quant./Conf.[3]	Quantified using
$^{13}C_2$-4:2 FTS	4.67	329.1	80.9	309.0		$^{18}O_2$-PFHxS
$^{13}C_2$-6:2 FTS	5.82	429.1	80.9	409.0		$^{18}O_2$-PFHxS
$^{13}C_2$-8:2 FTS	7.28	529.1	80.9	509.0		$^{18}O_2$-PFHxS
$^{13}C_8$-PFOSA	8.41	506.1	77.8	n.a.		$^{13}C_4$-PFOS
D_3-N-MeFOSA	9.70	515.0	219.0	n.a.		$^{13}C_4$-PFOS
D_5-N-EtFOSA	9.94	531.1	219.0	n.a.		$^{13}C_4$-PFOS
D_3-N-MeFOSAA	7.51	573.2	419.0	n.a.		$^{13}C_4$-PFOS
D_5-N-EtFOSAA	7.65	589.2	419.0	n.a.		$^{13}C_4$-PFOS
D_7-N-MeFOSE	9.56	623.2	58.9	n.a.		$^{13}C_4$-PFOS
D_9-N-EtFOSE	9.83	639.2	58.9	n.a.		$^{13}C_4$-PFOS
$^{13}C_3$-HFPO-DA	4.97	286.9	168.9	184.9		$^{13}C_2$-PFHxA
Recovery standards						
$^{13}C_3$-PFBA	1.95	216.0	172.0	n.a.		External
$^{13}C_2$-PFHxA	4.80	315.1	270.0	119.4		External
$^{13}C_4$-PFOA	6.16	417.1	172.0	n.a.		External
$^{13}C_5$-PFNA	6.99	468.0	423.0	n.a.		External
$^{13}C_2$-PFDA	7.47	515.1	470.1	n.a.		External
$^{18}O_2$-PFHxS	6.30	403.0	83.9	n.a.		External
$^{13}C_4$-PFOS	7.59	502.8	79.9	98.9		External

1 Times shown are in decimal minute units.
2 Alternate transition, second m/z, may be used if necessary to avoid interference.
3 Transition ion ratios may vary by instrument, values shown are examples. Ion ratios applicable to qualitative identification are determined from instrumental calibration data.
4 Unit mass resolution of this instrument suggests ± 0.5 amu uncertainty in indicated masses.
5 If the quantifying standard $^{13}C_3$-PFBS is unavailable PFBS may optionally be quantified against $^{13}C_3$-PFHxS.

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5.0 QUALITY ACCEPTANCE CRITERIA

Samples are analyzed in batches consisting of a maximum of twenty samples, one procedural blank and one spiked matrix (OPR) sample. A duplicate is analyzed, provided there is sufficient sample, with batches containing 7-20 samples. Matrix spike/matrix spike duplicate (MS/MSD) pairs may be analyzed on an individual contract basis. The batch is carried through the complete analytical process as a unit. For sample data to be reportable, the batch QC data must meet the established acceptance criteria presented on the analysis reports.

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QC Specifications for Aqueous, Solid, AFFF, Tissue and Blood/Serum Samples: Procedural Blank Levels and OPR Recovery Ranges

Compound	Procedural Blank Level (ng/sample)	OPR Recovery Range for Aqueous, Solid and AFFF Samples (%)	OPR Recovery Range for Tissue Samples (%)	OPR Recovery Range for Blood/ Serum Samples (%)
PFBA	≤ 1.6	70-130	70-130	70-130
PFPeA	≤ 0.8	70-130	70-130	70-130
PFHxA	≤ 0.4	70-130	70-130	70-130
PFHpA	≤ 0.4	70-130	70-130	70-130
PFOA	≤ 0.4	70-130	70-130	70-130
PFNA	≤ 0.4	70-130	70-130	70-130
PFDA	≤ 0.4	70-130	60-130	70-150
PFUnA	≤ 0.4	70-130	70-140	70-140
PFDoA	≤ 0.4	70-130	70-130	70-140
PFTrDA	≤ 0.4	70-130	70-130	70-130
PFTeDA	≤ 0.4	70-130	70-130	70-130
PFBS	≤ 0.4	70-130	60-130	70-130
PFPeS	≤ 0.4	70-130	70-130	70-130
PFHxS	≤ 0.4	70-130	70-130	70-130
PFHpS	≤ 0.4	70-130	70-130	70-130
PFOS	≤ 0.4	70-130	70-140	70-130
PFNS	≤ 0.4	70-130	60-150	40-140
PFDS	≤ 0.4	70-130	40-150	70-130
PFDoS	≤ 0.4	60-130	70-140	70-130
4:2 FTS	≤ 1.6	70-130	40-150	70-130
6:2 FTS	≤ 5	70-130	70-130	70-130
8:2 FTS	≤ 1.6	70-130	70-170	70-130
PFOSA	≤ 0.4	70-130	70-130	70-130
N-MeFOSA	≤ 0.4	70-130	50-140	70-130
N-EtFOSA	≤ 0.4	70-130	70-130	70-130
N-MeFOSAA	≤ 0.4	70-130	60-140	70-150
N-EtFOSAA	≤ 0.4	70-130	60-140	60-130
N-MeFOSE	≤ 4	70-130	70-150	70-130
N-EtFOSE	≤ 4	70-130	70-130	70-160
HFPO-DA	≤ 1.6	70-130	70-130	70-130
ADONA	≤ 1.6	70-130	70-130	70-130
9Cl-PF3ONS	≤1.6	70-130	70-130	60-130
11Cl-PF3OUdS	≤ 1.6	70-130	60-130	70-130

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Marginal exceedance allowance – results for one compound may fall outside of these limits by a maximum of 10% of the value. Note that for AFFF products, these are interim specifications and data outside the specifications may be acceptable based on application and professional judgment. DoD specification for procedural blanks: No analytes detected >½ LOQ or > 1/10th the amount measured in any sample or 1/10th the regulatory limit, whichever is greater.

DoD QSM Rev. 5.3 Recovery Acceptance Limits for OPRs

Compound	OPR Recovery Range for Aqueous Samples (%)	OPR Recovery Range for Solid Samples (%)
PFBA	73-129	71-135
PFPeA	72-129	69-132
PFHxA	72-129	70-132
PFHpA	72-130	71-131
PFOA	71-133	69-133
PFNA	69-130	72-129
PFDA	71-129	69-133
PFUnA	69-133	64-136
PFDoA	72-134	69-135
PFTrDA	65-144	66-139
PFTeDA	71-132	69-133
PFBS	72-130	72-128
PFPeS	71-127	73-123
PFHxS	68-131	67-130
PFHpS	69-134	70-132
PFOS	65-140	68-136
PFNS	69-127	69-125
PFDS	53-142	59-134
4:2 FTS	63-143	62-145
6:2 FTS	64-140	64-140
8:2 FTS	67-138	65-137
PFOSA	67-137	67-137
N-MeFOSA	68-141	n.a.
N-MeFOSAA	65-136	63-144
N-EtFOSAA	61-135	61-139

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QC Specifications for Aqueous, Solid, AFFF, Tissue and Blood Serum Samples: Surrogate Standard Recoveries, OPR and Samples

Surrogate Standard	OPR and Sample Recovery Range [1] for Aqueous, Solid and AFFF Samples [3] (%)	OPR and Sample Recovery Range [1] for Tissue Samples (%) [3]	OPR and Sample Recovery Range [1] for Blood/Serum Samples (%) [3]
$^{13}C_4$-PFBA	50-150	50-150	50-150
$^{13}C_5$-PFPeA	50-150	50-150	50-150
$^{13}C_5$-PFHxA	50-150	50-150	50-150
$^{13}C_4$-PFHpA	50-150	50-150	50-150
$^{13}C_8$-PFOA	50-150	50-150	50-150
$^{13}C_9$-PFNA	50-150	50-150	50-150
$^{13}C_6$-PFDA	50-150	50-180	50-150
$^{13}C_7$-PFUnA	50-150	50-150	50-160
$^{13}C_2$-PFDoA	50-150	50-150	50-150
$^{13}C_2$-PFTeDA	50-150	50-150	40-150
$^{13}C_3$-PFBS	50-150	50-150	50-150
$^{13}C_3$-PFHxS	50-150	50-150	50-150
$^{13}C_8$-PFOS	50-150	50-150	50-150
$^{13}C_2$-4:2 FTS	50-150	50-220	50-150
$^{13}C_2$-6:2 FTS	50-150	50-180	30-180
$^{13}C_2$-8:2 FTS	50-150	50-300	30-180
$^{13}C_8$-PFOSA	50-150	50-150	50-150
D_3-N-MeFOSA	30-150	[2]	50-150
D_5-N-EtFOSA	20-150	[2]	50-150
D_3-N-MeFOSAA	50-150	[2]	40-200
D_5-N-EtFOSAA	50-150	[2]	40-200
D_7-N-MeFOSE	30-150	[2]	50-150
D_9-N-EtFOSE	30-150	[2]	30-150
$^{13}C_3$-HFPO-DA	50-150	50-150	50-150

[1] Lower surrogate recoveries may be accepted based on application and professional judgment. Note that for AFFF products, these are interim specifications and data outside the specifications may be acceptable based on application and professional judgment.

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[2] These surrogates used only to quantify the analogous native compounds. Formal surrogate recovery limits are under review.

[3] For DoD: Surrogate recoveries are determined by comparing surrogate peak area in samples to surrogate's area measured in the day's initial cal/ver (or I-CAL if run that day).

QC Specification Table: Other Parameters

QC Parameter	Specification
MS Acquisition Rate	Minimum acquisition rate for every native analyte and labeled compound peak: At least 10 data points per peak.
Instrument Sensitivity	Daily, S:N ≥ 10:1 for the primary transition product ion for all analytes for the lowest calibration standard (CAL B) and S:N ≥ 3:1 for the secondary ion. *Additional requirement for DoD: Prior to sample analysis and then at least once every 12 hours, verify sensitivity at the LOQ level by running CAL C The found analyte concentrations must be within ±30% of the true values.*
Mass Calibration	Instrument must have a valid mass calibration following the manufacturer specified procedure prior to any sample analysis. The mass calibration is updated on an as-needed basis (e.g. QC failures, ion masses fall outside of the ±0.5 amu of the true value, major instrument maintenance, or if the instrument is moved.) Refer to SIN-033. The entire range (bracketing all the masses of the target analytes) must be mass calibrated. The maximal allowed residual error is ≤ 0.1 Da for each mode with no more than two calibration points missed.
Mass Calibration Verification	Mass calibration is verified after each mass calibration, prior to initial ICAL. Mass calibration must be verified to be ±0.5 amu of true value by acquiring a full scan continuum mass spectrum of a PFAS stock standard OR by following the instrument manufacturer's instructions for performing a mass calibration verification and using the instrument manufacturer's recommended standards as long as these standards cover the mass range of the PFAS ions of interest.
Initial Calibration (I-CAL)	Run initially, and as required to maintain calibration verification and instrument sensitivity. CAL A is a sensitivity standard S:N ≥ 3:1 for the primary transition product ion for all analytes. CAL B is the default lowest calibration standard. (CAL A is not included in determination of the RRF). Quantification is achieved by the constant RRF method. The I-CAL specifications for the RRF fit are <20% RSD of mean RRFs and 70-130 % recovery of analytes at each concentration level down to C level. The recovery specification for the B CAL is 50-200%. The surrogate recovery specifications are 50-150% recovery at each concentration level. Peak Asymmetry: 0.8-1.5 for PFBA and PFPeA measured in CAL E (mid cal point) at 10% of the peak height. If this is not achieved, perform instrument maintenance and re-run I-CAL.

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QC Parameter	Specification
Initial Calibration Verification (ICV):	After each Initial Calibration (I-CAL) and prior to sample analysis; analyze a second source standard (similar concentration to the CAL E); quantify against I-Cal, results must meet Cal/Ver accuracy specifications.
Calibration Verification (Cal/Ver or CCV)	Continuing Calibration Verification using CAL E Run every 12 hours, quantify against I-CAL. Calculated analyte conc. 70-130% of actual. Calculated surrogate recovery 50 – 150%. *Additional requirement for DoD: Run Cal/Ver every 10 client samples or every 12 hours, whichever occurs first, and at the end of the analytical sequence; quantify against I-CAL. Calculated conc. must be 70- 130 % of actual.* For internal purposes monitor Peak Asymmetry for every Cal/Ver
Instrumental Carryover and Instrument Background	An instrument blank containing surrogates is run after every Initial Calibration, Cal/Ver, or OPR. The specification is ≤ 0.3 % carryover from the standard into following instrument blank. This specification covers the *requirement for DoD that the concentration of each analyte in the instrument blank must be ≤ ½ of the LOQ (C CAL).*
Duplicate Samples	If conc. ≥ 5 times R.L., RPD ≤ 40% If conc. < 5 times R.L., guideline RPD ≤ 100%
MS/MSD	Optional test, client must request. Spiking at the OPR level. MS/MSD Analyte recoveries are evaluated against OPR limits, see Table 6a. RPD ≤ 40% *Additional requirement for DoD: For all matrices analyzed by SPE one Matrix Spike and one Matrix Spike Duplicate shall be included with every analysis batch. MS/MSD recoveries are evaluated against project limits if prescribed by the client, otherwise MS/MSD recoveries are evaluated against the DOD specific acceptance ranges for OPRs listed in Table 6b of this document, or against the MLA-110 OPR method recovery limits for analytes not listed in Table 6b (see Table 6a). RPDs are evaluated against project limits if prescribed by the client, otherwise RPDs are evaluated against the DoD specific limit of ≤30%.*

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Appendix A: Naming Convention and CAS Numbers

PFAS: Naming Convention and CAS Numbers

Abbreviation	***Name - Anion Form***	***CAS#***
PFBA	Perfluorobutanoate	45048-62-2
PFPeA	Perfluoropentanoate	45167-47-3
PFHxA	Perfluorohexanoate	92612-52-7
PFHpA	Perfluoroheptanoate	120885-29-2
PFOA	Perfluorooctanoate	45285-51-6
PFNA	Perfluorononanoate	72007-68-2
PFDA	Perfluorodecanoate	73829-36-4
PFUnA	Perfluoroundecanoate	196859-54-8
PFDoA	Perfluorododecanoate	171978-95-3
PFTrDA	Perfluorotridecanoate	862374-87-6
PFTeDA	Perfluorotetradecanoate	365971-87-5
PFBS	Perfluorobutanesulfonate	45187-15-3
PFPeS	Perfluoropentanesulfonate	175905-36-9
PFHxS	Perfluorohexanesulfonate	108427-53-8
PFHpS	Perfluoroheptanesulfonate	146689-46-5
PFOS	Perfluorooctanesulfonate	45298-90-6
PFNS	Perfluorononanesulfonate	474511-07-4
PFDS	Perfluorodecanesulfonate	126105-34-8
PFDoS	Perfluorododecanesulfonate	343629-43-6
4:2 FTS	4:2 fluorotelomersulfonate	414911-30-1
6:2 FTS	6:2 fluorotelomersulfonate	425670-75-3
8:2 FTS	8:2 fluorotelomersulfonate	481071-78-7
N-MeFOSAA	N-Methylperfluorooctanesulfonamidoacetate	n.a.
N-EtFOSAA	N-Ethylperfluorooctanesulfonamidoacetate	n.a.
HFPO-DA	2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)propanoate	122499-17-6
ADONA	Dodecafluoro-3H-4,8-dioxanonanoate	2127366-90-7
9Cl-PF3ONS	9-chlorohexadecafluoro-3-oxanonane-1-sulfonate	1621485-21-9
11Cl-PF3OUdS	11-chloroeicosafluoro-3-oxaundecane-1-sulfonate	2196242-82-5

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PFAS: Naming Convention and CAS Numbers

Abbreviation	***Name - Acid Form***	***CAS#***
PFBA	Perfluorobutyric acid	375-22-4
PFPeA	Perfluoropentanoic acid	2706-90-3
PFHxA	Perfluorohexanoic acid	307-24-4
PFHpA	Perfluoroheptanoic acid	375-85-9
PFOA	Perfluorooctanoic acid	335-67-1
PFNA	Perfluorononanoic acid	375-95-1
PFDA	Perfluorodecanoic acid	335-76-2
PFUnA	Perfluoroundecanoic acid	2058-94-8
PFDoA	Perfluorododecanoic acid	307-55-1
PFTrDA	Perfluorotridecanoic acid	72629-94-8
PFTeDA	Perfluorotetradecanoic acid	376-06-7
PFBS	Perfluorobutanesulfonic acid	375-73-5
PFPeS	Perfluoropentanesulfonic acid	2706-91-4
PFHxS	Perfluorohexanesulfonic acid	355-46-4
PFHpS	Perfluoroheptanesulfonic acid	375-92-8
PFOS	Perfluorooctanesulfonic acid	1763-23-1
PFNS	Perfluorononanesulfonic acid	68259-12-1
PFDS	Perfluorodecanesulfonic acid	335-77-3
PFDoS	Perfluorododecanesulfonic acid	79780-39-5
4:2 FTS	4:2 fluorotelomersulfonic acid	757124-72-4
6:2 FTS	6:2 fluorotelomersulfonic acid	27619-97-2
8:2 FTS	8:2 fluorotelomersulfonic acid	39108-34-4
N-MeFOSAA	N-Methylperfluorooctanesulfonamidoacetic acid	2355-31-9
N-EtFOSAA	N-Ethylperfluorooctanesulfonamidoacetic acid	2991-50-6
HFPO-DA	2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)propanoic acid	13252-13-6
ADONA	Dodecafluoro-3H-4,8-dioxanonanoic acid	919005-14-4
9Cl-PF3ONS	9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	756426-58-1
11Cl-PF3OUdS	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	763051-92-9

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SGS AXYS Analytical Services Ltd.

PFAS: Naming Convention and CAS Numbers

Abbreviation	***Name - Sulfonamide***	***CAS#***
PFOSA	Perfluorooctanesulfonamide	754-91-6
N-MeFOSA	N-Methylperfluorooctanesulfonamide	31506-32-8
N-EtFOSA	N-Ethylperfluorooctanesulfonamide	4151-50-2

Abbreviation	***Name - Sulfonamidoethanol***	***CAS#***
N-MeFOSE	N-Methylperfluorooctanesulfonamidoethanol	24448-09-7
N-EtFOSE	N-Ethylperfluorooctanesulfonamidoethanol	1691-99-2

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Appendix B: Sample Storage Conditions

Sample Storage Requirements

Matrix	Sample Size (per analysis)	Sample Container [1]	Sample Condition Upon Receipt	Storage Condition [2]	Sample Hold Time [3]	Extract Hold Time [4]	Preservation
Aqueous	Up to 1000 mL, but typically 500 mL or less (max. 50 mg solids)	High density polyethylene (HDPE)	0-4°C, dark	≤ -20ºC, dark	90 days	30 days	None Required
Solvent extracts	Typically 0.75 mL	High density polyethylene (HDPE)	0-4°C, dark	0-4°C, dark	60 days	30 days	None Required
Solid	Up to 5 g dry but not more than 10 g wet.	High density polyethylene (HDPE)	0-4°C, dark	≤ -20ºC, dark	1 Year	30 days	None required
Biosolid	Up to 0.5 g dry but not more than 5 g wet.	High density polyethylene (HDPE)	0-4°C, dark	≤ -20ºC, dark	1 Year	30 days	None required
Tissue	Up to 2 g (wet)	High density polyethylene (HDPE) or amber glass jar	0-4°C, dark	≤ -20ºC, dark	1 Year	30 days	None Required
AFFF	Up to 0.02 g	High density polyethylene (HDPE)	Room temperature.	0-4°C, dark	90 days	30 days	None Required
Whole Blood [5] or Serum[6]	Up to 2 mL	HDPE or Glass, not polypropylene.	0-4°C, dark	≤ -20ºC, dark	1 Year	30 days	None Required

[1] HDPE containers are preferred; amber glass containers are also acceptable. All containers should be organically clean; i.e. solvent-rinsed or purchased 'certified' clean. All containers should be tightly sealed with screw cap lids.

[2] Storage temperatures quoted are nominal temperatures.

[3] Hold times are from time of sampling. Client negotiated requests for specific holding times or other method-specific holding times are adhered to. This 90-day holding time on freezing of aqueous samples is based on SGS AXYS storage stability studies.

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[4] Hold times for sample extracts are from time of extraction with storage at 4°C. This 30-day holding time is a guideline, longer hold times may be accepted based on professional judgement.

[5] Whole blood must be treated with anticoagulant such as heparin or sodium citrate at time of collection.

[6] Glass vacutainers should be used for blood or serum collection. Plastic vacutainers (such as PET plastic) are not suitable as long chain PFAS compounds may be adsorbed onto the vacutainer surface.

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Stability of PFAS in Aqueous Samples

SGS AXYS has completed an extended-time storage study for the 29 PFAS listed in the table below. The study was conducted in reagent water, surface water and two wastewater treatment plant (WWTP) effluents. PFAS concentrations were measured at 0, 7, 14, 30, 90, and 180-day timepoints with data analysis of a 180-day timepoint in progress. Data analysis up to the 90-day timepoint shows that precursors present in samples containing matrix and biological activity can transform under room temperature and cold storage conditions within 7 days. At this time, only freezing of aqueous samples was demonstrated to stabilize the analytes over a period of up to 90 days. We are recommending freezing non-potable aqueous samples as soon as practicable if not analyzed within 3-4 days.

Summary of Analyte Stability in Aqueous Samples by Storage Condition

	Stability (days)		Remarks
Analyte	**4°C**	**-20°C**	
C_4-C_{14} Perfluorinated carboxylates including PFOA	90	90	
C_4-C_{10} perfluorinated sulfonates including PFOS	90	90	
PFDoS	90	90	
4:2 FTS	90	90	
6:2 FTS	90	90	
8:2 FTS	14	90	Decreasing trend seen from day 7 at 4°C
PFOSA	14	90	Increasing trend seen day 14 onwards at 4°C
N-MeFOSA	7	90	Decreasing trend seen at first stability point 4°C
N-EtFOSA	7	90	Decreasing trend seen at first stability point 4°C
N-MeFOSAA	<7	90	Increase from transformation of MeFOSE
N-EtFOSAA	7	90	Increase from transformation of EtFOSE
N-MeFOSE	<7	90	Loss seen at first stability point 4°C
N-EtFOSE	<7	90	Loss seen at first stability point 4°C

WSB & Associates, inc.

CORRELATION TABLE

PERFLUORINATED ORGANIC & FTS ANALYSIS

Lab Name: SGS AXYS Analytical Services Ltd.	**Project Manager: Dale Robinson**
Project Name: Lino Lakes WTP Feasibility 015822-000	**Contract No: 5036**
	SGS AXYS Method: MLA-110
Data Package Identification: DPWG72695	**Program: Aqueous Samples**
Client Sample No.	**Lab Sample ID**
LAB BLANK	WG72387-101
OPR	WG72387-102
OPR DUPLICATE	WG72387-103
Lino Lakes Well No.4	L33032-1
Lino Lakes Well No.3	L33032-2
Lino Lakes Well No.6	L33032-3
Lino Lakes Well No.5	L33032-4
Lino Lakes Well No.2	L33032-5

SGS AXYS

CHAIN OF CUSTODY

2045 Mills Road West TEL: (250) 655-5800 TOLL FREE 1-888-373-0881
Sidney, British Columbia, Canada V8L 5X2 FAX: (250) 655-5811

SGS AXYS CLIENT #: 5036

REPORT TO:

Company: City of Lino Lakes
Address: 600 Town Center Pkwy, Lino Lakes, MN, USA 55014
Contact: Justin Williams
Phone: 651-982-2452
FAX:
E-mail: jwilliams@linolakes.us

INVOICE TO:

Company: WSB
Address: 701 Xenia Ave S, Suite 300, Golden Valley, MN 55416
Contact: Sara Gow
Phone: 763-287-7141
FAX:
E-mail: sgow@wsbeng.com

Project Name/Number: Lino Lakes WTP Feasibility Study 015822-000
Sampler's Name: Jon Christensen
Signature:

ANALYSIS REQUESTED

Client Sample Identification	Matrix	Sampling Date	Sampling Time	Container Type/No.	SGS AXYS Lab Sample ID (Lab use only)
Lino Lakes Well No. 4		5/5/20	10:30 AM	2x500mL	L33032-1
Lino Lakes Well No. 3		5/5/20	11:00 AM	2x60mL	-2
Lino Lakes Well No. 6		5/5/20	11:20 AM		-3
Lino Lakes Well No. 5		5/5/20	11:40 AM		-4
Lino Lakes Well No. 2		5/5/20	12:00 PM		-5

Relinquished by (Signature)	Date	Time	Received by (Signature)	Courier	Waybill No.
	5/5/20	1:00 PM	Date 06 May 2020 Time 10:20		
Relinquished by (Signature)	Date	Time	Received by (Signature) Date Time		

Remarks

Sample Receipt

	Cooler
Temp °C	
Custody Seal #	
Seal Intact Y / N	
Sample Tags Y / N	

FedEx Express

International Air Waybill
Lettre de transport aérien internationale

For FedEx services worldwide. Packages up to 150 lbs. (68 kg), excluding dangerous goods. Not all services and options are available to all destinations. / Pour les services FedEx à l'international. Colis de jusqu'à 68 kg (150 lb), à l'exception des marchandises dangereuses. Certains services et options ne sont pas disponibles pour toutes les destinations.

5036 **Manifest Billing Copy**
Manifeste Copie facturation

FedEx Tracking Number / Numéro de suivi de FedEx: 8149 0205 3960 0412

Form ID No. / N° du formulaire

1 From / Expéditeur

Date: 5/5/20

Sender's FedEx Account Number / N° de compte FedEx de l'expéditeur:

Sender's Name / Nom de l'expéditeur: Jonathan Christensen

Phone / Téléphone: 612-437-7967

Company / Nom de la société: WSB

Address / Adresse: 178 9th St E #200

Dept/Floor/Service/Étage

Address / Adresse:

City / Ville: St. Paul

Province: MN

USA CANADA

Postal Code / Code postal: 55101

Email Address / Adresse courriel: jchristensen@wsbeng.com

Internal Billing Reference / Référence pour facturation interne

2 To / Destinataire

28 ☐ Residential Delivery / Livraison résidentielle

Recipient's Name / Nom du destinataire: Sample Receiving

Phone / Téléphone: 2506555831

Company / Nom de la société: SGS AXYS ANALYTICAL

Address / Adresse:

Dept/Floor/Service/Étage

Address / Adresse: 2045 MILLS RD W

City / Ville: SIDNEY

State / Province/État: BC

Country / Pays: CA

ZIP/Postal Code / Code postal: V8L5X2

Email Address / Adresse courriel:

Recipient's Tax ID Number Required for Customs Purposes / N° fiscal du destinataire aux fins de la douane

3 Shipment Information / Informations sur l'envoi

Total Packages / Nombre total de colis: 1

Shipper's Load and Count/SLAC / Envoi chargé et vérifié par l'expéditeur/ECVE:

Total Weight / Poids total: ☐ lbs. ☐ kg

DIM Poids VOL: / / ☐ in. po ☐ cm

Commodity Description / Description de la marchandise — DETAIL REQUIRED. PRINT IN ENGLISH. / DÉTAIL REQUIS. EN ANGLAIS SVP.	Harmonized Code / Code harmonisé	Country of Manufacture / Pays de fabrication	Value for Customs / Valeur déclarée à la douane
Products/Commodities	3822.00	USA	$112

Canada Export Declaration/B13A: / Déclaration d'exportation/B13A:

☐ B13A filed electronically. / B13A enregistrée électroniquement. ☐ No B13A required. B13A non exigée.

☐ Manual B13A attached. / B13A remplie manuellement et jointe. ☐ B13A Summary Reporting. B13A Rapport sommaire.

Auth. ID/ Form ID# / N° ID form/ID. aut.

Total Declared Value for Carriage / Valeur totale déclarée pour le transport

Total Declared Value for Customs / Valeur totale déclarée à la douane (Specify Currency) (Préciser la monnaie)

4 Express Package Service / Service colis express

NOTE: Service order has changed. Please select carefully.
NOTE : L'ordre des services a changé. Veuillez sélectionner avec attention.

06 ☐ FedEx International First
01 ☒ FedEx International Priority
03 ☐ FedEx International Economy

5 Packaging / Emballage

06 ☐ FedEx Envelope / Enveloppe FedEx
02 ☐ FedEx Pak / Pak FedEx
03 ☐ FedEx Box / Boîte FedEx
04 ☐ FedEx Tube / Tube FedEx
15 ☐ FedEx 10kg Box / Boîte 10kg FedEx
25 ☐ FedEx 25kg Box / Boîte 25kg FedEx
01 ☒ Other / Autre: Cooler

6 Special Handling and Delivery Signature Options / Options de manutention spéciale et de signature de livraison

Fees may apply. See the FedEx Service Guide. *Des frais peuvent s'appliquer.* Consultez le Guide des services de FedEx.

01 ☐ HOLD at FedEx Location / RETENIR à la succursale FedEx
03 ☐ SATURDAY Delivery / Livrer le SAMEDI
10 ☒ Direct Signature / Signature directe — Someone at recipient's address may sign for delivery. / Quelqu'un à l'adresse du destinataire peut réceptionner l'envoi.
34 ☐ Indirect Signature / Signature indirecte — If no one is available at recipient's address, someone at a neighbouring address may sign for delivery. For residential deliveries only. / Si personne n'est disponible à l'adresse du destinataire, quelqu'un à une adresse voisine peut réceptionner l'envoi. Livraisons résidentielles seulement.

7 Payment / Paiement

Complete payment options for both transportation charges and duties and taxes. Inscrire les options de paiement pour les frais de transport et les droits et taxes.

Bill transportation charges to:
Facturer le transport à :

Enter FedEx Acct. No. or Credit Card No. below. / Indiquer ci-dessous le n° de compte FedEx ou de la carte de crédit.

1 ☐ Sender / Expéditeur — Acct. No. in Section 1 will be billed. / Les frais seront imputés au numéro de compte figurant à la rubrique 1.
2 ☒ Recipient / Destinataire
3 ☐ Third Party / Tierce partie
4 ☐ Credit Card / Carte de crédit
5 ☐ Cash/Cheque / Argent liquide/Chèque

FedEx Acct. No. / N° de compte FedEx: 1678-7127-5

Credit Card No. / N° de carte de crédit:

Credit Card Exp. Date / Date d'expiration de la carte de crédit:

Credit Card Auth. / Autorisation de carte de crédit:

Bill Customs charges to:
Facturer les droits de douane à :

Enter FedEx Acct. No. below. / Indiquer le n° de compte FedEx

1 ☐ Sender / Expéditeur — Acct. No. in Section 1 will be billed. / Les frais seront imputés au numéro de compte figurant à la rubrique 1.
2 ☒ Recipient / Destinataire
3 ☐ Third Party / Tierce partie

FedEx Acct. No./N° de compte FedEx:

8 Required Signature / Signature requise

Use of this Air Waybill constitutes your agreement to the Conditions of Contract on the back of this Air Waybill, and you represent that this shipment does not contain dangerous goods. Certain international treaties, including the Warsaw or Montreal Convention, may apply to this shipment and limit our liability for damage, loss, or delay, as described in the Conditions of Contract./En utilisant la présente lettre de transport aérien, vous acceptez les conditions du contrat indiquées au verso et vous garantissez que cet envoi ne contient pas de marchandises dangereuses. Certains traités internationaux, y compris la Convention de Varsovie ou de Montréal, peuvent s'appliquer à cet envoi et limiter notre responsabilité pour tout dommage, perte ou retard, tel que précisé dans les Conditions du contrat.

Sender's Signature / Signature de l'expéditeur:

660

Origin Station ID / N.I. de la succ. d'origine	Country Code/Destination Station ID / Code de pays/N.I. de la succ. dest.	URSA Routing / Code de destination URSA	Handling Units / Unités de manutention; Total Volume (cm) / Volume total

Received At: / Reçu à : 1 ☐ Reg. Stop / Arrêt regulier 2 ☐ On-Call Stop / Arrêt sur demande 3 ☐ Drop Box / Boîte à colis 4 ☐ BSC/Comptoir de dépôt 5 ☐ Station Succursale

Forms Attached: / Formulaires joints : ☐ CI ☐ CO

FedEx Emp. # ____ Audit/Vér Emp. # ____ Date ____ Time / Heure ____ Del. Courier Messager Emp. # ____ Date ____ Time / Heure ____

Freight / Fret ____ Other / Autre ____ Total ____

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RRDA 04/19

5036

ORIGIN ID:GPZA (612) 437-7967
Jonathan Christensen
WSB
178 9TH ST E STE 200

SAINT PAUL, MN 55101
UNITED STATES, US

SHIP DATE: 05MAY20
ACTWGT: 34.70 LB
CAD: 6986634/SSFO2110

DIMS: 24x13x14 IN
BILL THIRD PARTY
EIN/VAT:

TO **SAMPLE RECEIVING**
SGS Axys Analytical
2045 W MILLS RD

SIDNEY, BC V8L5X2

CANADA, CA

(250) 655-5831

FedEx Express

(CA)

AWB

J20112000426Bxv

XQ YYJA
DSR
PKG:YOUR PKG

TRK# **3925 5299 8585**

Form 0430

AM
INTL PRIORITY

REF:
DESC1:PLASTIC PARTS - Plastic bottles containing Aqueous Samples f
DESC2:
DESC3:
DESC4:
EEI: NO EEI 30.36

These items are controlled by the U.S. Government and authorized for export only to the country of ultimate destination for use by the ultimate consignee or end-user(s) herein identified. They may not be resold, transferred, or otherwise disposed of, to any other country or to any person other than the authorized ultimate consignee or end-user(s), either in their original form or after being incorporated into other items, without first obtaining approval from the U.S. government or as otherwise authorized by U.S. law and regulations.

COUNTRY MFG: US
CARRIAGE VALUE: 112.00 USD
CUSTOMS VALUE: 112.00 USD

SIGN: Jonathan Christensen
T/C: 0 167871275
D/T: R

Part # 863272-035 RRDE EXP 09/20

The Montreal or Warsaw Convention may apply and will govern and in most cases limit the liability of Federal Express for loss or delay of or damage to your shipment. Subject to the conditions of the contract on the reverse.

FEDEX AWB COPY — PLEASE PLACE IN POUCH

10:20

RECEIVED
MAY 06 2020
Jennifer Carlson

2.3°C
5711
bagged wet ice
melting

SGS AXYS Analytical Services Ltd
SAMPLE RECEIVING RECORD

Waybill : Yes /No
Date Shipped: 05-MAY-20

Waybill #: 392552998585
Date /Time Received: 06-MAY-20 10:20
Receipt No: WB27442

Login:

SGS AXYS Client & Contract # 5036-WSB & Associates, Inc.

Received By: JCARLSON

Log in by: Jenifer Carlson Signature: Jenifer Carlson

Axys Sample ID's: L33032-1 to -5

Matrix Type: aq

Thermometer ID: 5711

Condition of Shipping Container: intact

Corrected Temperature: 2.2 Celcius

Temperature upon Receipt: 2.3 Celcius bagged wet ice melting

Samples received above temperature: Yes /No

Custody Seals: Shipping Containers Yes /No Intact Yes /No Seal Numbers Yes /No Signature and Date Yes /No

Samples Yes /No Intact Yes /No Seal Numbers Yes /No Signature and Date Yes /No

Chain of Custody or Documents: Yes /No
- Sample ID's Yes /No
- Collection Location Yes /No
- Date & Time Collection Yes /No
- Collector's Name Yes /No

Tracking Report /Packing List: Yes /No
- Sample Tag Numbers Yes /No
- Sample Type Yes /No
- Preservative Added Prior to Receipt Yes /No
- Preservative Added at SGS AXYS Yes /No

Sample Tags Yes /No

Sample Tags Cross Referenced to Sample Labels Yes /No Information Agrees Yes /No

Sample Tags Cross Referenced to COC Yes /No Information Agrees Yes /No

Sample Labels Yes /No

Sample Labels Cross Referenced to COC Yes /No

Information Agrees Yes /No

Samples logged in as per previous submissions Yes /No

Samples logged in as per COC Yes /No

Discrepancies attached Yes /No

Sample Container breakage Yes /No

Sample Lid breakage Yes /No

If yes, see sample transfer documentation

Comments:

FSA-015 Rev10, 19-Jun-2019

SGS AXYS Analytical Services Ltd.

Login Chain of Custody Report (ln01)

May. 07, 2020

02:14 PM

Checked 07-May-20 DPR

Login Number: L33032
Account: 5036 WSB & Associates, Inc.
Project: LINO LAKES

Axys ID versus Client Sample Identification		**Received**	**Due**	**PR**
L33032-1		06-MAY-20		
	Storage: WIF4, old ref shelf C			
Lino Lakes Well No.4 05-MAY-20 10:30	Project #: LINO LAKES			
EDataDeliv	FC110 EDD		:	USD
Data Package	FC110 MINI		:	USD
Aqueous	FC110		:	USD
Aqueous	FC110.PS		:	USD
ANY	ENVIRO DISPOSAL FEE		:	USD
ANY	SAMPLE RECEIPT	2	: 500 mL plastic	USD
ANY	SAMPLE RECEIPT 2	2	: 60 mL plastic	USD
L33032-2		06-MAY-20		
	Storage: WIF4, old ref shelf C			
Lino Lakes Well No.3 05-MAY-20 11:00	Project #: LINO LAKES			
EDataDeliv	FC110 EDD		:	USD
Data Package	FC110 MINI		:	USD
Aqueous	FC110		:	USD
Aqueous	FC110.PS		:	USD
ANY	ENVIRO DISPOSAL FEE		:	USD
ANY	SAMPLE RECEIPT	2	: 500 mL plastic	USD
ANY	SAMPLE RECEIPT 2	2	: 60 mL plastic	USD
L33032-3		06-MAY-20		
	Storage: WIF4, old ref shelf C			
Lino Lakes Well No.6 05-MAY-20 11:20	Project #: LINO LAKES			
EDataDeliv	FC110 EDD		:	USD
Data Package	FC110 MINI		:	USD
Aqueous	FC110		:	USD
Aqueous	FC110.PS		:	USD
ANY	ENVIRO DISPOSAL FEE		:	USD
ANY	SAMPLE RECEIPT	2	: 500 mL plastic	USD
ANY	SAMPLE RECEIPT 2	2	: 60 mL plastic	USD

SGS AXYS Analytical Services Ltd.

Login Chain of Custody Report (ln01)

May. 07, 2020

02:14 PM

Login Number: L33032
Account: 5036 WSB & Associates, Inc.
Project: LINO LAKES

Axys ID versus Client Sample Identification		**Received**	**Due**	**PR**
L33032-4		06-MAY-20		
	Storage: WIF4, old ref shelf C			
Lino Lakes Well No.5 05-MAY-20 11:40	Project #: LINO LAKES			
EDataDeliv	FC110 EDD		:	USD
Data Package	FC110 MINI		:	USD
Aqueous	FC110		:	USD
Aqueous	FC110.PS		:	USD
ANY	ENVIRO DISPOSAL FEE		:	USD
ANY	SAMPLE RECEIPT	2	: 500 mL plastic	USD
ANY	SAMPLE RECEIPT 2	2	: 60 mL plastic	USD
L33032-5		06-MAY-20		
	Storage: WIF4, old ref shelf C			
Lino Lakes Well No.2 05-MAY-20 12:00	Project #: LINO LAKES			
EDataDeliv	FC110 EDD		:	USD
Data Package	FC110 MINI		:	USD
Aqueous	FC110		:	USD
Aqueous	FC110.PS		:	USD
ANY	ENVIRO DISPOSAL FEE		:	USD
ANY	SAMPLE RECEIPT	2	: 500 mL plastic	USD
ANY	SAMPLE RECEIPT 2	2	: 60 mL plastic	USD

SGS AXYS METHOD MLA-110 Rev 02

Form 1A

PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Lino Lakes Well No.4
Sample Collection:
05-May-2020 10:30

SGS AXYS ANALYTICAL SERVICES
2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

		Project No.	LINO LAKES WTP FEASIBILITY 015822-000
Contract No.:	5036	**Lab Sample I.D.:**	L33032-1
Matrix:	AQUEOUS	**Sample Size:**	0.547 L
Sample Receipt Date:	06-May-2020	**Initial Calibration Date:**	18-Mar-2020
Extraction Date:	15-May-2020	**Instrument ID:**	LCMS/MS
Analysis Date:	15-May-2020 **Time:** 21:27:16	**Column ID:**	C18
Extract Volume (uL):	4000	**Sample Data Filename:**	**FC0L_151 S: 20**
Injection Volume (uL):	2	**Blank Data Filename:**	FC0L_151 S: 19
Dilution Factor:	N/A	**Cal. Ver. Data Filename:**	FC0L_151 S: 12
Concentration Units:	ng/L		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG [1]	CONC. FOUND	REPORTING LIMIT (RL)[2]	RETENTION TIME
PFBA	U		2.92 (L)	
PFPeA	U		1.46 (L)	
PFHxA	U		0.731 (L)	
PFHpA	U		0.731 (L)	
PFOA	U		0.731 (L)	
PFNA	U		0.731 (L)	
PFDA	U		0.731 (L)	
PFUnA	U		0.731 (L)	
PFDoA	U		0.731 (L)	
PFTrDA	U		0.731 (L)	
PFTeDA	U		0.731 (L)	
PFBS	U		0.731 (L)	
PFPeS	U		0.731 (L)	
PFHxS	U		0.731 (L)	
PFHpS	U		0.731 (L)	
PFOS	U		0.731 (L)	
PFNS	U		0.731 (L)	
PFDS	U		0.731 (L)	
PFDoS	U		0.731 (L)	
4:2 FTS	U		2.92 (L)	
6:2 FTS	B J	5.45	2.63 (L)	5:51
8:2 FTS	U		2.92 (L)	
PFOSA	U		0.731 (L)	
N-MeFOSA	U		0.840 (L)	
N-EtFOSA	U		1.83 (L)	
MeFOSAA	U		0.731 (L)	
EtFOSAA	U		0.731 (L)	
N-MeFOSE	U		7.31 (L)	
N-EtFOSE	U		5.48 (L)	
HFPO-DA	U		2.78 (L)	
ADONA	U		2.92 (L)	
9Cl-PF3ONS	U		2.92 (L)	
11Cl-PF3OUdS	U		2.92 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL; B = analyte found in the associated blank and concentration in sample is less than 10X the concentration in the associated blank; J = concentration less than limit of quantification.
(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____Bryan Alonzo_____

For Axys Internal Use Only [XSL Template: FC-Form1A.xsl; Created: 16-Jun-2020 11:23:07; Application: XMLTransformer-1.18.7;
Report Filename: PFC_FC_LC_PFAS_L33032-1_Form1A_FC0L_151S20_SJ2745753.html; Workgroup: WG72387; Design ID: 3973]

SGS AXYS METHOD MLA-110 Rev 02

Form 2

PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Lino Lakes Well No.4
Sample Collection:
05-May-2020 10:30

SGS AXYS ANALYTICAL SERVICES
2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

		Project No.	LINO LAKES WTP FEASIBILITY 015822-000
Contract No.:	5036	**Lab Sample I.D.:**	L33032-1
Matrix:	AQUEOUS	**Sample Size:**	0.547 L
Sample Receipt Date:	06-May-2020	**Initial Calibration Date:**	18-Mar-2020
Extraction Date:	15-May-2020	**Instrument ID:**	LCMS/MS
Analysis Date:	15-May-2020 **Time:** 21:27:16	**Column ID:**	C18
Extract Volume (uL):	4000	**Sample Data Filename:**	**FC0L_151 S: 20**
Injection Volume (uL):	2	**Blank Data Filename:**	FC0L_151 S: 19
Dilution Factor:	N/A	**Cal. Ver. Data Filename:**	FC0L_151 S: 12
Concentration Units:	ng absolute		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELED COMPOUND	LAB FLAG [1]	SPIKE CONC.	CONC. FOUND	R(%) [2]	RETENTION TIME
13C4-PFBA		40.0	33.0	82.5	1:55
13C5-PFPeA		20.0	17.6	88.2	4:21
13C5-PFHxA		10.0	8.63	86.3	4:56
13C4-PFHpA		10.0	9.14	91.4	5:24
13C8-PFOA		10.0	8.50	85.0	6:10
13C9-PFNA		5.00	3.92	78.4	7:01
13C6-PFDA		5.00	4.60	92.1	7:30
13C7-PFUnA		5.00	4.27	85.5	7:50
13C2-PFDoA		5.00	4.16	83.2	8:06
13C2-PFTeDA		5.00	3.74	74.8	8:52
13C3-PFBS		10.0	8.43	84.3	4:53
13C3-PFHxS		10.0	8.37	83.7	6:17
13C8-PFOS		10.0	8.83	88.3	7:36
13C2-4:2 FTS		20.0	12.7	63.5	4:49
13C2-6:2 FTS		20.0	12.5	62.3	5:51
13C2-8:2 FTS		20.0	13.1	65.6	7:21
13C8-PFOSA		10.0	8.75	87.5	8:43
D3-N-MeFOSA		10.0	7.76	77.6	10:07
D5-N-EtFOSA		10.0	6.93	69.3	10:24
D3-MeFOSAA		20.0	11.2	56.0	7:33
D5-EtFOSAA		20.0	10.6	52.9	7:42
d7-NMe-FOSE		100	69.9	69.9	9:59
d9-NEt-FOSE		100	63.6	63.6	10:17
13C3-HFPO-DA		40.0	31.9	79.8	5:04

(1) Where applicable, custom lab flags have been used on this report.
(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____Bryan Alonzo_____

For Axys Internal Use Only [XSL Template: FC-Form2.xsl; Created: 16-Jun-2020 11:23:07; Application: XMLTransformer-1.18.7;
Report Filename: PFC_FC_LC_PFAS_L33032-1_Form2_FC0L_151S20_SJ2745753.html; Workgroup: WG72387; Design ID: 3973]

SGS AXYS METHOD MLA-110 Rev 02

Form 1A

PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Lino Lakes Well No.3
Sample Collection:
05-May-2020 11:00

SGS AXYS ANALYTICAL SERVICES
2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

		Project No.	LINO LAKES WTP FEASIBILITY 015822-000
Contract No.:	5036	**Lab Sample I.D.:**	L33032-2
Matrix:	AQUEOUS	**Sample Size:**	0.547 L
Sample Receipt Date:	06-May-2020	**Initial Calibration Date:**	18-Mar-2020
Extraction Date:	15-May-2020	**Instrument ID:**	LCMS/MS
Analysis Date:	15-May-2020 **Time:** 21:40:21	**Column ID:**	C18
Extract Volume (uL):	4000	**Sample Data Filename:**	**FC0L_151 S: 21**
Injection Volume (uL):	2	**Blank Data Filename:**	FC0L_151 S: 19
Dilution Factor:	N/A	**Cal. Ver. Data Filename:**	FC0L_151 S: 12
Concentration Units:	ng/L		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG [1]	CONC. FOUND	REPORTING LIMIT (RL)[2]	RETENTION TIME
PFBA		10.2	2.93 (L)	1:55
PFPeA	U		1.46 (L)	
PFHxA	U		0.732 (L)	
PFHpA	U		0.732 (L)	
PFOA	U		0.732 (L)	
PFNA	U		0.732 (L)	
PFDA	U		0.732 (L)	
PFUnA	U		0.732 (L)	
PFDoA	U		0.732 (L)	
PFTrDA	U		0.732 (L)	
PFTeDA	U		0.732 (L)	
PFBS	U		0.732 (L)	
PFPeS	U		0.732 (L)	
PFHxS	U		0.732 (L)	
PFHpS	U		0.732 (L)	
PFOS	U		0.732 (L)	
PFNS	U		0.732 (L)	
PFDS	U		0.732 (L)	
PFDoS	U		0.732 (L)	
4:2 FTS	U		2.93 (L)	
6:2 FTS	B J	4.55	2.63 (L)	5:51
8:2 FTS	U		2.93 (L)	
PFOSA	U		0.732 (L)	
N-MeFOSA	U		0.841 (L)	
N-EtFOSA	U		1.83 (L)	
MeFOSAA	U		0.732 (L)	
EtFOSAA	U		0.732 (L)	
N-MeFOSE	U		7.32 (L)	
N-EtFOSE	U		5.49 (L)	
HFPO-DA	U		2.78 (L)	
ADONA	U		2.93 (L)	
9Cl-PF3ONS	U		2.93 (L)	
11Cl-PF3OUdS	U		2.93 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL; B = analyte found in the associated blank and concentration in sample is less than 10X the concentration in the associated blank; J = concentration less than limit of quantification.
(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____Bryan Alonzo_____

For Axys Internal Use Only [XSL Template: FC-Form1A.xsl; Created: 16-Jun-2020 11:23:07; Application: XMLTransformer-1.18.7;
Report Filename: PFC_FC_LC_PFAS_L33032-2_Form1A_FC0L_151S21_SJ2745754.html; Workgroup: WG72387; Design ID: 3973]

SGS AXYS METHOD MLA-110 Rev 02

Form 2

PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Lino Lakes Well No.3
Sample Collection:
05-May-2020 11:00

SGS AXYS ANALYTICAL SERVICES
2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

		Project No.	LINO LAKES WTP FEASIBILITY 015822-000
Contract No.:	5036	**Lab Sample I.D.:**	L33032-2
Matrix:	AQUEOUS	**Sample Size:**	0.547 L
Sample Receipt Date:	06-May-2020	**Initial Calibration Date:**	18-Mar-2020
Extraction Date:	15-May-2020	**Instrument ID:**	LCMS/MS
Analysis Date:	15-May-2020 **Time:** 21:40:21	**Column ID:**	C18
Extract Volume (uL):	4000	**Sample Data Filename:**	**FC0L_151 S: 21**
Injection Volume (uL):	2	**Blank Data Filename:**	FC0L_151 S: 19
Dilution Factor:	N/A	**Cal. Ver. Data Filename:**	FC0L_151 S: 12
Concentration Units:	ng absolute		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELED COMPOUND	LAB FLAG [1]	SPIKE CONC.	CONC. FOUND	R(%) [2]	RETENTION TIME
13C4-PFBA		40.0	26.0	64.9	1:55
13C5-PFPeA		20.0	18.0	90.0	4:21
13C5-PFHxA		10.0	9.01	90.1	4:56
13C4-PFHpA		10.0	8.56	85.6	5:24
13C8-PFOA		10.0	8.49	84.9	6:10
13C9-PFNA		5.00	3.98	79.6	7:01
13C6-PFDA		5.00	4.18	83.6	7:30
13C7-PFUnA		5.00	4.01	80.2	7:50
13C2-PFDoA		5.00	4.03	80.6	8:06
13C2-PFTeDA		5.00	3.14	62.8	8:52
13C3-PFBS		10.0	8.99	89.9	4:53
13C3-PFHxS		10.0	8.34	83.4	6:17
13C8-PFOS		10.0	8.78	87.8	7:36
13C2-4:2 FTS		20.0	12.4	62.1	4:49
13C2-6:2 FTS		20.0	12.1	60.6	5:51
13C2-8:2 FTS		20.0	13.0	64.9	7:21
13C8-PFOSA		10.0	8.84	88.4	8:43
D3-N-MeFOSA		10.0	8.60	86.0	10:07
D5-N-EtFOSA		10.0	7.65	76.5	10:24
D3-MeFOSAA		20.0	11.3	56.7	7:33
D5-EtFOSAA	V	20.0	9.42	47.1	7:42
d7-NMe-FOSE		100	70.7	70.7	9:59
d9-NEt-FOSE		100	65.2	65.2	10:16
13C3-HFPO-DA		40.0	33.4	83.6	5:05

(1) Where applicable, custom lab flags have been used on this report; V = surrogate recovery is not within method/contract control limits.
(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____Bryan Alonzo_____

For Axys Internal Use Only [XSL Template: FC-Form2.xsl; Created: 16-Jun-2020 11:23:07; Application: XMLTransformer-1.18.7;
Report Filename: PFC_FC_LC_PFAS_L33032-2_Form2_FC0L_151S21_SJ2745754.html; Workgroup: WG72387; Design ID: 3973]

SGS AXYS METHOD MLA-110 Rev 02

Form 1A

PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Lino Lakes Well No.6
Sample Collection:
05-May-2020 11:20

SGS AXYS ANALYTICAL SERVICES
2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

		Project No.	LINO LAKES WTP FEASIBILITY 015822-000
Contract No.:	5036	**Lab Sample I.D.:**	L33032-3
Matrix:	AQUEOUS	**Sample Size:**	0.550 L
Sample Receipt Date:	06-May-2020	**Initial Calibration Date:**	18-Mar-2020
Extraction Date:	15-May-2020	**Instrument ID:**	LCMS/MS
Analysis Date:	15-May-2020 **Time:** 21:53:18	**Column ID:**	C18
Extract Volume (uL):	4000	**Sample Data Filename:**	**FC0L_151 S: 22**
Injection Volume (uL):	2	**Blank Data Filename:**	FC0L_151 S: 19
Dilution Factor:	N/A	**Cal. Ver. Data Filename:**	FC0L_151 S: 12
Concentration Units:	ng/L		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG [1]	CONC. FOUND	REPORTING LIMIT (RL)[2]	RETENTION TIME
PFBA		39.2	2.91 (L)	1:55
PFPeA	U		1.45 (L)	
PFHxA	U		0.727 (L)	
PFHpA	U		0.727 (L)	
PFOA	U		0.727 (L)	
PFNA	U		0.727 (L)	
PFDA	U		0.727 (L)	
PFUnA	U		0.727 (L)	
PFDoA	U		0.727 (L)	
PFTrDA	U		0.727 (L)	
PFTeDA	U		0.727 (L)	
PFBS	U		0.727 (L)	
PFPeS	U		0.727 (L)	
PFHxS	U		0.727 (L)	
PFHpS	U		0.727 (L)	
PFOS	U		0.727 (L)	
PFNS	U		0.727 (L)	
PFDS	U		0.727 (L)	
PFDoS	U		0.727 (L)	
4:2 FTS	U		2.91 (L)	
6:2 FTS	B J	3.88	2.62 (L)	5:51
8:2 FTS	U		2.91 (L)	
PFOSA	U		0.727 (L)	
N-MeFOSA	U		0.837 (L)	
N-EtFOSA	U		1.82 (L)	
MeFOSAA	U		0.727 (L)	
EtFOSAA	U		0.727 (L)	
N-MeFOSE	U		7.27 (L)	
N-EtFOSE	U		5.46 (L)	
HFPO-DA	U		2.76 (L)	
ADONA	U		2.91 (L)	
9Cl-PF3ONS	U		2.91 (L)	
11Cl-PF3OUdS	U		2.91 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL; B = analyte found in the associated blank and concentration in sample is less than 10X the concentration in the associated blank; J = concentration less than limit of quantification.
(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____Bryan Alonzo_____

For Axys Internal Use Only [XSL Template: FC-Form1A.xsl; Created: 16-Jun-2020 11:23:07; Application: XMLTransformer-1.18.7;
Report Filename: PFC_FC_LC_PFAS_L33032-3_Form1A_FC0L_151S22_SJ2745755.html; Workgroup: WG72387; Design ID: 3973]

SGS AXYS METHOD MLA-110 Rev 02

Form 2

PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Lino Lakes Well No.6
Sample Collection:
05-May-2020 11:20

SGS AXYS ANALYTICAL SERVICES
2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

		Project No.	LINO LAKES WTP FEASIBILITY 015822-000
Contract No.:	5036	**Lab Sample I.D.:**	L33032-3
Matrix:	AQUEOUS	**Sample Size:**	0.550 L
Sample Receipt Date:	06-May-2020	**Initial Calibration Date:**	18-Mar-2020
Extraction Date:	15-May-2020	**Instrument ID:**	LCMS/MS
Analysis Date:	15-May-2020 **Time:** 21:53:18	**Column ID:**	C18
Extract Volume (uL):	4000	**Sample Data Filename:**	**FC0L_151 S: 22**
Injection Volume (uL):	2	**Blank Data Filename:**	FC0L_151 S: 19
Dilution Factor:	N/A	**Cal. Ver. Data Filename:**	FC0L_151 S: 12
Concentration Units:	ng absolute		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELED COMPOUND	LAB FLAG [1]	SPIKE CONC.	CONC. FOUND	R(%) [2]	RETENTION TIME
13C4-PFBA		40.0	32.7	81.7	1:55
13C5-PFPeA		20.0	17.2	85.8	4:21
13C5-PFHxA		10.0	8.64	86.4	4:56
13C4-PFHpA		10.0	8.54	85.4	5:24
13C8-PFOA		10.0	8.38	83.8	6:10
13C9-PFNA		5.00	4.11	82.1	7:00
13C6-PFDA		5.00	4.55	91.1	7:30
13C7-PFUnA		5.00	4.21	84.3	7:50
13C2-PFDoA		5.00	4.20	84.0	8:06
13C2-PFTeDA		5.00	3.47	69.4	8:52
13C3-PFBS		10.0	9.00	90.0	4:53
13C3-PFHxS		10.0	8.15	81.5	6:16
13C8-PFOS		10.0	9.02	90.2	7:36
13C2-4:2 FTS		20.0	11.6	58.0	4:49
13C2-6:2 FTS		20.0	12.1	60.4	5:51
13C2-8:2 FTS		20.0	12.9	64.7	7:20
13C8-PFOSA		10.0	9.07	90.7	8:43
D3-N-MeFOSA		10.0	7.20	72.0	10:07
D5-N-EtFOSA		10.0	7.21	72.1	10:24
D3-MeFOSAA		20.0	12.1	60.6	7:33
D5-EtFOSAA		20.0	11.0	55.2	7:42
d7-NMe-FOSE		100	71.2	71.2	9:59
d9-NEt-FOSE		100	66.0	66.0	10:16
13C3-HFPO-DA		40.0	31.7	79.1	5:05

(1) Where applicable, custom lab flags have been used on this report.
(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____Bryan Alonzo_____

For Axys Internal Use Only [XSL Template: FC-Form2.xsl; Created: 16-Jun-2020 11:23:07; Application: XMLTransformer-1.18.7;
Report Filename: PFC_FC_LC_PFAS_L33032-3_Form2_FC0L_151S22_SJ2745755.html; Workgroup: WG72387; Design ID: 3973]

SGS AXYS METHOD MLA-110 Rev 02

Form 1A

PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Lino Lakes Well No.5
Sample Collection:
05-May-2020 11:40

SGS AXYS ANALYTICAL SERVICES
2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

		Project No.	LINO LAKES WTP FEASIBILITY 015822-000
Contract No.:	5036	**Lab Sample I.D.:**	L33032-4
Matrix:	AQUEOUS	**Sample Size:**	0.546 L
Sample Receipt Date:	06-May-2020	**Initial Calibration Date:**	18-Mar-2020
Extraction Date:	15-May-2020	**Instrument ID:**	LCMS/MS
Analysis Date:	15-May-2020 **Time:** 22:06:23	**Column ID:**	C18
Extract Volume (uL):	4000	**Sample Data Filename:**	**FC0L_151 S: 23**
Injection Volume (uL):	2	**Blank Data Filename:**	FC0L_151 S: 19
Dilution Factor:	N/A	**Cal. Ver. Data Filename:**	FC0L_151 S: 12
Concentration Units:	ng/L		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG [1]	CONC. FOUND	REPORTING LIMIT (RL)[2]	RETENTION TIME
PFBA	J	3.80	2.93 (L)	1:55
PFPeA	U		1.46 (L)	
PFHxA	U		0.732 (L)	
PFHpA	U		0.732 (L)	
PFOA	U		0.732 (L)	
PFNA	U		0.732 (L)	
PFDA	U		0.732 (L)	
PFUnA	U		0.732 (L)	
PFDoA	U		0.732 (L)	
PFTrDA	U		0.732 (L)	
PFTeDA	U		0.732 (L)	
PFBS	U		0.732 (L)	
PFPeS	U		0.732 (L)	
PFHxS	U		0.732 (L)	
PFHpS	U		0.732 (L)	
PFOS	U		0.732 (L)	
PFNS	U		0.732 (L)	
PFDS	U		0.732 (L)	
PFDoS	U		0.732 (L)	
4:2 FTS	U		2.93 (L)	
6:2 FTS	B J	4.00	2.64 (L)	5:51
8:2 FTS	U		2.93 (L)	
PFOSA	U		0.732 (L)	
N-MeFOSA	U		0.842 (L)	
N-EtFOSA	U		1.83 (L)	
MeFOSAA	U		0.732 (L)	
EtFOSAA	U		0.732 (L)	
N-MeFOSE	U		7.32 (L)	
N-EtFOSE	U		5.49 (L)	
HFPO-DA	U		2.78 (L)	
ADONA	U		2.93 (L)	
9Cl-PF3ONS	U		2.93 (L)	
11Cl-PF3OUdS	U		2.93 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL; B = analyte found in the associated blank and concentration in sample is less than 10X the concentration in the associated blank; J = concentration less than limit of quantification.
(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____Bryan Alonzo_____

For Axys Internal Use Only [XSL Template: FC-Form1A.xsl; Created: 16-Jun-2020 11:23:07; Application: XMLTransformer-1.18.7;
Report Filename: PFC_FC_LC_PFAS_L33032-4_Form1A_FC0L_151S23_SJ2745756.html; Workgroup: WG72387; Design ID: 3973]

SGS AXYS METHOD MLA-110 Rev 02

CLIENT SAMPLE NO.
Lino Lakes Well No.5
Sample Collection:
05-May-2020 11:40

Form 2

PERFLUORINATED ORGANICS ANALYSIS REPORT

SGS AXYS ANALYTICAL SERVICES
2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

		Project No.	LINO LAKES WTP FEASIBILITY 015822-000
Contract No.:	5036	**Lab Sample I.D.:**	L33032-4
Matrix:	AQUEOUS	**Sample Size:**	0.546 L
Sample Receipt Date:	06-May-2020	**Initial Calibration Date:**	18-Mar-2020
Extraction Date:	15-May-2020	**Instrument ID:**	LCMS/MS
Analysis Date:	15-May-2020 **Time:** 22:06:23	**Column ID:**	C18
Extract Volume (uL):	4000	**Sample Data Filename:**	**FC0L_151 S: 23**
Injection Volume (uL):	2	**Blank Data Filename:**	FC0L_151 S: 19
Dilution Factor:	N/A	**Cal. Ver. Data Filename:**	FC0L_151 S: 12
Concentration Units:	ng absolute		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELED COMPOUND	LAB FLAG [1]	SPIKE CONC.	CONC. FOUND	R(%) [2]	RETENTION TIME
13C4-PFBA		40.0	33.0	82.4	1:54
13C5-PFPeA		20.0	18.0	90.0	4:21
13C5-PFHxA		10.0	9.07	90.7	4:56
13C4-PFHpA		10.0	8.85	88.5	5:24
13C8-PFOA		10.0	8.38	83.8	6:10
13C9-PFNA		5.00	4.02	80.3	7:01
13C6-PFDA		5.00	5.27	105	7:30
13C7-PFUnA		5.00	4.93	98.5	7:50
13C2-PFDoA		5.00	4.66	93.3	8:06
13C2-PFTeDA		5.00	4.23	84.6	8:51
13C3-PFBS		10.0	8.59	85.9	4:53
13C3-PFHxS		10.0	8.22	82.2	6:16
13C8-PFOS		10.0	8.80	88.0	7:36
13C2-4:2 FTS		20.0	12.8	64.2	4:49
13C2-6:2 FTS		20.0	11.8	59.2	5:51
13C2-8:2 FTS		20.0	13.6	68.1	7:20
13C8-PFOSA		10.0	8.94	89.4	8:43
D3-N-MeFOSA		10.0	7.18	71.8	10:07
D5-N-EtFOSA		10.0	6.97	69.7	10:24
D3-MeFOSAA		20.0	11.5	57.7	7:33
D5-EtFOSAA		20.0	11.6	58.0	7:42
d7-NMe-FOSE		100	71.0	71.0	9:59
d9-NEt-FOSE		100	67.1	67.1	10:16
13C3-HFPO-DA		40.0	33.3	83.2	5:04

(1) Where applicable, custom lab flags have been used on this report.
(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____Bryan Alonzo_____

For Axys Internal Use Only [XSL Template: FC-Form2.xsl; Created: 16-Jun-2020 11:23:07; Application: XMLTransformer-1.18.7;
Report Filename: PFC_FC_LC_PFAS_L33032-4_Form2_FC0L_151S23_SJ2745756.html; Workgroup: WG72387; Design ID: 3973]

SGS AXYS METHOD MLA-110 Rev 02

Form 1A

PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Lino Lakes Well No.2
Sample Collection:
05-May-2020 12:00

SGS AXYS ANALYTICAL SERVICES
2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

		Project No.	LINO LAKES WTP FEASIBILITY 015822-000
Contract No.:	5036	**Lab Sample I.D.:**	L33032-5
Matrix:	AQUEOUS	**Sample Size:**	0.552 L
Sample Receipt Date:	06-May-2020	**Initial Calibration Date:**	18-Mar-2020
Extraction Date:	15-May-2020	**Instrument ID:**	LCMS/MS
Analysis Date:	15-May-2020 **Time:** 22:19:28	**Column ID:**	C18
Extract Volume (uL):	4000	**Sample Data Filename:**	**FC0L_151 S: 24**
Injection Volume (uL):	2	**Blank Data Filename:**	FC0L_151 S: 19
Dilution Factor:	N/A	**Cal. Ver. Data Filename:**	FC0L_151 S: 12
Concentration Units:	ng/L		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG [1]	CONC. FOUND	REPORTING LIMIT (RL)[2]	RETENTION TIME
PFBA	U		2.90 (L)	
PFPeA	U		1.45 (L)	
PFHxA	U		0.725 (L)	
PFHpA	U		0.725 (L)	
PFOA		5.19	0.725 (L)	
PFNA	U		0.725 (L)	
PFDA	U		0.725 (L)	
PFUnA	U		0.725 (L)	
PFDoA	U		0.725 (L)	
PFTrDA	U		0.725 (L)	
PFTeDA	U		0.725 (L)	
PFBS	U		0.725 (L)	
PFPeS	U		0.725 (L)	
PFHxS	U		0.725 (L)	
PFHpS	U		0.725 (L)	
PFOS	U		0.725 (L)	
PFNS	U		0.725 (L)	
PFDS	U		0.725 (L)	
PFDoS	U		0.725 (L)	
4:2 FTS	U		2.90 (L)	
6:2 FTS	B J	5.77	2.61 (L)	5:51
8:2 FTS	U		2.90 (L)	
PFOSA	U		0.725 (L)	
N-MeFOSA	U		0.833 (L)	
N-EtFOSA	U		1.81 (L)	
MeFOSAA	U		0.725 (L)	
EtFOSAA	U		0.725 (L)	
N-MeFOSE	U		7.25 (L)	
N-EtFOSE	U		5.44 (L)	
HFPO-DA	U		2.75 (L)	
ADONA	U		2.90 (L)	
9Cl-PF3ONS	U		2.90 (L)	
11Cl-PF3OUdS	U		2.90 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL; B = analyte found in the associated blank and concentration in sample is less than 10X the concentration in the associated blank; J = concentration less than limit of quantification.
(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____Bryan Alonzo_____

For Axys Internal Use Only [XSL Template: FC-Form1A.xsl; Created: 16-Jun-2020 11:23:07; Application: XMLTransformer-1.18.7;
Report Filename: PFC_FC_LC_PFAS_L33032-5_Form1A_FC0L_151S24_SJ2745757.html; Workgroup: WG72387; Design ID: 3973]

SGS AXYS METHOD MLA-110 Rev 02

Form 2

PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Lino Lakes Well No.2
Sample Collection:
05-May-2020 12:00

SGS AXYS ANALYTICAL SERVICES
2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

		Project No.	LINO LAKES WTP FEASIBILITY 015822-000
Contract No.:	5036	**Lab Sample I.D.:**	L33032-5
Matrix:	AQUEOUS	**Sample Size:**	0.552 L
Sample Receipt Date:	06-May-2020	**Initial Calibration Date:**	18-Mar-2020
Extraction Date:	15-May-2020	**Instrument ID:**	LCMS/MS
Analysis Date:	15-May-2020 **Time:** 22:19:28	**Column ID:**	C18
Extract Volume (uL):	4000	**Sample Data Filename:**	**FC0L_151 S: 24**
Injection Volume (uL):	2	**Blank Data Filename:**	FC0L_151 S: 19
Dilution Factor:	N/A	**Cal. Ver. Data Filename:**	FC0L_151 S: 12
Concentration Units:	ng absolute		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELED COMPOUND	LAB FLAG [1]	SPIKE CONC.	CONC. FOUND	R(%) [2]	RETENTION TIME
13C4-PFBA		40.0	33.1	82.8	1:54
13C5-PFPeA		20.0	18.0	90.0	4:21
13C5-PFHxA		10.0	9.06	90.6	4:56
13C4-PFHpA		10.0	8.66	86.6	5:24
13C8-PFOA		10.0	8.41	84.1	6:10
13C9-PFNA		5.00	4.04	80.8	7:00
13C6-PFDA		5.00	4.35	86.9	7:30
13C7-PFUnA		5.00	4.25	85.1	7:50
13C2-PFDoA		5.00	3.93	78.6	8:06
13C2-PFTeDA		5.00	3.63	72.5	8:51
13C3-PFBS		10.0	8.69	86.9	4:53
13C3-PFHxS		10.0	8.42	84.2	6:16
13C8-PFOS		10.0	8.85	88.5	7:36
13C2-4:2 FTS		20.0	12.5	62.6	4:49
13C2-6:2 FTS		20.0	11.7	58.3	5:51
13C2-8:2 FTS		20.0	12.8	64.1	7:20
13C8-PFOSA		10.0	9.12	91.2	8:43
D3-N-MeFOSA		10.0	7.80	78.0	10:07
D5-N-EtFOSA		10.0	7.60	76.0	10:24
D3-MeFOSAA		20.0	11.4	57.1	7:33
D5-EtFOSAA		20.0	10.2	51.1	7:42
d7-NMe-FOSE		100	73.1	73.1	9:59
d9-NEt-FOSE		100	68.4	68.4	10:16
13C3-HFPO-DA		40.0	33.9	84.8	5:04

(1) Where applicable, custom lab flags have been used on this report.
(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____Bryan Alonzo_____

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Report Filename: PFC_FC_LC_PFAS_L33032-5_Form2_FC0L_151S24_SJ2745757.html; Workgroup: WG72387; Design ID: 3973]

SGS AXYS METHOD MLA-110 Rev 02

Form 1A

PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Lab Blank
Sample Collection:
N/A

SGS AXYS ANALYTICAL SERVICES
2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

		Project No.	N/A
Contract No.:	5036	**Lab Sample I.D.:**	WG72387-101
Matrix:	AQUEOUS	**Sample Size:**	0.500 L
Sample Receipt Date:	N/A	**Initial Calibration Date:**	18-Mar-2020
Extraction Date:	15-May-2020	**Instrument ID:**	LCMS/MS
Analysis Date:	15-May-2020 **Time:** 21:14:11	**Column ID:**	C18
Extract Volume (uL):	4000	**Sample Data Filename:**	**FC0L_151 S: 19**
Injection Volume (uL):	2	**Blank Data Filename:**	FC0L_151 S: 19
Dilution Factor:	N/A	**Cal. Ver. Data Filename:**	FC0L_151 S: 12
Concentration Units:	ng/L		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG [1]	CONC. FOUND	REPORTING LIMIT (RL)[2]	RETENTION TIME
PFBA	U		3.20 (L)	
PFPeA	U		1.60 (L)	
PFHxA	U		0.800 (L)	
PFHpA	U		0.800 (L)	
PFOA	U		0.800 (L)	
PFNA	U		0.800 (L)	
PFDA	U		0.800 (L)	
PFUnA	U		0.800 (L)	
PFDoA	U		0.800 (L)	
PFTrDA	U		0.800 (L)	
PFTeDA	U		0.800 (L)	
PFBS	U		0.800 (L)	
PFPeS	U		0.800 (L)	
PFHxS	U		0.800 (L)	
PFHpS	U		0.800 (L)	
PFOS	U		0.800 (L)	
PFNS	U		0.800 (L)	
PFDS	U		0.800 (L)	
PFDoS	U		0.800 (L)	
4:2 FTS	U		3.20 (L)	
6:2 FTS	J	29.2	2.88 (L)	5:51
8:2 FTS	U		3.20 (L)	
PFOSA	U		0.800 (L)	
N-MeFOSA	U		0.920 (L)	
N-EtFOSA	U		2.00 (L)	
MeFOSAA	U		0.800 (L)	
EtFOSAA	U		0.800 (L)	
N-MeFOSE	U		8.00 (L)	
N-EtFOSE	U		6.00 (L)	
HFPO-DA	U		3.04 (L)	
ADONA	U		3.20 (L)	
9Cl-PF3ONS	U		3.20 (L)	
11Cl-PF3OUdS	U		3.20 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL; J = concentration less than limit of quantification.
(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.
Signed: _____Bryan Alonzo_____

For Axys Internal Use Only [XSL Template: FC-Form1A.xsl; Created: 16-Jun-2020 11:23:07; Application: XMLTransformer-1.18.7;
Report Filename: PFC_FC_LC_PFAS_WG72387-101_Form1A_FC0L_151S19_SJ2745752.html; Workgroup: WG72387; Design ID: 3973]

SGS AXYS METHOD MLA-110 Rev 02

CLIENT SAMPLE NO.
Lab Blank
Sample Collection:
N/A

Form 2

PERFLUORINATED ORGANICS ANALYSIS REPORT

SGS AXYS ANALYTICAL SERVICES
2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

		Project No.	N/A
Contract No.:	5036	**Lab Sample I.D.:**	WG72387-101
Matrix:	AQUEOUS	**Sample Size:**	0.500 L
Sample Receipt Date:	N/A	**Initial Calibration Date:**	18-Mar-2020
Extraction Date:	15-May-2020	**Instrument ID:**	LCMS/MS
Analysis Date:	15-May-2020 **Time:** 21:14:11	**Column ID:**	C18
Extract Volume (uL):	4000	**Sample Data Filename:**	**FC0L_151 S: 19**
Injection Volume (uL):	2	**Blank Data Filename:**	FC0L_151 S: 19
Dilution Factor:	N/A	**Cal. Ver. Data Filename:**	FC0L_151 S: 12
Concentration Units:	ng absolute		

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELED COMPOUND	LAB FLAG [1]	SPIKE CONC.	CONC. FOUND	R(%) [2]	RETENTION TIME
13C4-PFBA		40.0	32.5	81.2	1:55
13C5-PFPeA		20.0	17.3	86.4	4:21
13C5-PFHxA		10.0	8.35	83.5	4:56
13C4-PFHpA		10.0	8.50	85.0	5:24
13C8-PFOA		10.0	8.18	81.8	6:10
13C9-PFNA		5.00	3.92	78.5	7:00
13C6-PFDA		5.00	4.31	86.3	7:30
13C7-PFUnA		5.00	4.31	86.2	7:50
13C2-PFDoA		5.00	4.25	85.0	8:06
13C2-PFTeDA		5.00	2.95	59.0	8:51
13C3-PFBS		10.0	8.74	87.4	4:54
13C3-PFHxS		10.0	8.31	83.1	6:17
13C8-PFOS		10.0	8.61	86.1	7:36
13C2-4:2 FTS		20.0	12.8	64.2	4:49
13C2-6:2 FTS		20.0	12.0	60.1	5:51
13C2-8:2 FTS		20.0	12.7	63.7	7:20
13C8-PFOSA		10.0	8.09	80.9	8:43
D3-N-MeFOSA		10.0	6.66	66.6	10:07
D5-N-EtFOSA		10.0	6.20	62.0	10:24
D3-MeFOSAA		20.0	10.4	52.1	7:33
D5-EtFOSAA		20.0	10.7	53.7	7:42
d7-NMe-FOSE		100	65.1	65.1	9:59
d9-NEt-FOSE		100	56.6	56.6	10:16
13C3-HFPO-DA		40.0	31.0	77.5	5:05

(1) Where applicable, custom lab flags have been used on this report.
(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____Bryan Alonzo_____

For Axys Internal Use Only [XSL Template: FC-Form2.xsl; Created: 16-Jun-2020 11:23:07; Application: XMLTransformer-1.18.7;
Report Filename: PFC_FC_LC_PFAS_WG72387-101_Form2_FC0L_151S19_SJ2745752.html; Workgroup: WG72387; Design ID: 3973]

SGS AXYS METHOD MLA-110 Rev 02

Form 8A

PERFLUORINATED ORGANICS ONGOING PRECISION AND RECOVERY (OPR)

SGS AXYS ANALYTICAL SERVICES
2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.:	5036	**Lab Sample I.D.:**	WG72387-102 (A)
Matrix:	AQUEOUS	**Initial Calibration Date:**	18-Mar-2020
Extraction Date:	15-May-2020	**Instrument ID:**	LCMS/MS
Analysis Date:	15-May-2020 **Time:** 20:34:56	**Column ID:**	C18
Extract Volume (uL):	4000	**OPR Data Filename:**	**FC0L_151 S: 16**
Injection Volume (uL):	2	**Blank Data Filename:**	FC0L_151 S: 19
Dilution Factor:	N/A	**Cal. Ver. Data Filename:**	FC0L_151 S: 12

ALL CONCENTRATIONS REPORTED ON THIS FORM ARE CONCENTRATIONS IN EXTRACT, BASED ON A 1 mL EXTRACT VOLUME.

COMPOUND	LAB FLAG [1]	SPIKE CONC. (ng/mL)	CONC. FOUND (ng/mL)	% RECOVERY	RETENTION TIME
PFBA		40.0	38.7	96.6	1:55
PFPeA		20.0	19.0	95.1	4:21
PFHxA		10.0	9.18	91.8	4:56
PFHpA		10.0	9.36	93.6	5:24
PFOA		10.0	8.97	89.7	
PFNA		10.0	10.2	102	
PFDA		10.0	9.13	91.3	7:30
PFUnA		10.0	9.84	98.4	7:50
PFDoA		10.0	9.66	96.6	8:06
PFTrDA		10.0	8.34	83.4	8:27
PFTeDA		10.0	10.3	103	8:52
PFBS		10.0	9.87	98.7	4:54
PFPeS		10.0	10.3	103	5:26
PFHxS		10.0	9.57	95.7	
PFHpS		10.0	9.12	91.2	7:07
PFOS		10.0	8.90	89.0	
PFNS		10.0	9.86	98.6	7:56
PFDS		10.0	8.64	86.4	8:13
PFDoS	N	10.0	7.72	77.2	9:03
4:2 FTS		40.0	44.0	110	4:49
6:2 FTS	N	36.1	43.5	121	5:51
8:2 FTS		40.0	38.0	95.1	7:21
PFOSA		10.0	9.67	96.7	
N-MeFOSA		11.5	12.0	104	
N-EtFOSA		25.0	22.3	89.3	
MeFOSAA		10.0	9.96	99.6	
EtFOSAA		10.0	9.98	99.8	
N-MeFOSE		100	100	100	
N-EtFOSE		75.0	75.7	101	
HFPO-DA		38.0	35.2	92.7	5:05
ADONA		40.0	39.9	99.7	5:38
9Cl-PF3ONS		40.0	42.7	107	7:50
11Cl-PF3OUdS		40.0	36.1	90.2	8:28

(1) Where applicable, custom lab flags have been used on this report; N = authentic recovery in the OPR is not within method/contract control limits.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____Bryan Alonzo_____

These pages are part of a larger report that may contain information necessary for full data evaluation. Results reported relate only to the sample tested.

SGS AXYS METHOD MLA-110 Rev 02

Form 8B

PERFLUORINATED ORGANICS ONGOING PRECISION AND RECOVERY (OPR)

SGS AXYS ANALYTICAL SERVICES
2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.:	5036	**Lab Sample I.D.:**	WG72387-102 (A)
Matrix:	AQUEOUS	**Initial Calibration Date:**	18-Mar-2020
Extraction Date:	15-May-2020	**Instrument ID:**	LCMS/MS
Analysis Date:	15-May-2020 **Time:** 20:34:56	**Column ID:**	C18
Extract Volume (uL):	4000	**OPR Data Filename:**	**FC0L_151 S: 16**
Injection Volume (uL):	2	**Blank Data Filename:**	FC0L_151 S: 19
Dilution Factor:	N/A	**Cal. Ver. Data Filename:**	FC0L_151 S: 12

ALL CONCENTRATIONS REPORTED ON THIS FORM ARE CONCENTRATIONS IN EXTRACT, BASED ON A 1 mL EXTRACT VOLUME.

LABELED COMPOUND	LAB FLAG [1]	SPIKE CONC. (ng/mL)	CONC. FOUND (ng/mL)	% RECOVERY	RETENTION TIME
13C4-PFBA		40.0	33.3	83.3	1:54
13C5-PFPeA		20.0	19.3	96.3	4:21
13C5-PFHxA		10.0	9.45	94.5	4:56
13C4-PFHpA		10.0	8.55	85.5	5:24
13C8-PFOA		10.0	8.40	84.0	6:10
13C9-PFNA		5.00	4.06	81.2	7:01
13C6-PFDA		5.00	4.65	93.0	7:30
13C7-PFUnA		5.00	4.45	88.9	7:50
13C2-PFDoA		5.00	4.45	89.0	8:06
13C2-PFTeDA		5.00	3.74	74.9	8:52
13C3-PFBS		10.0	8.42	84.2	4:54
13C3-PFHxS		10.0	8.28	82.8	6:17
13C8-PFOS		10.0	9.06	90.6	7:36
13C2-4:2 FTS		20.0	11.8	59.2	4:49
13C2-6:2 FTS		20.0	11.6	58.2	5:51
13C2-8:2 FTS		20.0	12.0	60.0	7:21
13C8-PFOSA		10.0	8.48	84.8	8:43
D3-N-MeFOSA		10.0	7.06	70.6	10:07
D5-N-EtFOSA		10.0	6.73	67.3	10:24
D3-MeFOSAA		20.0	11.7	58.3	7:33
D5-EtFOSAA		20.0	11.2	56.1	7:42
d7-NMe-FOSE		100	70.2	70.2	9:59
d9-NEt-FOSE		100	64.2	64.2	10:17
13C3-HFPO-DA		40.0	36.2	90.6	5:05

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____Bryan Alonzo_____

These pages are part of a larger report that may contain information necessary for full data evaluation. Results reported relate only to the sample tested.

For Axys Internal Use Only [XSL Template: FC-Form8B.xsl; Created: 16-Jun-2020 11:23:07; Application: XMLTransformer-1.18.7;
Report Filename: PFC_FC_LC_PFAS_WG72387-102_Form8B_SJ2745745.html; Workgroup: WG72387; Design ID: 3973]

SGS AXYS METHOD MLA-110 Rev 02

Form 8A

PERFLUORINATED ORGANICS ONGOING PRECISION AND RECOVERY (OPR)

SGS AXYS ANALYTICAL SERVICES
2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.:	5036	**Lab Sample I.D.:**	WG72387-103 (DUP WG72387-102)
Matrix:	AQUEOUS	**Initial Calibration Date:**	18-Mar-2020
Extraction Date:	15-May-2020	**Instrument ID:**	LCMS/MS
Analysis Date:	15-May-2020 **Time:** 20:48:01	**Column ID:**	C18
Extract Volume (uL):	4000	**OPR Data Filename:**	**FC0L_151 S: 17**
Injection Volume (uL):	2	**Blank Data Filename:**	FC0L_151 S: 19
Dilution Factor:	N/A	**Cal. Ver. Data Filename:**	FC0L_151 S: 12

ALL CONCENTRATIONS REPORTED ON THIS FORM ARE CONCENTRATIONS IN EXTRACT, BASED ON A 1 mL EXTRACT VOLUME.

COMPOUND	LAB FLAG [1]	SPIKE CONC. (ng/mL)	CONC. FOUND (ng/mL)	% RECOVERY	RETENTION TIME
PFBA		40.0	38.6	96.5	1:55
PFPeA		20.0	19.5	97.6	4:21
PFHxA		10.0	9.78	97.8	4:56
PFHpA		10.0	9.27	92.7	5:24
PFOA		10.0	9.01	90.1	
PFNA		10.0	9.80	98.0	
PFDA		10.0	9.63	96.3	7:30
PFUnA		10.0	9.67	96.7	7:50
PFDoA		10.0	10.4	104	8:06
PFTrDA		10.0	8.66	86.6	8:27
PFTeDA		10.0	10.2	102	8:52
PFBS		10.0	9.58	95.8	4:54
PFPeS		10.0	10.2	102	5:26
PFHxS		10.0	9.72	97.2	
PFHpS		10.0	9.10	91.0	7:07
PFOS		10.0	8.83	88.3	
PFNS		10.0	10.3	103	7:56
PFDS		10.0	8.26	82.6	8:13
PFDoS	N	10.0	7.89	78.9	9:03
4:2 FTS		40.0	43.1	108	4:49
6:2 FTS		36.1	40.6	113	5:51
8:2 FTS		40.0	41.0	102	7:21
PFOSA		10.0	9.83	98.3	
N-MeFOSA		11.5	11.7	102	
N-EtFOSA		25.0	22.1	88.4	
MeFOSAA	N	10.0	7.81	78.1	
EtFOSAA		10.0	8.34	83.4	
N-MeFOSE		100	99.6	99.6	
N-EtFOSE		75.0	75.5	101	
HFPO-DA		38.0	36.4	95.8	5:05
ADONA		40.0	43.4	108	5:38
9Cl-PF3ONS		40.0	47.0	118	7:50
11Cl-PF3OUdS		40.0	40.2	100	8:29

(1) Where applicable, custom lab flags have been used on this report; N = authentic recovery in the OPR is not within method/contract control limits.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____Bryan Alonzo_____

These pages are part of a larger report that may contain information necessary for full data evaluation. Results reported relate only to the sample tested.

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Report Filename: PFC_FC_LC_PFAS_WG72387-103_Form8A_SJ2745748.html; Workgroup: WG72387; Design ID: 3973]

SGS AXYS METHOD MLA-110 Rev 02

Form 8B

PERFLUORINATED ORGANICS ONGOING PRECISION AND RECOVERY (OPR)

SGS AXYS ANALYTICAL SERVICES
2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.:	5036	**Lab Sample I.D.:**	WG72387-103 (DUP WG72387-102)
Matrix:	AQUEOUS	**Initial Calibration Date:**	18-Mar-2020
Extraction Date:	15-May-2020	**Instrument ID:**	LCMS/MS
Analysis Date:	15-May-2020 **Time:** 20:48:01	**Column ID:**	C18
Extract Volume (uL):	4000	**OPR Data Filename:**	**FC0L_151 S: 17**
Injection Volume (uL):	2	**Blank Data Filename:**	FC0L_151 S: 19
Dilution Factor:	N/A	**Cal. Ver. Data Filename:**	FC0L_151 S: 12

ALL CONCENTRATIONS REPORTED ON THIS FORM ARE CONCENTRATIONS IN EXTRACT, BASED ON A 1 mL EXTRACT VOLUME.

LABELED COMPOUND	LAB FLAG [1]	SPIKE CONC. (ng/mL)	CONC. FOUND (ng/mL)	% RECOVERY	RETENTION TIME
13C4-PFBA		40.0	32.9	82.2	1:54
13C5-PFPeA		20.0	17.6	88.2	4:21
13C5-PFHxA		10.0	8.45	84.5	4:56
13C4-PFHpA		10.0	8.71	87.1	5:24
13C8-PFOA		10.0	8.10	81.0	6:10
13C9-PFNA		5.00	3.85	77.0	7:01
13C6-PFDA		5.00	4.41	88.2	7:30
13C7-PFUnA		5.00	4.25	85.0	7:50
13C2-PFDoA		5.00	3.97	79.4	8:06
13C2-PFTeDA		5.00	3.66	73.2	8:52
13C3-PFBS		10.0	8.80	88.0	4:53
13C3-PFHxS		10.0	8.26	82.6	6:16
13C8-PFOS		10.0	9.33	93.3	7:36
13C2-4:2 FTS		20.0	12.4	62.2	4:49
13C2-6:2 FTS		20.0	11.8	58.8	5:51
13C2-8:2 FTS		20.0	11.7	58.5	7:21
13C8-PFOSA		10.0	8.51	85.1	8:43
D3-N-MeFOSA		10.0	7.01	70.1	10:07
D5-N-EtFOSA		10.0	6.75	67.5	10:24
D3-MeFOSAA		20.0	11.8	59.0	7:33
D5-EtFOSAA		20.0	11.0	54.9	7:42
d7-NMe-FOSE		100	68.2	68.2	9:59
d9-NEt-FOSE		100	62.3	62.3	10:17
13C3-HFPO-DA		40.0	30.4	76.1	5:04

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____Bryan Alonzo_____

These pages are part of a larger report that may contain information necessary for full data evaluation. Results reported relate only to the sample tested.

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SGS AXYS METHOD MLA-110 Rev 02

PERFLUORINATED ORGANICS ANALYSIS REPORT
RELATIVE PERCENT DIFFERENCE

SGS AXYS ANALYTICAL SERVICES
2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 5036
Client ID: Spiked Matrix
Concentration Units: ng/mL

COMPOUND	WG72387-102 (A) LAB FLAG [1]	WG72387-102 (A) CONC. FOUND	WG72387-103 LAB FLAG [1]	WG72387-103 CONC. FOUND	MEAN	RELATIVE PERCENT DIFFERENCE
PFBA		38.7		38.6	38.6	0.176
PFPeA		19.0		19.5	19.3	2.59
PFHxA		9.18		9.78	9.48	6.39
PFHpA		9.36		9.27	9.32	1.02
PFOA		8.97		9.01	8.99	0.434
PFNA		10.2		9.80	10.0	4.18
PFDA		9.13		9.63	9.38	5.34
PFUnA		9.84		9.67	9.75	1.78
PFDoA		9.66		10.4	10.0	7.30
PFTrDA		8.34		8.66	8.50	3.72
PFTeDA		10.3		10.2	10.2	0.527
PFBS		9.87		9.58	9.72	2.93
PFPeS		10.3		10.2	10.2	1.34
PFHxS		9.57		9.72	9.65	1.57
PFHpS		9.12		9.10	9.11	0.220
PFOS		8.90		8.83	8.87	0.797
PFNS		9.86		10.3	10.1	4.37
PFDS		8.64		8.26	8.45	4.57
PFDoS	N	7.72	N	7.89	7.81	2.23
4:2 FTS		44.0		43.1	43.5	2.04
6:2 FTS	N	43.5		40.6	42.0	6.90
8:2 FTS		38.0		41.0	39.5	7.37
PFOSA		9.67		9.83	9.75	1.61
N-MeFOSA		12.0		11.7	11.9	1.95
N-EtFOSA		22.3		22.1	22.2	1.01
MeFOSAA		9.96	N	7.81	8.88	24.3
EtFOSAA		9.98		8.34	9.16	17.9
N-MeFOSE		100		99.6	100	0.899
N-EtFOSE		75.7		75.5	75.6	0.312
HFPO-DA		35.2		36.4	35.8	3.26
ADONA		39.9		43.4	41.6	8.43
9Cl-PF3ONS		42.7		47.0	44.9	9.58
11Cl-PF3OUdS		36.1		40.2	38.1	10.8

(1) Where applicable, custom lab flags have been used on this report; N = authentic recovery in the OPR is not within method/contract control limits.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.
Signed: _____Bryan Alonzo_____

These pages are part of a larger report that may contain information necessary for full data evaluation. Results reported relate only to the sample tested.

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Report Filename: RPD_FC_LC_PFAS-RPD_WG72387-103_WG72387-102_.html; Workgroup: WG72387; Design ID: 3973]

SGS AXYS METHOD MLA-110 Rev 02

Form 3A
LC MS/MS INITIAL CALIBRATION PERCENT RECOVERIES

SGS AXYS ANALYTICAL SERVICES
2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Initial Calibration Date: 18-Mar-2020

Instrument ID: LC MS/MS

LC Column ID: C18

CS0 Data Filename: N/A
CS1 Data Filename: FC0L_082 S: 10
CS2 Data Filename: FC0L_082 S: 11
CS3 Data Filename: FC0L_082 S: 12
CS4 Data Filename: FC0L_082 S: 13
CS5 Data Filename: FC0L_082 S: 14
CS6 Data Filename: FC0L_082 S: 15
CS7 Data Filename: FC0L_082 S: 16
CS8 Data Filename: N/A

		PERCENT RECOVERY (%)								
COMPOUND	**LAB FLAG [1]**	**CS0**	**CS1**	**CS2**	**CS3**	**CS4**	**CS5**	**CS6**	**CS7**	**CS8**
PFBA			105	104	101	99.8	94.2	96.1	100	
PFPeA			102	105	100	101	94.3	97.4	100	
PFHxA			112	108	101	98.0	88.5	94.8	97.3	
PFHpA			115	110	97.6	92.5	92.6	96.9	95.4	
PFOA			118	111	103	91.3	86.1	95.5	94.8	
PFNA			105	98.7	97.9	105	90.6	98.1	105	
PFDA			103	112	99.4	96.1	93.4	91.8	104	
PFUnA			99.9	99.9	102	103	96.3	102	97.3	
PFDoA			100	97.1	88.5	125	102	104	83.9	
PFTrDA			94.2	106	103	114	95.7	87.5		
PFTeDA			119	111	106	105	95.9	87.9	74.8	
PFBS			102	108	101	103	94.0	93.8	98.1	
PFPeS			102	106	101	105	97.1	97.7	90.3	
PFHxS			101	103	101	97.2	91.2	97.3	109	
PFHpS			100	114	101	99.9	90.6	95.7	98.7	
PFOS			119	115	91.5	93.3	89.6	91.4	101	
PFNS			114	129	76.4	83.2	81.8	107	108	
PFDS			112	118	93.5	94.2	91.1	90.4	101	
PFDoS			99.1	117	97.2	99.1	91.9	93.7	102	
4:2 FTS			114	101	102	111	99.9	95.9	76.0	
6:2 FTS			110	117	98.7	100	91.5	82.6		
8:2 FTS			94.7	117	102	100	100	85.4		
PFOSA			109	103	96.9	98.6	94.3	96.3	102	
N-MeFOSA			92.0	116	108	109	98.9	96.2	80.2	
N-EtFOSA			96.6	112	99.7	97.5	95.4	97.1	102	
MeFOSAA			98.3	104	97.0	110	97.2	102	91.0	
EtFOSAA			121	80.0	110	102	93.5	91.3	102	
N-MeFOSE			107	106	103	101	94.2	95.5	93.8	
N-EtFOSE			101	105	107	102	95.3	96.9	93.0	
HFPO-DA			104	104	105	106	99.2	95.5	86.5	
ADONA			104	98.2	99.7	102	99.3	95.9	101	
9Cl-PF3ONS			105	111	104	107	97.3	90.9	84.9	
11Cl-PF3OUdS			106	109	101	98.1	94.7	94.3	96.9	

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____Jordan Berends_____

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Report Filename: PFOA_FC_LC_18-Mar-2020_FC0L__Form3A_GS87543.html; Workgroup: WG72387; Design ID: 3973]

SGS AXYS METHOD MLA-110 Rev 02

Form 3B
LC MS/MS INITIAL CALIBRATION PERCENT RECOVERIES

SGS AXYS ANALYTICAL SERVICES
2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Initial Calibration Date: 18-Mar-2020

Instrument ID: LC MS/MS

LC Column ID: C18

CS0 Data Filename: N/A

CS1 Data Filename: FC0L_082 S: 10

CS2 Data Filename: FC0L_082 S: 11

CS3 Data Filename: FC0L_082 S: 12

CS4 Data Filename: FC0L_082 S: 13

CS5 Data Filename: FC0L_082 S: 14

CS6 Data Filename: FC0L_082 S: 15

CS7 Data Filename: FC0L_082 S: 16

CS8 Data Filename: N/A

		PERCENT RECOVERIES (%)								
LABELED COMPOUND	**LAB FLAG [1]**	**CS0**	**CS1**	**CS2**	**CS3**	**CS4**	**CS5**	**CS6**	**CS7**	**CS8**
13C4-PFBA			99.0	102	99.9	99.7	100	99.5	99.1	
13C5-PFPeA			108	106	104	105	103	94.5	79.2	
13C5-PFHxA			102	103	99.3	101	102	99.2	94.1	
13C4-PFHpA			95.2	106	105	106	106	94.9	86.8	
13C8-PFOA			97.0	101	103	101	106	95.5	95.7	
13C9-PFNA			97.7	105	104	99.3	97.3	102	95.1	
13C6-PFDA			114	108	82.8	113	106	98.3	77.0	
13C7-PFUnA			114	118	103	103	93.3	67.7		
13C2-PFDoA			111	111	96.0	85.8	98.6	94.8	103	
13C2-PFTeDA			97.0	102	95.6	94.2	94.1	99.3	118	
13C3-PFBS			97.7	112	105	102	101	99.2	82.6	
13C3-PFHxS			101	104	102	99.9	101	101	91.4	
13C8-PFOS			99.7	88.7	104	104	100	105	98.6	
13C2-4:2 FTS			105	116	109	96.6	73.2			
13C2-6:2 FTS			105	116	115	106	88.3	70.0		
13C2-8:2 FTS			111	116	116	114	85.5	71.7	85.6	
13C8-PFOSA			92.4	95.4	90.5	92.6	90.8	104	134	
D3-N-MeFOSA			97.8	101	88.3	95.5	100	118		
D5-N-EtFOSA			97.3	96.0	91.1	95.6	90.7	107	122	
D3-MeFOSAA			96.2	92.6	97.5	93.6	95.9	103	121	
D5-EtFOSAA			97.5	100	93.2	97.7	96.2	109	106	
d7-NMe-FOSE			95.8	95.8	89.7	96.2	95.8	107	120	
d9-NEt-FOSE			95.6	98.2	88.6	95.4	93.9	105	124	
13C3-HFPO-DA			109	110	110	107	101	90.0	72.7	

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____Jordan Berends_____

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SGS AXYS METHOD MLA-110 Rev 02

Form 3C
LC MS/MS INITIAL CALIBRATION RETENTION TIMES

SGS AXYS ANALYTICAL SERVICES
2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Initial Calibration Date: 18-Mar-2020

Instrument ID: LC MS/MS

LC Column ID: C18

CS0 Data Filename: N/A

CS1 Data Filename: FC0L_082 S: 10

CS2 Data Filename: FC0L_082 S: 11

CS3 Data Filename: FC0L_082 S: 12

CS4 Data Filename: FC0L_082 S: 13

CS5 Data Filename: FC0L_082 S: 14

CS6 Data Filename: FC0L_082 S: 15

CS7 Data Filename: FC0L_082 S: 16

CS8 Data Filename: N/A

		RETENTION TIMES									
COMPOUND	**LAB FLAG [1]**	**CS0**	**CS1**	**CS2**	**CS3**	**CS4**	**CS5**	**CS6**	**CS7**	**CS8**	**MEAN RT**
PFBA			1:58	1:58	1:58	1:58	1:58	1:58	1:58		1:58
PFPeA			4:19	4:19	4:19	4:19	4:19	4:19	4:19		4:19
PFHxA			4:54	4:54	4:53	4:53	4:54	4:54	4:54		4:54
PFHpA			5:23	5:23	5:23	5:23	5:23	5:23	5:24		5:23
PFOA			6:11	6:11	6:11	6:11	6:11	6:11	6:11		6:11
PFNA			7:02	7:03	7:02	7:03	7:02	7:02	7:02		7:02
PFDA			7:34	7:34	7:33	7:34	7:33	7:34	7:33		7:34
PFUnA			7:54	7:54	7:53	7:54	7:54	7:54	7:54		7:54
PFDoA			8:10	8:10	8:10	8:10	8:10	8:10	8:10		8:10
PFTrDA			8:30	8:30	8:29	8:29	8:30	8:30			8:30
PFTeDA			8:55	8:55	8:55	8:55	8:55	8:55	8:55		8:55
PFBS			4:51	4:51	4:51	4:51	4:51	4:51	4:51		4:51
PFPeS			5:25	5:26	5:25	5:25	5:25	5:26	5:26		5:25
PFHxS			6:17	6:17	6:17	6:17	6:17	6:17	6:17		6:17
PFHpS			7:09	7:09	7:09	7:09	7:09	7:09	7:09		7:09
PFOS			7:40	7:40	7:39	7:40	7:39	7:40	7:39		7:40
PFNS			7:59	7:59	7:59	7:59	7:59	7:59	7:59		7:59
PFDS			8:16	8:16	8:16	8:16	8:16	8:16	8:16		8:16
PFDoS			9:06	9:06	9:06	9:06	9:06	9:06	9:06		9:06
4:2 FTS			4:46	4:46	4:46	4:46	4:46	4:46	4:46		4:46
6:2 FTS			5:51	5:51	5:51	5:51	5:51	5:51			5:51
8:2 FTS			7:24	7:23	7:23	7:23	7:23	7:23			7:23
PFOSA			8:45	8:45	8:45	8:45	8:45	8:45	8:45		8:45
N-MeFOSA			10:12	10:12	10:12	10:12	10:12	10:12	10:12		10:12
N-EtFOSA			10:30	10:30	10:31	10:30	10:30	10:30	10:30		10:30
MeFOSAA			7:37	7:37	7:37	7:37	7:37	7:37	7:37		7:37
EtFOSAA			7:46	7:46	7:45	7:46	7:45	7:46	7:45		7:46
N-MeFOSE			10:04	10:03	10:04	10:04	10:04	10:04	10:04		10:04
N-EtFOSE			10:23	10:23	10:23	10:23	10:23	10:23	10:23		10:23
HFPO-DA			5:03	5:03	5:03	5:03	5:03	5:03	5:03		5:03
ADONA			5:38	5:38	5:38	5:38	5:38	5:38	5:38		5:38
9Cl-PF3ONS			7:54	7:54	7:53	7:53	7:53	7:54	7:53		7:53
11Cl-PF3OUdS			8:31	8:31	8:31	8:31	8:31	8:31	8:31		8:31

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____Jordan Berends_____

For Axys Internal Use Only [XSL Template: FC-Form3C.xsl; Created: 16-Jun-2020 11:23:07; Application: XMLTransformer-1.18.7;
Report Filename: PFOA_FC_LC_18-Mar-2020_FC0L__Form3C_GS87543.html; Workgroup: WG72387; Design ID: 3973]

SGS AXYS METHOD MLA-110 Rev 02

Form 3D
LC MS/MS INITIAL CALIBRATION RETENTION TIMES

SGS AXYS ANALYTICAL SERVICES
2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Initial Calibration Date: 18-Mar-2020

Instrument ID: LC MS/MS

LC Column ID: C18

CS0 Data Filename: N/A

CS1 Data Filename: FC0L_082 S: 10

CS2 Data Filename: FC0L_082 S: 11

CS3 Data Filename: FC0L_082 S: 12

CS4 Data Filename: FC0L_082 S: 13

CS5 Data Filename: FC0L_082 S: 14

CS6 Data Filename: FC0L_082 S: 15

CS7 Data Filename: FC0L_082 S: 16

CS8 Data Filename: N/A

		RETENTION TIMES									
LABELED COMPOUND	**LAB FLAG[1]**	**CS0**	**CS1**	**CS2**	**CS3**	**CS4**	**CS5**	**CS6**	**CS7**	**CS8**	**MEAN RT**
13C4-PFBA			1:57	1:57	1:57	1:57	1:57	1:57	1:57		1:57
13C5-PFPeA			4:18	4:19	4:18	4:18	4:19	4:19	4:19		4:19
13C5-PFHxA			4:53	4:53	4:53	4:53	4:53	4:54	4:54		4:53
13C4-PFHpA			5:23	5:23	5:23	5:23	5:23	5:23	5:23		5:23
13C8-PFOA			6:11	6:11	6:11	6:11	6:11	6:11	6:11		6:11
13C9-PFNA			7:02	7:02	7:02	7:02	7:02	7:02	7:02		7:02
13C6-PFDA			7:34	7:34	7:33	7:34	7:33	7:33	7:33		7:33
13C7-PFUnA			7:54	7:54	7:53	7:54	7:53	7:54			7:54
13C2-PFDoA			8:10	8:10	8:10	8:10	8:10	8:10	8:10		8:10
13C2-PFTeDA			8:55	8:55	8:55	8:55	8:55	8:55	8:55		8:55
13C3-PFBS			4:51	4:51	4:51	4:51	4:51	4:51	4:51		4:51
13C3-PFHxS			6:17	6:17	6:17	6:17	6:17	6:17	6:17		6:17
13C8-PFOS			7:40	7:40	7:39	7:40	7:39	7:40	7:39		7:40
13C2-4:2 FTS			4:46	4:46	4:46	4:46	4:46				4:46
13C2-6:2 FTS			5:51	5:51	5:51	5:51	5:51	5:51			5:51
13C2-8:2 FTS			7:23	7:24	7:23	7:23	7:23	7:23	7:23		7:23
13C8-PFOSA			8:45	8:45	8:45	8:45	8:45	8:45	8:45		8:45
D3-N-MeFOSA			10:11	10:11	10:12	10:11	10:12	10:11			10:11
D5-N-EtFOSA			10:30	10:30	10:30	10:30	10:30	10:30	10:30		10:30
D3-MeFOSAA			7:37	7:37	7:37	7:37	7:37	7:37	7:37		7:37
D5-EtFOSAA			7:45	7:45	7:45	7:45	7:45	7:45	7:45		7:45
d7-NMe-FOSE			10:03	10:02	10:03	10:03	10:03	10:03	10:02		10:03
d9-NEt-FOSE			10:22	10:22	10:22	10:22	10:22	10:22	10:22		10:22
13C3-HFPO-DA			5:03	5:03	5:03	5:03	5:03	5:03	5:03		5:03

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____Jordan Berends_____

For Axys Internal Use Only [XSL Template: FC-Form3D.xsl; Created: 16-Jun-2020 11:23:07; Application: XMLTransformer-1.18.7; Report Filename: PFOA_FC_LC_18-Mar-2020_FC0L__Form3D_GS87543.html; Workgroup: WG72387; Design ID: 3973]

SGS AXYS METHOD MLA-110 Rev 02

Form 4A
LC MS/MS CALIBRATION VERIFICATION

SGS AXYS ANALYTICAL SERVICES
2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Initial Calibration Date:	18-Mar-2020	**VER Data Filename:**	FC0L_151 S: 12
Instrument ID:	LCMS/MS	**Analysis Date:**	15-May-2020
LC Column ID:	C18	**Analysis Time:**	19:42:45

COMPOUND	LAB FLAG [1]	RETENTION TIME	EXPECTED CONC. (ng)	CONC. FOUND (ng)	RECOVERY (%)
PFBA		1:55	40.0	40.1	100
PFPeA		4:21	20.0	20.2	101
PFHxA		4:56	10.0	9.80	98.0
PFHpA		5:24	10.0	9.76	97.6
PFOA		6:10	10.0	9.47	94.7
PFNA		7:01	10.0	10.1	101
PFDA		7:31	10.0	9.22	92.2
PFUnA		7:50	10.0	10.3	103
PFDoA		8:07	10.0	10.1	101
PFTrDA		8:27	10.0	9.09	90.9
PFTeDA		8:52	10.0	10.2	102
PFBS		4:54	10.0	9.74	97.4
PFPeS		5:26	10.0	10.8	108
PFHxS		6:17	10.0	10.2	102
PFHpS		7:07	10.0	9.35	93.5
PFOS		7:37	10.0	8.91	89.1
PFNS		7:56	10.0	8.44	84.4
PFDS		8:14	10.0	9.94	99.4
PFDoS		9:03	10.0	9.20	92.0
4:2 FTS		4:49	40.0	43.2	108
6:2 FTS		5:51	36.0	35.2	97.8
8:2 FTS		7:21	40.0	41.1	103
PFOSA		8:43	10.0	9.88	98.8
N-MeFOSA		10:07	11.5	12.2	106
N-EtFOSA		10:25	25.0	24.6	98.5
MeFOSAA		7:34	10.0	10.3	103
EtFOSAA		7:42	10.0	9.07	90.7
N-MeFOSE		10:00	100	105	105
N-EtFOSE		10:18	75.0	79.0	105
HFPO-DA		5:05	40.0	40.4	101
ADONA		5:38	40.0	45.9	115
9Cl-PF3ONS		7:50	40.0	49.7	124
11Cl-PF3OUdS		8:29	40.0	46.0	115

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____Bryan Alonzo_____

For Axys Internal Use Only [XSL Template: FC-Form4A.xsl; Created: 16-Jun-2020 11:23:07; Application: XMLTransformer-1.18.7; Report Filename: PFOA_FC_LC_FC0L_151S12__Form4A_SJ2745739.html; Workgroup: WG72387; Design ID: 3973]

SGS AXYS METHOD MLA-110 Rev 02

Form 4B
LC MS/MS CALIBRATION VERIFICATION

SGS AXYS ANALYTICAL SERVICES
2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Initial Calibration Date:	18-Mar-2020	**VER Data Filename:**	FC0L_151 S: 12
Instrument ID:	LCMS/MS	**Analysis Date:**	15-May-2020
LC Column ID:	C18	**Analysis Time:**	19:42:45

LABELED COMPOUND	LAB FLAG [1]	RETENTION TIME	EXPECTED CONC. (ng)	CONC. FOUND (ng)	RECOVERY (%)
13C4-PFBA		1:55	40.0	39.0	97.6
13C5-PFPeA		4:21	20.0	20.9	105
13C5-PFHxA		4:56	10.0	9.88	98.8
13C4-PFHpA		5:24	10.0	10.2	102
13C8-PFOA		6:10	10.0	9.95	99.5
13C9-PFNA		7:01	5.00	4.95	99.0
13C6-PFDA		7:30	5.00	5.40	108
13C7-PFUnA		7:50	5.00	4.94	98.7
13C2-PFDoA		8:07	5.00	5.22	104
13C2-PFTeDA		8:52	5.00	4.45	89.1
13C3-PFBS		4:54	9.18	9.78	106
13C3-PFHxS		6:17	10.0	9.93	99.3
13C8-PFOS		7:37	10.0	10.6	106
13C2-4:2 FTS		4:49	20.0	13.9	69.7
13C2-6:2 FTS		5:51	20.0	13.7	68.5
13C2-8:2 FTS		7:21	20.0	14.0	69.9
13C8-PFOSA		8:43	10.0	10.1	101
D3-N-MeFOSA		10:07	10.0	10.1	101
D5-N-EtFOSA		10:24	10.0	9.39	93.9
D3-MeFOSAA		7:33	20.0	13.0	65.0
D5-EtFOSAA		7:42	20.0	12.3	61.5
d7-NMe-FOSE		9:59	100	84.3	84.3
d9-NEt-FOSE		10:17	100	79.3	79.3
13C3-HFPO-DA		5:05	40.0	36.0	90.1

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____Bryan Alonzo_____

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SGS AXYS METHOD MLA-110 Rev 02

Form 4A
LC MS/MS CALIBRATION VERIFICATION

SGS AXYS ANALYTICAL SERVICES
2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Initial Calibration Date:	18-Mar-2020	**VER Data Filename:**	FC0L_151 S: 25
Instrument ID:	LCMS/MS	**Analysis Date:**	15-May-2020
LC Column ID:	C18	**Analysis Time:**	22:32:32

COMPOUND	LAB FLAG [1]	RETENTION TIME	EXPECTED CONC. (ng)	CONC. FOUND (ng)	RECOVERY (%)
PFBA		1:55	40.0	40.5	101
PFPeA		4:21	20.0	20.4	102
PFHxA		4:56	10.0	9.55	95.5
PFHpA		5:24	10.0	10.0	100
PFOA		6:10	10.0	9.17	91.7
PFNA		7:01	10.0	10.1	101
PFDA		7:30	10.0	9.40	94.0
PFUnA		7:50	10.0	10.4	104
PFDoA		8:06	10.0	8.13	81.3
PFTrDA		8:26	10.0	9.41	94.1
PFTeDA		8:52	10.0	10.2	102
PFBS		4:54	10.0	9.80	98.0
PFPeS		5:26	10.0	10.8	108
PFHxS		6:17	10.0	9.84	98.4
PFHpS		7:07	10.0	9.75	97.5
PFOS		7:36	10.0	9.26	92.6
PFNS		7:55	10.0	10.9	109
PFDS		8:13	10.0	9.62	96.2
PFDoS		9:03	10.0	9.73	97.3
4:2 FTS		4:49	40.0	45.1	113
6:2 FTS		5:51	36.0	34.7	96.3
8:2 FTS		7:21	40.0	41.6	104
PFOSA		8:43	10.0	10.2	102
N-MeFOSA		10:07	11.5	12.0	104
N-EtFOSA		10:25	25.0	24.6	98.2
MeFOSAA		7:33	10.0	10.5	105
EtFOSAA		7:42	10.0	10.7	107
N-MeFOSE		10:00	100	103	103
N-EtFOSE		10:18	75.0	77.2	103
HFPO-DA		5:05	40.0	41.0	102
ADONA		5:38	40.0	42.6	106
9Cl-PF3ONS		7:50	40.0	45.0	112
11Cl-PF3OUdS		8:28	40.0	44.8	112

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____Bryan Alonzo_____

For Axys Internal Use Only [XSL Template: FC-Form4A.xsl; Created: 16-Jun-2020 11:23:07; Application: XMLTransformer-1.18.7; Report Filename: PFOA_FC_LC_FC0L_151S25__Form4A_SJ2745758.html; Workgroup: WG72387; Design ID: 3973]

SGS AXYS METHOD MLA-110 Rev 02

Form 4B
LC MS/MS CALIBRATION VERIFICATION

SGS AXYS ANALYTICAL SERVICES
2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Initial Calibration Date:	18-Mar-2020	**VER Data Filename:**	FC0L_151 S: 25
Instrument ID:	LCMS/MS	**Analysis Date:**	15-May-2020
LC Column ID:	C18	**Analysis Time:**	22:32:32

LABELED COMPOUND	LAB FLAG [1]	RETENTION TIME	EXPECTED CONC. (ng)	CONC. FOUND (ng)	RECOVERY (%)
13C4-PFBA		1:55	40.0	38.8	97.0
13C5-PFPeA		4:21	20.0	20.9	104
13C5-PFHxA		4:56	10.0	10.5	105
13C4-PFHpA		5:24	10.0	11.3	113
13C8-PFOA		6:10	10.0	10.5	105
13C9-PFNA		7:01	5.00	4.96	99.2
13C6-PFDA		7:30	5.00	5.42	108
13C7-PFUnA		7:50	5.00	5.21	104
13C2-PFDoA		8:06	5.00	5.68	114
13C2-PFTeDA		8:51	5.00	4.98	99.7
13C3-PFBS		4:54	9.18	9.80	107
13C3-PFHxS		6:17	10.0	9.90	99.0
13C8-PFOS		7:36	10.0	10.4	104
13C2-4:2 FTS		4:49	20.0	13.8	68.9
13C2-6:2 FTS		5:51	20.0	13.8	68.9
13C2-8:2 FTS		7:21	20.0	13.9	69.4
13C8-PFOSA		8:43	10.0	10.4	104
D3-N-MeFOSA		10:07	10.0	10.8	108
D5-N-EtFOSA		10:24	10.0	9.95	99.5
D3-MeFOSAA		7:33	20.0	13.8	69.2
D5-EtFOSAA		7:42	20.0	12.8	63.8
d7-NMe-FOSE		9:59	100	92.2	92.2
d9-NEt-FOSE		10:16	100	86.7	86.7
13C3-HFPO-DA		5:05	40.0	38.3	95.7

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____Bryan Alonzo_____

For Axys Internal Use Only [XSL Template: FC-Form4B.xsl; Created: 16-Jun-2020 11:23:07; Application: XMLTransformer-1.18.7; Report Filename: PFOA_FC_LC_FC0L_151S25__Form4B_SJ2745758.html; Workgroup: WG72387; Design ID: 3973]

Accreditation Scope

SGS AXYS Analytical Services Ltd.
file ref.: ACC-101 Rev. 49

				Serum	Solids												Tissue						Urine	Water	Water, Non-Potable									AFFF	
Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	CALA	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	ANAB DoD **	ANAB ISO 17025	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	CALA	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Pennsylvania DEP	Virginia DGS	Washington DE *	ANAB DoD **	ANAB ISO 17025
BFR	BTBPE	SGS AXYS MLA-033	MLA-033					Y											Y						Y														
	DBDPE	SGS AXYS MLA-033	MLA-033					Y											Y						Y														
	HBB	SGS AXYS MLA-033	MLA-033					Y											Y						Y														
	PBEB	SGS AXYS MLA-033	MLA-033					Y											Y						Y														
Bisphenols	Bisphenol A	SGS AXYS MLA-113	MLA-113					Y																	Y														
	Bisphenol AF	SGS AXYS MLA-113	MLA-113					Y																	Y														
	Bisphenol B	SGS AXYS MLA-113	MLA-113					Y																	Y														
	Bisphenol E	SGS AXYS MLA-113	MLA-113					Y																	Y														
	Bisphenol F	SGS AXYS MLA-113	MLA-113					Y																	Y														
	Bisphenol S	SGS AXYS MLA-113	MLA-113					Y																	Y														
BPA and MPE	4,4'-dihydroxy-2,2-diphenylpropane (Bisphenol A) (BPA)	SGS AXYS MLA-059	MLA-059																					Y														
	Mono-(2-ethyl-5-hydroxyhexyl) phthalate (MEHHP)	SGS AXYS MLA-059	MLA-059																					Y														
	Mono-(2-ethyl-5-oxohexyl) phthalate (MEOHP)	SGS AXYS MLA-059	MLA-059																					Y														
	Mono-(3-carboxypropyl) phthalate (MCPP)	SGS AXYS MLA-059	MLA-059																					Y														
	Mono-2-ethylhexyl phthalate (MEHP)	SGS AXYS MLA-059	MLA-059																					Y														
	Mono-benzyl phthalate (MBzP)	SGS AXYS MLA-059	MLA-059																					Y														
	Mono-butyl phthalate (MBP) (n + iso)	SGS AXYS MLA-059	MLA-059																					Y														
	Mono-cyclohexyl phthalate (MCHP)	SGS AXYS MLA-059	MLA-059																					Y														
	Mono-ethyl phthalate (MEP)	SGS AXYS MLA-059	MLA-059																					Y														
	Mono-iso-nonyl phthalate (MiNP)	SGS AXYS MLA-059	MLA-059																					Y														
	Mono-methyl phthalate (MMP)	SGS AXYS MLA-059	MLA-059																					Y														
OC Pesticides	"Organochlorine Pesticides and PCBs" category (CA only)	EPA 608	MLA-007																										Y									
		EPA 625	MLA-007																										Y									
	"Organochlorine Pesticides" category (CA only)	EPA 8081	MLA-007						Y																													
	"Pesticides" category (CA only)	EPA 8270	MLA-007						Y																													
	2,4'-DDD	EPA 625	MLA-007																											Y								
		EPA 8270	MLA-007							Y						Y																						
		EPA 1699	MLA-028							Y										Y										Y								
		SGS AXYS MLA-028	MLA-028	Y				Y		Y						Y			Y	Y				Y						Y							Y	
		SGS AXYS MLA-007	MLA-007					Y		Y									Y						Y					Y								
		SGS AXYS MLA-228	MLA-228					Y		Y									Y	Y					Y					Y								
	2,4'-DDE	EPA 625	MLA-007																											Y								
		EPA 8270	MLA-007							Y						Y																						
		EPA 1699	MLA-028							Y										Y										Y								
		SGS AXYS MLA-028	MLA-028	Y				Y		Y						Y			Y	Y				Y						Y							Y	
		SGS AXYS MLA-007	MLA-007					Y		Y									Y						Y					Y								
		SGS AXYS MLA-228	MLA-228					Y		Y									Y	Y					Y					Y								
	2,4'-DDT	EPA 625	MLA-007																											Y								
		EPA 8270	MLA-007							Y						Y																						
		EPA 1699	MLA-028							Y										Y										Y								
		SGS AXYS MLA-028	MLA-028	Y				Y		Y						Y			Y	Y				Y						Y							Y	
		SGS AXYS MLA-007	MLA-007					Y		Y									Y						Y					Y								
		SGS AXYS MLA-228	MLA-228					Y		Y									Y	Y					Y					Y								
	4,4'-DDD	EPA 625	MLA-007																											Y	Y			Y		Y		
		EPA 8270	MLA-007							Y	Y			Y	Y	Y																						
		EPA 1699	MLA-028							Y										Y										Y								
		SGS AXYS MLA-028	MLA-028	Y				Y		Y						Y			Y	Y				Y						Y							Y	
		SGS AXYS MLA-007	MLA-007					Y		Y									Y						Y					Y								
		SGS AXYS MLA-228	MLA-228					Y		Y									Y	Y					Y					Y								
	4,4'-DDE	EPA 625	MLA-007																											Y	Y			Y		Y		
		EPA 8270	MLA-007							Y	Y			Y	Y	Y																						
		EPA 1699	MLA-028							Y										Y										Y								
		SGS AXYS MLA-028	MLA-028	Y				Y		Y						Y			Y	Y				Y						Y							Y	
		SGS AXYS MLA-007	MLA-007					Y		Y									Y						Y					Y								
		SGS AXYS MLA-228	MLA-228					Y		Y									Y	Y					Y					Y								
	4,4'-DDT	EPA 625	MLA-007																											Y	Y			Y		Y		
		EPA 8270	MLA-007							Y	Y			Y	Y	Y																						
		EPA 1699	MLA-028							Y										Y										Y								
		SGS AXYS MLA-028	MLA-028	Y				Y		Y						Y			Y	Y				Y						Y							Y	
		SGS AXYS MLA-007	MLA-007					Y		Y									Y						Y					Y								
		SGS AXYS MLA-228	MLA-228					Y		Y									Y	Y					Y					Y								
	Aldrin	EPA 625	MLA-007																											Y	Y			Y		Y		
		EPA 8270	MLA-007							Y	Y			Y	Y	Y																						
		EPA 1699	MLA-028							Y										Y										Y								
		SGS AXYS MLA-028	MLA-028	Y				Y		Y						Y			Y	Y					Y					Y								

Accreditation Scope

SGS AXYS Analytical Services Ltd.
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				Serum	Solids												Tissue						Urine	Water	Water, Non-Potable										AFFF	
Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	CALA	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	ANAB DoD **	ANAB ISO 17025	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	CALA	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Pennsylvania DEP	Virginia DGS	Washington DE *	ANAB DoD **	ANAB ISO 17025
		SGS AXYS MLA-007	MLA-007					Y		Y									Y						Y						Y									
		SGS AXYS MLA-228	MLA-228					Y		Y									Y	Y											Y									
	Alpha-HCH	EPA 625	MLA-007																												Y	Y			Y		Y			
		EPA 8270	MLA-007							Y	Y			Y	Y	Y																								
		EPA 1699	MLA-028							Y										Y											Y									
		SGS AXYS MLA-028	MLA-028	Y				Y		Y						Y			Y	Y					Y						Y							Y		
		SGS AXYS MLA-007	MLA-007					Y		Y									Y						Y						Y									
		SGS AXYS MLA-228	MLA-228					Y		Y									Y	Y											Y									
	Beta-HCH	EPA 625	MLA-007																												Y	Y			Y		Y			
		EPA 8270	MLA-007							Y	Y			Y	Y	Y																								
		EPA 1699	MLA-028							Y										Y											Y									
		SGS AXYS MLA-028	MLA-028	Y				Y		Y						Y			Y	Y					Y						Y							Y		
		SGS AXYS MLA-007	MLA-007					Y		Y									Y						Y						Y									
		SGS AXYS MLA-228	MLA-228					Y		Y									Y	Y					Y						Y									
	Chlordane, technical	EPA 8270	MLA-007							Y	Y			Y	Y																Y	Y			Y		Y			
		SGS AXYS MLA-007	MLA-007							Y																					Y									
		SGS AXYS MLA-228	MLA-228																												Y									
	cis-Chlordane (alpha-Chlordane)	EPA 8270	MLA-007							Y	Y			Y		Y															Y	Y			Y					
		EPA 1699	MLA-028							Y										Y											Y									
		SGS AXYS MLA-028	MLA-028	Y				Y		Y						Y			Y	Y					Y						Y							Y		
		SGS AXYS MLA-007	MLA-007					Y		Y									Y						Y						Y									
		SGS AXYS MLA-228	MLA-228					Y		Y									Y	Y					Y						Y									
	cis-Nonachlor	EPA 8270	MLA-007							Y						Y															Y									
		EPA 1699	MLA-028							Y										Y											Y									
		SGS AXYS MLA-028	MLA-028	Y				Y		Y						Y			Y	Y					Y						Y							Y		
		SGS AXYS MLA-007	MLA-007					Y		Y									Y						Y						Y									
		SGS AXYS MLA-228	MLA-228					Y		Y									Y	Y					Y						Y									
	Delta-HCH	EPA 608	MLA-007																												Y	Y			Y		Y			
		EPA 8081	MLA-007							Y	Y			Y	Y	Y																								
		EPA 1699	MLA-028							Y										Y											Y									
		SGS AXYS MLA-028	MLA-028	Y				Y		Y						Y			Y	Y					Y						Y							Y		
		SGS AXYS MLA-007	MLA-007					Y		Y									Y						Y						Y									
		SGS AXYS MLA-228	MLA-228					Y		Y									Y	Y					Y						Y									
	Dieldrin	EPA 608	MLA-007																												Y	Y			Y		Y			
		EPA 8081	MLA-007							Y	Y			Y	Y	Y																								
		EPA 1699	MLA-028							Y										Y											Y									
		SGS AXYS MLA-028	MLA-028	Y				Y		Y						Y			Y	Y					Y						Y							Y		
		SGS AXYS MLA-007	MLA-007					Y		Y									Y						Y						Y									
		SGS AXYS MLA-228	MLA-228					Y		Y									Y	Y					Y						Y									
	Endosulphan I	EPA 608	MLA-007																												Y	Y			Y		Y			
		EPA 8081	MLA-007							Y	Y			Y	Y	Y																								
		EPA 1699	MLA-028							Y										Y											Y									
		SGS AXYS MLA-028	MLA-028	Y				Y		Y						Y			Y	Y					Y						Y							Y		
		SGS AXYS MLA-007	MLA-007					Y		Y									Y						Y						Y									
		SGS AXYS MLA-228	MLA-228					Y		Y									Y	Y					Y						Y									
	Endosulphan II	EPA 608	MLA-007																												Y	Y			Y		Y			
		EPA 8081	MLA-007							Y	Y			Y	Y	Y																								
		EPA 1699	MLA-028							Y										Y											Y									
		SGS AXYS MLA-028	MLA-028	Y				Y		Y						Y			Y	Y					Y						Y							Y		
		SGS AXYS MLA-007	MLA-007					Y		Y									Y						Y						Y									
		SGS AXYS MLA-228	MLA-228					Y		Y									Y	Y					Y						Y									
	Endosulphan sulphate	EPA 608	MLA-007																												Y	Y			Y		Y			
		EPA 8081	MLA-007							Y	Y			Y	Y	Y																								
		EPA 1699	MLA-028							Y										Y											Y									
		SGS AXYS MLA-028	MLA-028	Y				Y		Y						Y			Y	Y					Y						Y							Y		
		SGS AXYS MLA-007	MLA-007					Y		Y									Y						Y						Y									
		SGS AXYS MLA-228	MLA-228					Y		Y									Y	Y					Y						Y									
	Endrin	EPA 608	MLA-007																												Y	Y			Y		Y			
		EPA 8081	MLA-007							Y	Y			Y	Y	Y																								
		EPA 1699	MLA-028							Y										Y											Y									
		SGS AXYS MLA-028	MLA-028	Y				Y		Y						Y			Y	Y					Y						Y							Y		
		SGS AXYS MLA-007	MLA-007					Y		Y									Y						Y						Y									
		SGS AXYS MLA-228	MLA-228					Y		Y									Y	Y					Y						Y									
	Endrin aldehyde	EPA 608	MLA-007																												Y	Y			Y		Y			
		EPA 8081	MLA-007							Y	Y			Y	Y	Y																								

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				Serum	Solids												Tissue							Urine	Water	Water, Non-Potable										AFFF	
Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	CALA	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	ANAB DoD **	ANAB ISO 17025	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	CALA	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Pennsylvania DEP	Virginia DGS	Washington DE *	ANAB DoD **	ANAB ISO 17025
		EPA 1699	MLA-028							Y										Y										Y									
		SGS AXYS MLA-028	MLA-028	Y				Y		Y						Y			Y	Y					Y					Y							Y		
		SGS AXYS MLA-007	MLA-007					Y		Y															Y					Y									
		SGS AXYS MLA-228	MLA-228					Y		Y									Y	Y					Y					Y									
	Endrin ketone	EPA 8081	MLA-007							Y				Y		Y																							
		EPA 1699	MLA-028							Y										Y										Y									
		SGS AXYS MLA-028	MLA-028	Y				Y		Y						Y			Y	Y					Y					Y							Y		
		SGS AXYS MLA-007	MLA-007					Y		Y									Y						Y					Y									
		SGS AXYS MLA-228	MLA-228					Y		Y									Y	Y					Y					Y									
	Gamma-HCH (Lindane)	EPA 625	MLA-007																											Y	Y			Y		Y			
		EPA 8270	MLA-007							Y	Y			Y	Y	Y																							
		EPA 1699	MLA-028							Y										Y										Y									
		SGS AXYS MLA-028	MLA-028	Y				Y		Y						Y			Y	Y					Y					Y							Y		
		SGS AXYS MLA-007	MLA-007					Y		Y									Y						Y					Y									
		SGS AXYS MLA-228	MLA-228					Y		Y									Y	Y					Y					Y									
	Heptachlor	EPA 625	MLA-007																											Y	Y			Y		Y			
		EPA 8270	MLA-007							Y	Y			Y	Y	Y																							
		EPA 1699	MLA-028							Y										Y										Y									
		SGS AXYS MLA-028	MLA-028	Y				Y		Y						Y			Y	Y					Y					Y							Y		
		SGS AXYS MLA-007	MLA-007					Y		Y									Y						Y					Y									
		SGS AXYS MLA-228	MLA-228					Y		Y									Y	Y					Y					Y									
	Heptachlor epoxide	EPA 608	MLA-007																											Y	Y			Y		Y			
		EPA 8081	MLA-007							Y	Y			Y	Y	Y																							
		EPA 1699	MLA-028							Y										Y										Y									
		SGS AXYS MLA-028	MLA-028	Y				Y		Y						Y			Y	Y					Y					Y							Y		
		SGS AXYS MLA-007	MLA-007					Y		Y									Y						Y					Y									
		SGS AXYS MLA-228	MLA-228					Y		Y									Y	Y					Y					Y									
	Hexachlorobenzene	EPA 1625	MLA-007																											Y				Y					
		EPA 8270	MLA-007							Y	Y			Y	Y	Y																							
		EPA 1699	MLA-028							Y										Y										Y									
		SGS AXYS MLA-028	MLA-028	Y						Y						Y			Y	Y					Y					Y							Y		
		SGS AXYS MLA-007	MLA-007					Y		Y									Y						Y					Y									
		SGS AXYS MLA-228	MLA-228							Y									Y	Y					Y					Y									
	Methoxychlor	EPA 608	MLA-007																											Y				Y		Y			
		EPA 8081	MLA-007							Y	Y			Y	Y	Y																							
		EPA 1699	MLA-028							Y										Y										Y									
		SGS AXYS MLA-028	MLA-028	Y				Y		Y						Y			Y	Y					Y					Y							Y		
		SGS AXYS MLA-007	MLA-007					Y		Y									Y						Y					Y									
		SGS AXYS MLA-228	MLA-228					Y		Y									Y	Y					Y					Y									
	Mirex	EPA 8270	MLA-007							Y				Y		Y														Y	Y			Y		Y			
		EPA 1699	MLA-028							Y										Y										Y									
		SGS AXYS MLA-028	MLA-028	Y				Y		Y						Y			Y	Y					Y					Y							Y		
		SGS AXYS MLA-007	MLA-007					Y		Y									Y						Y					Y									
		SGS AXYS MLA-228	MLA-228					Y		Y									Y	Y					Y					Y									
	Oxychlordane	EPA 8270	MLA-007							Y						Y														Y									
		EPA 1699	MLA-028							Y										Y										Y									
		SGS AXYS MLA-028	MLA-028	Y				Y		Y						Y			Y	Y					Y					Y							Y		
		SGS AXYS MLA-007	MLA-007					Y		Y									Y						Y					Y									
		SGS AXYS MLA-228	MLA-228					Y		Y									Y	Y					Y					Y									
	Toxaphene	EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
	trans-Chlordane (gamma-Chlordane)	EPA 8270	MLA-007							Y	Y			Y		Y														Y	Y			Y					
		EPA 1699	MLA-028							Y										Y										Y									
		SGS AXYS MLA-028	MLA-028	Y				Y		Y						Y			Y	Y					Y					Y							Y		
		SGS AXYS MLA-007	MLA-007					Y		Y									Y						Y					Y									
		SGS AXYS MLA-228	MLA-228					Y		Y									Y	Y					Y					Y									
	trans-Nonachlor	EPA 8270	MLA-007							Y						Y														Y									
		EPA 1699	MLA-028							Y										Y										Y									
		SGS AXYS MLA-028	MLA-028	Y				Y		Y						Y			Y	Y					Y					Y							Y		
		SGS AXYS MLA-007	MLA-007					Y		Y									Y											Y									
		SGS AXYS MLA-228	MLA-228					Y		Y									Y	Y					Y					Y									
PAH	"Extractable Organics" category (CA only)	EPA 8270	MLA-021						Y																														
	"Semi-volatile Organic Compounds" category (CA only)	EPA 1625	MLA-021																										Y										
	1,2,6-Trimethylphenanthrene	SGS AXYS MLA-021	MLA-021					Y																	Y														
	1,2-Dimethylnaphthalene	SGS AXYS MLA-021	MLA-021					Y																	Y														

Accreditation Scope

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				Serum	Solids												Tissue							Urine	Water	Water, Non-Potable										AFFF	
Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	CALA	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	ANAB DoD **	ANAB ISO 17025	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	CALA	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Pennsylvania DEP	Virginia DGS	Washington DE *	ANAB DoD **	ANAB ISO 17025
	1,4,6,7-Tetramethylnaphthalene	SGS AXYS MLA-021	MLA-021					Y																	Y														
	1,7-Dimethylfluorene	SGS AXYS MLA-021	MLA-021					Y																	Y														
	1,7-Dimethylphenanthrene	SGS AXYS MLA-021	MLA-021					Y																	Y														
	1,8-Dimethylphenanthrene	SGS AXYS MLA-021	MLA-021					Y																	Y														
	1-Methylchrysene	SGS AXYS MLA-021	MLA-021					Y																	Y														
	1-Methylnaphthalene	SGS AXYS MLA-021	MLA-021					Y																	Y														
	1-Methylphenanthrene	SGS AXYS MLA-021	MLA-021					Y																	Y														
	2,3,5-Trimethylnaphthalene	SGS AXYS MLA-021	MLA-021					Y																	Y														
	2,3,6-Trimethylnaphthalene	SGS AXYS MLA-021	MLA-021					Y																	Y														
	2,4-Dimethyldibenzothiophene	SGS AXYS MLA-021	MLA-021					Y																	Y														
	2,6-Dimethylnaphthalene	SGS AXYS MLA-021	MLA-021					Y																	Y														
	2,6-Dimethylphenanthrene	SGS AXYS MLA-021	MLA-021					Y																	Y														
	2-Methylanthracene	SGS AXYS MLA-021	MLA-021					Y																	Y														
	2-Methyldibenzothiophene	SGS AXYS MLA-021	MLA-021					Y																	Y														
	2-Methylfluorene	SGS AXYS MLA-021	MLA-021					Y																	Y														
	2-Methylnaphthalene	EPA 8270	MLA-021							Y				Y						Y										Y									
		SGS AXYS MLA-021	MLA-021					Y												Y					Y					Y									
	2-Methylphenanthrene	SGS AXYS MLA-021	MLA-021					Y																	Y														
	3,6-Dimethylphenanthrene	SGS AXYS MLA-021	MLA-021					Y																	Y														
	3-Methyldibenzothiophene	SGS AXYS MLA-021	MLA-021					Y																	Y														
	3-Methylfluoranthene/ Benzo(a)fluorene	SGS AXYS MLA-021	MLA-021					Y																	Y														
	3-Methylphenanthrene	SGS AXYS MLA-021	MLA-021					Y																	Y														
	5,9-Dimethylchrysene	SGS AXYS MLA-021	MLA-021					Y																	Y														
	5/6-Methylchrysenes	SGS AXYS MLA-021	MLA-021					Y																	Y														
	7-Methylbenzo(a)pyrene	SGS AXYS MLA-021	MLA-021					Y																	Y														
	9/4-Methylphenanthrenes	SGS AXYS MLA-021	MLA-021					Y																	Y														
	Acenaphthene	EPA 1625	MLA-021																											Y				Y		Y			
		EPA 8270	MLA-021							Y	Y			Y	Y					Y																			
		SGS AXYS MLA-021	MLA-021					Y		Y									Y	Y					Y					Y									
	Acenaphthylene	EPA 1625	MLA-021																											Y				Y		Y			
		EPA 8270	MLA-021							Y	Y			Y	Y					Y																			
		SGS AXYS MLA-021	MLA-021					Y		Y									Y	Y					Y					Y									
	Anthracene	EPA 1625	MLA-021																											Y				Y		Y			
		EPA 8270	MLA-021							Y	Y			Y	Y					Y																			
		SGS AXYS MLA-021	MLA-021					Y		Y									Y	Y					Y					Y									
	Benz[a]anthracene	EPA 1625	MLA-021																											Y				Y		Y			
		EPA 8270	MLA-021							Y	Y			Y	Y					Y																			
		SGS AXYS MLA-021	MLA-021					Y		Y									Y	Y					Y					Y									
	Benzo[a]pyrene	EPA 1625	MLA-021																											Y				Y		Y			
		EPA 8270	MLA-021							Y	Y			Y	Y					Y																			
		SGS AXYS MLA-021	MLA-021					Y		Y									Y	Y					Y					Y									
	Benzo[b]fluoranthene	EPA 1625	MLA-021																											Y	Y			Y		Y			
		EPA 8270	MLA-021							Y	Y			Y	Y					Y																			
		SGS AXYS MLA-021	MLA-021					Y		Y									Y	Y					Y					Y									
	Benzo[e]pyrene	SGS AXYS MLA-021	MLA-021					Y											Y						Y														
	Benzo[ghi]perylene	EPA 1625	MLA-021																											Y				Y		Y			
		EPA 8270	MLA-021							Y	Y			Y	Y					Y																			
		SGS AXYS MLA-021	MLA-021					Y		Y									Y	Y					Y					Y									
	Benzo[j/k]fluoranthenes	SGS AXYS MLA-021	MLA-021					Y											Y						Y														
	Benzo[k]fluoranthene	EPA 1625	MLA-021																											Y	Y			Y		Y			
		EPA 8270	MLA-021							Y	Y			Y						Y																			
		SGS AXYS MLA-021	MLA-021							Y										Y										Y									
	Biphenyl	SGS AXYS MLA-021	MLA-021					Y																	Y														
	C1-Acenaphthenes	SGS AXYS MLA-021	MLA-021					Y																	Y														
	C1-Benz(a)anthracenes/chrysenes	SGS AXYS MLA-021	MLA-021					Y																	Y														
	C1-Benzofluoranthenes/ Benzopyrenes	SGS AXYS MLA-021	MLA-021					Y																	Y														
	C1-Biphenyls	SGS AXYS MLA-021	MLA-021					Y																	Y														
	C1-Dibenzothiophene	SGS AXYS MLA-021	MLA-021					Y																	Y														
	C1-Fluoranthenes/Pyrenes	SGS AXYS MLA-021	MLA-021					Y																	Y														
	C1-Fluorenes	SGS AXYS MLA-021	MLA-021					Y																	Y														
	C1-Naphthalenes	SGS AXYS MLA-021	MLA-021					Y																	Y														
	C1-Phenanthrenes/Anthracenes	SGS AXYS MLA-021	MLA-021					Y																	Y														
	C2-Benz(a)anthracenes/Chrysenes	SGS AXYS MLA-021	MLA-021					Y																	Y														
	C2-Benzofluoranthenes/ Benzopyrenes	SGS AXYS MLA-021	MLA-021					Y																	Y														
	C2-Biphenyls	SGS AXYS MLA-021	MLA-021					Y																	Y														

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				Serum	Solids												Tissue							Urine	Water	Water, Non-Potable										AFFF	
Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	CALA	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	ANAB DoD **	ANAB ISO 17025	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	CALA	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Pennsylvania DEP	Virginia DGS	Washington DE *	ANAB DoD **	ANAB ISO 17025
	C2-Dibenzothiophene	SGS AXYS MLA-021	MLA-021					Y																	Y														
	C2-Fluoranthenes/Pyrenes	SGS AXYS MLA-021	MLA-021					Y																	Y														
	C2-Fluorenes	SGS AXYS MLA-021	MLA-021					Y																	Y														
	C2-Naphthalenes	SGS AXYS MLA-021	MLA-021					Y																	Y														
	C2-Phenanthrenes/Anthracenes	SGS AXYS MLA-021	MLA-021					Y																	Y														
	C3-Benz(a)anthracenes/Chrysenes	SGS AXYS MLA-021	MLA-021					Y																	Y														
	C3-Dibenzothiophene	SGS AXYS MLA-021	MLA-021					Y																	Y														
	C3-Fluoranthenes/Pyrenes	SGS AXYS MLA-021	MLA-021					Y																	Y														
	C3-Fluorenes	SGS AXYS MLA-021	MLA-021					Y																	Y														
	C3-Naphthalenes	SGS AXYS MLA-021	MLA-021					Y																	Y														
	C3-Phenanthrenes/Anthracenes	SGS AXYS MLA-021	MLA-021					Y																	Y														
	C4-Benz(a)anthracenes/Chrysenes	SGS AXYS MLA-021	MLA-021					Y																	Y														
	C4-Dibenzothiophene	SGS AXYS MLA-021	MLA-021					Y																	Y														
	C4-Fluoranthenes/Pyrenes	SGS AXYS MLA-021	MLA-021					Y																	Y														
	C4-Naphthalenes	SGS AXYS MLA-021	MLA-021					Y																	Y														
	C4-Phenanthrenes/Anthracenes	SGS AXYS MLA-021	MLA-021					Y																	Y														
	Chrysene	EPA 1625	MLA-021																											Y				Y		Y			
		EPA 8270	MLA-021							Y	Y			Y	Y					Y																			
		SGS AXYS MLA-021	MLA-021					Y		Y									Y	Y					Y					Y									
	Dibenz[a,h]anthracene	EPA 1625	MLA-021																											Y				Y		Y			
		EPA 8270	MLA-021							Y	Y			Y	Y					Y																			
		SGS AXYS MLA-021	MLA-021					Y		Y									Y	Y					Y					Y									
	Dibenzothiophene	SGS AXYS MLA-021	MLA-021					Y																	Y														
	Fluoranthene	EPA 1625	MLA-021																											Y				Y		Y			
		EPA 8270	MLA-021							Y	Y			Y	Y					Y																			
		SGS AXYS MLA-021	MLA-021					Y		Y									Y	Y					Y					Y									
	Fluorene	EPA 1625	MLA-021																											Y				Y		Y			
		EPA 8270	MLA-021							Y	Y			Y	Y					Y																			
		SGS AXYS MLA-021	MLA-021					Y		Y									Y	Y					Y					Y									
	Indeno[1,2,3-cd]pyrene	EPA 1625	MLA-021																											Y				Y		Y			
		EPA 8270	MLA-021							Y	Y			Y	Y					Y																			
		SGS AXYS MLA-021	MLA-021					Y		Y									Y	Y					Y					Y									
	Naphthalene	EPA 1625	MLA-021																											Y				Y		Y			
		EPA 8270	MLA-021							Y	Y			Y	Y					Y																			
		SGS AXYS MLA-021	MLA-021					Y		Y									Y	Y					Y					Y									
	Perylene	SGS AXYS MLA-021	MLA-021					Y											Y						Y														
	Phenanthrene	EPA 1625	MLA-021																											Y				Y		Y			
		EPA 8270	MLA-021							Y	Y			Y	Y					Y																			
		SGS AXYS MLA-021	MLA-021					Y		Y									Y	Y					Y					Y									
	Pyrene	EPA 1625	MLA-021																											Y				Y		Y			
		EPA 8270	MLA-021							Y	Y			Y	Y					Y																			
		SGS AXYS MLA-021	MLA-021					Y		Y									Y	Y					Y					Y									
	Retene	SGS AXYS MLA-021	MLA-021					Y																	Y														
PBDPE	BDE 10 2,6-dibromodiphenylether	EPA 1614	MLA-033													Y																					Y		
		SGS AXYS MLA-033	MLA-033					Y											Y						Y														
	BDE 100 2,2',4,4',6-pentabromodiphenylether	EPA 1614	MLA-033													Y																					Y		
		SGS AXYS MLA-033	MLA-033					Y											Y						Y														
	BDE 105 2,3,3',4,4'-pentabromodiphenylether	EPA 1614	MLA-033													Y																					Y		
		SGS AXYS MLA-033	MLA-033					Y											Y						Y														
	BDE 11 3,3'-dibromodiphenylether	EPA 1614	MLA-033													Y																					Y		
		SGS AXYS MLA-033	MLA-033					Y											Y						Y														
	BDE 116 2,3,4,5,6-pentabromodiphenylether	EPA 1614	MLA-033													Y																					Y		
		SGS AXYS MLA-033	MLA-033					Y											Y						Y														
	BDE 119 2,3',4,4',6-pentabromodiphenylether	EPA 1614	MLA-033													Y																					Y		
		SGS AXYS MLA-033	MLA-033					Y											Y						Y														
	BDE 12 3,4-dibromodiphenylether	EPA 1614	MLA-033													Y																					Y		
		SGS AXYS MLA-033	MLA-033					Y											Y						Y														
	BDE 126 3,3',4,4',5-pentabromodiphenylether	EPA 1614	MLA-033													Y																					Y		
		SGS AXYS MLA-033	MLA-033					Y											Y						Y														
	BDE 13 3,4'-dibromodiphenylether	EPA 1614	MLA-033													Y																					Y		
		SGS AXYS MLA-033	MLA-033					Y											Y						Y														
	BDE 140 2,2',3,4,4',6'-hexabromodiphenylether	EPA 1614	MLA-033													Y																					Y		
		SGS AXYS MLA-033	MLA-033					Y											Y						Y														
	BDE 15 4,4'-dibromodiphenylether	EPA 1614	MLA-033													Y																					Y		
		SGS AXYS MLA-033	MLA-033					Y											Y						Y														

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				Serum	Solids												Tissue							Urine	Water	Water, Non-Potable										AFFF	
Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	CALA	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	ANAB DoD **	ANAB ISO 17025	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	CALA	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Pennsylvania DEP	Virginia DGS	Washington DE *	ANAB DoD **	ANAB ISO 17025
	BDE 153 2,2',4,4',5,5'-hexabromodiphenylether	EPA 1614	MLA-033													Y																					Y		
		SGS AXYS MLA-033	MLA-033					Y											Y						Y														
	BDE 154 2,2',4,4',5',6-hexabromodiphenylether	EPA 1614	MLA-033													Y																					Y		
		SGS AXYS MLA-033	MLA-033					Y											Y						Y														
	BDE 155 2,2',4,4',6,6'-hexabromodiphenylether	EPA 1614	MLA-033													Y																					Y		
		SGS AXYS MLA-033	MLA-033					Y											Y						Y														
	BDE 166 2,3,4,4',5,6-hexabromodiphenylether	EPA 1614	MLA-033													Y																					Y		
		SGS AXYS MLA-033	MLA-033					Y											Y						Y														
	BDE 17 2,2',4-tribromodiphenylether	EPA 1614	MLA-033													Y																					Y		
		SGS AXYS MLA-033	MLA-033					Y											Y						Y														
	BDE 181 2,2',3,4,4',5,6-heptabromodiphenylether	EPA 1614	MLA-033													Y																					Y		
		SGS AXYS MLA-033	MLA-033					Y											Y						Y														
	BDE 183 2,2',3,4,4',5',6-heptabromodiphenylether	EPA 1614	MLA-033													Y																					Y		
		SGS AXYS MLA-033	MLA-033					Y											Y						Y														
	BDE 190 2,3,3',4,4',5,6-heptabromodiphenylether	EPA 1614	MLA-033													Y																					Y		
		SGS AXYS MLA-033	MLA-033					Y											Y						Y														
	BDE 206 2,2',3,3',4,4',5,5',6-nonabromodiphenylether	EPA 1614	MLA-033													Y																					Y		
		SGS AXYS MLA-033	MLA-033					Y											Y						Y														
	BDE 207 2,2',3,3',4,4',5,6,6'-nonabromodiphenylether	EPA 1614	MLA-033													Y																					Y		
		SGS AXYS MLA-033	MLA-033					Y											Y						Y														
	BDE 208 2,2',3,3',4,5,5',6,6'-nonabromodiphenylether	EPA 1614	MLA-033													Y																					Y		
		SGS AXYS MLA-033	MLA-033					Y											Y						Y														
	BDE 209 Decabromodiphenylether	EPA 1614	MLA-033													Y																					Y		
		SGS AXYS MLA-033	MLA-033					Y											Y						Y														
	BDE 25 2,3',4-tribromodiphenylether	EPA 1614	MLA-033													Y																					Y		
		SGS AXYS MLA-033	MLA-033					Y											Y						Y														
	BDE 28 2,4,4'-tribromodiphenylether	EPA 1614	MLA-033													Y																					Y		
		SGS AXYS MLA-033	MLA-033					Y											Y						Y														
	BDE 30 2,4,6-tribromodiphenylether	EPA 1614	MLA-033													Y																					Y		
		SGS AXYS MLA-033	MLA-033					Y											Y						Y														
	BDE 33 2',3,4-tribromodiphenylether	EPA 1614	MLA-033													Y																					Y		
		SGS AXYS MLA-033	MLA-033					Y											Y						Y														
	BDE 35 3,3',4-tribromodiphenylether	EPA 1614	MLA-033													Y																					Y		
		SGS AXYS MLA-033	MLA-033					Y											Y						Y														
	BDE 37 3,4,4'-tribromodiphenylether	EPA 1614	MLA-033													Y																					Y		
		SGS AXYS MLA-033	MLA-033					Y											Y						Y														
	BDE 47 2,2',4,4'-tetrabromodiphenylether	EPA 1614	MLA-033													Y																					Y		
		SGS AXYS MLA-033	MLA-033					Y											Y						Y														
	BDE 49 2,2',4,5'-tetrabromodiphenylether	EPA 1614	MLA-033													Y																					Y		
		SGS AXYS MLA-033	MLA-033					Y											Y						Y														
	BDE 66 2,3',4,4'-tetrabromodiphenylether	EPA 1614	MLA-033													Y																					Y		
		SGS AXYS MLA-033	MLA-033					Y											Y						Y														
	BDE 7 2,4-dibromodiphenylether	EPA 1614	MLA-033													Y																					Y		
		SGS AXYS MLA-033	MLA-033					Y											Y						Y														
	BDE 75 2,4,4',6-tetrabromodiphenylether	EPA 1614	MLA-033													Y																					Y		
		SGS AXYS MLA-033	MLA-033					Y											Y						Y														
	BDE 77 3,3',4,4'-tetrabromodiphenylether	EPA 1614	MLA-033													Y																					Y		
		SGS AXYS MLA-033	MLA-033					Y											Y						Y														
	BDE 8 2,4'-dibromodiphenylether	EPA 1614	MLA-033													Y																					Y		
		SGS AXYS MLA-033	MLA-033					Y											Y						Y														
	BDE 85 2,2',3,4,4'-pentabromodiphenylether	EPA 1614	MLA-033													Y																					Y		
		SGS AXYS MLA-033	MLA-033					Y											Y						Y														
	BDE 99 2,2',4,4',5-pentabromodiphenylether	EPA 1614	MLA-033													Y																					Y		
		SGS AXYS MLA-033	MLA-033					Y											Y						Y														
PCB Aroclors	"Organochlorine Pesticides and PCBs" category (CA only)	EPA 625	MLA-007																										Y										
	"PCBs" category (CA only)	EPA 8270	MLA-007						Y																														
	PCB Aroclor 1016	EPA 1668	MLA-010							Y	Y																			Y	Y								
		EPA 625	MLA-007																											Y	Y			Y		Y			
		EPA 8270	MLA-007							Y				Y	Y																								
		SGS AXYS MLA-010	MLA-010							Y																				Y									
		SGS AXYS MLA-007	MLA-007					Y		Y									Y						Y					Y									
	PCB Aroclor 1016/1242	EPA 8270	MLA-007													Y																							
	PCB Aroclor 1221	EPA 1668	MLA-010							Y	Y																			Y	Y								
		EPA 625	MLA-007																											Y	Y			Y		Y			
		EPA 8270	MLA-007							Y				Y	Y	Y																							

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				Serum	Solids												Tissue							Urine	Water	Water, Non-Potable										AFFF	
Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	CALA	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	ANAB DoD **	ANAB ISO 17025	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	CALA	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Pennsylvania DEP	Virginia DGS	Washington DE *	ANAB DoD **	ANAB ISO 17025
		SGS AXYS MLA-010	MLA-010							Y																				Y									
		SGS AXYS MLA-007	MLA-007					Y		Y									Y						Y					Y									
	PCB Aroclor 1232	EPA 1668	MLA-010							Y	Y																			Y	Y								
		EPA 625	MLA-007																											Y	Y			Y		Y			
		EPA 8270	MLA-007							Y				Y	Y	Y																							
		SGS AXYS MLA-010	MLA-010							Y																				Y									
		SGS AXYS MLA-007	MLA-007					Y		Y									Y						Y					Y									
	PCB Aroclor 1242	EPA 1668	MLA-010							Y	Y																			Y	Y								
		EPA 625	MLA-007																											Y	Y			Y		Y			
		EPA 8270	MLA-007							Y				Y	Y																								
		SGS AXYS MLA-010	MLA-010							Y																				Y									
		SGS AXYS MLA-007	MLA-007					Y		Y									Y						Y					Y									
	PCB Aroclor 1248	EPA 1668	MLA-010							Y	Y																			Y	Y								
		EPA 625	MLA-007																											Y	Y			Y		Y			
		EPA 8270	MLA-007							Y				Y	Y	Y																							
		SGS AXYS MLA-010	MLA-010							Y																				Y									
		SGS AXYS MLA-007	MLA-007					Y		Y									Y						Y					Y									
	PCB Aroclor 1254	EPA 1668	MLA-010							Y	Y																			Y	Y								
		EPA 625	MLA-007																											Y	Y			Y		Y			
		EPA 8270	MLA-007							Y				Y	Y	Y																							
		SGS AXYS MLA-010	MLA-010							Y																				Y									
		SGS AXYS MLA-007	MLA-007					Y		Y									Y						Y					Y									
	PCB Aroclor 1260	EPA 1668	MLA-010							Y	Y																			Y	Y								
		EPA 625	MLA-007																											Y	Y			Y		Y			
		EPA 8270	MLA-007							Y				Y	Y	Y																							
		SGS AXYS MLA-010	MLA-010							Y																				Y									
		SGS AXYS MLA-007	MLA-007					Y		Y									Y						Y					Y									
	PCB Aroclor 1268	SGS AXYS MLA-007	MLA-007					Y											Y						Y														
PCB congeners	PCB 1 2-Chlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 10 2,6-Dichlorobiphenyl	EPA 1668	MLA-010							Y			Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 100 2,2',4,4',6-Pentachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 101 2,2',4,5,5'-Pentachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 101/90/89	EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
	PCB 102 2,2',4,5,6'-Pentachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 103 2,2',4,5',6-Pentachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 104 2,2',4,6,6'-Pentachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 105 2,3,3',4,4'-Pentachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									

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				Serum	Solids												Tissue							Urine	Water	Water, Non-Potable												AFFF	
Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	CALA	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	ANAB DoD **	ANAB ISO 17025	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	CALA	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Pennsylvania DEP	Virginia DGS	Washington DE *	ANAB DoD **	ANAB ISO 17025
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 105/127	EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
	PCB 106 2,3,3',4,5-Pentachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 107 2,3,3',4',5-Pentachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 107/109	EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
	PCB 108 2,3,3',4,5'-Pentachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 109 2,3,3',4,6-Pentachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 11 3,3'-Dichlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 110 2,3,3',4',6-Pentachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 111 2,3,3',5,5'-Pentachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 111/117	EPA 8270	MLA-007													Y																							
	PCB 112 2,3,3',5,6-Pentachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 113 2,3,3',5',6-Pentachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 114 2,3,4,4',5-Pentachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 115 2,3,4,4',6-Pentachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 116 2,3,4,5,6-Pentachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 117 2,3,4',5,6-Pentachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			

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				Serum	Solids												Tissue							Urine	Water	Water, Non-Potable												AFFF	
Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	CALA	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	ANAB DoD **	ANAB ISO 17025	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	CALA	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Pennsylvania DEP	Virginia DGS	Washington DE *	ANAB DoD **	ANAB ISO 17025
	PCB 118 2,3',4,4',5-Pentachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-901	MLA-901	Y																																			
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y							Y		
	PCB 118/106	EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
	PCB 119 2,3',4,4',6-Pentachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y							Y		
	PCB 12 3,4-Dichlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y							Y		
	PCB 12/13	EPA 8270	MLA-007													Y																							
	PCB 120 2,3',4,5,5'-Pentachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y							Y		
	PCB 121 2,3',4,5',6-Pentachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y							Y		
	PCB 122 2,3,3',4',5'-Pentachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y							Y		
	PCB 123 2,3',4,4',5'-Pentachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y							Y		
	PCB 124 2,3',4',5,5'-Pentachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y							Y		
	PCB 125 2,3',4',5',6-Pentachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y							Y		
	PCB 126 3,3',4,4',5-Pentachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y							Y		
	PCB 127 3,3',4,5,5'-Pentachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y							Y		
	PCB 128 2,2',3,3',4,4'-Hexachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y							Y		
	PCB 129 2,2',3,3',4,5-Hexachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														

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				Serum	Solids												Tissue						Urine	Water	Water, Non-Potable											AFFF	
Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	CALA	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	ANAB DoD **	ANAB ISO 17025	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	CALA	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Pennsylvania DEP	Virginia DGS	Washington DE *	ANAB DoD **	ANAB ISO 17025
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 13 3,4'-Dichlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y				Y						Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y				Y						Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 130 2,2',3,3',4,5'-Hexachlorobiphenyl	EPA 1668	MLA-010							Y			Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y				Y						Y									
		SGS AXYS MLA-007	MLA-007					Y											Y					Y															
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y				Y						Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 131 2,2',3,3',4,6-Hexachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y				Y						Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y				Y						Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 131/142	EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
	PCB 132 2,2',3,3',4,6'-Hexachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y				Y						Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y				Y						Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 132/168	EPA 8270	MLA-007													Y																							
	PCB 133 2,2',3,3',5,5'-Hexachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y				Y						Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y				Y						Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 134 2,2',3,3',5,6-Hexachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y				Y						Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y				Y						Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 134/143	EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
	PCB 135 2,2',3,3',5,6'-Hexachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y				Y						Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y				Y						Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 136 2,2',3,3',6,6'-Hexachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y				Y						Y									
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 137 2,2',3,4,4',5-Hexachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y				Y						Y									
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 138 2,2',3,4,4',5'-Hexachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y				Y						Y									
		SGS AXYS MLA-901	MLA-901	Y																																			
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 138/163/164	EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
	PCB 139 2,2',3,4,4',6-Hexachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y				Y						Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y				Y						Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 14 3,5-Dichlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y				Y						Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y				Y						Y									

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				Serum	Solids												Tissue							Urine	Water	Water, Non-Potable											AFFF	
Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	CALA	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	ANAB DoD **	ANAB ISO 17025	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	CALA	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Pennsylvania DEP	Virginia DGS	Washington DE *	ANAB DoD **	ANAB ISO 17025
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 140 2,2',3,4,4',6'-Hexachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 141 2,2',3,4,5,5'-Hexachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 142 2,2',3,4,5,6-Hexachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 143 2,2',3,4,5,6'-Hexachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 144 2,2',3,4,5',6-Hexachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 144/135	EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
	PCB 145 2,2',3,4,6,6'-Hexachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 146 2,2',3,4',5,5'-Hexachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
		SGS AXYS MLA-901	MLA-901	Y																																			
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 147 2,2',3,4',5,6-Hexachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 148 2,2',3,4',5,6'-Hexachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 149 2,2',3,4',5',6-Hexachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 149/139	EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
	PCB 15 4,4'-Dichlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 150 2,2',3,4',6,6'-Hexachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			

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				Serum	Solids												Tissue							Urine	Water	Water, Non-Potable												AFFF	
Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	CALA	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	ANAB DoD **	ANAB ISO 17025	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	CALA	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Pennsylvania DEP	Virginia DGS	Washington DE *	ANAB DoD **	ANAB ISO 17025
	PCB 151 2,2',3,5,5',6-Hexachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 152 2,2',3,5,6,6'-Hexachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 153 2,2',4,4',5,5'-Hexachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
		SGS AXYS MLA-901	MLA-901	Y																																			
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 154 2,2',4,4',5,6'-Hexachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 155 2,2',4,4',6,6'-Hexachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 156 2,3,3',4,4',5-Hexachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
		SGS AXYS MLA-901	MLA-901	Y																																			
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 157 2,3,3',4,4',5'-Hexachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 158 2,3,3',4,4',6-Hexachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 158/160	EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
	PCB 159 2,3,3',4,5,5'-Hexachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-007	MLA-007																						Y														
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 16 2,2',3-Trichlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 16/32	EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
	PCB 160 2,3,3',4,5,6-Hexachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 161 2,3,3',4,5',6-Hexachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							

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				Serum	Solids												Tissue						Urine	Water	Water, Non-Potable											AFFF	
Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	CALA	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	ANAB DoD **	ANAB ISO 17025	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	CALA	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Pennsylvania DEP	Virginia DGS	Washington DE *	ANAB DoD **	ANAB ISO 17025
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y							Y		
	PCB 162 2,3,3',4',5,5'-Hexachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y							Y		
	PCB 163 2,3,3',4',5,6-Hexachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y							Y		
	PCB 164 2,3,3',4',5',6-Hexachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y							Y		
	PCB 165 2,3,3',5,5',6-Hexachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y							Y		
	PCB 166 2,3,4,4',5,6-Hexachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y							Y		
	PCB 167 2,3',4,4',5,5'-Hexachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y							Y		
	PCB 168 2,3',4,4',5',6-Hexachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y							Y		
	PCB 169 3,3',4,4',5,5'-Hexachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-007	MLA-007					Y											Y																				
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y							Y		
	PCB 17 2,2',4-Trichlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y							Y		
	PCB 170 2,2',3,3',4,4',5-Heptachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-901	MLA-901	Y																																			
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y							Y		
	PCB 170/190	EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
	PCB 171 2,2',3,3',4,4',6-Heptachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y							Y		
	PCB 172 2,2',3,3',4,5,5'-Heptachlorobiphenyl	EPA 1668	MLA-010							Y			Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y							Y		
	PCB 172/192	EPA 8270	MLA-007													Y																							

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				Serum	Solids												Tissue						Urine	Water	Water, Non-Potable											AFFF	
Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	CALA	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	ANAB DoD **	ANAB ISO 17025	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	CALA	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Pennsylvania DEP	Virginia DGS	Washington DE *	ANAB DoD **	ANAB ISO 17025
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
	PCB 173 2,2',3,3',4,5,6-Heptachlorobiphenyl	EPA 1668	MLA-010							Y			Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 174 2,2',3,3',4,5,6'-Heptachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 174/181	EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
	PCB 175 2,2',3,3',4,5',6-Heptachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 176 2,2',3,3',4,6,6'-Heptachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 177 2,2',3,3',4,5',6'-Heptachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 178 2,2',3,3',5,5',6-Heptachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 179 2,2',3,3',5,6,6'-Heptachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 18 2,2',5-Trichlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 180 2,2',3,4,4',5,5'-Heptachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
		SGS AXYS MLA-901	MLA-901	Y																																			
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 181 2,2',3,4,4',5,6-Heptachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 182 2,2',3,4,4',5,6'-Heptachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 183 2,2',3,4,4',5',6-Heptachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							

Accreditation Scope

SGS AXYS Analytical Services Ltd.
file ref.: ACC-101 Rev. 49

				Serum	Solids												Tissue						Urine	Water	Water, Non-Potable											AFFF	
Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	CALA	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	ANAB DoD **	ANAB ISO 17025	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	CALA	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Pennsylvania DEP	Virginia DGS	Washington DE *	ANAB DoD **	ANAB ISO 17025
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y							Y		
	PCB 184 2,2',3,4,4',6,6'-Heptachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y							Y		
	PCB 185 2,2',3,4,5,5',6-Heptachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y							Y		
	PCB 186 2,2',3,4,5,6,6'-Heptachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y							Y		
	PCB 187 2,2',3,4',5,5',6-Heptachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-901	MLA-901	Y																																			
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y							Y		
	PCB 187/182	EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
	PCB 188 2,2',3,4',5,6,6'-Heptachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y							Y		
	PCB 189 2,3,3',4,4',5,5'-Heptachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y							Y		
	PCB 19 2,2',6-Trichlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y							Y		
	PCB 190 2,3,3',4,4',5,6-Heptachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y							Y		
	PCB 191 2,3,3',4,4',5',6-Heptachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y							Y		
	PCB 192 2,3,3',4,5,5',6-Heptachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y							Y		
	PCB 193 2,3,3',4',5,5',6-Heptachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y							Y		
	PCB 194 2,2',3,3',4,4',5,5'-Octachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		

Accreditation Scope

SGS AXYS Analytical Services Ltd.
file ref.: ACC-101 Rev. 49

				Serum	Solids												Tissue							Urine	Water	Water, Non-Potable											AFFF	
Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	CALA	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	ANAB DoD **	ANAB ISO 17025	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	CALA	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Pennsylvania DEP	Virginia DGS	Washington DE *	ANAB DoD **	ANAB ISO 17025
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
		SGS AXYS MLA-901	MLA-901	Y																																			
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 195 2,2',3,3',4,4',5,6-Octachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 196 2,2',3,3',4,4',5,6'-Octachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 196/203	EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
	PCB 197 2,2',3,3',4,4',6,6'-Octachlorobiphenyl	EPA 1668	MLA-010							Y			Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 198 2,2',3,3',4,5,5',6-Octachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 199 2,2',3,3',4,5,5',6'-Octachlorobiphenyl	EPA 1668	MLA-010							Y			Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 2 3-Chlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 20 2,3,3'-Trichlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 200 2,2',3,3',4,5,6,6'-Octachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 201 2,2',3,3',4,5',6,6'-Octachlorobiphenyl	EPA 1668	MLA-010							Y			Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 202 2,2',3,3',5,5',6,6'-Octachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 203 2,2',3,4,4',5,5',6-Octachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			

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				Serum	Solids												Tissue							Urine	Water	Water, Non-Potable												AFFF	
Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	CALA	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	ANAB DoD **	ANAB ISO 17025	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	CALA	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Pennsylvania DEP	Virginia DGS	Washington DE *	ANAB DoD **	ANAB ISO 17025
	PCB 204 2,2',3,4,4',5,6,6'-Octachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 205 2,3,3',4,4',5,5',6-Octachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 206 2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 207 2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl	EPA 1668	MLA-010							Y			Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 208 2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl	EPA 1668	MLA-010							Y			Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 209 Decachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 21 2,3,4-Trichlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 22 2,3,4'-Trichlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 23 2,3,5-Trichlorobiphenyl	EPA 1668	MLA-010							Y			Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 23/34	EPA 8270	MLA-007													Y																							
	PCB 24 2,3,6-Trichlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 24/27	EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
	PCB 25 2,3',4-Trichlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 26 2,3',5-Trichlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									

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				Serum	Solids												Tissue						Urine	Water	Water, Non-Potable											AFFF	
Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	CALA	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	ANAB DoD **	ANAB ISO 17025	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	CALA	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Pennsylvania DEP	Virginia DGS	Washington DE *	ANAB DoD **	ANAB ISO 17025
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y							Y		
	PCB 27 2,3',6-Trichlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y							Y		
	PCB 28 2,4,4'-Trichlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y							Y		
	PCB 29 2,4,5-Trichlorobiphenyl	EPA 1668	MLA-010							Y			Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y							Y		
	PCB 3 4-Chlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y							Y		
	PCB 30 2,4,6-Trichlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y							Y		
	PCB 31 2,4',5-Trichlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y							Y		
	PCB 32 2,4',6-Trichlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y							Y		
	PCB 33 2,3',4'-Trichlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y							Y		
	PCB 33/20/21	EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
	PCB 34 2,3',5'-Trichlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y							Y		
	PCB 35 3,3',4-Trichlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y							Y		
	PCB 36 3,3',5-Trichlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y							Y		
	PCB 37 3,4,4'-Trichlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y							Y		
	PCB 38 3,4,5-Trichlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									

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				Serum	Solids												Tissue							Urine	Water	Water, Non-Potable												AFFF	
Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	CALA	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	ANAB DoD **	ANAB ISO 17025	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	CALA	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Pennsylvania DEP	Virginia DGS	Washington DE *	ANAB DoD **	ANAB ISO 17025
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y								Y						Y		
	PCB 39 3,4',5-Trichlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y								Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y								Y						Y		
	PCB 4 2,2'-Dichlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y								Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y								Y						Y		
	PCB 4/10	EPA 8270	MLA-007													Y																							
	PCB 40 2,2',3,3'-Tetrachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y								Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y								Y						Y		
	PCB 41 2,2',3,4-Tetrachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y								Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y								Y						Y		
	PCB 41/71/64/68	EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
	PCB 42 2,2',3,4'-Tetrachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y								Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y								Y						Y		
	PCB 42/59	EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
	PCB 43 2,2',3,5-Tetrachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y								Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y								Y						Y		
	PCB 44 2,2',3,5'-Tetrachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y								Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y								Y						Y		
	PCB 45 2,2',3,6-Tetrachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y								Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y								Y						Y		
	PCB 46 2,2',3,6'-Tetrachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y								Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y								Y						Y		
	PCB 47 2,2',4,4'-Tetrachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y								Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y								Y						Y		
	PCB 47/48/75	EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
	PCB 48 2,2',4,5-Tetrachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y								Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y								Y						Y		
	PCB 49 2,2',4,5'-Tetrachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y								Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y								Y						Y		

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				Serum	Solids												Tissue							Urine	Water	Water, Non-Potable											AFFF	
Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	CALA	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	ANAB DoD **	ANAB ISO 17025	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	CALA	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Pennsylvania DEP	Virginia DGS	Washington DE *	ANAB DoD **	ANAB ISO 17025
	PCB 49/43	EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-007	MLA-007																Y						Y														
	PCB 5 2,3-Dichlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 50 2,2',4,6-Tetrachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 51 2,2',4,6'-Tetrachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 52 2,2',5,5'-Tetrachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 52/73	EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
	PCB 53 2,2',5,6'-Tetrachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 54 2,2',6,6'-Tetrachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 55 2,3,3',4-Tetrachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 56 2,3,3',4'-Tetrachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 56/60	EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
	PCB 57 2,3,3',5-Tetrachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 58 2,3,3',5'-Tetrachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 59 2,3,3',6-Tetrachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 6 2,3'-Dichlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 60 2,3,4,4'-Tetrachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									

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				Serum	Solids												Tissue							Urine	Water	Water, Non-Potable											AFFF	
Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	CALA	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	ANAB DoD **	ANAB ISO 17025	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	CALA	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Pennsylvania DEP	Virginia DGS	Washington DE *	ANAB DoD **	ANAB ISO 17025
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 61 2,3,4,5-Tetrachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 62 2,3,4,6-Tetrachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 62/65	EPA 8270	MLA-007													Y																							
	PCB 63 2,3,4',5-Tetrachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 64 2,3,4',6-Tetrachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 65 2,3,5,6-Tetrachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 66 2,3',4,4'-Tetrachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 66/80	EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
	PCB 67 2,3',4,5-Tetrachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 68 2,3',4,5'-Tetrachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 69 2,3',4,6-Tetrachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 7 2,4-Dichlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 7/9	EPA 8270	MLA-007													Y																							
	PCB 70 2,3',4',5-Tetrachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 70/76	EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
	PCB 71 2,3',4',6-Tetrachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 72 2,3',5,5'-Tetrachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 73 2,3',5',6-Tetrachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									

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				Serum	Solids												Tissue						Urine	Water	Water, Non-Potable											AFFF	
Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	CALA	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	ANAB DoD **	ANAB ISO 17025	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	CALA	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Pennsylvania DEP	Virginia DGS	Washington DE *	ANAB DoD **	ANAB ISO 17025
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 74 2,4,4',5-Tetrachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-901	MLA-901	Y																																			
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 74/61	EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
	PCB 75 2,4,4',6-Tetrachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 76 2,3',4',5'-Tetrachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 77 3,3',4,4'-Tetrachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 78 3,3',4,5-Tetrachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 79 3,3',4,5'-Tetrachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 8 2,4'-Dichlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 8/5	EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
	PCB 80 3,3',5,5'-Tetrachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 81 3,4,4',5-Tetrachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 82 2,2',3,3',4-Pentachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 83 2,2',3,3',5-Pentachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 83/108	EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
	PCB 84 2,2',3,3',6-Pentachlorobiphenyl	EPA 1668	MLA-010							Y			Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			

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				Serum	Solids												Tissue							Urine	Water	Water, Non-Potable												AFFF	
Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	CALA	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	ANAB DoD **	ANAB ISO 17025	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	CALA	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Pennsylvania DEP	Virginia DGS	Washington DE *	ANAB DoD **	ANAB ISO 17025
	PCB 85 2,2',3,4,4'-Pentachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y							Y		
	PCB 85/120	EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
	PCB 86 2,2',3,4,5-Pentachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y							Y		
	PCB 87 2,2',3,4,5'-Pentachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y							Y		
	PCB 87/115/116	EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
	PCB 88 2,2',3,4,6-Pentachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y							Y		
	PCB 88/121	EPA 8270	MLA-007													Y																							
	PCB 89 2,2',3,4,6'-Pentachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y							Y		
	PCB 9 2,5-Dichlorobiphenyl	EPA 1668	MLA-010							Y			Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y							Y		
	PCB 90 2,2',3,4',5-Pentachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y							Y		
	PCB 91 2,2',3,4',6-Pentachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y							Y		
	PCB 92 2,2',3,5,5'-Pentachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y							Y		
	PCB 93 2,2',3,5,6-Pentachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y							Y		
	PCB 94 2,2',3,5,6'-Pentachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y							Y		
	PCB 95 2,2',3,5',6-Pentachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y							Y		
	PCB 95/93	EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
	PCB 96 2,2',3,6,6'-Pentachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y							Y		
	PCB 97 2,2',3,4',5'-Pentachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y							Y		
	PCB 97/86	EPA 8270	MLA-007													Y																							
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														

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				Serum	Solids													Tissue						Urine	Water	Water, Non-Potable											AFFF	
Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	CALA	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	ANAB DoD **	ANAB ISO 17025	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	CALA	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Pennsylvania DEP	Virginia DGS	Washington DE *	ANAB DoD **	ANAB ISO 17025
	PCB 98 2,2',3,4',6'-Pentachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB 98/102	EPA 8270	MLA-007													Y																						
	PCB 99 2,2',4,4',5-Pentachlorobiphenyl	EPA 1668	MLA-010							Y	Y		Y	Y	Y	Y				Y			Y							Y			Y	Y	Y	Y	Y		
		EPA 8270	MLA-007													Y																						
		SGS AXYS MLA-010	MLA-010	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-007	MLA-007					Y											Y						Y														
		SGS AXYS MLA-901	MLA-901	Y																																		
		SGS AXYS MLA-210	MLA-210					Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	PCB congeners, total	EPA 1668	MLA-010											Y																				Y				
	PCBs, as congeners	EPA 1668	MLA-010																	Y																		
		SGS AXYS MLA-010	MLA-010																	Y																		
		SGS AXYS MLA-210	MLA-210							Y										Y										Y								
		SGS AXYS MLA-908	MLA-908							Y										Y										Y								
	Total Dichlorobiphenyls	EPA 8270	MLA-007													Y																						
		SGS AXYS MLA-010	MLA-010	Y				Y											Y						Y													
		SGS AXYS MLA-007	MLA-007					Y											Y						Y													
		SGS AXYS MLA-210	MLA-210					Y											Y																			
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	Total Heptachlorobiphenyls	EPA 8270	MLA-007													Y																						
		SGS AXYS MLA-010	MLA-010	Y				Y											Y						Y													
		SGS AXYS MLA-007	MLA-007					Y											Y						Y													
		SGS AXYS MLA-210	MLA-210					Y											Y																			
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	Total Hexachlorobiphenyls	EPA 8270	MLA-007													Y																						
		SGS AXYS MLA-010	MLA-010	Y				Y											Y						Y													
		SGS AXYS MLA-007	MLA-007					Y											Y						Y													
		SGS AXYS MLA-210	MLA-210					Y											Y																			
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	Total Monochlorobiphenyls	SGS AXYS MLA-010	MLA-010	Y				Y											Y						Y													
		SGS AXYS MLA-210	MLA-210					Y											Y																			
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	Total Nonachlorobiphenyls	EPA 8270	MLA-007													Y																						
		SGS AXYS MLA-010	MLA-010	Y				Y											Y						Y													
		SGS AXYS MLA-007	MLA-007					Y											Y						Y													
		SGS AXYS MLA-210	MLA-210					Y											Y																			
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	Total Octachlorobiphenyls	EPA 8270	MLA-007													Y																						
		SGS AXYS MLA-010	MLA-010	Y				Y											Y						Y													
		SGS AXYS MLA-007	MLA-007					Y											Y						Y													
		SGS AXYS MLA-210	MLA-210					Y											Y																			
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	Total Pentachlorobiphenyls	EPA 8270	MLA-007													Y																						
		SGS AXYS MLA-010	MLA-010	Y				Y											Y						Y													
		SGS AXYS MLA-007	MLA-007					Y											Y						Y													
		SGS AXYS MLA-210	MLA-210					Y											Y																			
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	Total Polychlorinated biphenyls	SGS AXYS MLA-007	MLA-007					Y											Y						Y													
	Total Tetrachlorobiphenyls	EPA 8270	MLA-007													Y																						
		SGS AXYS MLA-010	MLA-010	Y				Y											Y						Y													
		SGS AXYS MLA-007	MLA-007					Y											Y						Y													
		SGS AXYS MLA-210	MLA-210					Y											Y																			
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
	Total Trichlorobiphenyls	EPA 8270	MLA-007													Y																						
		SGS AXYS MLA-010	MLA-010	Y				Y											Y						Y													
		SGS AXYS MLA-007	MLA-007					Y											Y						Y													
		SGS AXYS MLA-210	MLA-210					Y											Y																			
		SGS AXYS MLA-908	MLA-908							Y					Y					Y			Y							Y						Y			
PCDDF	"Dioxins and Dibenzofurans" category (CA only)	EPA 1613	MLA-017																										Y									
		EPA 8290	MLA-017						Y																													
	1,2,3,4,6,7,8-HpCDD	EPA 1613	MLA-017		Y					Y						Y				Y						Y				Y	Y		Y	Y		Y	Y		
		EPA 8290	MLA-017		Y					Y	Y		Y	Y	Y					Y		Y	Y			Y				Y				Y		Y			
		SGS AXYS MLA-017	MLA-017	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-217	MLA-217					Y		Y									Y	Y					Y					Y									
	1,2,3,4,6,7,8-HpCDF	EPA 1613	MLA-017		Y					Y						Y				Y						Y				Y	Y		Y	Y		Y	Y		
		EPA 8290	MLA-017		Y					Y	Y		Y	Y	Y					Y		Y	Y			Y				Y				Y		Y			
		SGS AXYS MLA-017	MLA-017	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-217	MLA-217					Y		Y									Y	Y					Y					Y									
	1,2,3,4,7,8,9-HpCDF	EPA 1613	MLA-017		Y					Y						Y				Y						Y				Y	Y		Y	Y		Y	Y		
		EPA 8290	MLA-017		Y					Y	Y		Y	Y	Y					Y		Y	Y			Y				Y				Y		Y			

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				Serum	Solids												Tissue						Urine	Water	Water, Non-Potable											AFFF	
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		SGS AXYS MLA-017	MLA-017	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-217	MLA-217					Y		Y									Y	Y					Y					Y									
	1,2,3,4,7,8-HxCDD	EPA 1613	MLA-017		Y					Y						Y				Y						Y				Y	Y		Y	Y		Y	Y		
		EPA 8290	MLA-017		Y					Y	Y		Y	Y	Y					Y		Y	Y			Y				Y				Y		Y			
		SGS AXYS MLA-017	MLA-017	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-217	MLA-217					Y		Y									Y	Y					Y					Y									
	1,2,3,4,7,8-HxCDF	EPA 1613	MLA-017		Y					Y						Y				Y						Y				Y	Y		Y	Y		Y	Y		
		EPA 8290	MLA-017		Y					Y	Y		Y	Y	Y					Y		Y	Y			Y				Y				Y		Y			
		SGS AXYS MLA-017	MLA-017	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-217	MLA-217					Y		Y									Y	Y					Y					Y									
	1,2,3,6,7,8-HxCDD	EPA 1613	MLA-017		Y					Y						Y				Y						Y				Y	Y		Y	Y		Y	Y		
		EPA 8290	MLA-017		Y					Y	Y		Y	Y	Y					Y		Y	Y			Y				Y				Y		Y			
		SGS AXYS MLA-017	MLA-017	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-217	MLA-217					Y		Y									Y	Y					Y					Y									
	1,2,3,6,7,8-HxCDF	EPA 1613	MLA-017		Y					Y						Y				Y						Y				Y	Y		Y	Y		Y	Y		
		EPA 8290	MLA-017		Y					Y	Y		Y	Y	Y					Y		Y	Y			Y				Y				Y		Y			
		SGS AXYS MLA-017	MLA-017	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-217	MLA-217					Y		Y									Y	Y					Y					Y									
	1,2,3,7,8,9-HxCDD	EPA 1613	MLA-017		Y					Y						Y				Y						Y				Y	Y		Y	Y		Y	Y		
		EPA 8290	MLA-017		Y					Y	Y		Y	Y	Y					Y		Y	Y			Y				Y				Y		Y			
		SGS AXYS MLA-017	MLA-017	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-217	MLA-217					Y		Y									Y	Y					Y					Y									
	1,2,3,7,8,9-HxCDF	EPA 1613	MLA-017		Y					Y						Y				Y						Y				Y	Y		Y	Y		Y	Y		
		EPA 8290	MLA-017		Y					Y	Y		Y	Y	Y					Y		Y	Y			Y				Y				Y		Y			
		SGS AXYS MLA-017	MLA-017	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-217	MLA-217					Y		Y									Y	Y					Y					Y									
	1,2,3,7,8-PeCDD	EPA 1613	MLA-017		Y					Y						Y				Y						Y				Y	Y		Y	Y		Y	Y		
		EPA 8290	MLA-017		Y					Y	Y		Y	Y	Y					Y		Y	Y			Y				Y				Y		Y			
		SGS AXYS MLA-017	MLA-017	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-217	MLA-217					Y		Y									Y	Y					Y					Y									
	1,2,3,7,8-PeCDF	EPA 1613	MLA-017		Y					Y						Y				Y						Y				Y	Y		Y	Y		Y	Y		
		EPA 8290	MLA-017		Y					Y	Y		Y	Y	Y					Y		Y	Y			Y				Y				Y		Y			
		SGS AXYS MLA-017	MLA-017	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-217	MLA-217					Y		Y									Y	Y					Y					Y									
	2,3,4,6,7,8-HxCDF	EPA 1613	MLA-017		Y					Y						Y				Y						Y				Y	Y		Y	Y		Y	Y		
		EPA 8290	MLA-017		Y					Y	Y		Y	Y	Y					Y		Y	Y			Y				Y				Y		Y			
		SGS AXYS MLA-017	MLA-017	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-217	MLA-217					Y		Y									Y	Y					Y					Y									
	2,3,4,7,8-PeCDF	EPA 1613	MLA-017		Y					Y						Y				Y						Y				Y	Y		Y	Y		Y	Y		
		EPA 8290	MLA-017		Y					Y	Y		Y	Y	Y					Y		Y	Y			Y				Y				Y		Y			
		SGS AXYS MLA-017	MLA-017	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-217	MLA-217					Y		Y									Y	Y					Y					Y									
	2,3,7,8-TCDD	EPA 1613	MLA-017		Y					Y						Y				Y						Y				Y	Y		Y	Y		Y	Y		
		EPA 8290	MLA-017		Y					Y	Y		Y	Y	Y					Y		Y	Y			Y				Y				Y		Y			
		SGS AXYS MLA-017	MLA-017	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-217	MLA-217					Y		Y									Y	Y					Y					Y									
	2,3,7,8-TCDF	EPA 1613	MLA-017		Y					Y						Y				Y						Y				Y	Y		Y	Y		Y	Y		
		EPA 8290	MLA-017		Y					Y	Y		Y	Y	Y					Y		Y	Y			Y				Y				Y		Y			
		SGS AXYS MLA-017	MLA-017	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-217	MLA-217					Y		Y									Y	Y					Y					Y									
	OCDD	EPA 1613	MLA-017		Y					Y						Y				Y						Y				Y	Y		Y	Y		Y	Y		
		EPA 8290	MLA-017		Y					Y	Y		Y	Y	Y					Y		Y	Y			Y				Y				Y		Y			
		SGS AXYS MLA-017	MLA-017	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-217	MLA-217					Y		Y									Y	Y					Y					Y									
	OCDF	EPA 1613	MLA-017		Y					Y						Y				Y						Y				Y	Y		Y	Y		Y	Y		
		EPA 8290	MLA-017		Y					Y	Y		Y	Y	Y					Y		Y	Y			Y				Y				Y		Y			
		SGS AXYS MLA-017	MLA-017	Y				Y		Y									Y	Y					Y					Y									
		SGS AXYS MLA-217	MLA-217					Y		Y									Y	Y					Y					Y									
	Total HpCDD	EPA 1613	MLA-017		Y					Y										Y						Y				Y	Y								
		EPA 8290	MLA-017		Y					Y	Y		Y		Y					Y		Y	Y			Y				Y						Y			
		SGS AXYS MLA-017	MLA-017							Y										Y										Y									
		SGS AXYS MLA-217	MLA-217							Y										Y										Y									
	Total HpCDF	EPA 1613	MLA-017		Y					Y										Y						Y				Y	Y								
		EPA 8290	MLA-017		Y					Y	Y		Y		Y					Y		Y	Y			Y				Y						Y			
		SGS AXYS MLA-017	MLA-017							Y										Y										Y									
		SGS AXYS MLA-217	MLA-217							Y										Y										Y									
	Total HxCDD	EPA 1613	MLA-017		Y					Y										Y						Y				Y	Y								
		EPA 8290	MLA-017		Y					Y	Y		Y		Y					Y		Y	Y			Y				Y						Y			
		SGS AXYS MLA-017	MLA-017							Y										Y										Y									
		SGS AXYS MLA-217	MLA-217							Y										Y										Y									
	Total HxCDF	EPA 1613	MLA-017		Y					Y										Y						Y				Y	Y								
		EPA 8290	MLA-017		Y					Y	Y		Y		Y					Y		Y	Y			Y				Y						Y			
		SGS AXYS MLA-017	MLA-017							Y										Y										Y									

Accreditation Scope

SGS AXYS Analytical Services Ltd.
file ref.: ACC-101 Rev. 49

				Serum	Solids											Tissue						Urine	Water	Water, Non-Potable										AFFF	
Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	CALA	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	ANAB DoD **	ANAB ISO 17025	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	CALA	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Pennsylvania DEP	Virginia DGS	Washington DE *	ANAB DoD **	ANAB ISO 17025
		SGS AXYS MLA-217	MLA-217							Y										Y										Y									
	Total PCDD	EPA 1613	MLA-017		Y																					Y													
		EPA 8290	MLA-017		Y																					Y													
	Total PCDD/F	EPA 1613	MLA-017		Y																					Y													
		EPA 8290	MLA-017		Y																					Y													
	Total PCDF	EPA 1613	MLA-017		Y																					Y													
		EPA 8290	MLA-017		Y																					Y													
	Total PeCDD	EPA 1613	MLA-017		Y					Y										Y						Y				Y	Y								
		EPA 8290	MLA-017		Y					Y	Y		Y		Y					Y		Y	Y			Y				Y							Y		
		SGS AXYS MLA-017	MLA-017							Y										Y										Y									
		SGS AXYS MLA-217	MLA-217							Y										Y										Y									
	Total PeCDF	EPA 1613	MLA-017		Y					Y										Y						Y				Y	Y								
		EPA 8290	MLA-017		Y					Y	Y		Y		Y					Y		Y	Y			Y				Y							Y		
		SGS AXYS MLA-017	MLA-017							Y										Y										Y									
		SGS AXYS MLA-217	MLA-217							Y										Y										Y									
	Total TCDD	EPA 1613	MLA-017		Y					Y										Y						Y				Y	Y								
		EPA 8290	MLA-017		Y					Y	Y		Y		Y					Y		Y	Y			Y				Y							Y		
		SGS AXYS MLA-017	MLA-017							Y										Y										Y									
		SGS AXYS MLA-217	MLA-217							Y										Y										Y									
	Total TCDF	EPA 1613	MLA-017		Y					Y										Y						Y				Y	Y								
		EPA 8290	MLA-017		Y					Y	Y		Y		Y					Y		Y	Y			Y				Y							Y		
		SGS AXYS MLA-017	MLA-017							Y										Y										Y									
		SGS AXYS MLA-217	MLA-217							Y										Y										Y									
PFAS	"Per- and Polyfluorinated Alkyl Substances (PFAS)" category (CA only)	DoD QSM Version 5.1	MLA-110																										Y										
	11-chloroeicosafluoro-3-oxaundecane-1-sulfonate (11Cl-PF3OUdS)	SGS AXYS MLA-110	MLA-110			Y	Y										Y	Y								Y	Y	Y										Y	Y
	11-chloroeicosafluoro-3-oxaundecane-1-sulfonate (11Cl-PF3UdS)	SGS AXYS MLA-110	MLA-110					Y											Y						Y														
	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11-Cl-PF3OUdS)	SGS AXYS MLA-110	MLA-110							Y										Y										Y									
	4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	SGS AXYS MLA-110	MLA-110							Y		Y								Y	Y									Y		Y							
	4,8-dioxa-3H-perfuorononanoate (ADONA)	SGS AXYS MLA-110	MLA-110			Y	Y										Y	Y								Y	Y	Y										Y	Y
	4:2 Fluorotelomersulfonate (4:2 FTS)	SGS AXYS MLA-110	MLA-110			Y	Y	Y		Y		Y				Y	Y	Y	Y	Y	Y			Y			Y	Y		Y		Y					Y	Y	Y
	6:2 Fluorotelomersulfonate (6:2 FTS)	SGS AXYS MLA-110	MLA-110			Y	Y	Y		Y		Y				Y	Y	Y	Y	Y	Y			Y			Y	Y		Y		Y					Y	Y	Y
	8:2 Fluorotelomersulfonate (8:2 FTS)	SGS AXYS MLA-110	MLA-110			Y	Y	Y		Y		Y				Y	Y	Y	Y	Y	Y			Y			Y	Y		Y		Y					Y	Y	Y
	9-chlorohexadecafluoro-3-oxanonane-1-sufonate (9Cl-PF3ONS)	SGS AXYS MLA-110	MLA-110			Y	Y										Y	Y								Y	Y	Y										Y	Y
	9-chlorohexadecafluoro-3-oxanonane-1-sulfonate (9Cl-PF3ONS)	SGS AXYS MLA-110	MLA-110					Y											Y						Y														
	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9-Cl-PF3ONS)	SGS AXYS MLA-110	MLA-110							Y										Y										Y									
	Dodecafluoro-3H-4,8-dioxanonanoate (ADONA)	SGS AXYS MLA-110	MLA-110					Y											Y						Y														
	Hexafluoropropylene oxide dimer acid (HFPO-DA)	SGS AXYS MLA-110	MLA-110					Y											Y						Y														
	Hexafluoropropylene oxide dimer acid, anion and acid (HFPO-DA)	SGS AXYS MLA-110	MLA-110			Y	Y										Y	Y								Y	Y	Y										Y	Y
	Hexaflurorpropylene oxide dimer acid (HFPO-DA)	SGS AXYS MLA-110	MLA-110							Y		Y								Y	Y									Y		Y							
	N-Ethylperfluorooctane sulfonamide (EtFOSAm)	SGS AXYS MLA-110	MLA-110							Y		Y								Y	Y									Y		Y							
	N-Ethylperfluorooctanesulfonamide (N-EtFOSA)	SGS AXYS MLA-110	MLA-110		Y	Y	Y	Y								Y	Y	Y	Y						Y		Y	Y										Y	Y	Y
	N-Ethylperfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	SGS AXYS MLA-110	MLA-110		Y	Y	Y	Y		Y		Y				Y	Y	Y	Y	Y	Y				Y		Y	Y		Y		Y					Y	Y	Y
	N-Ethylperfluorooctanesulfonamidoethanol (N-EtFOSE)	SGS AXYS MLA-110	MLA-110		Y	Y	Y	Y		Y		Y				Y	Y	Y	Y	Y	Y				Y		Y	Y		Y		Y					Y	Y	Y
	N-Methylperfluorooctanesulfonamide (N-MeFOSA)	SGS AXYS MLA-110	MLA-110		Y	Y	Y	Y		Y		Y				Y	Y	Y	Y	Y	Y				Y		Y	Y		Y		Y					Y	Y	Y
	N-Methylperfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	SGS AXYS MLA-110	MLA-110		Y	Y	Y	Y		Y		Y				Y	Y	Y	Y	Y	Y				Y		Y	Y		Y		Y					Y	Y	Y
	N-Methylperfluorooctanesulfonamidoethanol (N-MeFOSE)	SGS AXYS MLA-110	MLA-110		Y	Y	Y	Y		Y		Y				Y	Y	Y	Y	Y	Y				Y		Y	Y		Y		Y					Y	Y	Y
	Perfluorobutanesulfonate (PFBS)	SGS AXYS MLA-060	MLA-060																						Y					Y		Y	Y						
		SGS AXYS MLA-041	MLA-041					Y		Y		Y	Y																										
		SGS AXYS MLA-043	MLA-043																Y	Y	Y	Y																	
		SGS AXYS MLA-042	MLA-042	Y																																			
		SGS AXYS MLA-110	MLA-110			Y	Y	Y		Y		Y				Y	Y	Y	Y	Y	Y				Y		Y	Y		Y		Y					Y	Y	Y
	Perfluorobutanoate (PFBA)	SGS AXYS MLA-060	MLA-060																						Y					Y		Y	Y						
		SGS AXYS MLA-041	MLA-041					Y		Y		Y	Y																										
		SGS AXYS MLA-043	MLA-043																Y	Y	Y	Y																	
		SGS AXYS MLA-042	MLA-042	Y																																			
		SGS AXYS MLA-110	MLA-110			Y	Y	Y		Y		Y				Y	Y	Y	Y	Y	Y				Y		Y	Y		Y		Y					Y	Y	Y
	Perfluorodecanesulfonate (PFDS)	SGS AXYS MLA-110	MLA-110			Y	Y	Y		Y		Y				Y	Y	Y	Y	Y	Y				Y		Y	Y		Y		Y					Y	Y	Y
	Perfluorodecanoate (PFDA)	SGS AXYS MLA-060	MLA-060																						Y					Y		Y	Y						
		SGS AXYS MLA-041	MLA-041					Y		Y		Y	Y																										
		SGS AXYS MLA-043	MLA-043																Y	Y	Y	Y																	
		SGS AXYS MLA-042	MLA-042	Y																																			
		SGS AXYS MLA-110	MLA-110			Y	Y	Y		Y		Y				Y	Y	Y	Y	Y	Y				Y		Y	Y		Y		Y					Y	Y	Y
	Perfluorododecanesulfonate (PFDoS)	SGS AXYS MLA-110	MLA-110			Y	Y	Y		Y		Y				Y	Y	Y	Y	Y	Y				Y	Y	Y	Y		Y		Y					Y	Y	Y
	Perfluorododecanoate (PFDoA)	SGS AXYS MLA-060	MLA-060																						Y					Y		Y	Y						
		SGS AXYS MLA-041	MLA-041					Y		Y		Y	Y																										
		SGS AXYS MLA-043	MLA-043																Y	Y	Y	Y																	
		SGS AXYS MLA-042	MLA-042	Y																																			
		SGS AXYS MLA-110	MLA-110			Y	Y	Y		Y		Y				Y	Y	Y	Y	Y	Y				Y		Y	Y		Y		Y					Y	Y	Y
	Perfluoroheptanesulfonate (PFHpS)	SGS AXYS MLA-110	MLA-110			Y	Y	Y		Y		Y				Y	Y	Y	Y	Y	Y				Y		Y	Y		Y		Y					Y	Y	Y

Accreditation Scope

SGS AXYS Analytical Services Ltd.
file ref.: ACC-101 Rev. 49

				Serum	Solids											Tissue							Urine	Water	Water, Non-Potable										AFFF	
Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	CALA	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	ANAB DoD **	ANAB ISO 17025	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	CALA	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Pennsylvania DEP	Virginia DGS	Washington DE *	ANAB DoD **	ANAB ISO 17025
	Perfluoroheptanoate (PFHpA)	SGS AXYS MLA-060	MLA-060																						Y					Y		Y	Y							
		SGS AXYS MLA-041	MLA-041					Y		Y		Y	Y																										
		SGS AXYS MLA-043	MLA-043																Y	Y	Y	Y																	
		SGS AXYS MLA-042	MLA-042	Y																																			
		SGS AXYS MLA-110	MLA-110			Y	Y	Y		Y		Y				Y	Y	Y	Y	Y	Y				Y		Y	Y		Y		Y					Y	Y	Y
	Perfluorohexanesulfonate (PFHxS)	SGS AXYS MLA-060	MLA-060																						Y					Y		Y	Y							
		SGS AXYS MLA-041	MLA-041					Y		Y		Y	Y																										
		SGS AXYS MLA-043	MLA-043																Y	Y	Y	Y																	
		SGS AXYS MLA-042	MLA-042	Y																																			
		SGS AXYS MLA-110	MLA-110			Y	Y	Y		Y		Y				Y	Y	Y	Y	Y	Y				Y		Y	Y		Y		Y					Y	Y	Y
	Perfluorohexanoate (PFHxA)	SGS AXYS MLA-060	MLA-060																						Y					Y		Y	Y							
		SGS AXYS MLA-041	MLA-041					Y		Y		Y	Y																										
		SGS AXYS MLA-043	MLA-043																Y	Y	Y	Y																	
		SGS AXYS MLA-042	MLA-042	Y																																			
		SGS AXYS MLA-110	MLA-110			Y	Y	Y		Y		Y				Y	Y	Y	Y	Y	Y				Y		Y	Y		Y		Y					Y	Y	Y
	Perfluorononanesulfonate (PFNS)	SGS AXYS MLA-110	MLA-110			Y	Y	Y		Y		Y				Y	Y	Y	Y	Y	Y				Y		Y	Y		Y		Y					Y	Y	Y
	Perfluorononanoate (PFNA)	SGS AXYS MLA-060	MLA-060																						Y					Y		Y	Y							
		SGS AXYS MLA-041	MLA-041					Y		Y		Y	Y																										
		SGS AXYS MLA-043	MLA-043																Y	Y	Y	Y																	
		SGS AXYS MLA-042	MLA-042	Y																																			
		SGS AXYS MLA-110	MLA-110			Y	Y	Y		Y		Y				Y	Y	Y	Y	Y	Y				Y		Y	Y		Y		Y					Y	Y	Y
	Perfluorooctanesulfonamide (PFOSA), a.k.a. FOSA	SGS AXYS MLA-060	MLA-060																						Y					Y		Y	Y							
		SGS AXYS MLA-041	MLA-041					Y		Y		Y	Y																										
		SGS AXYS MLA-043	MLA-043																Y	Y	Y	Y																	
		SGS AXYS MLA-042	MLA-042	Y																																			
		SGS AXYS MLA-110	MLA-110			Y	Y	Y		Y		Y				Y	Y	Y	Y	Y	Y				Y		Y	Y		Y		Y					Y	Y	Y
	Perfluorooctanesulfonate (PFOS)	SGS AXYS MLA-060	MLA-060																						Y					Y		Y	Y							
		SGS AXYS MLA-041	MLA-041					Y		Y		Y	Y																										
		SGS AXYS MLA-043	MLA-043																Y	Y	Y	Y																	
		SGS AXYS MLA-042	MLA-042	Y																																			
		SGS AXYS MLA-110	MLA-110			Y	Y	Y		Y		Y				Y	Y	Y	Y	Y	Y				Y		Y	Y		Y		Y					Y	Y	Y
	Perfluorooctanoate (PFOA)	SGS AXYS MLA-060	MLA-060																						Y					Y		Y	Y							
		SGS AXYS MLA-041	MLA-041					Y		Y		Y	Y																										
		SGS AXYS MLA-043	MLA-043																Y	Y	Y	Y																	
		SGS AXYS MLA-042	MLA-042	Y																																			
		SGS AXYS MLA-110	MLA-110			Y	Y	Y		Y		Y				Y	Y	Y	Y	Y	Y				Y	Y	Y	Y		Y		Y					Y	Y	Y
	Perfluoropentanesulfonate (PFPeS)	SGS AXYS MLA-110	MLA-110			Y	Y	Y		Y		Y				Y	Y	Y	Y	Y	Y				Y		Y	Y		Y		Y					Y	Y	Y
	Perfluoropentanoate (PFPeA)	SGS AXYS MLA-060	MLA-060																						Y					Y		Y	Y							
		SGS AXYS MLA-041	MLA-041					Y		Y		Y	Y																										
		SGS AXYS MLA-043	MLA-043																Y	Y	Y	Y																	
		SGS AXYS MLA-042	MLA-042	Y																																			
		SGS AXYS MLA-110	MLA-110			Y	Y	Y		Y		Y				Y	Y	Y	Y	Y	Y				Y		Y	Y		Y		Y					Y	Y	Y
	Perfluorotetradecanoate (PFTeDA)	SGS AXYS MLA-110	MLA-110			Y	Y	Y		Y		Y				Y	Y	Y	Y	Y	Y				Y		Y	Y		Y		Y					Y	Y	Y
	Perfluorotridecanoate (PFTrDA)	SGS AXYS MLA-110	MLA-110			Y	Y	Y		Y		Y				Y	Y	Y	Y	Y	Y				Y		Y	Y		Y		Y					Y	Y	Y
	Perfluoroundecanoate (PFUnA)	SGS AXYS MLA-060	MLA-060																						Y					Y		Y	Y							
		SGS AXYS MLA-041	MLA-041					Y		Y		Y	Y																										
		SGS AXYS MLA-043	MLA-043																Y	Y	Y	Y																	
		SGS AXYS MLA-042	MLA-042	Y																																			
		SGS AXYS MLA-110	MLA-110			Y	Y	Y		Y		Y				Y	Y	Y	Y	Y	Y				Y		Y	Y		Y		Y					Y	Y	Y
PPCP	1,7-Dimethylxanthine	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	10-hydroxy-amitriptyline	SGS AXYS MLA-075	MLA-075					Y																	Y														
	2-hydroxy-ibuprofen	SGS AXYS MLA-075	MLA-075					Y																	Y														
	4-Epianhydrochlortetracycline (EACTC)	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	4-Epianhydrotetracycline (EATC)	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	4-Epichlortetracycline (ECTC)	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	4-Epioxytetracycline (EOTC)	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	4-Epitetracycline (ETC)	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Acetaminophen	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Albuterol	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Alprazolam	SGS AXYS MLA-075	MLA-075					Y																	Y														
	Amitriptyline	SGS AXYS MLA-075	MLA-075					Y																	Y														

Accreditation Scope

SGS AXYS Analytical Services Ltd.
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				Serum	Solids												Tissue							Urine	Water	Water, Non-Potable										AFFF	
Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	CALA	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	ANAB DoD **	ANAB ISO 17025	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	CALA	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Pennsylvania DEP	Virginia DGS	Washington DE *	ANAB DoD **	ANAB ISO 17025
	Amlodipine	SGS AXYS MLA-075	MLA-075					Y																	Y														
	Amphetamine	SGS AXYS MLA-075	MLA-075					Y																	Y														
	Anhydrochlortetracycline (ACTC)	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Anhydrotetracycline (ATC)	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Atenolol	SGS AXYS MLA-075	MLA-075					Y																	Y														
	Atorvastatin	SGS AXYS MLA-075	MLA-075					Y																	Y														
	Azithromycin	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Benzoylecgonine	SGS AXYS MLA-075	MLA-075					Y																	Y														
	Benztropine	SGS AXYS MLA-075	MLA-075					Y																	Y														
	Betamethasone	SGS AXYS MLA-075	MLA-075					Y																	Y														
	Bisphenol A	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Caffeine	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Carbadox	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Carbamazepine	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Cefotaxime	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Chlortetracycline (CTC)	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Cimetidine	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Ciprofloxacin	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Clarithromycin	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Clinafloxacin	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Clonidine	SGS AXYS MLA-075	MLA-075					Y																	Y														
	Cloxacillin	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Cocaine	SGS AXYS MLA-075	MLA-075					Y																	Y														
	Codeine	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Cotinine	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	DEET (N,N-diethyl-m-toluamide)	SGS AXYS MLA-075	MLA-075					Y																	Y														
	Dehydronifedipine	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Demeclocycline	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Desmethyldiltiazem	SGS AXYS MLA-075	MLA-075					Y																	Y														
	Diazepam	SGS AXYS MLA-075	MLA-075					Y																	Y														
	Digoxigenin	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Digoxin	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Diltiazem	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Diphenhydramine	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Doxycycline	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Enalapril	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Enrofloxacin	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Erythromycin	SGS AXYS MLA-075	MLA-075					Y																	Y														
	Erythromycin anydrate	EPA 1694	MLA-075								Y																				Y								
	Flumequine	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Fluocinonide	SGS AXYS MLA-075	MLA-075					Y																	Y														
	Fluoxetine	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Fluticasone propionate	SGS AXYS MLA-075	MLA-075					Y																	Y														
	Furosemide	SGS AXYS MLA-075	MLA-075					Y																	Y														
	Gemfibrozil	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														

Accreditation Scope
SGS AXYS Analytical Services Ltd.
file ref.: ACC-101 Rev. 49

				Serum	Solids												Tissue							Urine	Water	Water, Non-Potable										AFFF	
Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	CALA	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	ANAB DoD **	ANAB ISO 17025	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	CALA	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Pennsylvania DEP	Virginia DGS	Washington DE *	ANAB DoD **	ANAB ISO 17025
	Glipizide	SGS AXYS MLA-075	MLA-075					Y																	Y														
	Glyburide	SGS AXYS MLA-075	MLA-075					Y																	Y														
	Hydrochlorothiazide	SGS AXYS MLA-075	MLA-075					Y																	Y														
	Hydrocodone	SGS AXYS MLA-075	MLA-075					Y																	Y														
	Hydrocortisone	SGS AXYS MLA-075	MLA-075					Y																	Y														
	Ibuprofen	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Isochlortetracycline (ICTC)	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Lincomycin	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Lomefloxacin	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Meprobamate	SGS AXYS MLA-075	MLA-075					Y																	Y														
	Metformin	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Methylprednisolone	SGS AXYS MLA-075	MLA-075					Y																	Y														
	Metoprolol	SGS AXYS MLA-075	MLA-075					Y																	Y														
	Miconazole	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Minocycline	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Naproxen	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Norfloxacin	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Norfluoxetine	SGS AXYS MLA-075	MLA-075					Y																	Y														
	Norgestimate	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Norverapamil	SGS AXYS MLA-075	MLA-075					Y																	Y														
	Ofloxacin	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Ormetoprim	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Oxacillin	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Oxolinic acid	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Oxycodone	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Oxytetracycline (OTC)	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Paroxetine	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Penicillin G	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Penicillin V	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Prednisolone	SGS AXYS MLA-075	MLA-075					Y																	Y														
	Prednisone	SGS AXYS MLA-075	MLA-075					Y																	Y														
	Promethazine	SGS AXYS MLA-075	MLA-075					Y																	Y														
	Propoxyphene	SGS AXYS MLA-075	MLA-075					Y																	Y														
	Propranolol	SGS AXYS MLA-075	MLA-075					Y																	Y														
	Ranitidine	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Roxithromycin	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Sarafloxacin	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Sertraline	SGS AXYS MLA-075	MLA-075					Y																	Y														
	Simvastatin	SGS AXYS MLA-075	MLA-075					Y																	Y														
	Sulfachloropyridazine	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Sulfadiazine	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Sulfadimethoxine	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Sulfamerazine	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Sulfamethazine	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Sulfamethizole	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														

Accreditation Scope

SGS AXYS Analytical Services Ltd.
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				Serum	Solids												Tissue							Urine	Water	Water, Non-Potable										AFFF	
Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	CALA	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	ANAB DoD **	ANAB ISO 17025	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	CALA	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Pennsylvania DEP	Virginia DGS	Washington DE *	ANAB DoD **	ANAB ISO 17025
	Sulfamethoxazole	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Sulfanilamide	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Sulfathiazole	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Tetracycline (TC)	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Theophylline	SGS AXYS MLA-075	MLA-075					Y																	Y														
	Thiabendazole	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Trenbolone	SGS AXYS MLA-075	MLA-075					Y																	Y														
	Trenbolone acetate	SGS AXYS MLA-075	MLA-075					Y																	Y														
	Triamterene	SGS AXYS MLA-075	MLA-075					Y																	Y														
	Triclocarban	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Triclosan	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Trimethoprim	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Tylosin	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Valsartan	SGS AXYS MLA-075	MLA-075					Y																	Y														
	Verapamil	SGS AXYS MLA-075	MLA-075					Y																	Y														
	Virginiamycin	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
	Warfarin	EPA 1694	MLA-075								Y																				Y								
		SGS AXYS MLA-075	MLA-075					Y																	Y														
Targeted Metabolites	11, 14, 17-eicosatrienoic acid (eicosatrienoic acid)	SGS AXYS MLM-001	MLM-001																Y																				
	11, 14-eicosadienoic acid	SGS AXYS MLM-001	MLM-001																Y																				
	3-hydroxytyrosine	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Acetylcarnitine	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Acetylornithine	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Alanine	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	alpha-Aminoadipic acid	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Arginine	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Asparagine	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Aspartate	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Asymmetric dimethylarginine	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Butenylcarnitine	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Butyrylcarnitine	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	C22:5 ISOMER 1 (tentatively all-cis-4, 8, 12, 15, 19-docosapentaenoic acid)	SGS AXYS MLM-001	MLM-001																Y																				
	C22:5 ISOMER 2 (all-cis-7,10,13,16,19-docosapentaenoic acid (DPA)	SGS AXYS MLM-001	MLM-001																Y																				
	C22:5 ISOMER 3 (tentatively all-cis-4, 7, 10, 13, 16-docosapentaenoic acid)	SGS AXYS MLM-001	MLM-001																Y																				
	Carnitine	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Carnosine	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	chenodeoxycholic acid	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	cholic acid	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Citrulline	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Creatinine	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Decadienylcarnitine	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	decanoic acid (capric acid)	SGS AXYS MLM-001	MLM-001																Y																				
	Decanoylcarnitine	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Decenoylcarnitine	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	deoxycholic acid	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	docosahexaenoic acid (DHA)	SGS AXYS MLM-001	MLM-001																Y																				
	docosatetraenoic acid (adrenic acid)	SGS AXYS MLM-001	MLM-001																Y																				
	Dodecanedioylcarnitine	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Dodecanoylcarnitine	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Dodecenoylcarnitine	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Dopamine	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	eicosapentaenoic acid (EPA)	SGS AXYS MLM-001	MLM-001																Y																				
	Eicosatetraenoic acid (arachidonic acid)	SGS AXYS MLM-001	MLM-001																Y																				
	eicosatrienoic acid (dihomo-γ-linolenic acid)	SGS AXYS MLM-001	MLM-001																Y																				
	Glutaconylcarnitine	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Glutamate	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Glutamine	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Glutarylcarnitine (Hydroxyhexanoylcarnitine)	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Glycine	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	glycochenodeoxycholic acid	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	glycocholic acid	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	glycodeoxycholic acid	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Hexadecadienylcarnitine	SGS AXYS MLM-001	MLM-001	Y															Y					Y															

Accreditation Scope
SGS AXYS Analytical Services Ltd.
file ref.: ACC-101 Rev. 49

				Serum	Solids												Tissue						Urine	Water	Water, Non-Potable										AFFF	
Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	CALA	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	ANAB DoD **	ANAB ISO 17025	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	CALA	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Pennsylvania DEP	Virginia DGS	Washington DE *	ANAB DoD **	ANAB ISO 17025
	hexadecanoic acid (palmitic acid)	SGS AXYS MLM-001	MLM-001																Y																				
	Hexadecanoylcarnitine	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	hexadecenoic acid (palmitoleic acid)	SGS AXYS MLM-001	MLM-001																Y																				
	Hexadecenoylcarnitine	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Hexanoylcarnitine (Fumarylcarnitine)	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Hexenoylcarnitine	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Hexose (sum isomers)	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Histamine	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Histidine	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Hydroxyhexadecadienylcarnitine	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Hydroxyhexadecanoylcarnitine	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Hydroxyhexadecenoylcarnitine	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Hydroxylbutyrylcarnitine	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Hydroxyoctadecenoylcarnitine	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Hydroxyproline	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Hydroxypropionylcarnitine	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Hydroxysphingomyeline C14:1	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Hydroxysphingomyeline C16:1	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Hydroxysphingomyeline C22:1	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Hydroxysphingomyeline C22:2	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Hydroxysphingomyeline C24:1	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Hydroxytetradecadienylcarnitine	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Hydroxytetradecenoylcarnitine	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Hydroxyvalerylcarnitine (Methylmalonylcarnitine)	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Isoleucine	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Kynurenine	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Leucine	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	lithocholic acid	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Lysine	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	lysoPhosphatidylcholine acyl C14:0	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	lysoPhosphatidylcholine acyl C16:0	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	lysoPhosphatidylcholine acyl C16:1	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	lysoPhosphatidylcholine acyl C17:0	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	lysoPhosphatidylcholine acyl C18:0	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	lysoPhosphatidylcholine acyl C18:1	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	lysoPhosphatidylcholine acyl C18:2	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	lysoPhosphatidylcholine acyl C20:3	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	lysoPhosphatidylcholine acyl C20:4	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	lysoPhosphatidylcholine acyl C24:0	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	lysoPhosphatidylcholine acyl C26:1	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	lysoPhosphatidylcholine acyl C28:0	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	lysoPhosphatidylcholine acyl C28:1	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Methionine	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Methioninesulfoxide	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Methylglutarylcarnitine	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Nitrotyrosine	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Nonaylcarnitine	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	octadecadienoic acid (linoleic acid)	SGS AXYS MLM-001	MLM-001																Y																				
	Octadecadienylcarnitine	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	octadecanoic acid (stearic acid)	SGS AXYS MLM-001	MLM-001																Y																				
	Octadecanoylcarnitine	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	octadecatrienoic acid (γ-linolenic acid)	SGS AXYS MLM-001	MLM-001																Y																				
	Octadecenoylcarnitine	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Octanoylcarnitine	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Ornithine	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Phenylalanine	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Phenylethylamine	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Phosphatidylcholine acyl-alkyl C30:0	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Phosphatidylcholine acyl-alkyl C30:1	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Phosphatidylcholine acyl-alkyl C30:2	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Phosphatidylcholine acyl-alkyl C32:1	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Phosphatidylcholine acyl-alkyl C32:2	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Phosphatidylcholine acyl-alkyl C34:0	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Phosphatidylcholine acyl-alkyl C34:1	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Phosphatidylcholine acyl-alkyl C34:2	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Phosphatidylcholine acyl-alkyl C34:3	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Phosphatidylcholine acyl-alkyl C36:0	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Phosphatidylcholine acyl-alkyl C36:1	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Phosphatidylcholine acyl-alkyl C36:2	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Phosphatidylcholine acyl-alkyl C36:3	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Phosphatidylcholine acyl-alkyl C36:4	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Phosphatidylcholine acyl-alkyl C36:5	SGS AXYS MLM-001	MLM-001	Y															Y					Y															
	Phosphatidylcholine acyl-alkyl C38:0	SGS AXYS MLM-001	MLM-001	Y															Y					Y															

Accreditation Scope

SGS AXYS Analytical Services Ltd.
file ref.: ACC-101 Rev. 49

				Serum	Solids												Tissue						Urine	Water	Water, Non-Potable										AFFF	
Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	CALA	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	ANAB DoD **	ANAB ISO 17025	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	CALA	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Pennsylvania DEP	Virginia DGS	Washington DE *	ANAB DoD **	ANAB ISO 17025
	Phosphatidylcholine acyl-alkyl C38:1	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Phosphatidylcholine acyl-alkyl C38:2	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Phosphatidylcholine acyl-alkyl C38:3	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Phosphatidylcholine acyl-alkyl C38:5	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Phosphatidylcholine acyl-alkyl C38:6	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Phosphatidylcholine acyl-alkyl C40:1	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Phosphatidylcholine acyl-alkyl C40:2	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Phosphatidylcholine acyl-alkyl C40:3	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Phosphatidylcholine acyl-alkyl C40:4	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Phosphatidylcholine acyl-alkyl C40:5	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Phosphatidylcholine acyl-alkyl C40:6	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Phosphatidylcholine acyl-alkyl C42:0	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Phosphatidylcholine acyl-alkyl C42:1	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Phosphatidylcholine acyl-alkyl C42:2	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Phosphatidylcholine acyl-alkyl C42:3	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Phosphatidylcholine acyl-alkyl C42:4	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Phosphatidylcholine acyl-alkyl C42:5	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Phosphatidylcholine acyl-alkyl C44:3	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Phosphatidylcholine acyl-alkyl C44:4	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Phosphatidylcholine acyl-alkyl C44:5	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Phosphatidylcholine acyl-alkyl C44:6	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Phosphatidylcholine diacyl C24:0	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Phosphatidylcholine diacyl C26:0	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Phosphatidylcholine diacyl C28:1	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Phosphatidylcholine diacyl C30:0	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Phosphatidylcholine diacyl C30:2	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Phosphatidylcholine diacyl C32:0	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Phosphatidylcholine diacyl C32:1	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Phosphatidylcholine diacyl C32:2	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Phosphatidylcholine diacyl C32:3	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Phosphatidylcholine diacyl C34:1	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Phosphatidylcholine diacyl C34:2	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Phosphatidylcholine diacyl C34:3	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Phosphatidylcholine diacyl C34:4	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Phosphatidylcholine diacyl C36:0	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Phosphatidylcholine diacyl C36:1	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Phosphatidylcholine diacyl C36:2	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Phosphatidylcholine diacyl C36:3	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Phosphatidylcholine diacyl C36:4	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Phosphatidylcholine diacyl C36:5	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Phosphatidylcholine diacyl C36:6	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Phosphatidylcholine diacyl C38:0	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Phosphatidylcholine diacyl C38:1	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Phosphatidylcholine diacyl C38:3	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Phosphatidylcholine diacyl C38:4	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Phosphatidylcholine diacyl C38:5	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Phosphatidylcholine diacyl C38:6	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Phosphatidylcholine diacyl C40:1	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Phosphatidylcholine diacyl C40:2	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Phosphatidylcholine diacyl C40:3	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Phosphatidylcholine diacyl C40:4	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Phosphatidylcholine diacyl C40:5	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Phosphatidylcholine diacyl C40:6	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Phosphatidylcholine diacyl C42:0	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Phosphatidylcholine diacyl C42:1	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Phosphatidylcholine diacyl C42:2	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Phosphatidylcholine diacyl C42:4	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Phosphatidylcholine diacyl C42:5	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Phosphatidylcholine diacyl C42:6	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Pimelylcarnitine	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Proline	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Propenoylcarnitine	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Propionylcarnitine	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Putrescine	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Sarcosine	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Serine	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Serotonin	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Spermidine	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Spermine	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Sphingomyeline C16:0	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Sphingomyeline C16:1	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Sphingomyeline C18:0	SGS AXYS MLM-001	MLM-001	Y															Y					Y														
	Sphingomyeline C18:1	SGS AXYS MLM-001	MLM-001	Y															Y					Y														

Accreditation Scope

SGS AXYS Analytical Services Ltd.
file ref.: ACC-101 Rev. 49

				Serum	Solids												Tissue						Urine	Water	Water, Non-Potable										AFFF	
Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	CALA	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	ANAB DoD **	ANAB ISO 17025	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	CALA	CALA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Pennsylvania DEP	Virginia DGS	Washington DE *	ANAB DoD **	ANAB ISO 17025
	Sphingomyeline C20:2	SGS AXYS MLM-001	MLM-001	Y				Y											Y					Y															
	Sphingomyeline C22:3	SGS AXYS MLM-001	MLM-001	Y				Y											Y					Y															
	Sphingomyeline C24:0	SGS AXYS MLM-001	MLM-001	Y				Y											Y					Y															
	Sphingomyeline C24:1	SGS AXYS MLM-001	MLM-001	Y				Y											Y					Y															
	Sphingomyeline C26:0	SGS AXYS MLM-001	MLM-001	Y				Y											Y					Y															
	Sphingomyeline C26:1	SGS AXYS MLM-001	MLM-001	Y				Y											Y					Y															
	Symmetric dimethylarginine	SGS AXYS MLM-001	MLM-001	Y				Y											Y					Y															
	Taurine	SGS AXYS MLM-001	MLM-001	Y				Y											Y					Y															
	taurochenodeoxycholic acid	SGS AXYS MLM-001	MLM-001	Y				Y											Y					Y															
	taurocholic acid	SGS AXYS MLM-001	MLM-001	Y				Y											Y					Y															
	taurodeoxycholic acid	SGS AXYS MLM-001	MLM-001	Y				Y											Y					Y															
	taurolithocholic acid	SGS AXYS MLM-001	MLM-001	Y				Y											Y					Y															
	tauroursodexoycholic acid	SGS AXYS MLM-001	MLM-001	Y				Y											Y					Y															
	Tetradecadienylcarnitine	SGS AXYS MLM-001	MLM-001	Y				Y											Y					Y															
	tetradecanoic acid (myristic acid)	SGS AXYS MLM-001	MLM-001					Y																														
	Tetradecanoylcarnitine	SGS AXYS MLM-001	MLM-001	Y				Y											Y					Y															
	Tetradecenoylcarnitine	SGS AXYS MLM-001	MLM-001	Y				Y											Y					Y															
	Threonine	SGS AXYS MLM-001	MLM-001	Y				Y											Y					Y															
	Tiglylcarnitine	SGS AXYS MLM-001	MLM-001	Y				Y											Y					Y															
	Total dimethylarginine	SGS AXYS MLM-001	MLM-001	Y				Y											Y					Y															
	Tryptophan	SGS AXYS MLM-001	MLM-001	Y				Y											Y					Y															
	Tyrosine	SGS AXYS MLM-001	MLM-001	Y				Y											Y					Y															
	ursodexoycholic acid	SGS AXYS MLM-001	MLM-001	Y				Y											Y					Y															
	Valerylcarnitine	SGS AXYS MLM-001	MLM-001	Y				Y											Y					Y															
	Valine	SGS AXYS MLM-001	MLM-001	Y				Y											Y					Y															
TOP	Perfluorobutanesulfonate (PFBS)	SGS AXYS MLA-111	MLA-111					Y																	Y														
	Perfluorobutanoate (PFBA)	SGS AXYS MLA-111	MLA-111					Y																	Y														
	Perfluorodecanesulfonate (PFDS)	SGS AXYS MLA-111	MLA-111					Y																	Y														
	Perfluorodecanoate (PFDA)	SGS AXYS MLA-111	MLA-111					Y																	Y														
	Perfluorododecanesulfonate (PFDoS)	SGS AXYS MLA-111	MLA-111					Y																	Y														
	Perfluorododecanoate (PFDoA)	SGS AXYS MLA-111	MLA-111					Y																	Y														
	Perfluoroheptanesulfonate (PFHpS)	SGS AXYS MLA-111	MLA-111					Y																	Y														
	Perfluoroheptanoate (PFHpA)	SGS AXYS MLA-111	MLA-111					Y																	Y														
	Perfluorohexanesulfonate (PFHxS)	SGS AXYS MLA-111	MLA-111					Y																	Y														
	Perfluorohexanoate (PFHxA)	SGS AXYS MLA-111	MLA-111					Y																	Y														
	Perfluorononanesulfonate (PFNS)	SGS AXYS MLA-111	MLA-111					Y																	Y														
	Perfluorononanoate (PFNA)	SGS AXYS MLA-111	MLA-111					Y																	Y														
	Perfluorooctanesulfonate (PFOS)	SGS AXYS MLA-111	MLA-111					Y																	Y														
	Perfluorooctanoate (PFOA)	SGS AXYS MLA-111	MLA-111					Y																	Y														
	Perfluoropentanesulfonate (PFPeS)	SGS AXYS MLA-111	MLA-111					Y																	Y														
	Perfluoropentanoate (PFPeA)	SGS AXYS MLA-111	MLA-111					Y																	Y														
	Perfluorotetradecanoate (PFTeDA)	SGS AXYS MLA-111	MLA-111					Y																	Y														
	Perfluorotridecanoate (PFTrDA)	SGS AXYS MLA-111	MLA-111					Y																	Y														
	Perfluoroundecanoate (PFUnA)	SGS AXYS MLA-111	MLA-111					Y																	Y														

Note * Analysis of pesticides and PCBs in non-potable water samples by SGS AXYS method MLA-007, with the exception of NPDES or State permitted discharges and Stormwater applications, may fall within the scope of Washington State Department of Ecology solids matrix accreditation, subject to approval of the Ecology Project Manager.

Note ** PFAS by LC-MS/MS compliant with US DoD QSM 5.3 table B-15

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Legend

Y	Accreditation scope
AFFF	Aqueous film forning foam
BFR	Brominated flame retardants (non-PBDPE)
BPA and mPE	Bisphenol A and mono-Phthalate Esters
OC Pesticides	Organochlorine Pesticides
PAH	Polycyclic Aromatic Hydrocarbons
PBDPE	Polybrominated diphenylethers
PCB	Polychlorinated Biphenyls
PCDDF	Polychlorinated dibenzodioxins/furans
PFAS	Per- and Polyfluoroalkyl Substances
PPCP	Pharmaceutical and Personal Care Products
TOP	Total Oxidizable Precursors
California WB	California Water Boards, Lab ID 2911
Florida DOH	Florida Department of Health, Lab ID E871007, (NELAC Standard)
Pennsylvania DEP	Pennsylvania Department of Environmental Protection
Minnesota DOH	Minnesota Department of Health, Lab ID 232-999-430, (NELAC Standard)
New Jersey DEP	New Jersey Department of Environmental Protection, Lab ID CANA005, (NELAC Standard)
New York DOH	New York Department of Health, Lab ID 11674, (NELAC Standard)
Washington DE	Washington Department of Ecology, Lab ID C404
Virginia DGS	Virginia Department of General Services, Division of Consolidated Laboratory Services, Lab ID 460224, (NELAC Standard)
Alaska DEC	Alaska Department of Environmental Conservation, Contaminated Sites Laboratory Approval 17-014
Maine DOH	Maine Center for Disease Control and Prevention, Department of Health and Human Services, Lab ID CN00003
ANAB DoD	ANSI National Accreditation Board, certificate ADE-1861, (US DoD QSM 5.3 Standard)
CALA	Canadian Association for Laboratory Accreditation Inc., Lab ID A2637, (ISO/IEC 17025:2005 Standard)

APPENDIX C

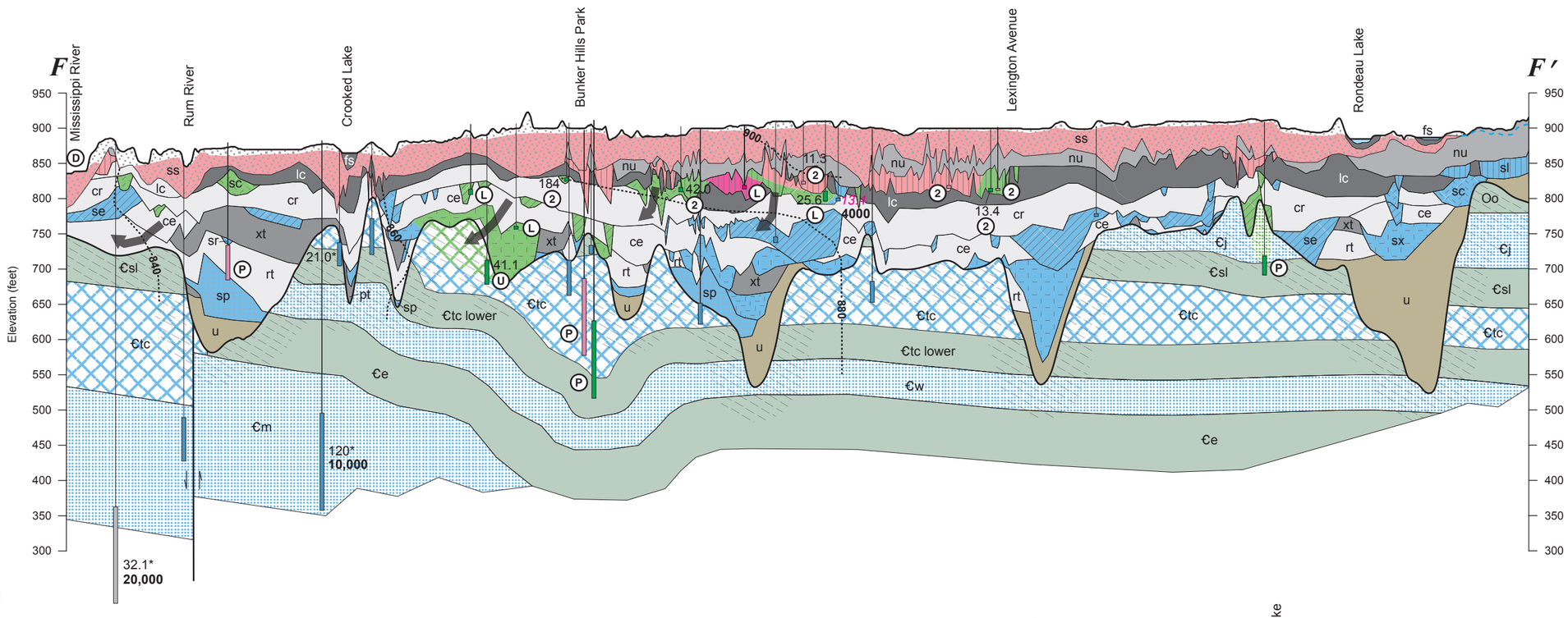
Anoka County Geologic Atlas

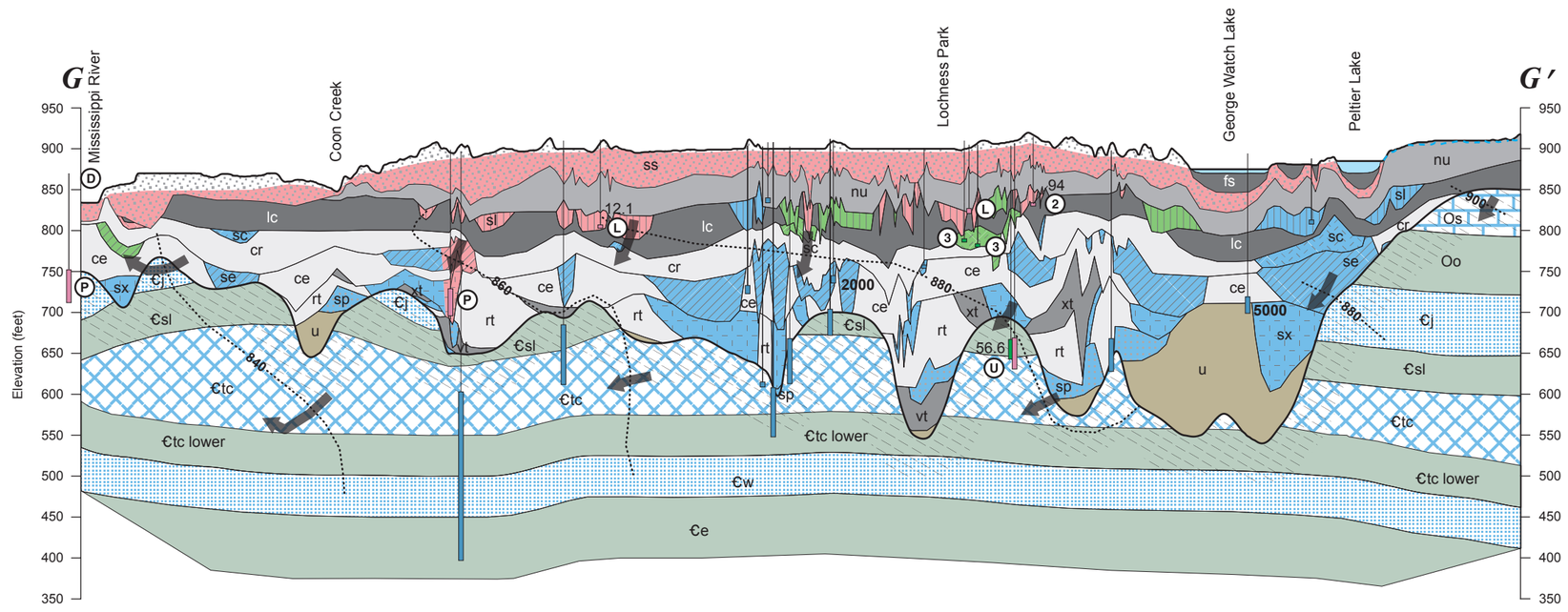
Prepared and Published with the Support of the
MINNESOTA ENVIRONMENT AND NATURAL RESOURCES TRUST FUND
and the CLEAN WATER, LAND AND LEGACY AMENDMENT

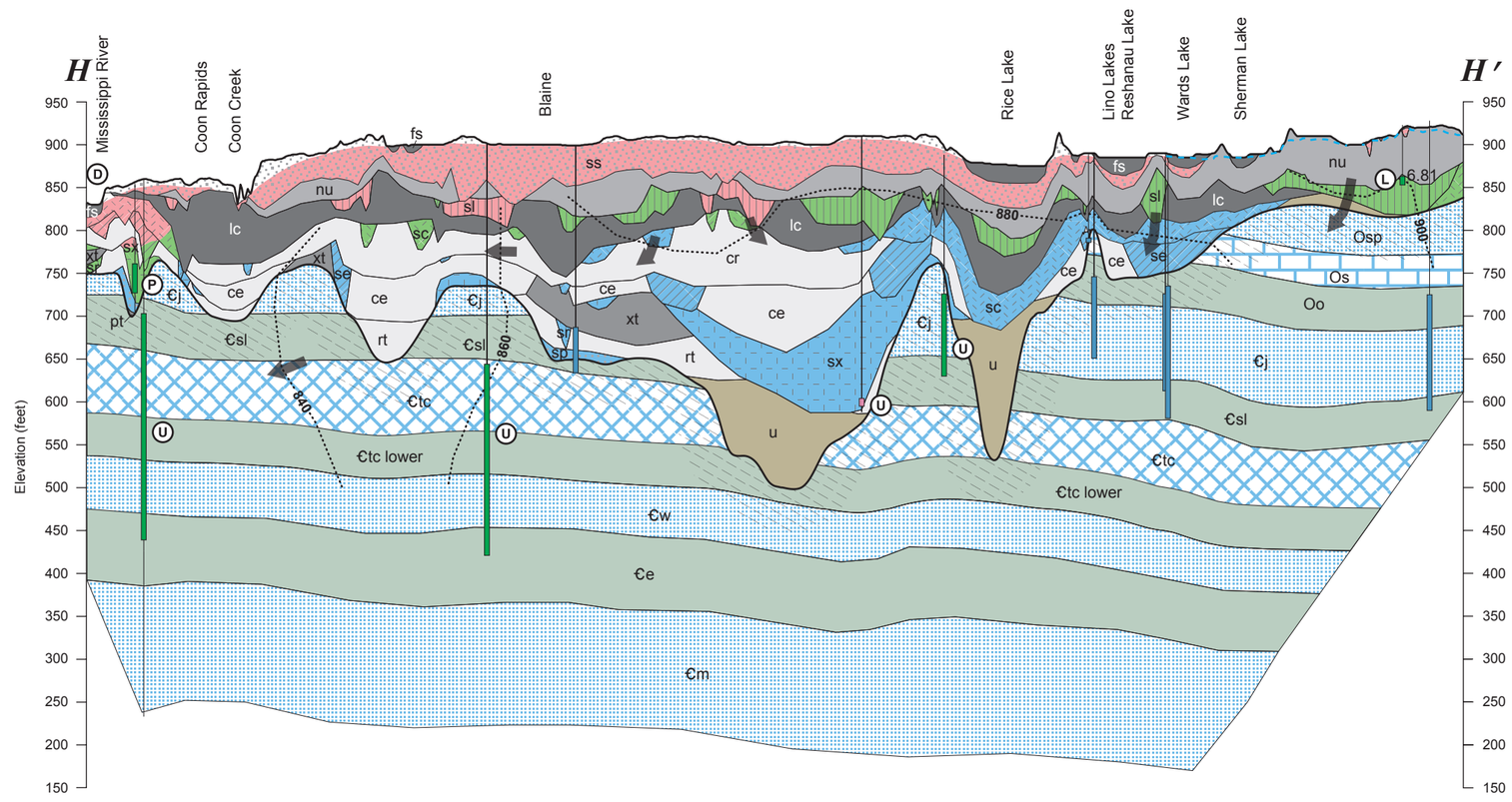
Hydrogeologic Cross Sections

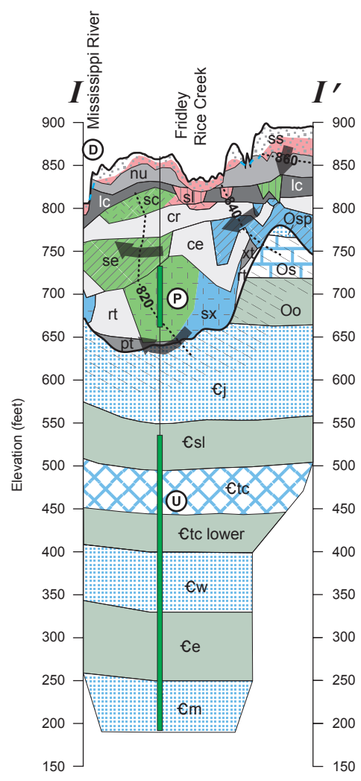
By James A. Berg

2016









CROSS SECTION EXPLANATION

Aquifers and aquitards grouped by stratigraphy

Interpreted tritium age is indicated by background color

Interpreted tritium age is indicated by pattern color

Surficial sand

- ss

Buried sand and gravel and Quaternary sediment

- sl
- sc
- se
- sx
- sr
- sp
- Undifferentiated sediment (u)

Bedrock

- Osp — St. Peter
- Os — Shakopee
- Oo — Oneota Dolomite*
- Ꞓj — Jordan
- Ꞓsl — St. Lawrence Formation*
- Ꞓtc — Upper Tunnel City
- Ꞓtc lower — Lower Tunnel City*
- Ꞓw — Wonewoc
- Ꞓe — Eau Claire Formation*
- Ꞓm — Mt. Simon (not shown in areas where data were not available)
- Enhanced-permeability zone near the bedrock surface

*aquitard

Quaternary aquitards

Grouped by texture ranging from highest to lowest sand content indicating relative hydraulic conductivity.

Hydrogeologic unit code	Percent sand
cr, ce, rt, lc (sandy)	> 60%
nu	> 40% and ≤ 50%
xt, pt	> 30% and ≤ 40%
lc	≤ 30%

Tritium age

Darker color in small vertical rectangle (well screen symbol) indicates tritium age of water sampled in well. Lighter color indicates interpreted age of water in aquifer.

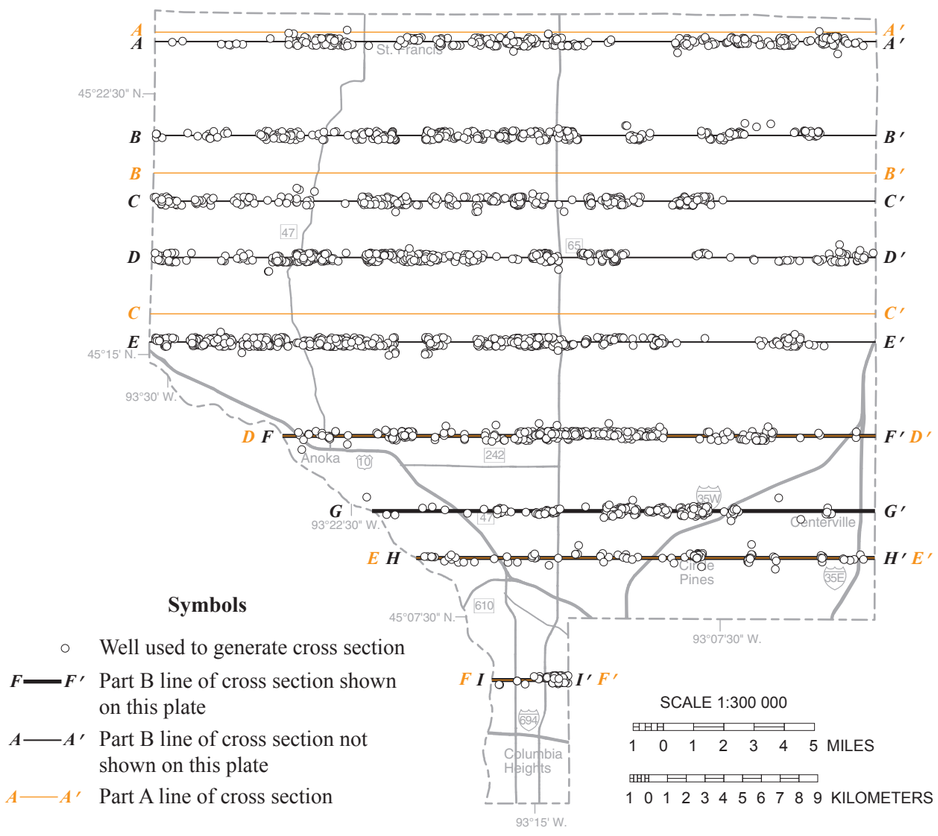
- Cold War era: water entered the ground during the peak period of atmospheric tritium concentration during nuclear bomb testing, 1958–1959 and 1961–1972 (greater than 15 tritium units [TU]).
- Recent: water entered the ground since about 1953 (8 to 15 TU).
- Mixed: water is a mixture of recent and vintage waters (greater than 1 TU to less than 8 TU).
- Vintage: water entered the ground before 1953 (less than or equal to 1 TU).
- Well not sampled for tritium.

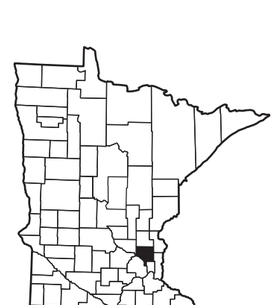
Symbols and labels

- 41.1 — If shown, chloride concentration equals or exceeds 5 parts per million. (* indicates naturally elevated values)
- *13.4* — If shown, arsenic concentration equals or exceeds 10 parts per billion.
- **3000** — If shown, groundwater residence time in years as estimated by carbon-14 (^{14}C) isotope analysis.
- General groundwater flow direction
- 900 — Approximate equipotential contour; contour interval 20 feet
- Geologic contact
- Land or bedrock surface
- Water table
- Lake
- Direction of fault movement, arrows indicate relative movement

Groundwater conditions

- (2) Groundwater moves from an overlying surficial aquifer to a buried aquifer.
- (3) Groundwater moves from an overlying buried aquifer to an underlying buried aquifer.
- (D) Groundwater discharges to a surface-water body.
- (L) Groundwater flows laterally.
- (P) Tritium concentrations may be artificially elevated by high capacity pumping.
- (U) Groundwater flowpath is unknown.





LOCATION DIAGRAM

SCALE 1:100 000
VERTICAL EXAGGERATION X 50

1 0 1 2 3 4 5 MILES

1 0 1 2 3 4 5 6 7 8 9 KILOMETERS

This map was compiled and generated in a geographic information system (GIS). Digital data products, including chemistry data, are available from the Minnesota Department of Natural Resources (DNR) Ecological and Water Resources Division at http://www.mndnr.gov/waters.

This map was prepared from publicly available information. Every reasonable effort has been made to ensure the accuracy of the factual data on which this map interpretation is based. However, the DNR does not warrant the accuracy, completeness, or any implied uses of these data. Users may wish to verify critical information; sources include both the references in the report and information on file in the offices of the Minnesota Geological Survey and the DNR. Every effort has been made to ensure the interpretation shown conforms to sound geologic and cartographic principles. This map should not be used to establish legal title, boundaries, or locations of improvements.

Base modified from Minnesota Geological Survey, Anoka County Geologic Atlas, Part A, 2013.

Universal Transverse Mercator projection, zone 15N, North American Datum of 1983. North American Vertical Datum of 1988.

GIS and cartography by James A. Berg and Holly Johnson. Edited by Ruth MacDonald.

The DNR Information Center

Minnesota Department of Natural Resources
Ecological and Water Resources Division
500 Lafayette Road
St. Paul, MN 55155-4025
For more information call 651-296-6157 or 888-646-6367
http://www.mndnr.gov/waters

This information is available in alternative format on request.

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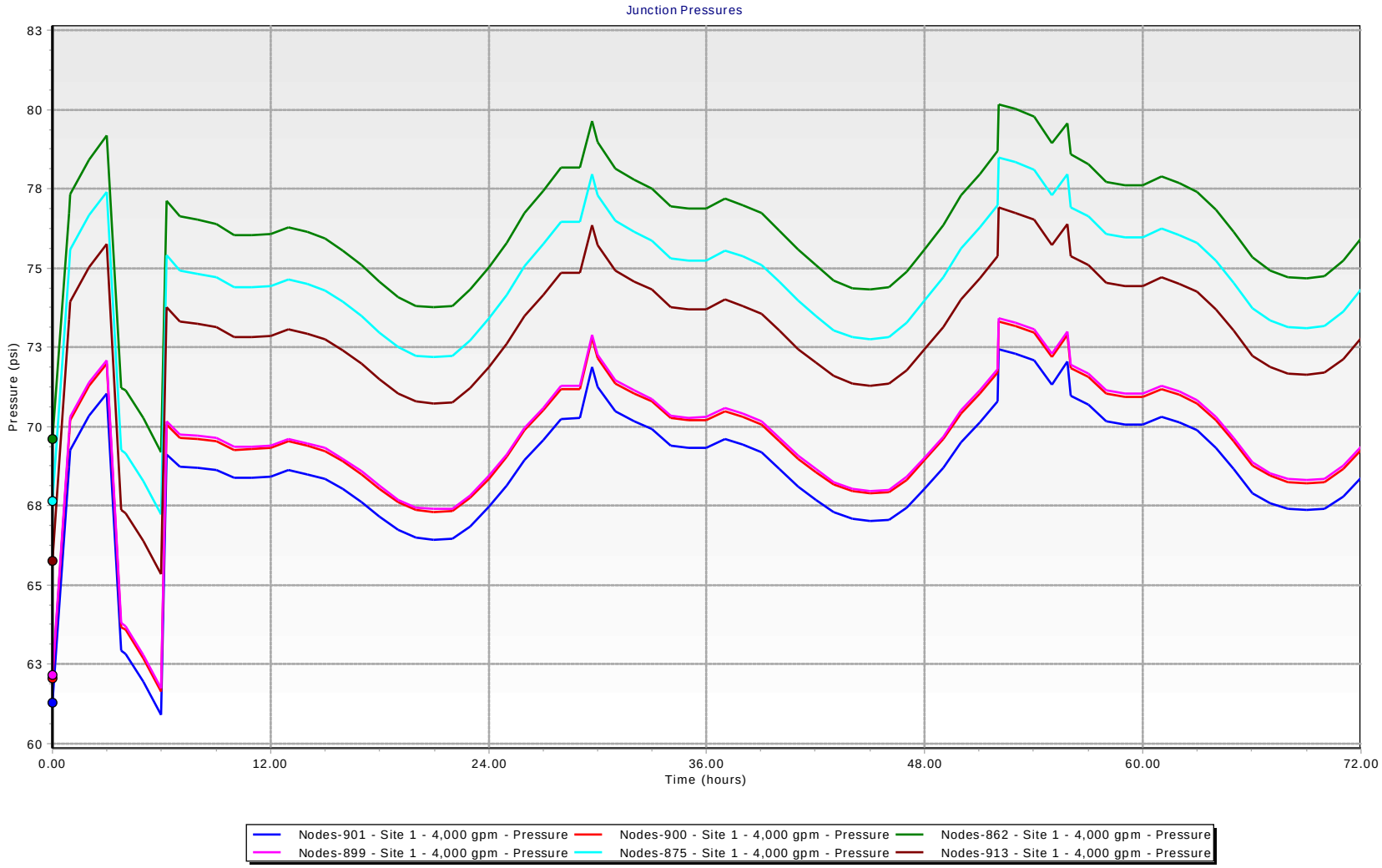
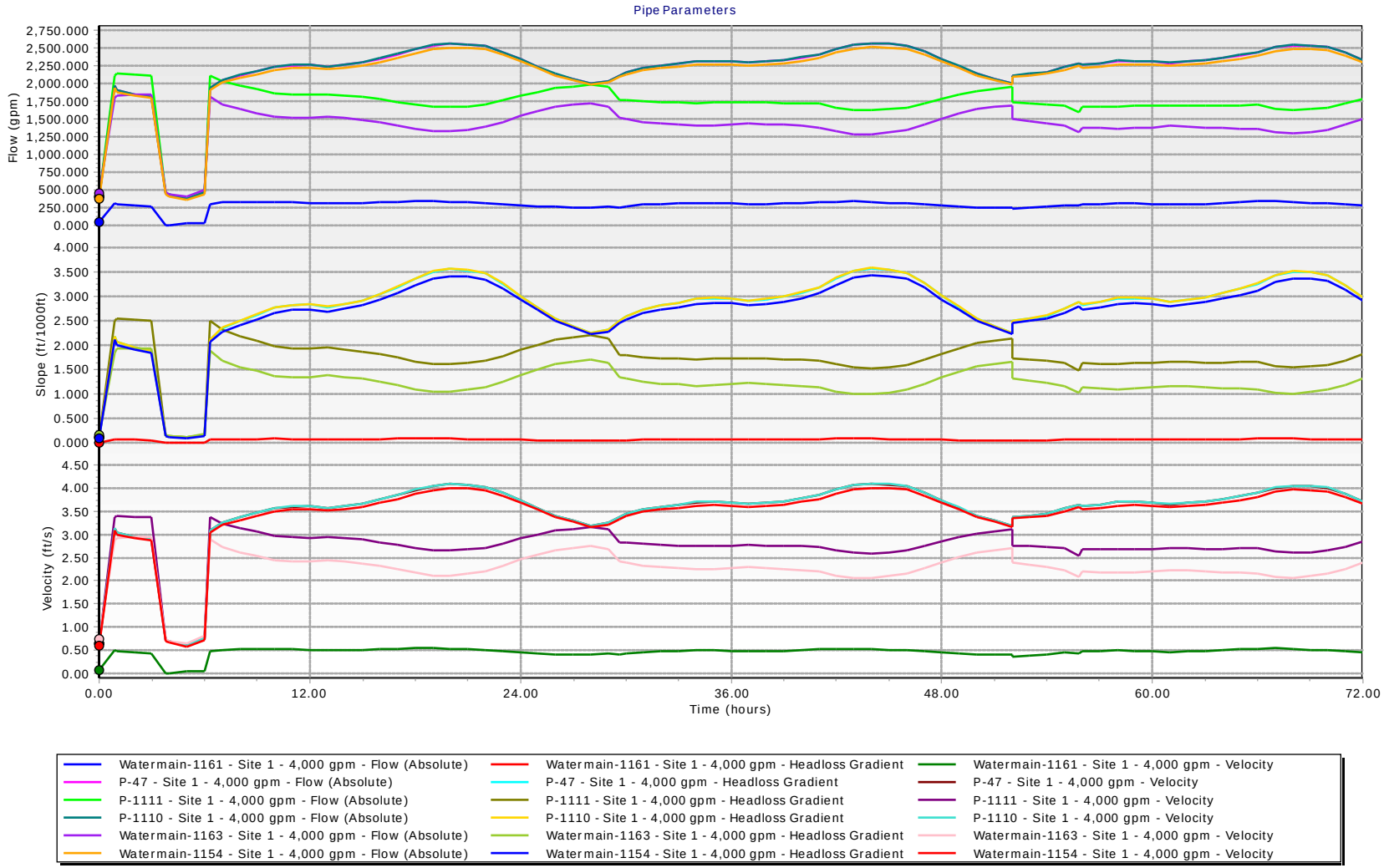
APPENDIX D

Modeling Results

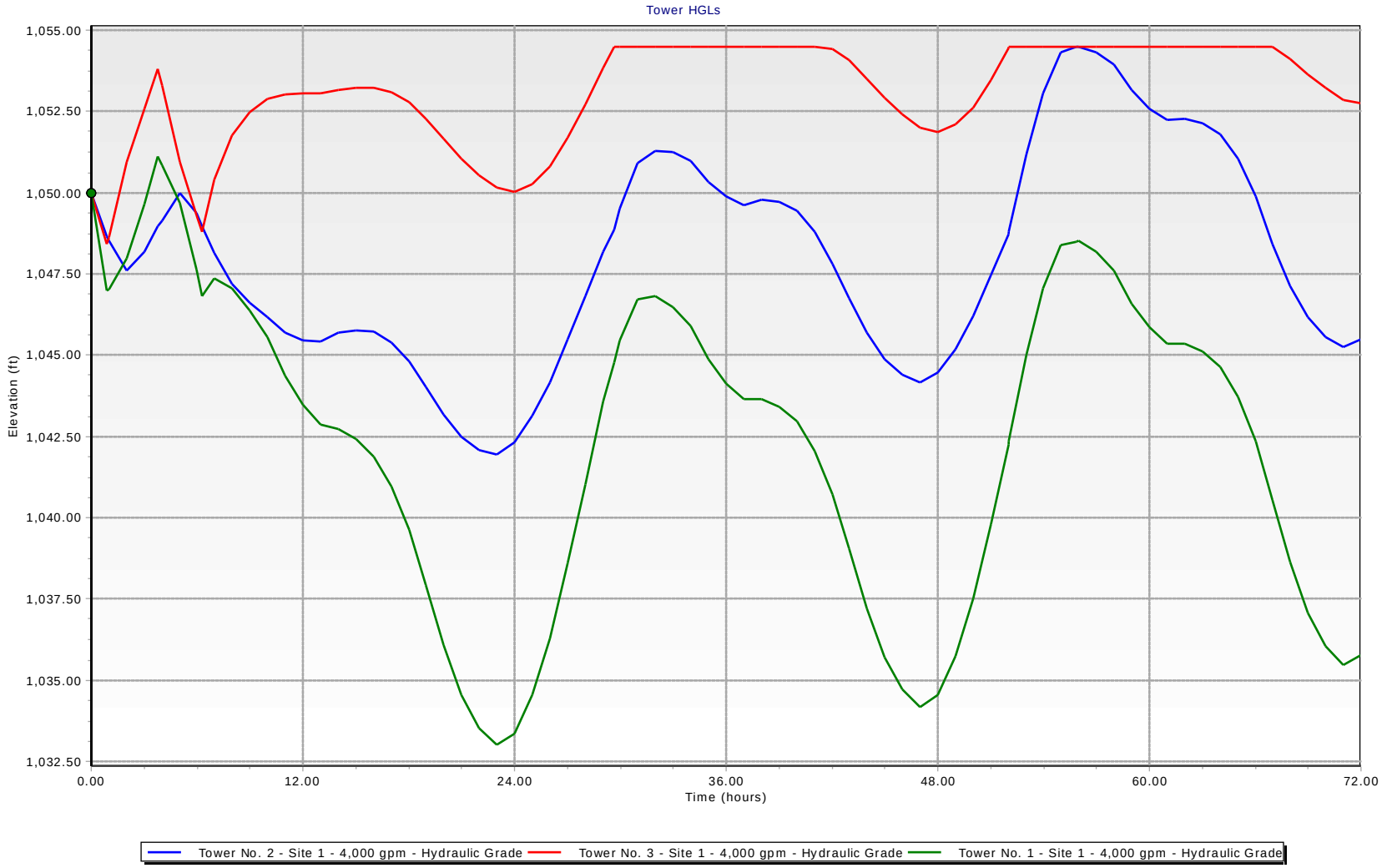
Central WTP - Birch St & 12th Ave S
Existing Watermain
Extended Period Simulation (EPS)
Maximum Day Demand
4,000 GPM WTP Flow



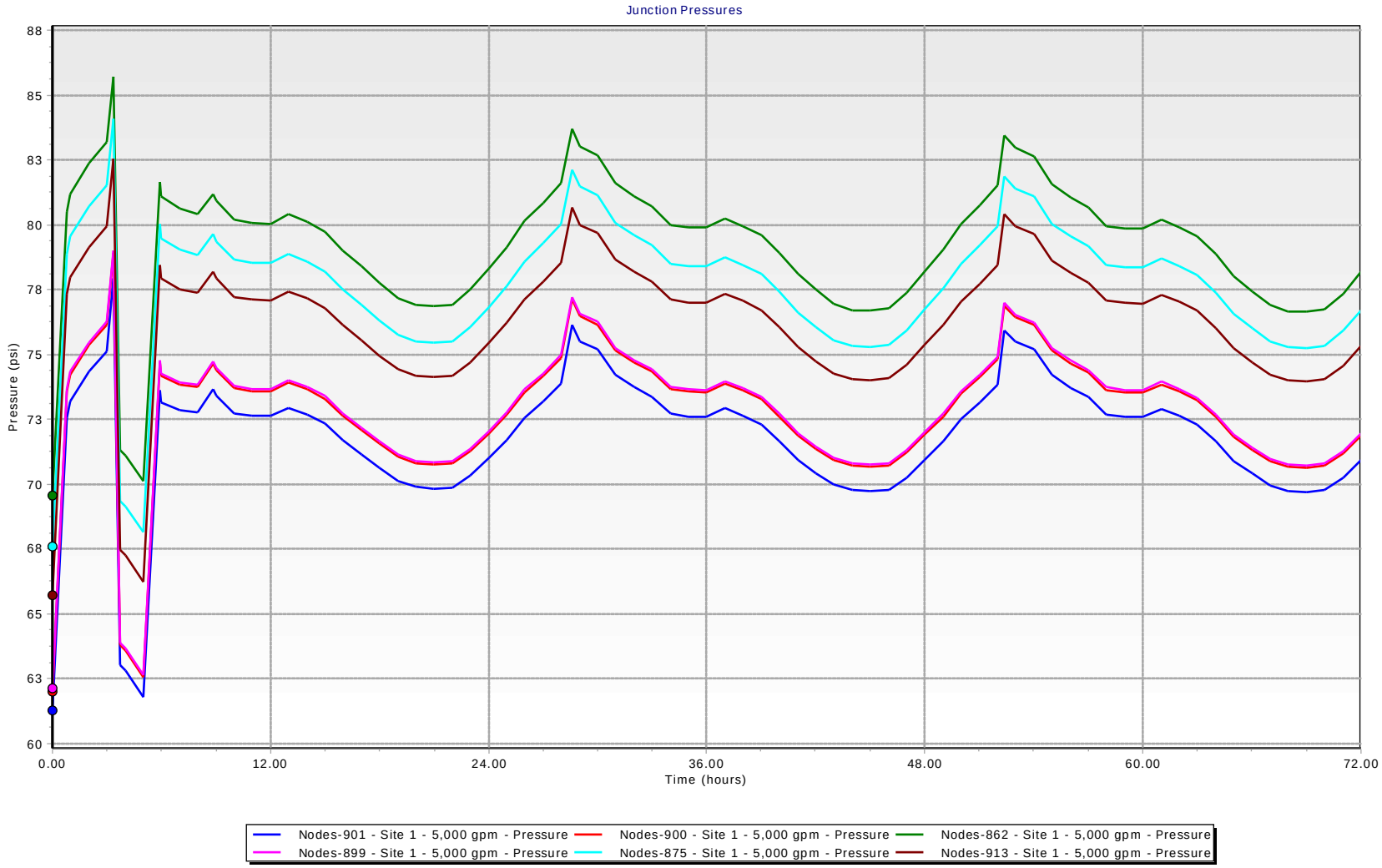
Central WTP - Birch St & 12th Ave S
Existing Watermain
Extended Period Simulation (EPS)
Maximum Day Demand
4,000 GPM WTP Flow



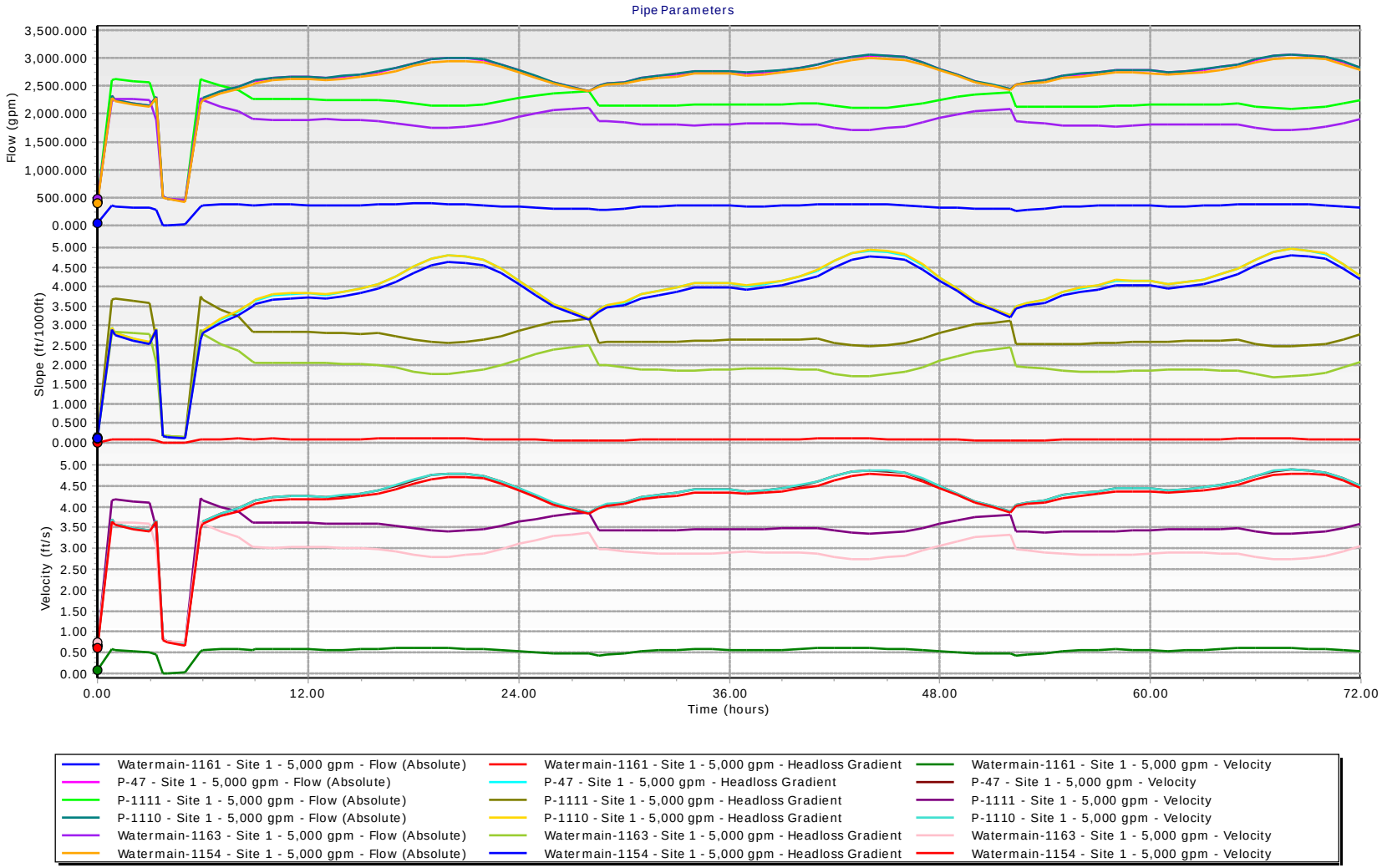
Central WTP - Birch St & 12th Ave S
Existing Watermain
Extended Period Simulation (EPS)
Maximum Day Demand
4,000 GPM WTP Flow



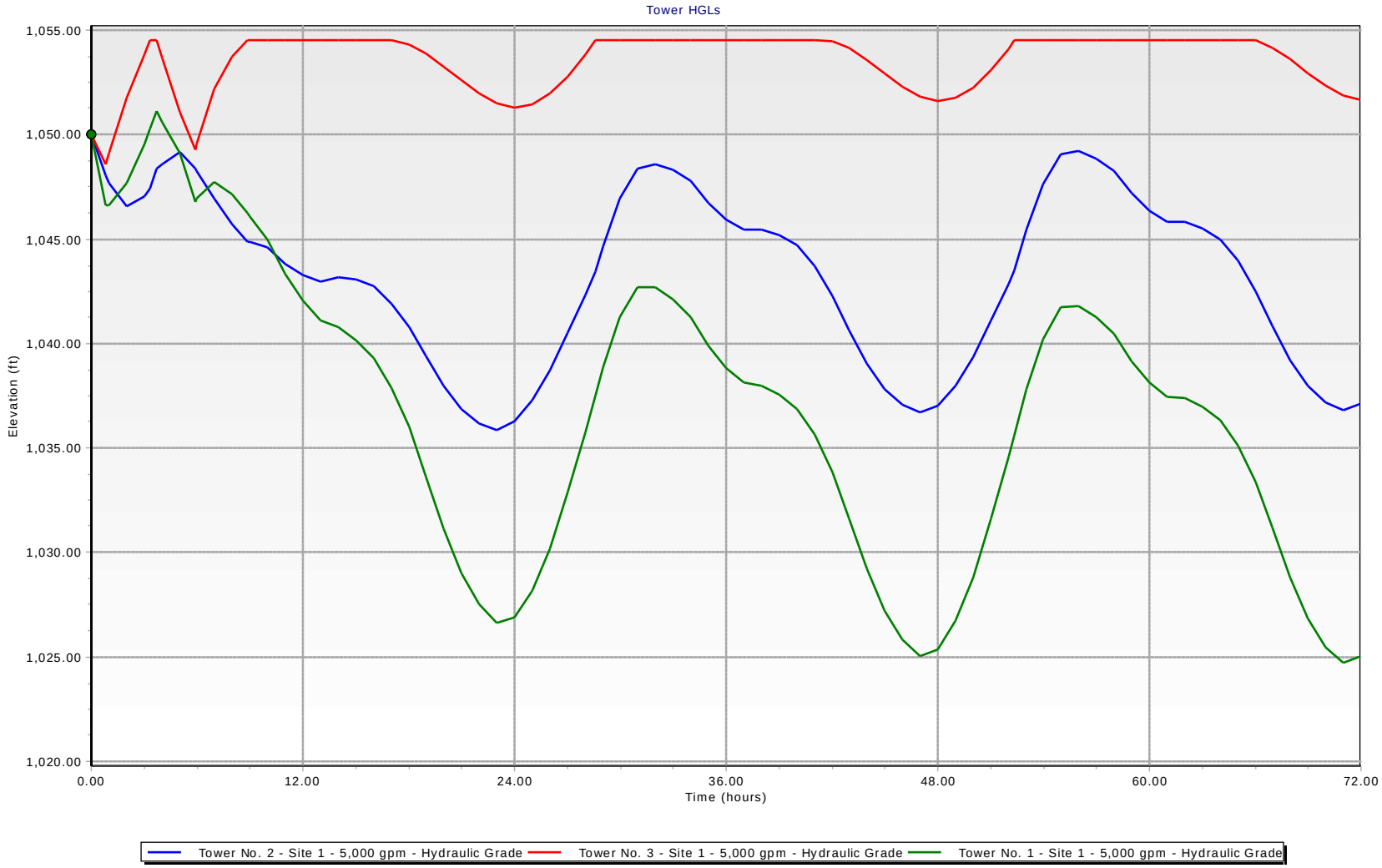
Central WTP - Birch St & 12th Ave S
Existing Watermain
Extended Period Simulation (EPS)
Maximum Day Demand
5,000 GPM WTP Flow



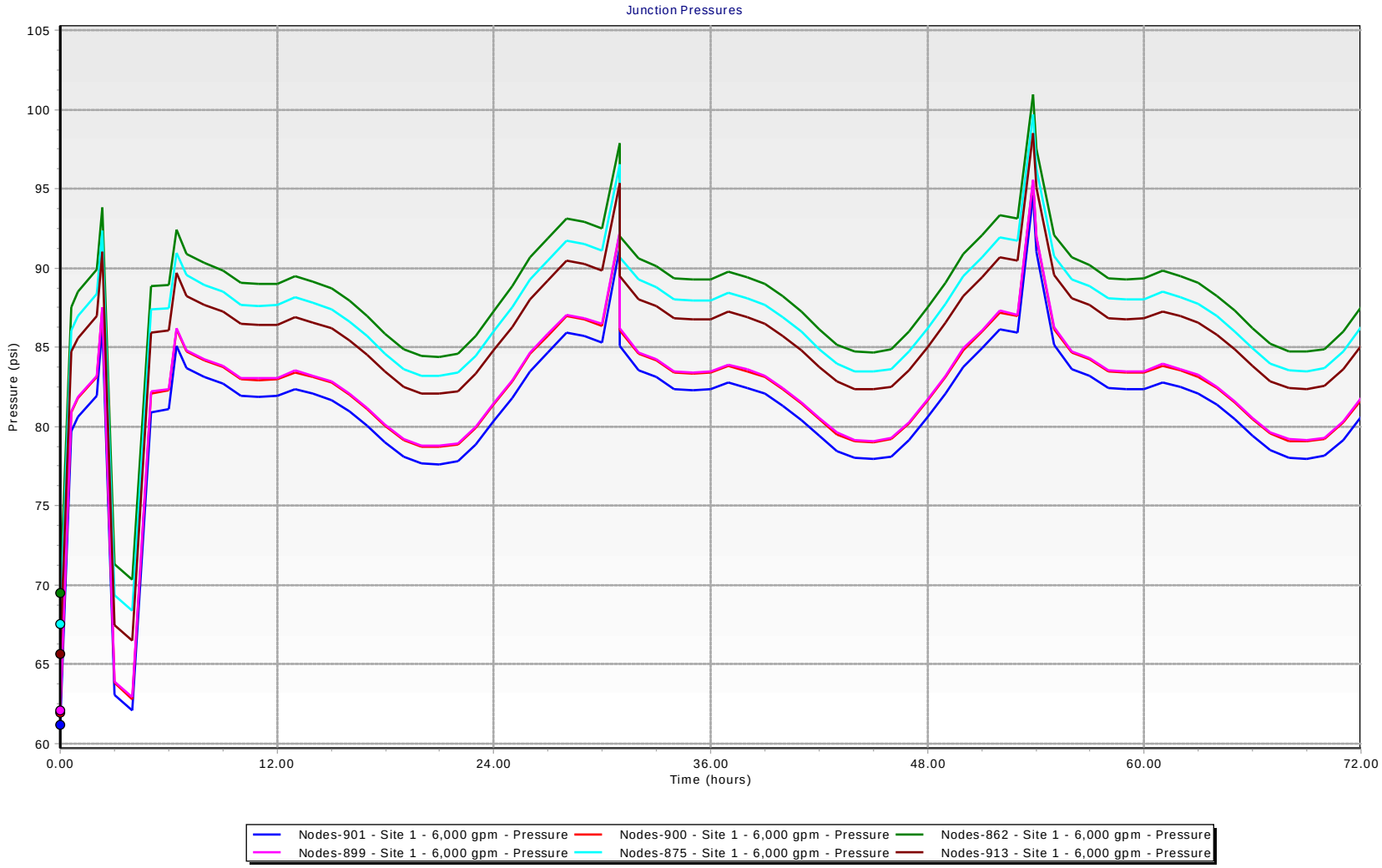
Central WTP - Birch St & 12th Ave S
Existing Watermain
Extended Period Simulation (EPS)
Maximum Day Demand
5,000 GPM WTP Flow



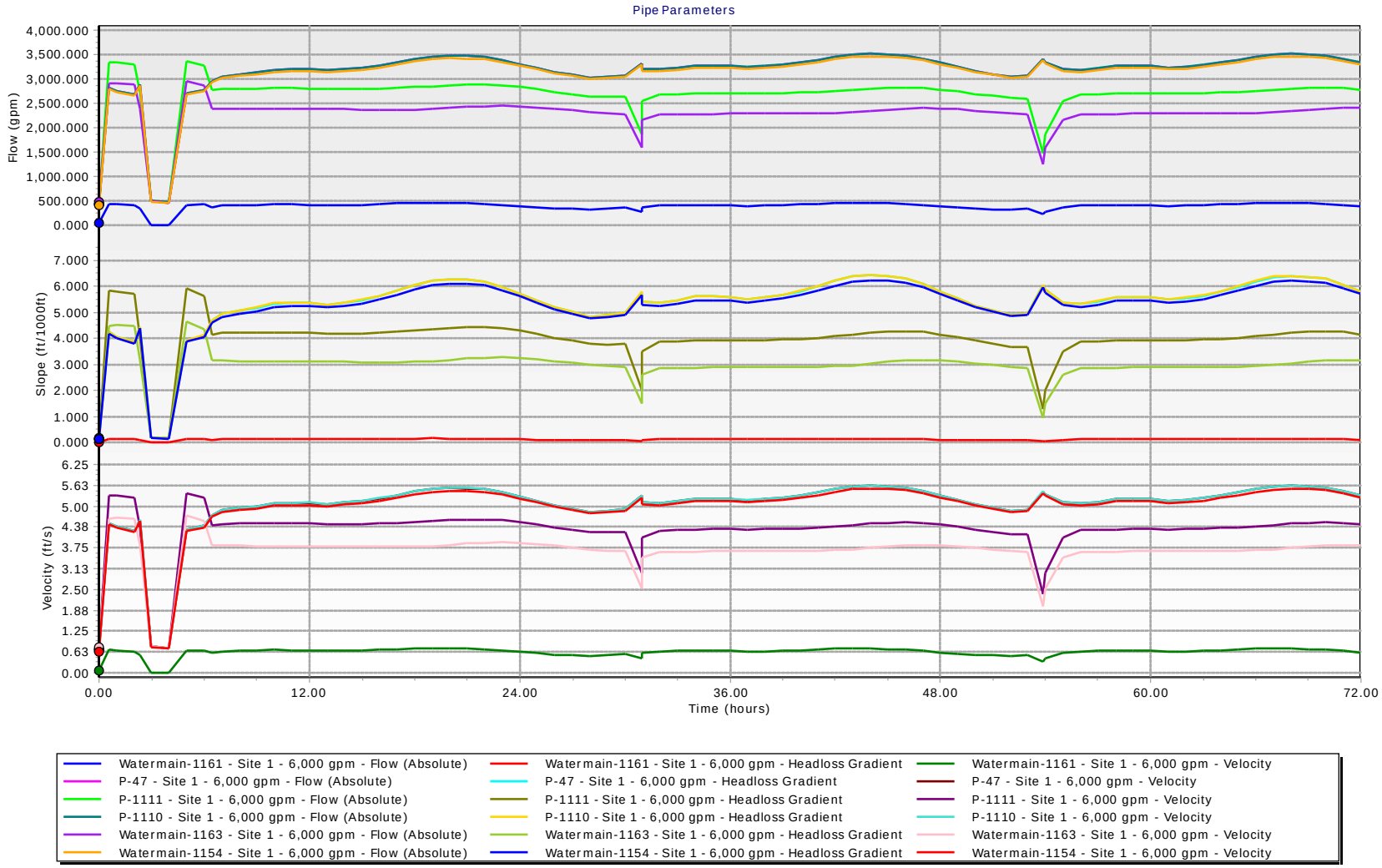
Central WTP - Birch St & 12th Ave S
Existing Watermain
Extended Period Simulation (EPS)
Maximum Day Demand
5,000 GPM WTP Flow



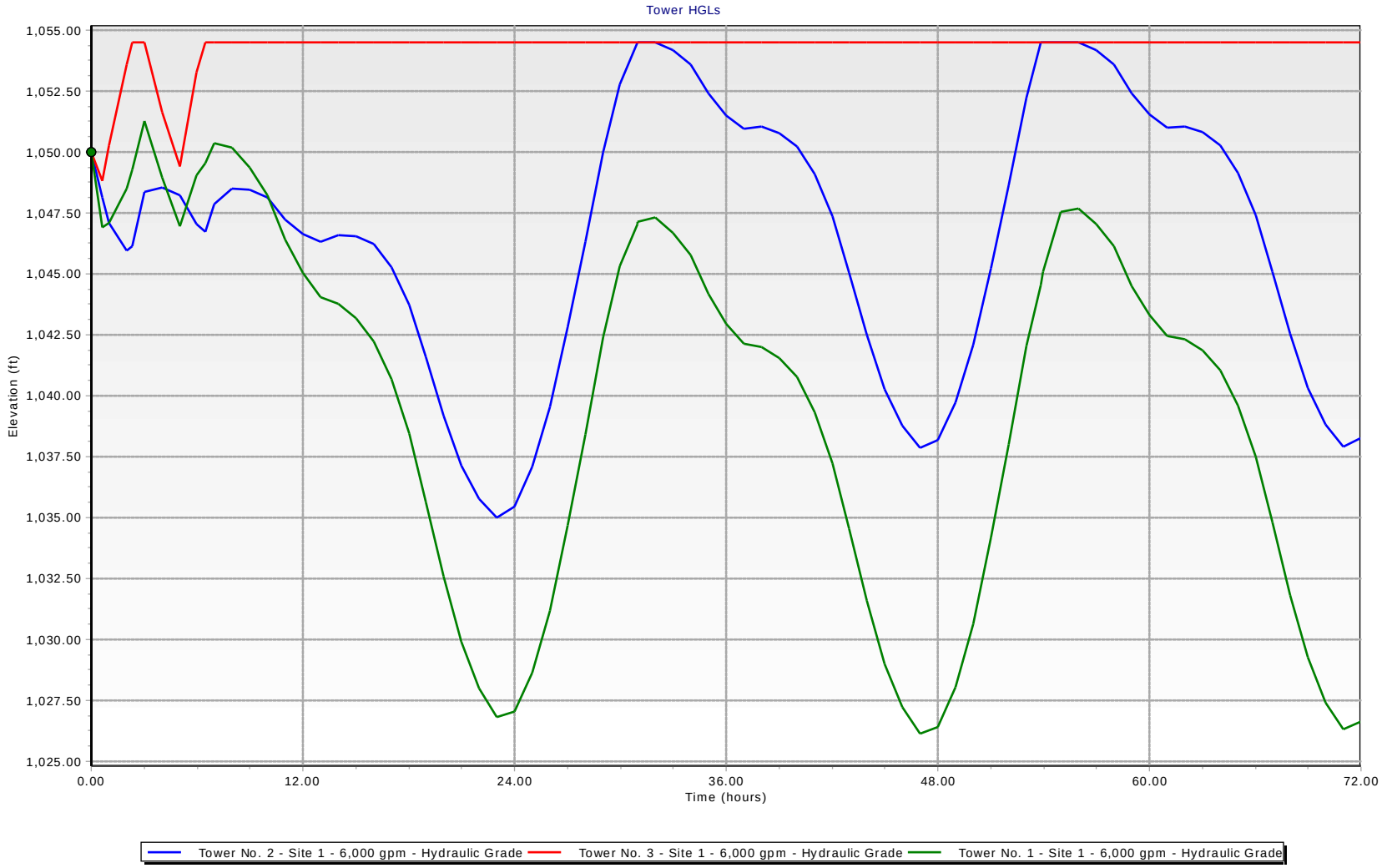
Central WTP - Birch St & 12th Ave S
Existing Watermain
Extended Period Simulation (EPS)
Maximum Day Demand
6,000 GPM WTP Flow



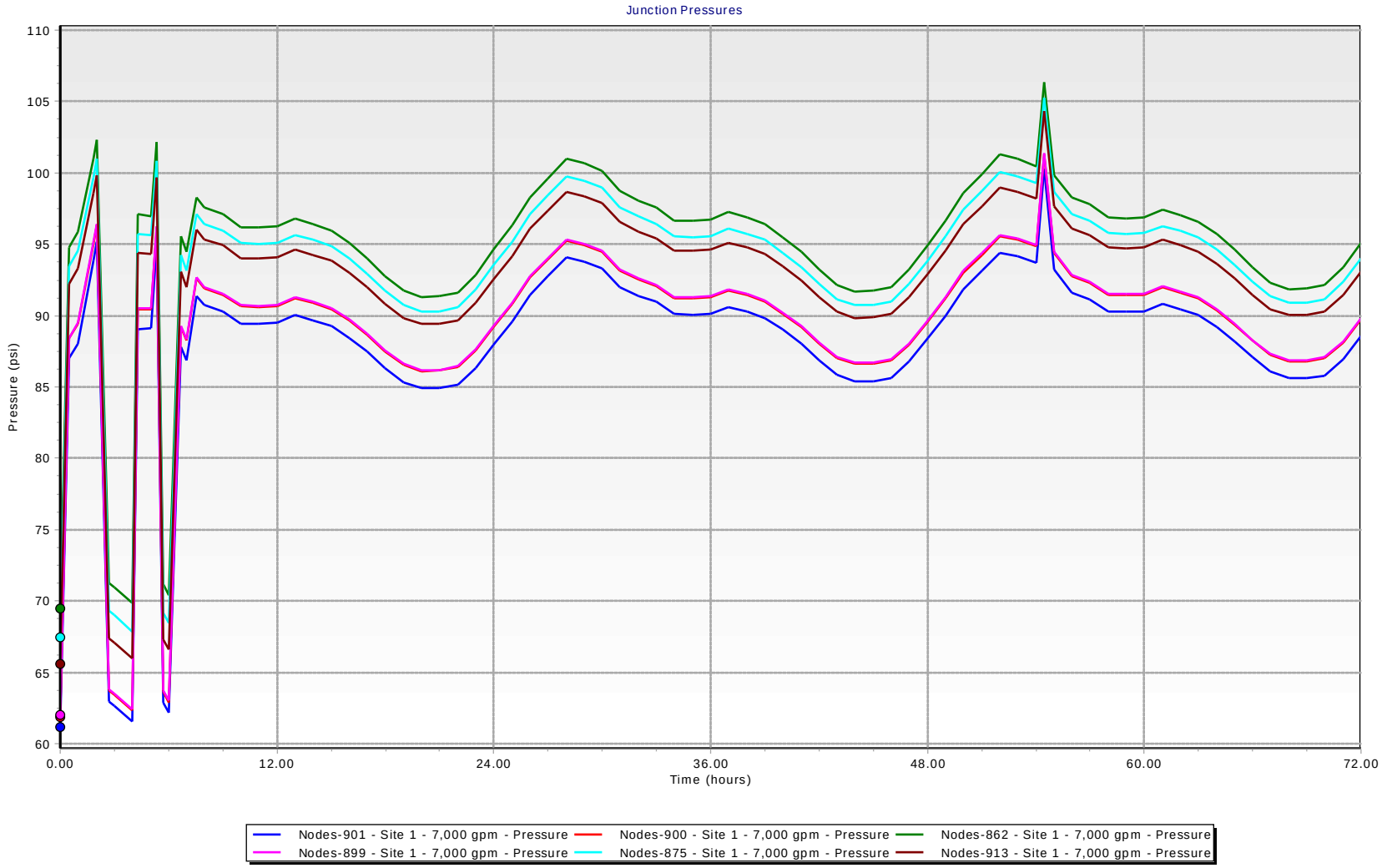
Central WTP - Birch St & 12th Ave S
Existing Watermain
Extended Period Simulation (EPS)
Maximum Day Demand
6,000 GPM WTP Flow



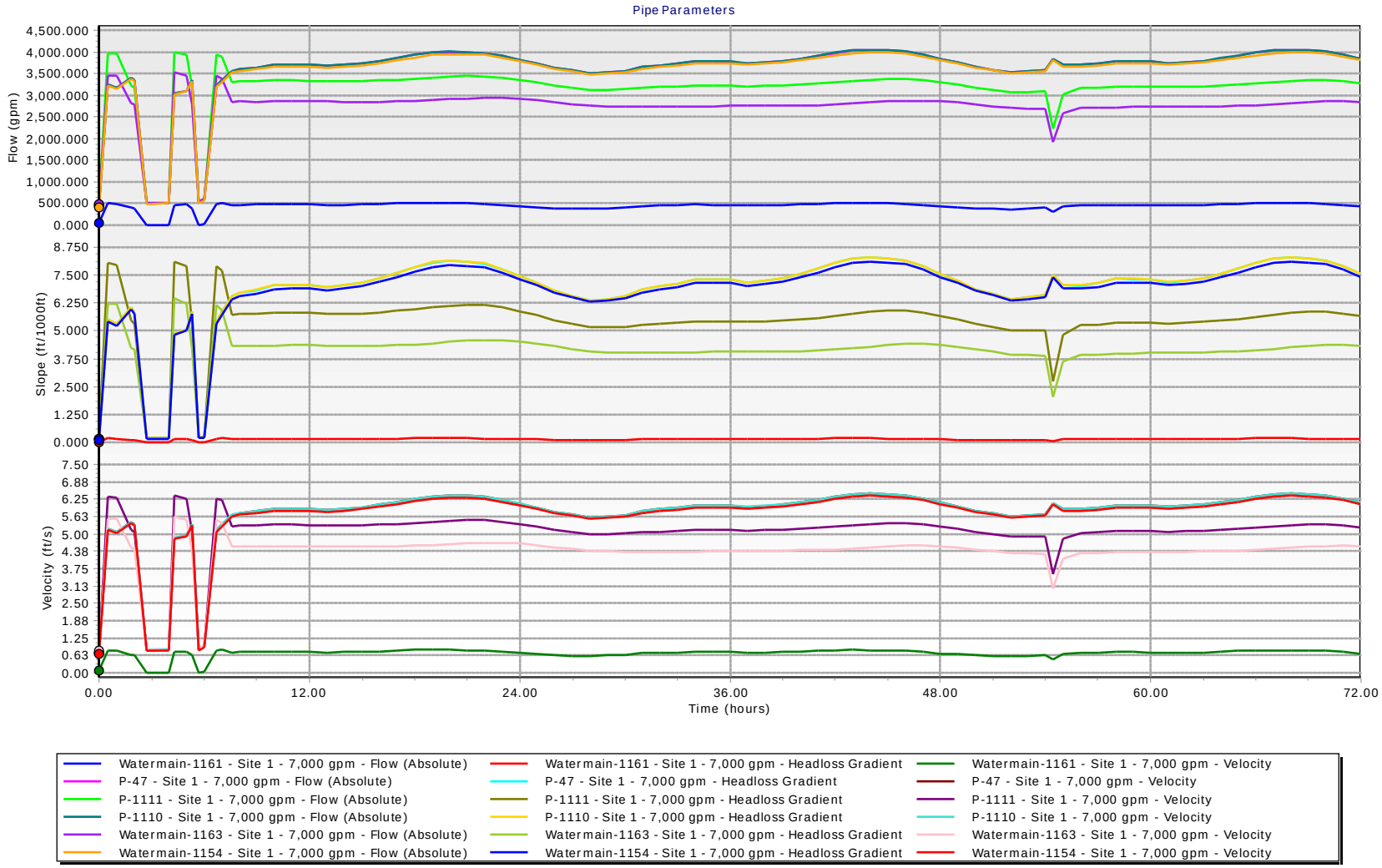
Central WTP - Birch St & 12th Ave S
Existing Watermain
Extended Period Simulation (EPS)
Maximum Day Demand
6,000 GPM WTP Flow



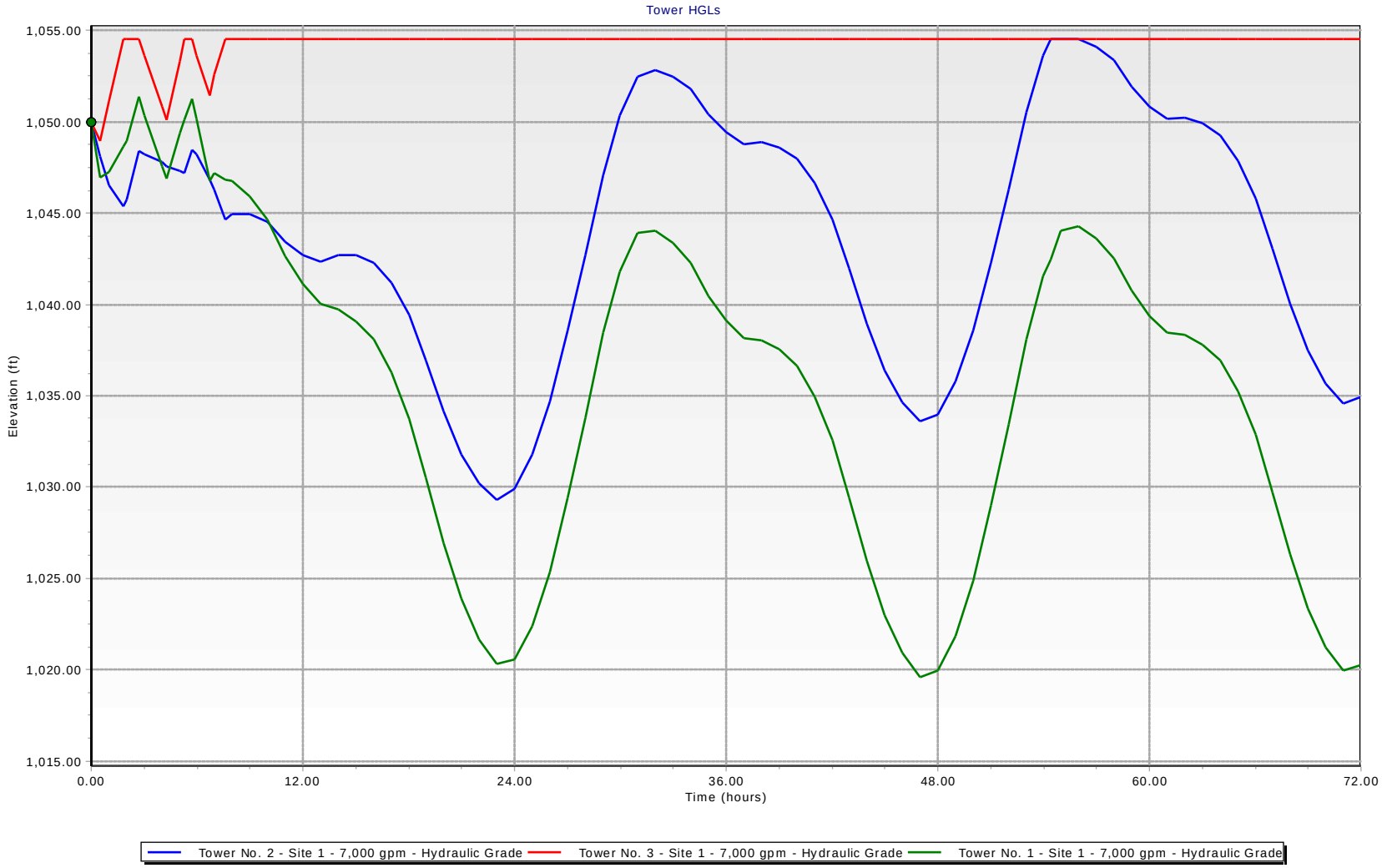
Central WTP - Birch St & 12th Ave S
Existing Watermain
Extended Period Simulation (EPS)
Maximum Day Demand
7,000 GPM WTP Flow



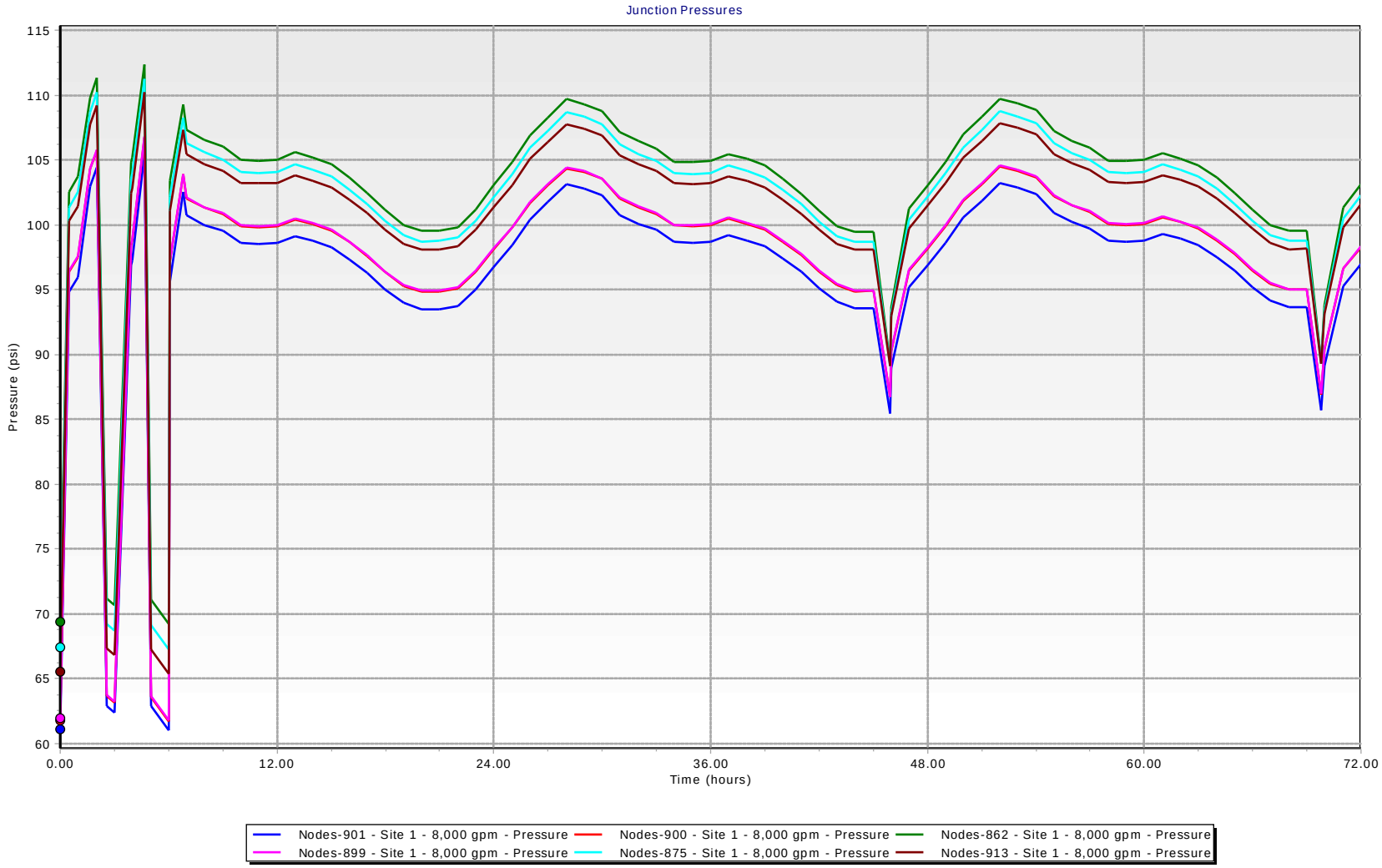
Central WTP - Birch St & 12th Ave S
Existing Watermain
Extended Period Simulation (EPS)
Maximum Day Demand
7,000 GPM WTP Flow



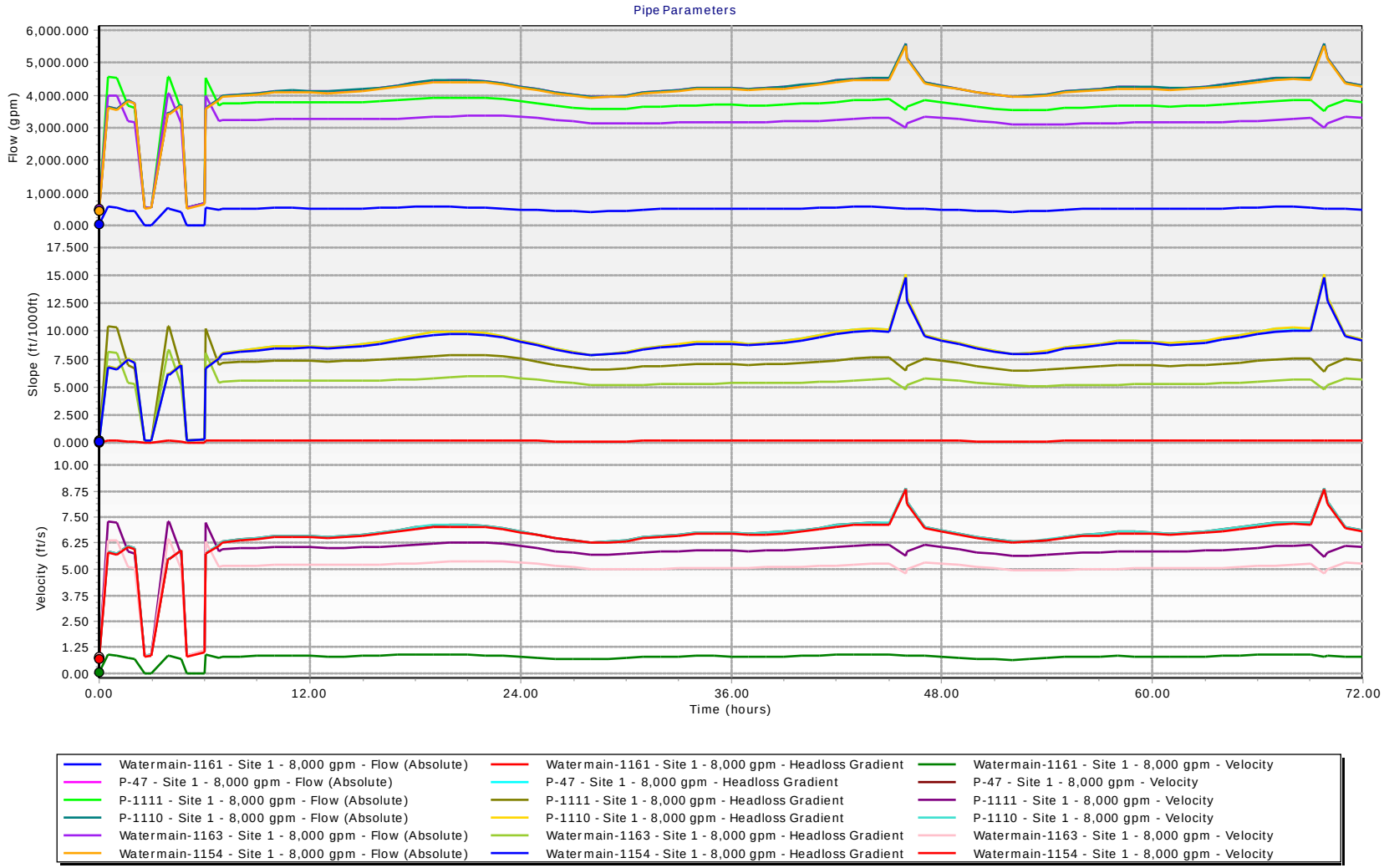
Central WTP - Birch St & 12th Ave S
Existing Watermain
Extended Period Simulation (EPS)
Maximum Day Demand
7,000 GPM WTP Flow



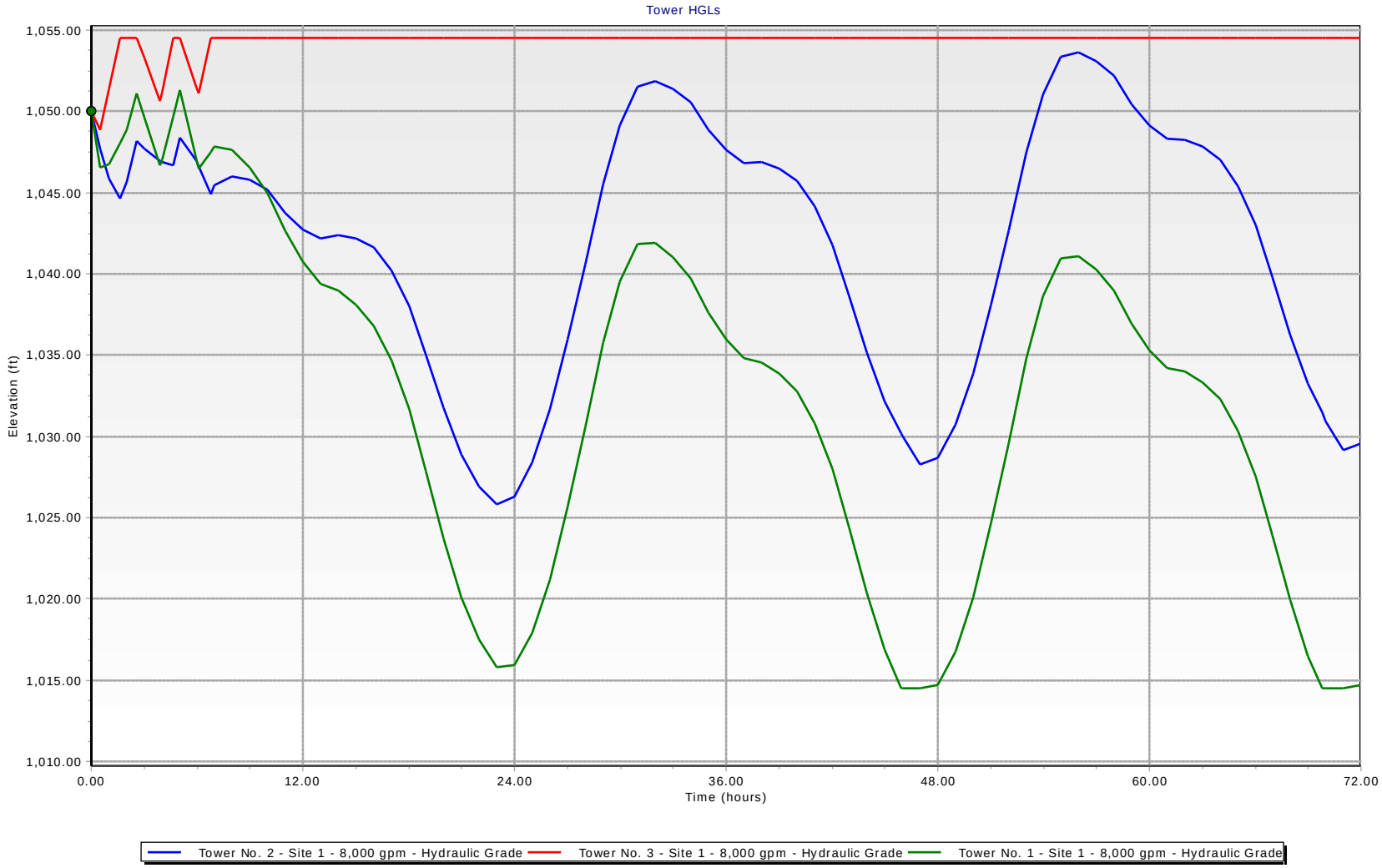
Central WTP - Birch St & 12th Ave S
Existing Watermain
Extended Period Simulation (EPS)
Maximum Day Demand
8,000 GPM WTP Flow



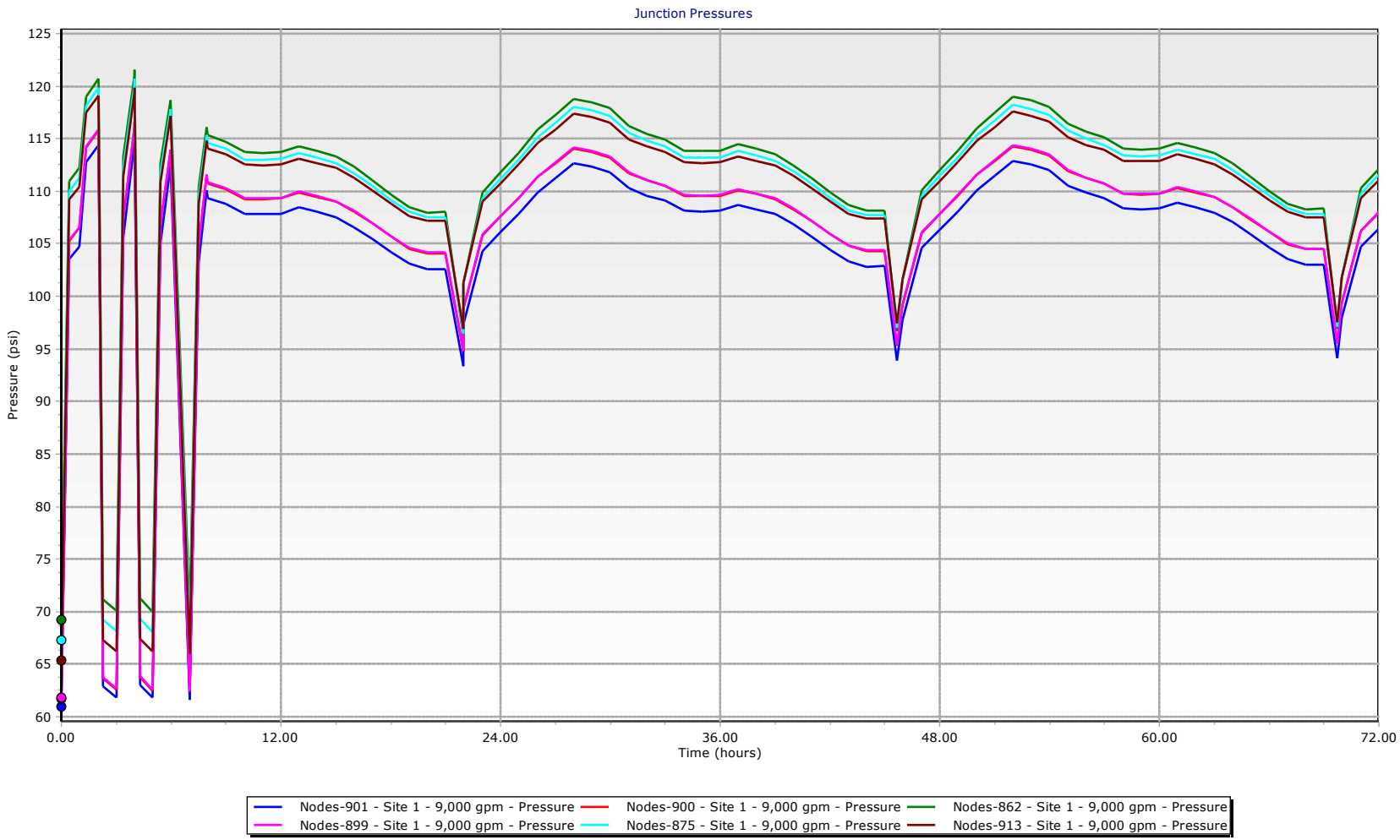
Central WTP - Birch St & 12th Ave S
Existing Watermain
Extended Period Simulation (EPS)
Maximum Day Demand
8,000 GPM WTP Flow



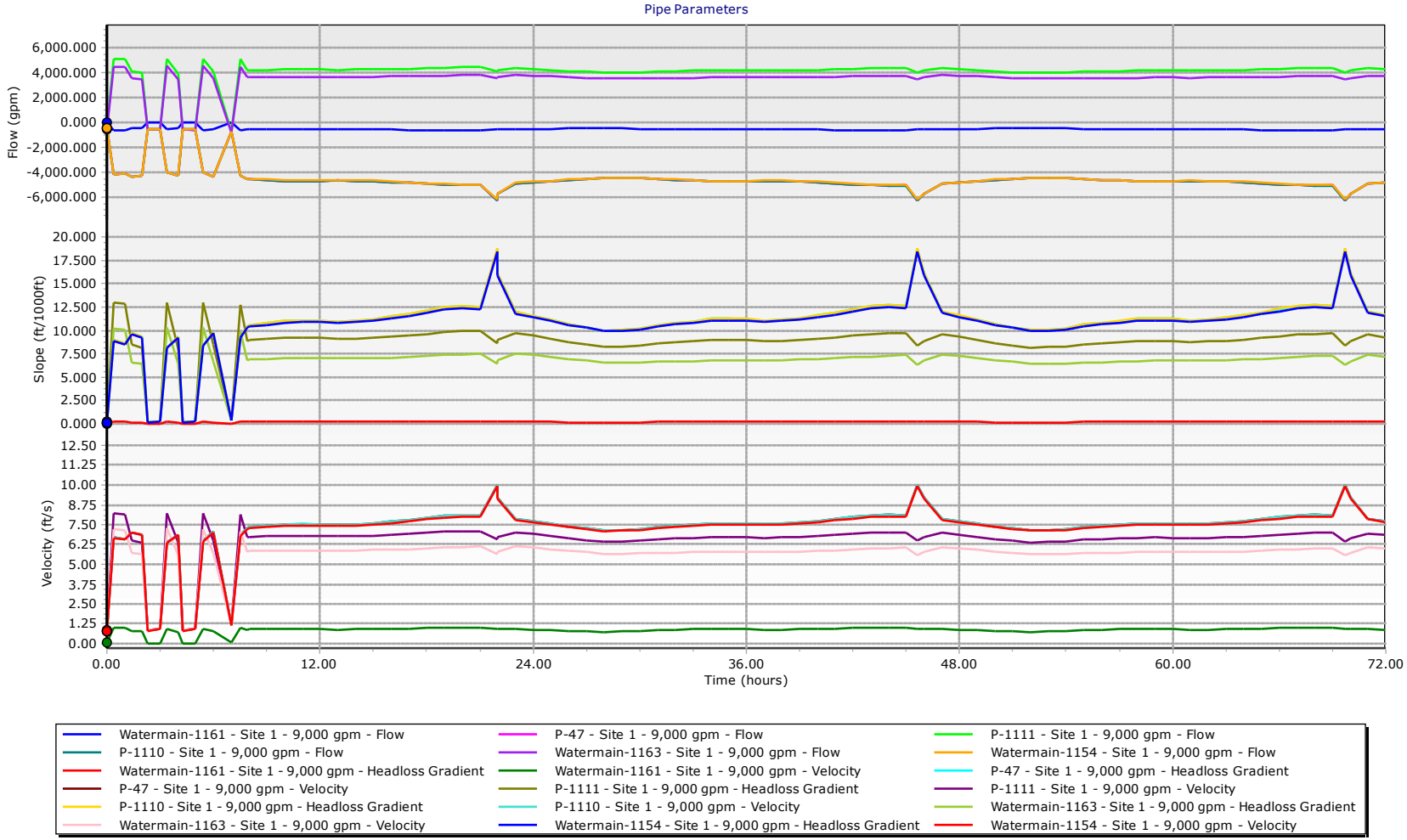
Central WTP - Birch St & 12th Ave S
Existing Watermain
Extended Period Simulation (EPS)
Maximum Day Demand
8,000 GPM WTP Flow



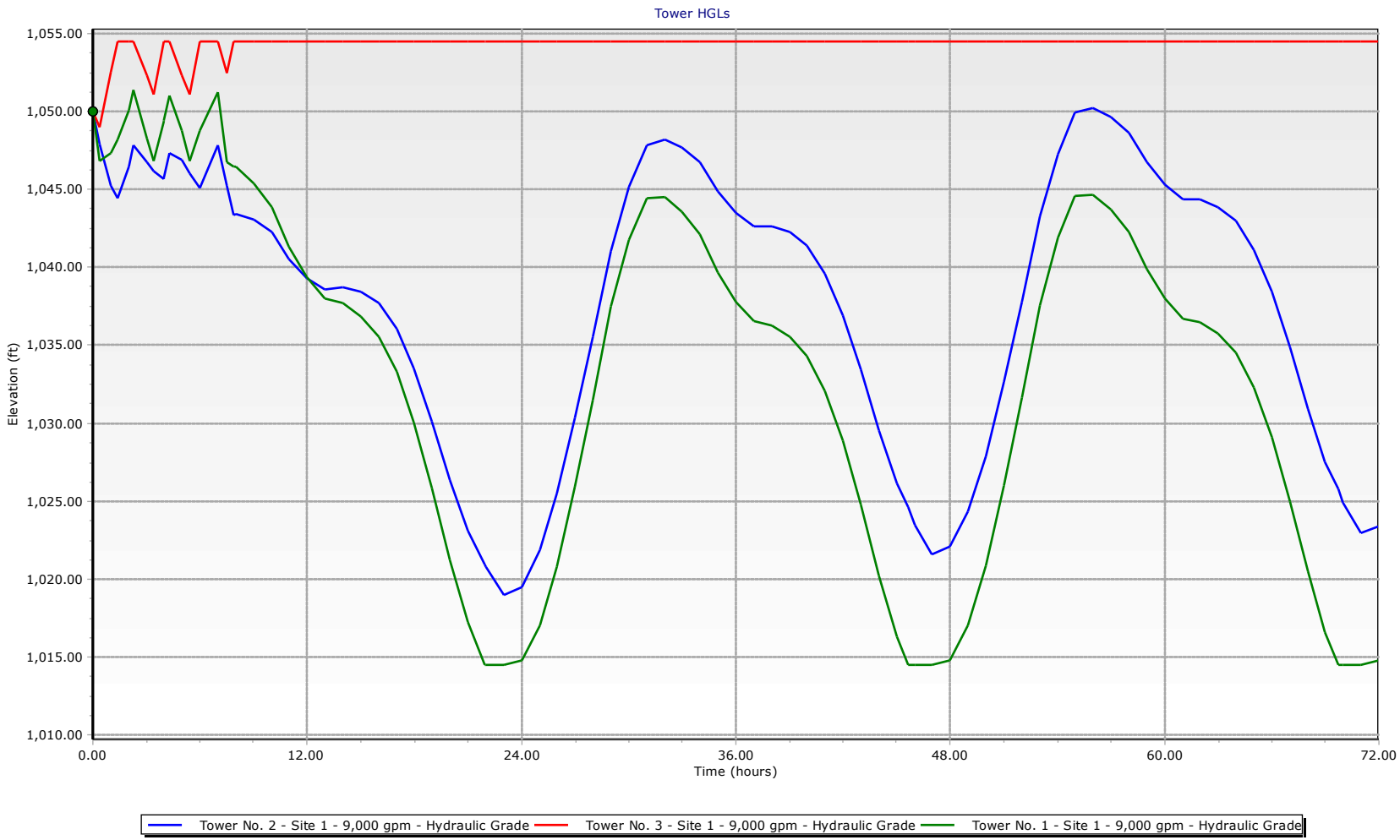
Central WTP - Birch St & 12th Ave S
Existing Watermain
Extended Period Simulation (EPS)
Maximum Day Demand
9,000 GPM WTP Flow



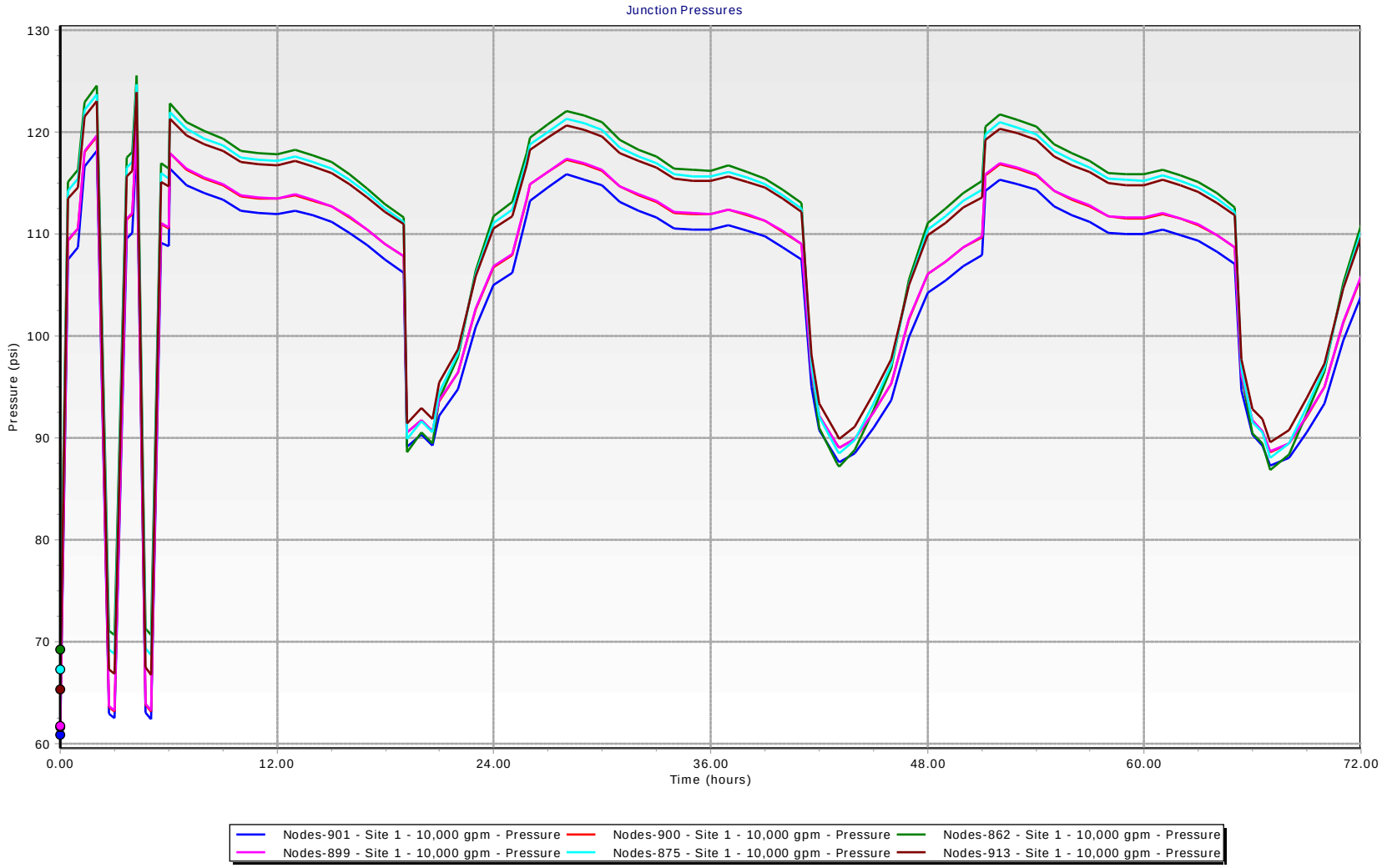
Central WTP - Birch St & 12th Ave S
Existing Watermain
Extended Period Simulation (EPS)
Maximum Day Demand
9,000 GPM WTP Flow



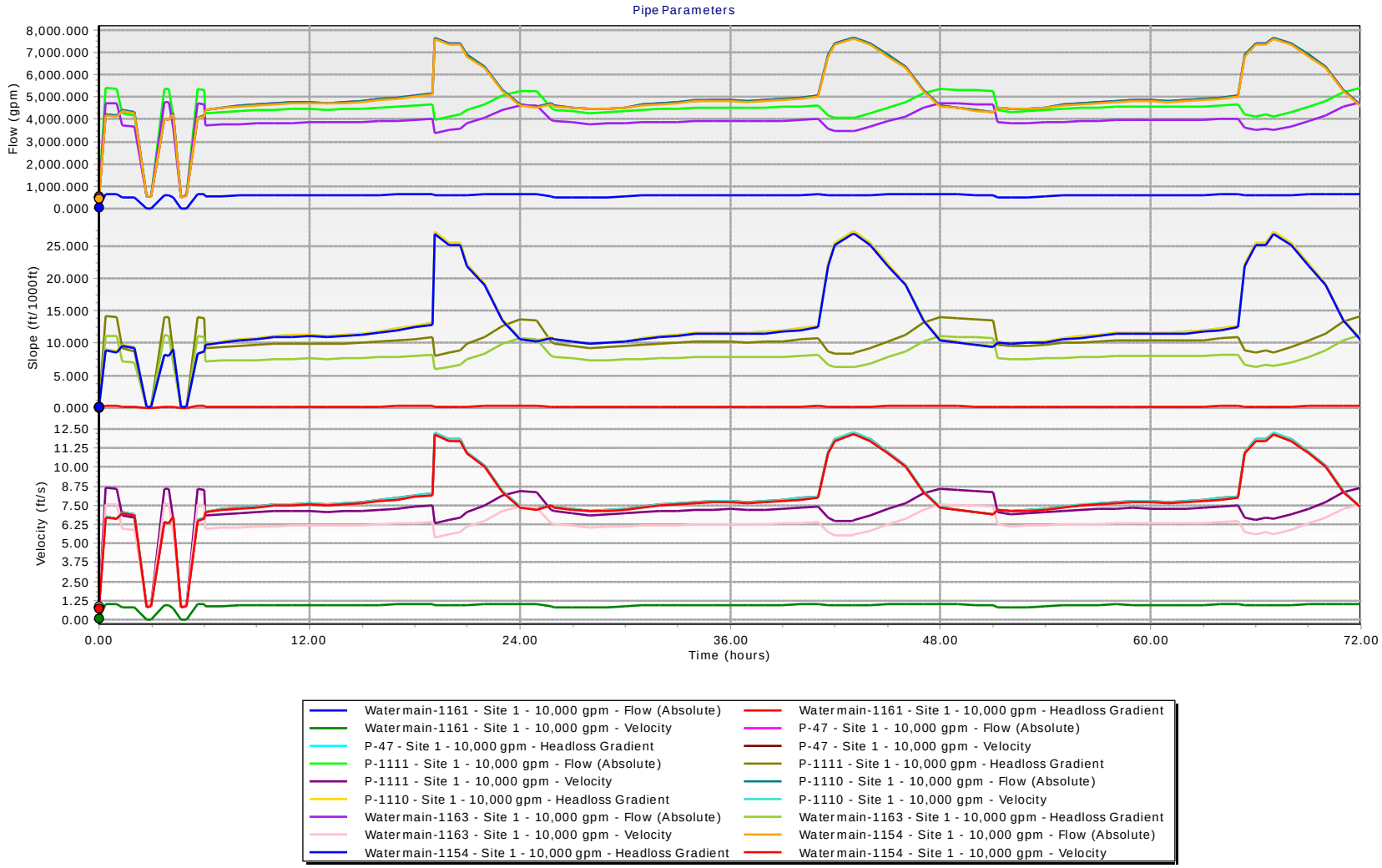
Central WTP - Birch St & 12th Ave S
Existing Watermain
Extended Period Simulation (EPS)
Maximum Day Demand
9,000 GPM WTP Flow



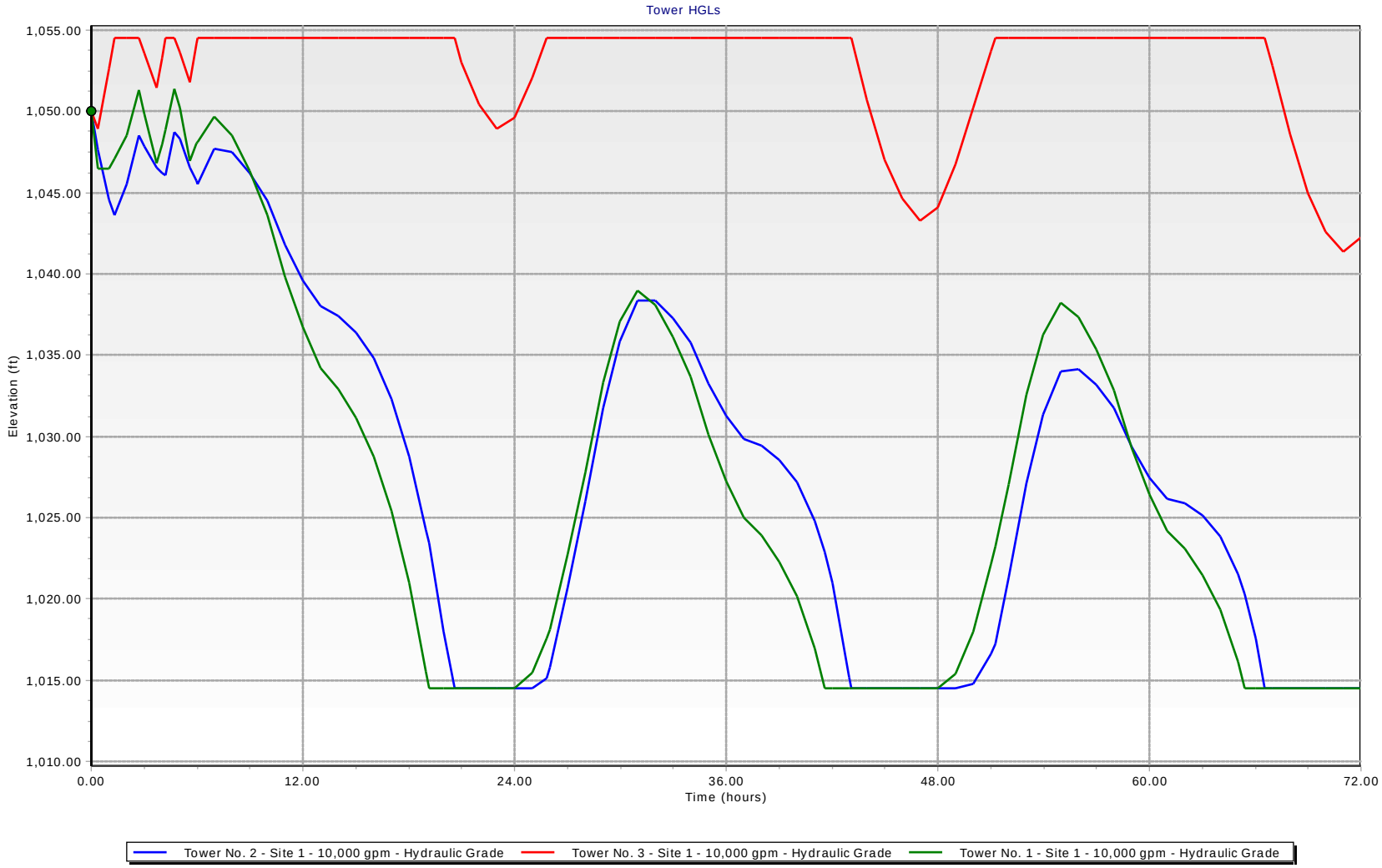
Central WTP - Birch St & 12th Ave S
Existing Watermain
Extended Period Simulation (EPS)
Maximum Day Demand
10,000 GPM WTP Flow



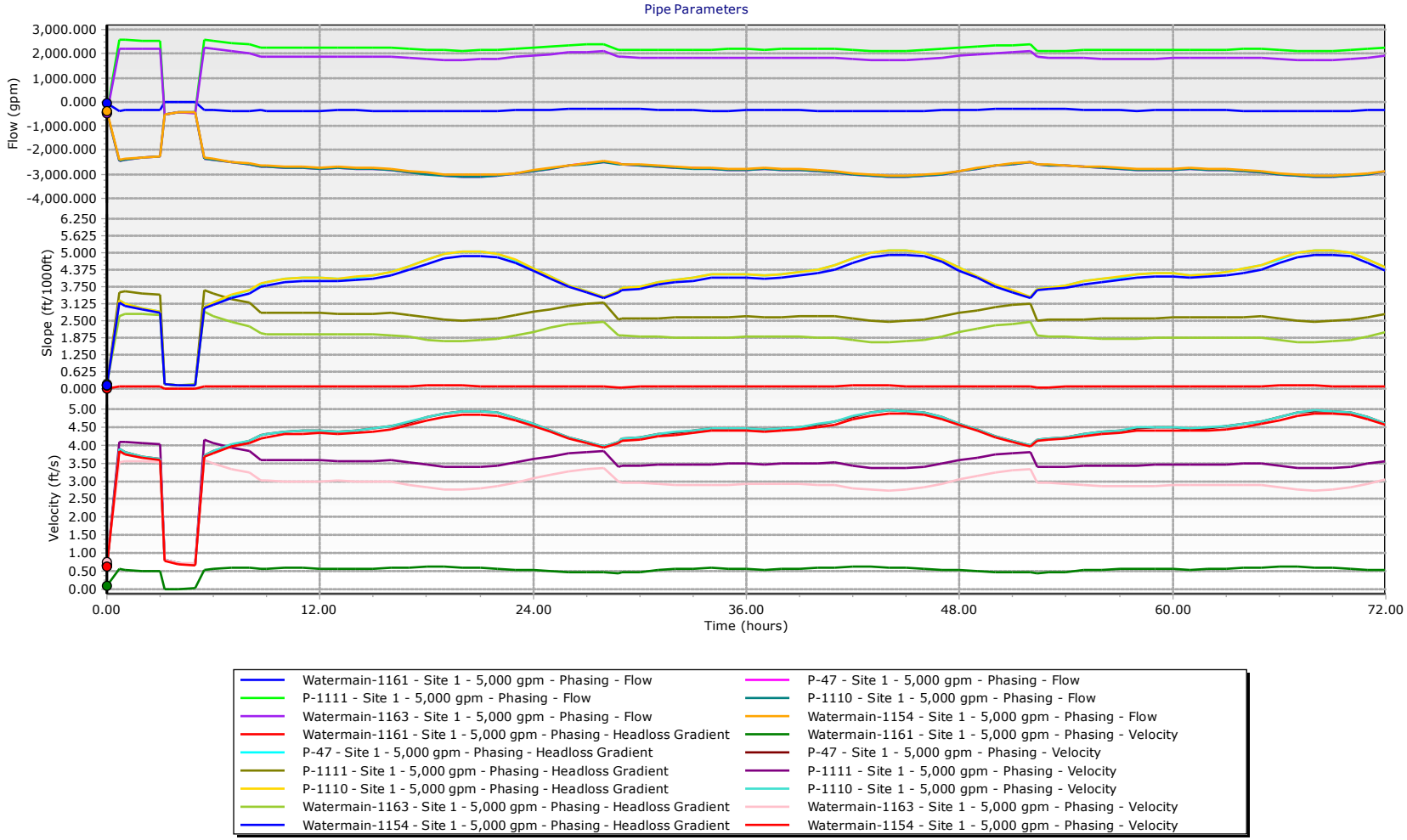
Central WTP - Birch St & 12th Ave S
Existing Watermain
Extended Period Simulation (EPS)
Maximum Day Demand
10,000 GPM WTP Flow



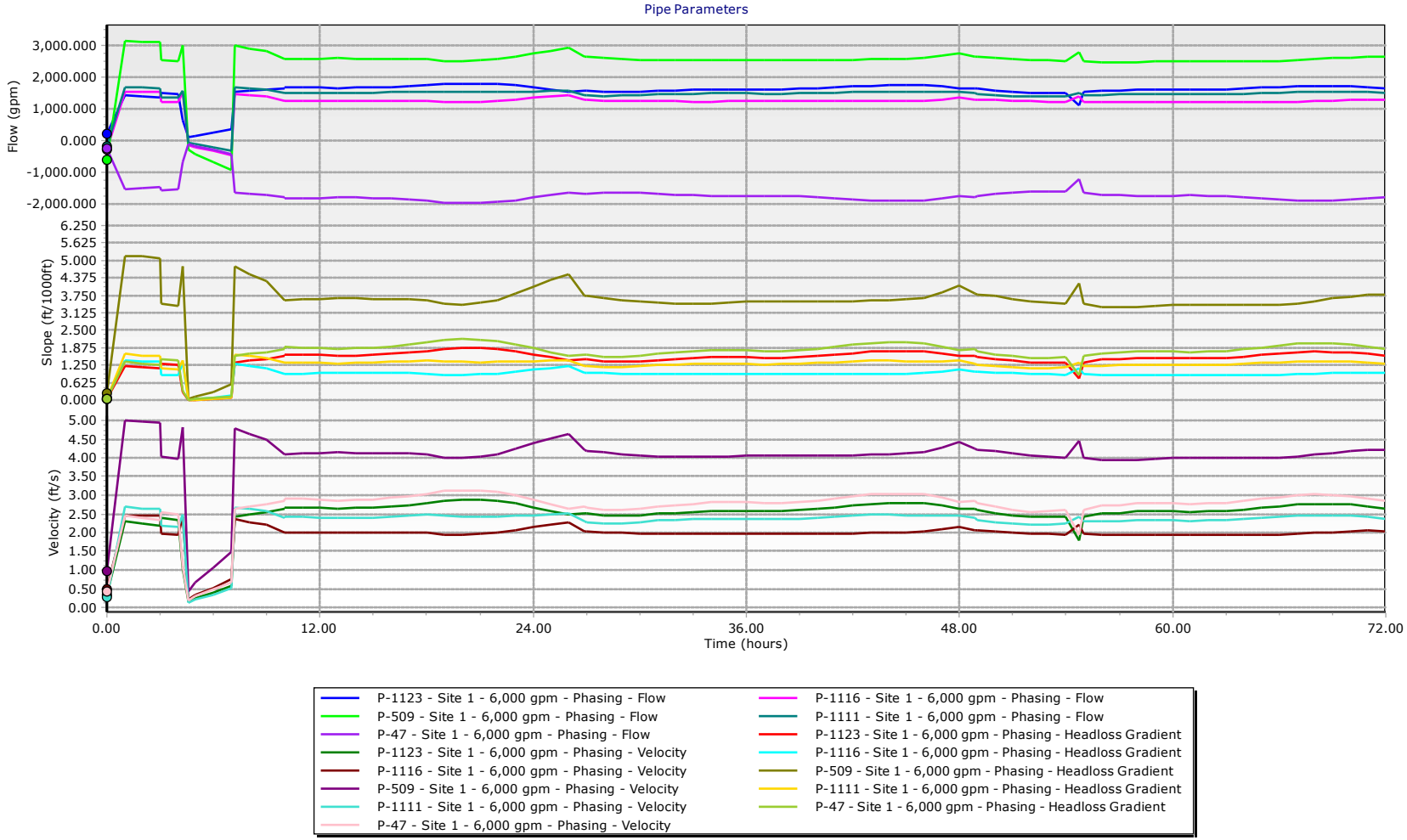
Central WTP - Birch St & 12th Ave S
Existing Watermain
Extended Period Simulation (EPS)
Maximum Day Demand
10,000 GPM WTP Flow



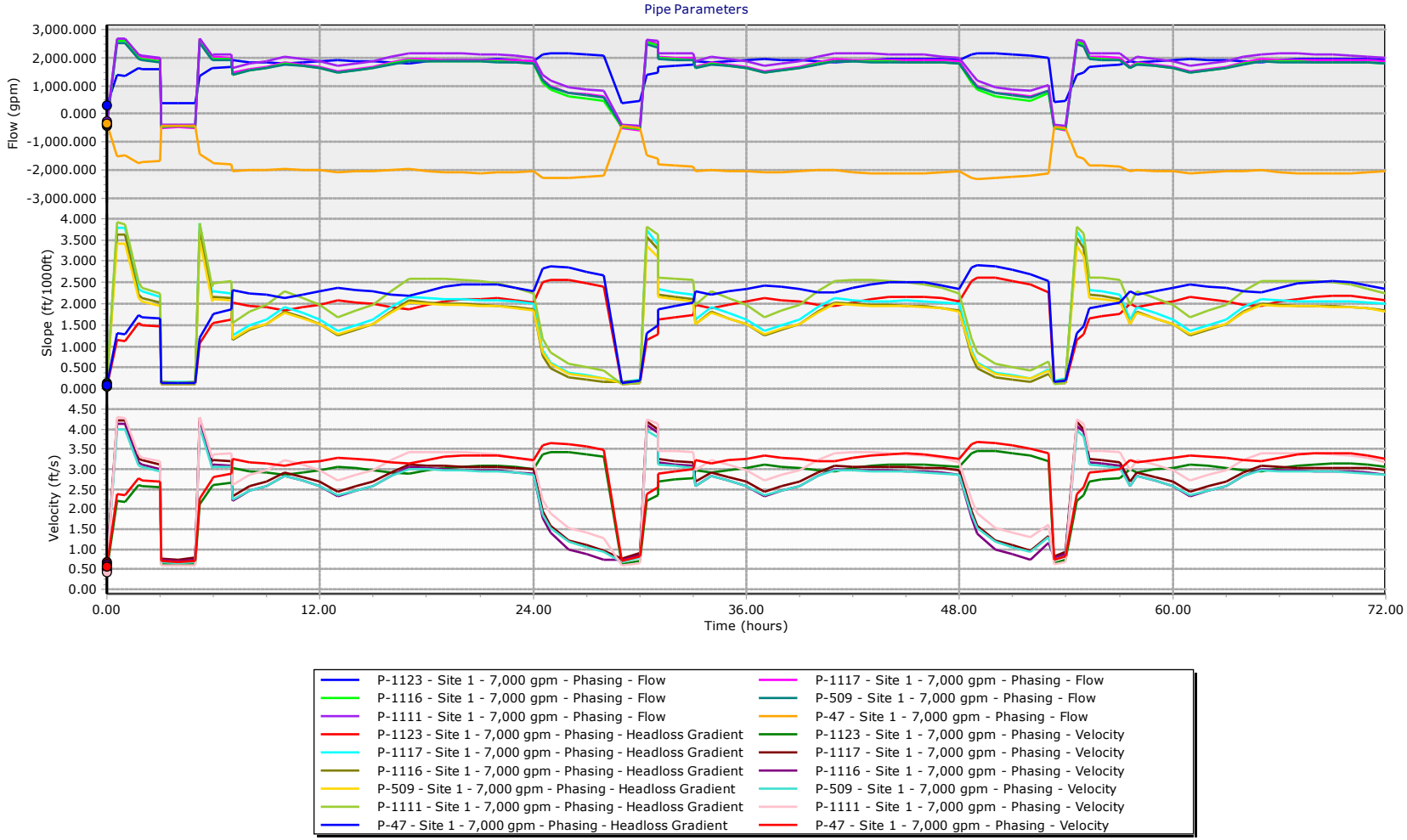
Central WTP - Birch St & 12th Ave S
Phase 2 Watermain
Extended Period Simulation (EPS)
Maximum Day Demand
5,000 GPM WTP Flow



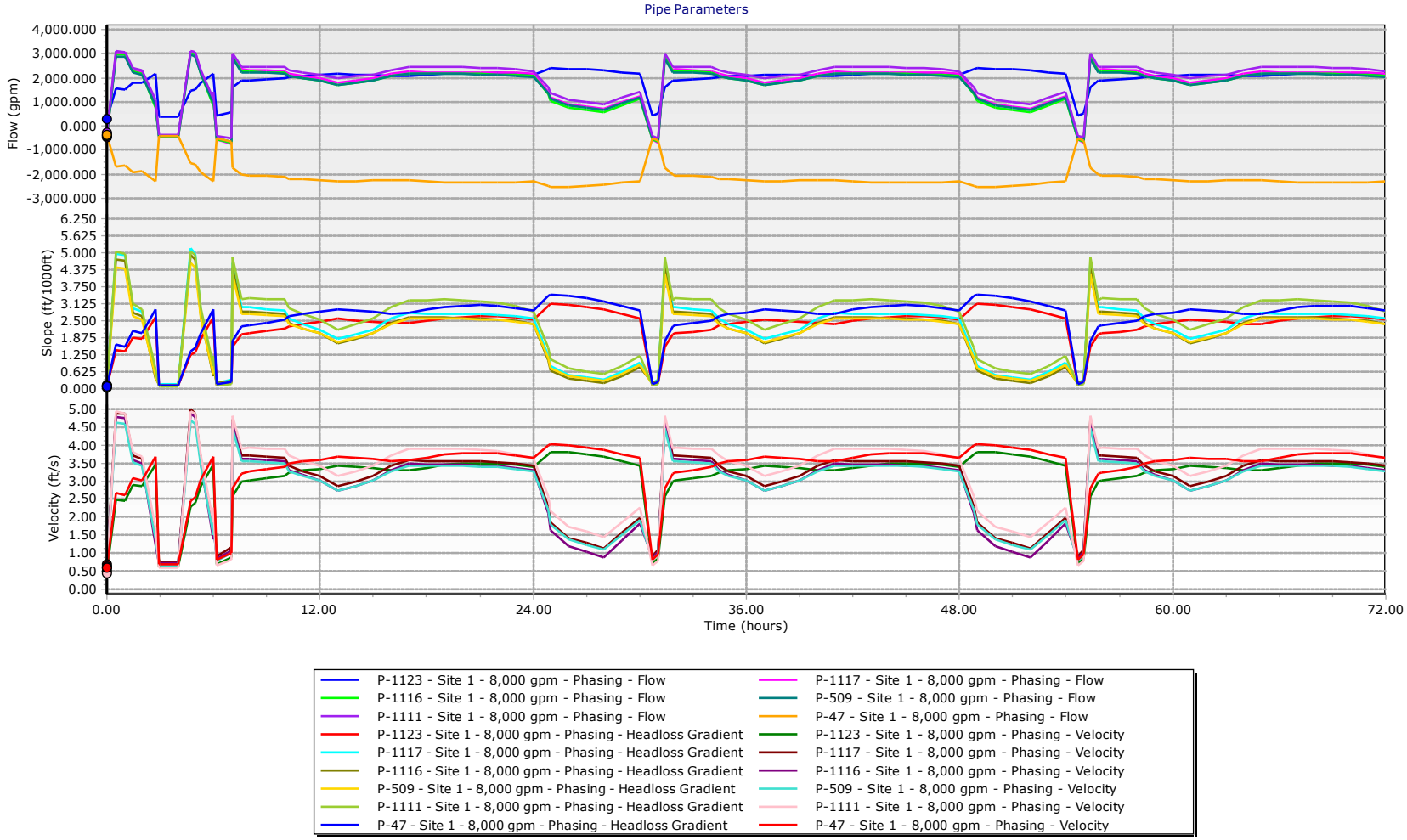
Central WTP - Birch St & 12th Ave S
Phase 3 Watermain
Extended Period Simulation (EPS)
Maximum Day Demand
6,000 GPM WTP Flow



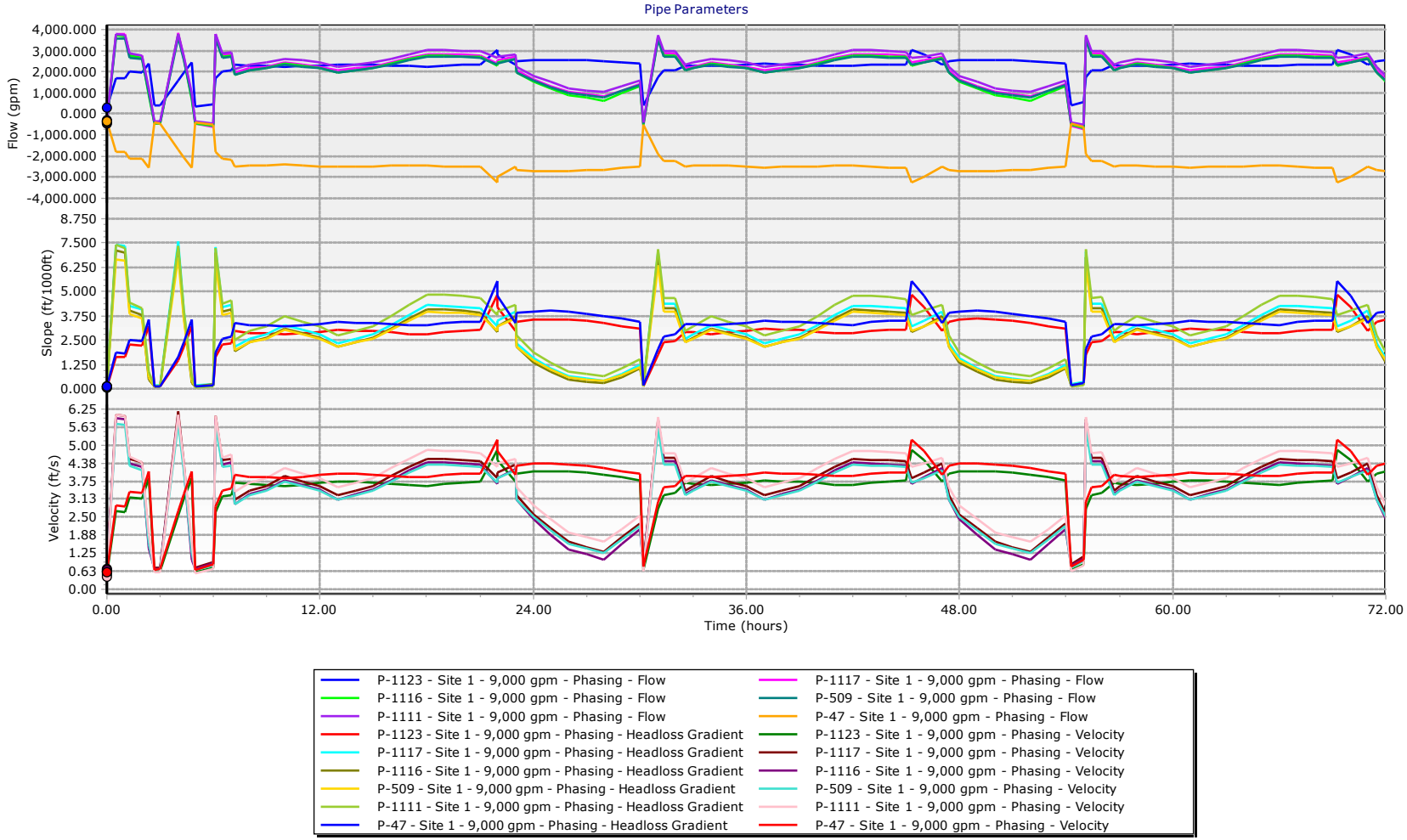
Central WTP - Birch St & 12th Ave S
Phase 4 Watermain
Extended Period Simulation (EPS)
Maximum Day Demand
7,000 GPM WTP Flow



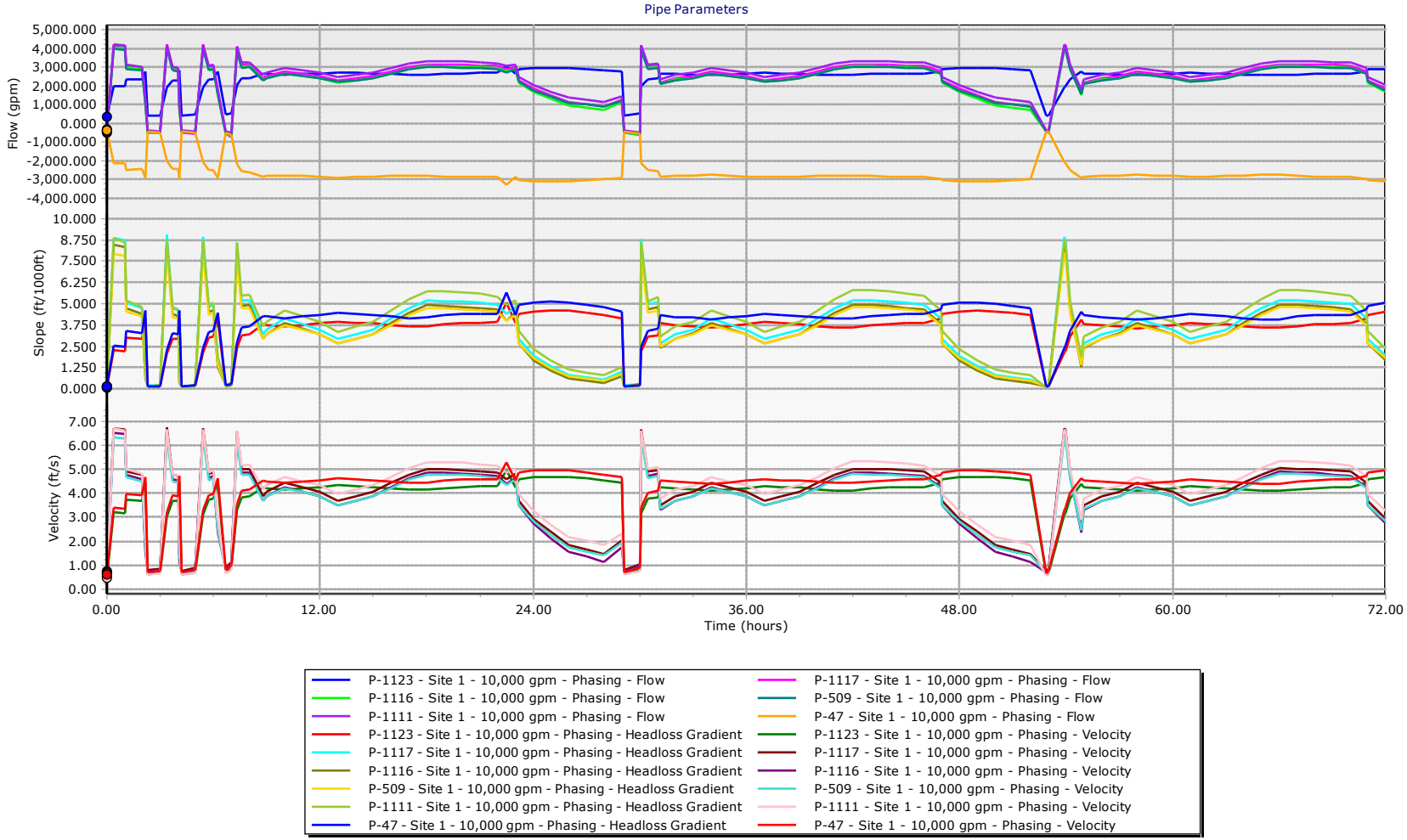
Central WTP - Birch St & 12th Ave S
Phase 4 Watermain
Extended Period Simulation (EPS)
Maximum Day Demand
8,000 GPM WTP Flow



Central WTP - Birch St & 12th Ave S
Phase 5 Watermain (same as Phase 4)
Extended Period Simulation (EPS)
Maximum Day Demand
9,000 GPM WTP Flow



Central WTP - Birch St & 12th Ave S
Phase 5 Watermain (same as Phase 4)
Extended Period Simulation (EPS)
Maximum Day Demand
10,000 GPM WTP Flow



APPENDIX E

Cost Tables

OPTION 3: IMPLEMENT TREATMENT

WATER TREATMENT PLANT				
ITEM	UNIT	QTY.	UNIT COST	COST
GENERAL CONDITIONS	LS	1	$300,000	$300,000
BONDS & INSURANCE	LS	1	$180,000	$180,000
OFFICE TRAILERS & UTILITIES	LS	1	$120,000	$120,000
MOBILIZATION	LS	1	$300,000	$300,000
SUBMITTALS	LS	1	$120,000	$120,000
O&M MANUALS	LS	1	$30,000	$30,000
OPERATOR TRAINING	LS	1	$18,000	$18,000
PLANT START-UP & CHECKOUT	LS	1	$36,000	$36,000
CLEARING AND GRUBBING	LS	1	$6,000	$6,000
EROSION CONTROL	LS	1	$33,600	$33,600
EARTHWORK	LS	1	$1,088,400	$1,088,400
STRUCTURAL	LS	1	$3,708,000	$3,708,000
ARCHITECTURAL	LS	1	$2,997,600	$2,997,600
HVAC/PLUMBING	LS	1	$1,215,000	$1,215,000
PROCESS	LS	1	$3,357,600	$3,357,600
ELECTRICAL & SCADA INTEGRATION	LS	1	$2,016,000	$2,016,000
RAW WATERMAINS FROM WELLS				
REMOVE EXISTING 16-INCH DIP WATERMAIN	LF	400	$12	$4,800
REMOVE EXISTING 12-INCH PVC SANITARY SEWER	LF	450	$8	$3,600
REMOVE EXISTING MANHOLE	EACH	1	$500	$500
12-INCH PVC SANITARY SEWER	LF	450	$58	$26,100
48-INCH DIAMETER SANITARY MANHOLE	EACH	1	$3,600	$3,600
CONNECT TO EXISTING MANHOLE	EACH	2	$2,000	$4,000
CONNECT TO EXISTING WATERMAIN	EACH	2	$2,500	$5,000
REMOVE EXISTING 10-INCH DIP WATERMAIN	LF	800	$12	$9,600
REMOVE EXISTING 12-INCH DIP WATERMAIN	LF	320	$12	$3,840
12-INCH DIP RAW WATERMAIN & SURFACE RESTORATION	LF	300	$105	$31,500
16-INCH HDPE RAW WATERMAIN (DIRECTIONAL DRILLED)	LF	900	$310	$279,000
20-INCH HDPE RAW WATERMAIN (DIRECTIONAL DRILLED)	LF	900	$330	$297,000
24-INCH DIP RAW WATERMAIN	LF	700	$240	$168,000
HYDRANT ASSEMBLY	EACH	8	$5,500	$44,000
			SUB-TOTAL	$16,406,740
			CONTINGENCY (10%)	$1,640,674
			SUB-TOTAL	$18,047,414
			INDIRECT COSTS (10%)	$1,804,741
			SUB-TOTAL	$19,852,155
			LAND PURCHASE COST	$180,000
			TOTAL WATER TREATMENT PLANT	**$20,032,155**

WELL NO. 7 & 8 RAW WATERMAIN				
16-INCH HDPE WATERMAIN (DIRECTIONAL DRILLED)	LF	7,800	$310	$2,418,000
			SUB-TOTAL	$2,418,000
			CONTINGENCY (10%)	$241,800
			SUB-TOTAL	$2,659,800
			INDIRECT COSTS (15%)	$398,970
			TOTAL	$3,058,770

PHASE 2 WATERMAIN				
REMOVE EXISTING WATERMAIN	LF	1,110	$12	$13,320
12-INCH DIP WATERMAIN & SURFACE RESTORATION	LF	1,110	$105	$116,550
			SUB-TOTAL	$129,870
			CONTINGENCY (10%)	$12,987
			SUB-TOTAL	$142,857
			INDIRECT COSTS (25%)	$35,714
			TOTAL	$178,571

PHASE 3 WATERMAIN				
REMOVE EXISTING WATERMAIN	LF	2,380	$12	$28,560
12-INCH DIP WATERMAIN & SURFACE RESTORATION	LF	2,380	$105	$249,900
16-INCH HDPE WATERMAIN (DIRECTIONAL DRILLED)	LF	3,300	$310	$1,023,000
			SUB-TOTAL	$1,301,460
			CONTINGENCY (10%)	$130,146
			SUB-TOTAL	$1,431,606
			INDIRECT COSTS (15%)	$214,741
			TOTAL	$1,646,347

PHASE 4 WATERMAIN				
16-INCH HDPE WATERMAIN (DIRECTIONAL DRILLED)	LF	10,000	$310	$3,100,000
			SUB-TOTAL	$3,100,000
			CONTINGENCY (10%)	$310,000
			SUB-TOTAL	$3,410,000
			INDIRECT COSTS (15%)	$511,500
			TOTAL	$3,921,500

ESTIMATED ANNUAL O&M COST				
ITEM	UNIT	QTY.	UNIT COST	COST
EQUIPMENT MAINTENANCE	LS	1	$53,736	$53,736
BUILDING MAINTENANCE	LS	1	$6,000	$6,000
ELECTRIC	LS	1	$4,800	$4,800
HEATING, COOLING & DEHUMIDIFICATION	LS	1	$20,000	$20,000
HIGH SERVICE PUMPING (30 ft of additional pumping head)	LS	1	$7,900	$7,900
SODIUM PERMANGANATE	LS	1	$13,500	$13,500
CHLORINE	LS	1	$1,500	$1,500
PROPERTY INSURANCE	LS	1	$10,000	$10,000
			TOTAL ANNUAL	$117,436
			PER 20 YEARS	$2,348,720
			PER 20 YEARS WITH 3.5% INFLATION RATE	$3,323,439

ESTIMATED WATER AVAILABILITY CHARGE (WAC) & WATER RATE INCREASE

	WATER TREATMENT PLANT	WELL NO. 7 & 8 RAW WATERMAIN	PHASE 2 WATERMAIN	PHASE 3 WATERMAIN	PHASE 4 WATERMAIN
20-YEAR CAPITAL COST	$20,032,155.40	$3,058,770.00	$178,571.25	$1,646,346.90	$3,921,500.00
20-YEAR LOAN INTEREST (1.5%)	$3,303,597.25	$504,436.19	$29,449.03	$271,506.83	$646,713.06
20-YEAR O&M COST	$3,323,438.80	$0.00	$0.00	$0.00	$0.00
20-YEAR TOTAL COST WITH LOAN INTEREST	**$26,659,191.45**	**$3,563,206.19**	**$208,020.28**	**$1,917,853.73**	**$4,568,213.06**
WAC FRACTION	25%	25%	25%	25%	25%
20-YEAR WAC COST	$6,664,797.86	$890,801.55	$52,005.07	$479,463.43	$1,142,053.27
20-YEAR WAC CONNECTIONS (MET COUNCIL)	3,300	3,300	3,300	3,300	3,300
20-YEAR COST PER WAC	**$2,019.64**	**$269.94**	**$15.76**	**$145.29**	**$346.08**
WATER RATE FRACTION	75%	75%	75%	75%	75%
20-YEAR WATER RATE COST	$19,994,393.59	$2,672,404.64	$156,015.21	$1,438,390.30	$3,426,159.80
20-YEAR WATER PUMPED (MILLION GALLONS)	14,020	14,020	14,020	14,020	14,020
HISTORICAL WATER DELIVERED / WATER PUMPED	98.4%	98.4%	98.4%	98.4%	98.4%
20-YEAR WATER SALES (MILLION GALLONS)	13,796	13,796	13,796	13,796	13,796
20-YEAR COST PER 1,000 GAL	**$1.45**	**$0.19**	**$0.01**	**$0.10**	**$0.25**