Local Water Supply Plan Template
Third Generation for 2016-2018

Revised April 10, 2017

Formerly called Water Emergency & Water Conservation Plan

DEPARTMENT OF NATURAL RESOURCES

Cover photo by Molly Shodeen

For more information on this Water Supply Plan Template, please contact the DNR Division of Ecological and Water Resources at (651) 259-5034 or (651) 259-5100.

This information is available in an alternative format upon request.

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INTRODUCTION TO WATER SUPPLY PLANS (WSP)

Who needs to complete a Water Supply Plan

Public water suppliers serving more than 1,000 people, large private water suppliers in designated Groundwater Management Areas, and all water suppliers in the Twin Cities metropolitan area are required to prepare and submit a water supply plan.

The goal of the WSP is to help water suppliers: 1) implement long term water sustainability and conservation measures; and 2) develop critical emergency preparedness measures. Your community needs to know what measures will be implemented in case of a water crisis. A lot of emergencies can be avoided or mitigated if long term sustainability measures are implemented.

Groundwater Management Areas (GWMA)

The DNR has designated three areas of the state as Groundwater Management Areas (GWMAs) to focus groundwater management efforts in specific geographies where there is an added risk of overuse or water quality degradation. A plan directing the DNRs actions within each GWMA has been prepared. Although there are no specific additional requirements with respect to the water supply planning for communities within designated GWMAs, communities should be aware of the issues and actions planned if they are within the boundary of one of the GWMAs. The three GWMAs are the North and East Metro GWMA (Twin Cities Metro), the Bonanza Valley GWMA and the Straight River GWMA (near Park Rapids). Additional information and maps are included in the DNR Groundwater Management Areas webpage.

Benefits of completing a WSP

Completing a WSP using this template, fulfills a water supplier's statutory obligations under M.S. M.S.103G.291 to complete a water supply plan. For water suppliers in the metropolitan area, the WSP will help local governmental units to fulfill their requirements under M.S. 473.859 to complete a local comprehensive plan. Additional benefits of completing WSP template:

- The standardized format allows for quicker and easier review and approval
- Help water suppliers prepare for droughts and water emergencies.
- Create eligibility for funding requests to the Minnesota Department of Health (MDH) for the Drinking Water Revolving Fund.
- Allow water suppliers to submit requests for new wells or expanded capacity of existing wells.
- Simplify the development of county comprehensive water plans and watershed plans.
- Fulfill the contingency plan provisions required in the MDH wellhead protection and surface water protection plans.
- Fulfill the demand reduction requirements of Minnesota Statutes, section 103G.291 subd 3 and 4.

- Upon implementation, contribute to maintaining aquifer levels, reducing potential well interference and water use conflicts, and reducing the need to drill new wells or expand system capacity.
- Enable DNR to compile and analyze water use and conservation data to help guide decisions.
- Conserve Minnesota's water resources

If your community needs assistance completing the Water Supply Plan, assistance is available from your area hydrologist or groundwater specialist, the MN Rural Waters Association circuit rider program, or in the metropolitan area from Metropolitan Council staff. Many private consultants are also available.

WSP Approval Process

10 Basic Steps for completing a 10-Year Water Supply Plan

1. Download the DNR/Metropolitan Council Water Supply Plan Template from the DNR Water Supply Plan webpage.
2. Save the document with a file name with this naming convention: WSP_cityname_permitnumber_date.doc.
3. The template is a form that should be completed electronically.
4. Compile the required water use data (Part 1) and emergency procedures information (Part 2)
5. The Water Conservation section (Part 3) may need discussion with the water department, council, or planning commission, if your community does not already have an active water conservation program.
6. Communities in the seven-county Twin Cities metropolitan area should complete all the information discussed in Part 4. The Metropolitan Council has additional guidance information on their Water Supply webpage. All out-state water suppliers ***do not*** need to complete the content addressed in Part 4.
7. Use the Plan instructions and Checklist document from the DNR Water Supply Plan webpage to insure all data is complete and attachments are included. This will allow for a quicker approval process.
8. Plans should be submitted electronically using the MPARS website – no paper documents are required.
9. DNR hydrologist will review plans (in cooperation with Metropolitan Council in Metro area) and approve the plan or make recommendations.
10. Once approved, communities should complete a Certification of Adoption form, and send a copy to the DNR.

Complete Table 1 with information about the public water supply system covered by this WSP.

Table 1. General information regarding this WSP

Requested Information	Description
DNR Water Appropriation Permit Number(s)	**1981-6062**
Ownership	☒ Public or ☐ Private
Metropolitan Council Area	☒ Yes or ☐ No (and county name)
Street Address	**4349 Warren Avenue**
City, State, Zip	**Spring Park, MN 55384**
Contact Person Name	Dan Tolsma
Title	City Administrator
Phone Number	952-471-9051
MDH Supplier Classification	Municipal

PART 1. WATER SUPPLY SYSTEM DESCRIPTION AND EVALUATION

The first step in any water supply analysis is to assess the current status of demand and availability. Information summarized in Part 1 can be used to develop Emergency Preparedness Procedures (Part 2) and the Water Conservation Plan (Part 3). This data is also needed to track progress for water efficiency measures.

A. Analysis of Water Demand

Complete Table 2 showing the past 10 years of water demand data.

- Some of this information may be in your Wellhead Protection Plan.
- If you do not have this information, do your best, call your engineer for assistance or if necessary leave blank.

If your customer categories are different than the ones listed in Table 2, please describe the differences below:

Table 2. Historic water demand (see definitions in the glossary after Part 4 of this template)

Year	Pop. Served	Total Connections	Residential Water Delivered (MG)	C/I/I Water Delivered (MG)	Water used for Non-essential (MG)	Wholesale Deliveries (MG)	Total Water Delivered (MG)	Total Water Pumped (MG)	Water Supplier Services	Percent Unmetered/ Unaccounted	Average Daily Demand (MGD)	Max. Daily Demand (MGD)	Date of Max. Demand	Residential Per Capita Demand (GPCD)	Total per capita Demand (GPCD)
2009	1882	413	42.6	23.0	18.8	0	65.6	68.1	Hydrant Flushing	3.67	0.186	0.305	8-31-17	61.98	99.09
2010	1868	423	41.8	23.2	20.2	0	65.0	77.4	Hydrant Flushing	16.02	0.212	0.349	9-9-10	61.36	113.57
2011	1669	443	42.0	24.5	22.5	0	66.5	74.1	Hydrant Flushing	10.26	0.203	0.403	8-11-11	68.89	121.70
2012	1880	470	41.6	25.5	23.9	0	67.1	82.5	Hydrant Flushing	18.67	0.226	0.305	7-17-12	60.58	120.26
2013	1849	488	47.1	18.1	13.1	.296	65.2	71.6	Hydrant Flushing	8.94	0.196	0.366	2-13-13	69.75	106.04
2014	1676	361	40.0	26.1	25.4	.296	66.1	68.1	Hydrant Flushing	3.02	0.187	0.370	9-11-14	65.40	111.40
2015	1809	363	39.1	29.7	27.4	.296	68.8	66.1	Hydrant Flushing	0*	0.181	0.457	7-14-15	59.28	100.15
2016	1713	365	43.6	18.6	18.5	0	62.2	61.2	Hydrant Flushing	0*	0.168	0.297	7-18-2016	69.75	104.38
Avg. 2011-2016	1766	415	42.2	23.75	21.8	0.148	66.0	70.6	-	6.82	0.194	0.366	-	65.61	110.66

MG – Million Gallons **MGD –** Million Gallons per Day **GPCD** – Gallons per Capita per Day

See Glossary for definitions. A list of Acronyms and Initialisms can be found after the Glossary.

*Water purchased from City of Orono and City of Mound during these years presented determination of percent unmetered/unaccounted water

Complete Table 3 by listing the top 10 water users by volume, from largest to smallest. For each user, include information about the category of use (residential, commercial, industrial, institutional, or wholesale), the amount of water used in gallons per year, the percent of total water delivered, and the status of water conservation measures.

Table 3. Large volume users

Customer	Use Category (Residential, Industrial, Commercial, Institutional, Wholesale)	Amount Used (Gallons per Year)	Percent of Total Annual Water Delivered	Implementing Water Conservation Measures? (Yes/No/Unknown)
1. BOOMERANG	INDUSTRIAL	6,484,000	10.4%	NO
2. TONKA VENTURE	COMMERCIAL	4,047,000	6.5%	NO
3. FLETCHERS	COMMERCIAL	3,860,000	6.2%	NO
4. PRESS HOMES	INSTITUTIONAL	3,812,000	6.1%	NO
5. MIST LOFTS	RESIDENTIAL	3,469,000	5.6%	NO
6. PRESS HOMES #2	RESIDENTIAL	2,478,000	4.0%	NO
7. PRESS HOMES #3	RESIDENTIAL	2,345,000	3.8%	NO
8. PARK ISLAND APT	RESIDENTIAL	2,325,000	3.7%	NO
9. EDGEWATER APT	RESIDENTIAL	2,168,000	3.5%	NO
10. FLETCHERS APT	RESIDENTIAL	1,192,000	1.9%	NO

B. Treatment and Storage Capacity

Complete Table 4 with a description of where water is treated, the year treatment facilities were constructed, water treatment capacity, the treatment methods (i.e. chemical addition, reverse osmosis, coagulation, sedimentation, etc.) and treatment types used (i.e. fluoridation, softening, chlorination, Fe/MN removal, coagulation, etc.). Also describe the annual amount and method of disposal of treatment residuals. Add rows to the table as needed.

Table 4. Water treatment capacity and treatment processes

Treatment Site ID (Plant Name or Well ID)	Year Constructed	Treatment Capacity (GPD)	Treatment Method	Treatment Type	Annual Volume of Residuals	Disposal Process for Residuals	Do You Reclaim Filter Backwash Water?
Insert Facility ID here	1981	1,080,000	Filtration	Iron Removal, Chlorination, Fluoridation, Air stripping	280,366 Gallons	Sanitary Sewer	Yes
Total	NA	1,080,000	NA	NA	280,366	NA	

Complete Table 5 with information about storage structures. Describe the type (i.e. elevated, ground, etc.), the storage capacity of each type of structure, the year each structure was constructed, and the primary material for each structure. Add rows to the table as needed.

Table 5. Storage capacity, as of the end of the last calendar year

Structure Name	Type of Storage Structure	Year Constructed	Primary Material	Storage Capacity (Gallons)
Elevated Tank	Elevated storage	2005	Steel	200,000
Ground Tank	Ground storage	1981	Concrete	100,000
Total	NA	NA	NA	300,000

Treatment and storage capacity versus demand

It is recommended that total storage equal or exceed the average daily demand.

Discuss the difference between current storage and treatment capacity versus the water supplier's projected average water demand over the next 10 years (see Table 7 for projected water demand):

The City will have more than adequate treatment and storage capacity for future water demands.

C. Water Sources

Complete Table 6 by listing all types of water sources that supply water to the system, including groundwater, surface water, interconnections with other water suppliers, or others. Provide the name of each source (aquifer name, river or lake name, name of interconnecting water supplier) and the Minnesota unique well number or intake ID, as appropriate. Report the year the source was installed or established and the current capacity. Provide information about the depth of all wells. Describe the status of the source (active, inactive, emergency only, retail/wholesale interconnection) and if the source facilities have a dedicated emergency power source. Add rows to the table as needed for each installation.

Include copies of well records and maintenance summary for each well that has occurred since your last approved plan in **Appendix 1.**

Table 6. Water sources and status

Resource Type (Groundwater, Surface water, Interconnection)	Resource Name	MN Unique Well # or Intake ID	Year Installed	Capacity (Gallons per Minute)	Well Depth (Feet)	Status of Normal and Emergency Operations (active, inactive, emergency only, retail/wholesale interconnection))	Does this Source have a Dedicated Emergency Power Source? (Yes or No)
Groundwater	Well #1	224642	1964	320	640	Active	Yes
Groundwater	Well #2	224643	1964	270	391	Active	Yes
Groundwater	Well #3	165595	1980	650	776	Active	Yes
Interconnection	Orono	N/A		1300	N/A	Emergency Only	N/A
Interconnection	Mound	N/A		4050	N/A	Emergency Only	N/A

Limits on Emergency Interconnections

Discuss any limitations on the use of the water sources (e.g. not to be operated simultaneously, limitations due to blending, aquifer recovery issues etc.) and the use of interconnections, including capacity limits or timing constraints (i.e. only 200 gallons per minute are available from the City of Prior

Lake, and it is estimated to take 6 hours to establish the emergency connection). If there are no limitations, list none.

None.

D. Future Demand Projections – *Key Metropolitan Council Benchmark*

Water Use Trends

Use the data in Table 2 to describe trends in 1) population served; 2) total per capita water demand; 3) average daily demand; 4) maximum daily demand. Then explain the causes for upward or downward trends. For example, over the ten years has the average daily demand trended up or down? Why is this occurring?

Over the years, the population served has remained relatively consistent due to limited space for growth.

- We expect this will also be the case in the future.

- The per capita residential demand has been stable.

Use the water use trend information discussed above to complete Table 7 with projected annual demand for the next ten years. Communities in the seven-county Twin Cities metropolitan area must also include projections for 2030 and 2040 as part of their local comprehensive planning.

Projected demand should be consistent with trends evident in the historical data in Table 2, as discussed above. Projected demand should also reflect state demographer population projections and/or other planning projections.

Table 7. Projected annual water demand

Year	Projected Total Population	Projected Population Served	Projected Total Per Capita Water Demand (GPCD)	Projected Average Daily Demand (MGD)	Projected Maximum Daily Demand (MGD)
2017	1,705	1,705	104.40	0.178	0.336
2018	1,714	1,714	103.88	0.178	0.336
2019	1,722	1,722	103.36	0.178	0.336
2020	1,730	1,730	102.84	0.178	0.336
2021	1,743	1,743	102.33	0.178	0.336
2022	1,756	1,756	101.82	0.179	0.337
2023	1,769	1,769	101.31	0.179	0.338
2024	1,782	1,782	100.80	0.180	0.339
2025	1,795	1,795	100.30	0.180	0.340
2026	1,808	1,808	99.79	0.180	0.340
2027	1,821	1,821	99.30	0.181	0.341
2030	1,860	1,860	97.81	0.182	0.343
2040	1,950	1,950	93.03	0.181	0.342

GPCD – Gallons per Capita per Day **MGD** – Million Gallons per Day

Projection Method

Describe the method used to project water demand, including assumptions for population and business growth and how water conservation and efficiency programs affect projected water demand:

Projections were made based on a straight-line growth rate from 2017 population of 1705 and projection population of 1,730 in 2020, 1,860 in 2030 and 1,950 in 2040 forecast by Metropolitan Council and Minnesota State Demographer. Because per capita demands have been trending downward, the demand projections were calculated from the projected populations using a per capita demand of 104.4 gpcd, based on the gcpd observed in 2016. An average to maximum day peaking factor of 1.886 was used based on the average value between 2011 and 2016. Following the national trend of 0.5% decrease per year, we decreased by 0.5% annually.

E. Resource Sustainability

Monitoring – *Key DNR Benchmark*

Complete Table 8 by inserting information about source water quality and quantity monitoring efforts. The list should include all production wells, observation wells, and source water intakes or reservoirs. Groundwater level data for DNR's statewide network of observation wells are available online through the DNR's Cooperative Groundwater Monitoring (CGM) webpage.

Table 8. Information about source water quality and quantity monitoring

MN Unique Well # or Surface Water ID	Type of monitoring point	Monitoring program	Frequency of monitoring	Monitoring Method
224642	☒ production well ☐ observation well ☐ source water intake ☐ source water reservoir	☒ routine MDH sampling ☒ routine water utility sampling ☐ other	☐ continuous ☐ hourly ☐ daily ☒ monthly ☐ quarterly ☐ annually	☒ SCADA ☒ grab sampling ☒ steel tape ☐ stream gauge
224643	☒ production well ☐ observation well ☐ source water intake ☐ source water reservoir	☒ routine MDH sampling ☒ routine water utility sampling ☐ other	☐ continuous ☐ hourly ☐ daily ☒ monthly ☐ quarterly ☐ annually	☒ SCADA ☒ grab sampling ☒ steel tape ☐ stream gauge
165595	☒ production well ☐ observation well ☐ source water intake ☐ source water reservoir	☒ routine MDH sampling ☒ routine water utility sampling ☐ other	☐ continuous ☐ hourly ☐ daily ☒ monthly ☐ quarterly ☐ annually	☒ SCADA ☒ grab sampling ☒ steel tape ☐ stream gauge

Water Level Data

A water level monitoring plan that includes monitoring locations and a schedule for water level readings must be submitted as **Appendix 2**. If one does not already exist, it needs to be prepared and submitted with the WSP. Ideally, all production and observation wells are monitored at least monthly.

Complete Table 9 to summarize water level data for each well being monitored. Provide the name of the aquifer and a brief description of how much water levels vary over the season (the difference between the highest and lowest water levels measured during the year) and the long-term trends for each well. If water levels are not measured and recorded on a routine basis, then provide the static water level when each well was constructed and the most recent water level measured during the same season the well was constructed. Also include all water level data taken during any well and pump maintenance. Add rows to the table as needed.

Groundwater hydrographs illustrate the historical record of aquifer water levels measured within a well and can indicate water level trends over time. For each well in your system, provide a hydrograph for the life of the well, or for as many years as water levels have been measured. Include the hydrographs in **Appendix 3**. An example of a hydrograph can be found on the DNR's Groundwater Hydrograph webpage. Hydrographs for DNR Observation wells can be found in the CGM discussed above.

Table 9. Water level data

Unique Well Number or Well ID	Aquifer Name	Seasonal Variation (Feet)	Long-term Trend in water level data	Water level measured during well/pumping maintenance
Well #1 / 224642	Franconia-Ironton-Galesville	4	☐ Falling ☒ Stable ☐ Rising	06/22/64: 58ft 09/04/64: 58ft 10/01/91: 58ft 04/05/12: 71.5ft 04/06/12: 64ft 06/01/12: 65.25ft 06/04/12: 65.75ft 05/17/16: 63.61ft 01/27/17: 62ft
Well #2 / 224643	Jordan	4	☐ Falling ☒ Stable ☐ Rising	04/04/12: 67ft 04/06/12: 62ft 06/05/12: 65.25ft 05/17/16: 60.98
Well #3 / 165595	MT. Simon	3	☐ Falling ☒ Stable ☐ Rising	08/06/08: 165ft 12/09/04: 170ft

Potential Water Supply Issues & Natural Resource Impacts – *Key DNR & Metropolitan Council Benchmark*

Complete Table 10 by listing the types of natural resources that are or could potentially be impacted by permitted water withdrawals in the future. You do not need to identify every single water resource in your entire community. The goal is to help you triage the most important water resources and/or the water resources that may be impacted by your water supply system – perhaps during a drought or when the population has grown significantly in ten years. This is emerging science, so do the best you can with available data. For identified resources, provide the name of specific resources that may be impacted. Identify what the greatest risks to the resource are and how the risks are being assessed. Identify any resource protection thresholds – formal or informal – that have been established to identify when

actions should be taken to mitigate impacts. Provide information about the potential mitigation actions that may be taken, if a resource protection threshold is crossed. Add additional rows to the table as needed. See the glossary at the end of the template for definitions.

Some of this baseline data should have been in your earlier water supply plans or county comprehensive water plans. When filling out this table, think of what are the water supply risks, identify the resources, determine the threshold and then determine what your community will do to mitigate the impacts.

Your DNR area hydrologist is available to assist with this table.

For communities in the seven-county Twin Cities metropolitan area, the Master Water Supply Plan *Appendix 1 (Water Supply Profiles)*, provides information about potential water supply issues and natural resource impacts for your community.

Steps for completing Table 10

1. ***Identify the potential for natural resource impacts/issues within the community***
   First, review available information to identify resources that may be impacted by the operation of your water supply system (such as pumping).
   Potential Sources of Information:
   - County Geologic Atlas
   - Local studies
   - Metropolitan Council System Statement (for metro communities)
   - Metropolitan Council Master Water Supply Plan (for metro communities)

   ACTION: Check the resource type(s) that may be impacted in the column "Resource Type"

2. ***Identify where your water supply system is most likely to impact those resources (and vice versa).***
   Potential Sources of Information:
   - Drinking Water Supply Management Areas
   - Geologic Atlas - Sensitivity
   - If no WHPA or other information exists, consider rivers, lakes, wetlands and significant within 1.5 miles of wells; and calcareous fens and trout streams within 5 miles of wells

   ACTION: Focus the rest of your work in these areas.

3. ***Within focus areas, identify specific features of value to the community***
   You know your community best. What resources are important to pay attention to? It may be useful to check in with your community's planning and zoning staff and others.

   Potential Sources of Information:
   - Park plans
   - Local studies
   - Natural resource inventories
   - Tourist attractions/recreational areas/valued community resource

ACTION: Identify specific features that the community prioritizes in the "Resource Name" column (for example: North Lake, Long River, Brook Trout Stream, or Green Fen). If, based on a review of available information, no features are likely to be at risk, note "None".

4. Identify what impact(s) the resource is at risk for

Potential Sources of Information:

- Wellhead Protection Plan
- Water Appropriation Permit
- County Geologic Atlas
- MDH or PCA reports of the area
- Metropolitan Council System Statement (for metro communities)
- Metropolitan Council Master Water Supply Plan (for metro communities)

ACTION: Check the risk type in the column "Risk". If, based on a review of available information, no risk is identified, note "None anticipated".

5. Describe how the risk was assessed

Potential Sources of Information:

- Local studies
- Monitoring data (community, WMO, DNR, etc.)
- Aquifer testing
- County Geologic Atlas or other hydrogeologic studies
- Regional or state studies, such as DNR's report 'Definitions and Thresholds for Negative Impacts to Surface Waters'
- Well boring logs

ACTION: Identify the method(s) used to identify the risk to the resource in the "Risk Assessed Through" column

6. Describe protection threshold/goals

What is the goal, if any, for protecting these resources? For example, is there a lower limit on acceptable flow in a river or stream? Water quality outside of an accepted range? A lower limit on acceptable aquifer level decline at one or more monitoring wells? Withdrawals that exceed some percent of the total amount available from a source? Or a lower limit on acceptable changes to a protected habitat?

Potential Sources of Information:

- County Comprehensive Water Plans
- Watershed Plans or One Watershed/One Plan
- Groundwater or Aquifer Plans
- Metropolitan Master Plans
- DNR Thresholds study
- Community parks, open space, and natural resource plans

ACTION: Describe resource protection goals in the "Describe Resource Protection Threshold" column or reference an existing plan/document/webpage

7. ***If a goal/threshold should trigger action, describe the plan that will be implemented.***
Identify specific action, mitigation measures or management plan that the water supplier will implement, or refer to a partner's plan that includes actions to be taken.

Potential Sources of Information:

- County Comprehensive Water Plans
- Watershed Plans or One Watershed/One Plan
- Groundwater or Aquifer Plans
- Metropolitan Master Plans
- Studies such as DNR Thresholds study

ACTION: Describe the mitigation measure or management plan in the "Mitigation Measure or Management Plan" column.

8. ***Describe work to evaluate these risks going forward.***
For example, what is the plan to regularly check in to stay current on plans or new data?

Identify specific action that the water supplier will take to identify the creation of or change to goals/thresholds, or refer to a partner's plan that includes actions to be taken.

Potential Sources of Information:

- County Comprehensive Water Plans
- Watershed Plans or One Watershed/One Plan
- Groundwater or Aquifer Plans
- Metropolitan Master Plans
- Studies such as DNR Thresholds study

ACTION: Describe what will be done to evaluate risks going forward, including any changes to goals or protection thresholds in the "Describe how Changes to Goals are monitored" column.

Table 10. Natural resource impacts (*List specific resources in Appendix 12)

Resource Type	Resource Name	Risk	Risk Assessed Through *	Describe Resource Protection Threshold or Goal *	Mitigation Measures or Management Plan	Describe How Thresholds or Goals are Monitored
☒ Lake	Minnetonka West Arm 27013314 Minnetonka Black Lake 27013306 Minnetonka Seton Lake 27013307 Minnetonka Harrison Bay 27013314 Minnetonka Spring Park Bay 27013310	☐ None anticipated ☐ Flow/water level decline ☐ Degrading water quality trends ☐ Impacts on endangered, threatened, or special concern species habitat ☒ Other: Potential risk as wells 1 & 2 source water is pumped from the FIG and Jordan aquifers. These aquifers are hydraulically connected to surface waters.	☐ Geologic atlas or other mapping ☐ Modeling ☐ Monitoring ☐ Aquifer testing ☐WRAPS or other watershed report ☒Proximity (<1.5 miles) ☐ Other: _____ ☒ Other: _Inferred__	☐ Not applicable ☒ Additional data is needed to establish ☐ See report: _____ ☐ Other: _____	☐Not applicable ☐ Change groundwater pumping ☒ Increase conservation ☐ Other: _____	☐Not applicable ☐ Newly collected data will be analyzed ☒ Regular check-in with these partners: ___DNR_____ ☐ Other: _____
☐ Aquifer	Franconia/ Ironton Galesville (FIG) Jordan Mount Simon	☒ None anticipated ☐ Flow/water level decline ☐ Degrading water quality trends ☐ Impacts on endangered, threatened, or special concern species habitat ☐ Other: _____	☐ Geologic atlas or other mapping ☐ Modeling ☒ Monitoring ☐ Aquifer testing ☐Proximity (obwell < 5 miles) ☐ Other: _____	☒ Not applicable ☐ Additional data is needed to establish ☐ See report: _____ ☐ Other: _____	☐Not applicable ☐ Change groundwater pumping ☒ Increase conservation ☐ Other: _____	☐Not applicable ☐ Newly collected data will be analyzed ☒ Regular check-in with these partners: ____DNR____ ☐ Other: _____

Wellhead Protection (WHP) and Source Water Protection (SWP) Plans

Complete Table 11 to provide status information about WHP and SWP plans.

The emergency procedures in this plan are intended to comply with the contingency plan provisions required in the Minnesota Department of Health's (MDH) Wellhead Protection (WHP) Plan and Surface Water Protection (SWP) Plan.

Table 11. Status of Wellhead Protection and Source Water Protection Plans

Plan Type	Status	Date Adopted	Date for Update
WHP	☐ In Process ☒ Completed ☐ Not Applicable	June 2012	As needed
SWP	☐ In Process ☐ Completed ☒ Not Applicable		

WHP – Wellhead Protection Plan **SWP** – Source Water Protection Plan

F. Capital Improvement Plan (CIP)

Please note that any wells that received approval under a ten-year permit, but that were not built, are now expired and must submit a water appropriations permit.

Adequacy of Water Supply System

Complete Table 12 with information about the adequacy of wells and/or intakes, storage facilities, treatment facilities, and distribution systems to sustain current and projected demands. List planned capital improvements for any system components, in chronological order. Communities in the seven-county Twin Cities metropolitan area should also include information about plans through 2040.

The assessment can be the general status by category; it is not necessary to identify every single well, storage facility, treatment facility, lift station, and mile of pipe.

Please attach your latest Capital Improvement Plan as **Appendix 4**.

Table 12. Adequacy of Water Supply System

System Component	Planned action	Anticipated Construction Year	Notes
Wells/Intakes	☐ No action planned - adequate ☒ Repair/replacement ☐ Expansion/addition	NA	Redevelopment of well #1
Water Storage Facilities	☐ No action planned - adequate ☒ Repair/replacement ☐ Expansion/addition	NA	Water Tower Interior re-painting
Water Treatment Facilities	☐ No action planned - adequate ☒ Repair/replacement ☐ Expansion/addition	NA	Replace Filter Media

System Component	Planned action	Anticipated Construction Year	Notes
Distribution Systems (Pipes, valves, etc.)	☐ No action planned - adequate ☒ Repair/replacement ☐ Expansion/addition	NA	Replace all underground utilities in areas
Pressure Zones	☒ No action planned - adequate ☐ Repair/replacement ☐ Expansion/addition		
Other:	☐ No action planned - adequate ☐ Repair/replacement ☐ Expansion/addition		

Proposed Future Water Sources

Complete Table 13 to identify new water source installation planned over the next ten years. Add rows to the table as needed.

Table 13. Proposed future installations/sources

Source	Installation Location (approximate)	Resource Name	Proposed Pumping Capacity (gpm)	Planned Installation Year	Planned Partnerships
Groundwater	N/A	N/A	N/A	N/A	N/A
Surface Water	N/A	N/A	N/A	N/A	N/A
Interconnection to another supplier	N/A	N/A	N/A	N/A	N/A

Water Source Alternatives - *Key Metropolitan Council Benchmark*

Do you anticipate the need for alternative water sources in the next 10 years? Yes ☐ No ☒

For metro communities, will you need alternative water sources by the year 2040? Yes ☐ No ☒

If you answered yes for either question, then complete table 14. If no, insert NA.

Complete Table 14 by checking the box next to alternative approaches that your community is considering, including approximate locations (if known), the estimated amount of future demand that could be met through the approach, the estimated timeframe to implement the approach, potential partnerships, and the major benefits and challenges of the approach. Add rows to the table as needed.

For communities in the seven-county Twin Cities metropolitan area, these alternatives should include approaches the community is considering to meet projected 2040 water demand.

Table 14. Alternative water sources

Alternative Source Considered	Source and/or Installation Location (approximate)	Estimated Amount of Future Demand (%)	Timeframe to Implement (YYYY)	Potential Partners	Benefits	Challenges
☐ Groundwater	N/A	N/A	N/A	N/A	N/A	N/A
☐ Surface Water	N/A	N/A	N/A	N/A	N/A	N/A
☐ Reclaimed stormwater	N/A	N/A	N/A	N/A	N/A	N/A
☐ Reclaimed wastewater	N/A	N/A	N/A	N/A	N/A	N/A
☐ Interconnection to another supplier	N/A	N/A	N/A	N/A	N/A	N/A

PART 2. EMERGENCY PREPAREDNESS PROCEDURES

The emergency preparedness procedures outlined in this plan are intended to comply with the contingency plan provisions required by MDH in the WHP and SWP. Water emergencies can occur as a result of vandalism, sabotage, accidental contamination, mechanical problems, power failings, drought, flooding, and other natural disasters. The purpose of emergency planning is to develop emergency response procedures and to identify actions needed to improve emergency preparedness. In the case of a municipality, these procedures should be in support of, and part of, an all-hazard emergency operations plan. Municipalities that already have written procedures dealing with water emergencies should review the following information and update existing procedures to address these water supply protection measures.

A. Emergency Response Plan

Section 1433(b) of the Safe Drinking Water Act, (Public Law 107-188, Title IV- Drinking Water Security and Safety) requires community water suppliers serving over 3,300 people to prepare an Emergency Response Plan. MDH recommends that Emergency Response Plans are updated annually.

Do you have an Emergency Response Plan? Yes ☒ No ☐

Have you updated the Emergency Response Plan in the last year? Yes ☐ No ☒

When did you last update your Emergency Response Plan? 1-2-2014

Complete Table 15 by inserting the noted information regarding your completed Emergency Response Plan.

Table 15. Emergency Response Plan contact information

Emergency Response Plan Role	Contact Person	Contact Phone Number	Contact Email
Emergency Response Lead	DALLAS ROGGEMAN	320-305-0748	DROGGEMAN@PEOPLESERVICE.COM
Alternate Emergency Response Lead	DAN TOLSMA	952-471-9051	DTOLSMA@CI.SPRING-PARK.MN.US

B. Operational Contingency Plan

All utilities should have a written operational contingency plan that describes measures to be taken for water supply mainline breaks and other common system failures as well as routine maintenance.

Do you have a written operational contingency plan? Yes ☒ No ☐

At a minimum, a water supplier should prepare and maintain an emergency contact list of contractors and suppliers.

C. Emergency Response Procedures

Water suppliers must meet the requirements of MN Rules 4720.5280. Accordingly, the Minnesota Department of Natural Resources (DNR) requires public water suppliers serving more than 1,000 people to submit Emergency and Conservation Plans. Water emergency and conservation plans that have been approved by the DNR, under provisions of Minnesota Statute 186 and Minnesota Rules, part 6115.0770, will be considered equivalent to an approved WHP contingency plan.

Emergency Telephone List

Prepare and attach a list of emergency contacts, including the MN Duty Officer (1-800-422-0798), as **Appendix 5**. An Emergency Contact List template is available at the MnDNR Water Supply Plans webpage.

The list should include key utility and community personnel, contacts in adjacent water suppliers, and appropriate local, state and federal emergency contacts. Please be sure to verify and update the contacts on the emergency telephone list and date it. Thereafter, update on a regular basis (once a year is recommended). In the case of a municipality, this information should be contained in a notification and warning standard operating procedure maintained by the Emergency Manager for that community. Responsibilities and services for each contact should be defined.

Current Water Sources and Service Area

Quick access to concise and detailed information on water sources, water treatment, and the distribution system may be needed in an emergency. System operation and maintenance records should be maintained in secured central and back-up locations so that the records are accessible for emergency purposes. A detailed map of the system showing the treatment plants, water sources, storage facilities, supply lines, interconnections, and other information that would be useful in an emergency should also be readily available. It is critical that public water supplier representatives and emergency response personnel communicate about the response procedures and be able to easily obtain this kind of information both in electronic and hard copy formats (in case of a power outage).

Do records and maps exist? Yes ☒ No ☐

Can staff access records and maps from a central secured location in the event of an emergency?

Yes ☒ No ☐

Does the appropriate staff know where the materials are located?

Yes ☒ No ☐

Procedure for Augmenting Water Supplies

Complete Tables 16 – 17 by listing all available sources of water that can be used to augment or replace existing sources in an emergency. Add rows to the tables as needed.

In the case of a municipality, this information should be contained in a notification and warning standard operating procedure maintained by the warning point for that community. Municipalities are encouraged to execute cooperative agreements for potential emergency water services and copies should be included in **Appendix 6**. Outstate Communities may consider using nearby high capacity wells (industry, golf course) as emergency water sources.

WSP should include information on any physical or chemical problems that may limit interconnections to other sources of water. Approvals from the MDH are required for interconnections or the reuse of water.

Table 16. Interconnections with other water supply systems to supply water in an emergency

Other Water Supply System Owner	Capacity (GPM & MGD)	Note Any Limitations On Use	List of services, equipment, supplies available to respond
City Of Orono	1300 GPM 1.872 MGD	N/A	N/A
City of Mound	4050 GPM 5.832 MGD	N/A	N/A

GPM – Gallons per minute MGD – million gallons per day

Table 17. Utilizing surface water as an alternative source

Surface Water Source Name	Capacity (GPM)	Capacity (MGD)	Treatment Needs	Note Any Limitations On Use
Insert name of surface water source here	N/A	N/A	N/A	N/A

If not covered above, describe additional emergency measures for providing water (obtaining bottled water, or steps to obtain National Guard services, etc.)

Allocation and Demand Reduction Procedures

Complete Table 18 by adding information about how decisions will be made to allocate water and reduce demand during an emergency. Provide information for each customer category, including its priority ranking, average day demand, and demand reduction potential for each customer category. Modify the customer categories as needed, and add additional lines if necessary.

Water use categories should be prioritized in a way that is consistent with Minnesota Statutes 103G.261 (#1 is highest priority) as follows:

1. Water use for human needs such as cooking, cleaning, drinking, washing and waste disposal; use for on-farm livestock watering; and use for power production that meets contingency requirements.
2. Water use involving consumption of less than 10,000 gallons per day (usually from private wells or surface water intakes)
3. Water use for agricultural irrigation and processing of agricultural products involving consumption of more than 10,000 gallons per day (usually from private high-capacity wells or surface water intakes)
4. Water use for power production above the use provided for in the contingency plan.
5. All other water use involving consumption of more than 10,000 gallons per day.
6. Nonessential uses – car washes, golf courses, etc.

Water used for human needs at hospitals, nursing homes and similar types of facilities should be designated as a high priority to be maintained in an emergency. Lower priority uses will need to address water used for human needs at other types of facilities such as hotels, office buildings, and manufacturing plants. The volume of water and other types of water uses at these facilities must be carefully considered. After reviewing the data, common sense should dictate local allocation priorities to protect domestic requirements over certain types of economic needs. Water use for lawn sprinkling, vehicle washing, golf courses, and recreation are legislatively considered non-essential.

Table 18. Water use priorities

Customer Category	Allocation Priority	Average Daily Demand (GDP)	Short-Term Emergency Demand Reduction Potential (GPD)
Residential	1	110,016	
Institutional	1	10,444	
Commercial	2	39,748	
Industrial	2	0	
Irrigation	3	10,203	10,203
Wholesale	5	0	
Non-Essential	6	50,685	50,685
TOTAL	NA	NA	60,888

GPD – Gallons per Day

Tip: Calculating Emergency Demand Reduction Potential

The emergency demand reduction potential for all uses will typically equal the difference between maximum use (summer demand) and base use (winter demand). In extreme emergency situations, lower priority water uses must be restricted or eliminated to protect priority domestic water requirements. Emergency demand reduction potential should be based on average day demands for customer categories within each priority class. Use the tables in Part 3 on water conservation to help you determine strategies.

Complete Table 19 by selecting the triggers and actions during water supply disruption conditions.

Table 19. Emergency demand reduction conditions, triggers and actions (Select all that may apply and describe)

Emergency Triggers	Short-term Actions	Long-term Actions
☒ Contamination ☒ Loss of production ☒ Infrastructure failure ☒ Executive order by Governor ☐ Other: _____	☒ Supply augmentation through interconnection ☒ Adopt (if not already) and enforce a critical water deficiency ordinance to penalize lawn watering, vehicle washing, golf course and park irrigation & other nonessential uses. ☐ Water allocation through____ ☒ Meet with large water users to discuss their contingency plan.	☐ Supply augmentation through ____ ☒ Adopt (if not already) and enforce a critical water deficiency ordinance to penalize lawn watering, vehicle washing, golf course and park irrigation & other nonessential uses. ☐ Water allocation through____ ☒ Meet with large water users to discuss their contingency plan.

Notification Procedures

Complete Table 20 by selecting trigger for informing customers regarding conservation requests, water use restrictions, and suspensions; notification frequencies; and partners that may assist in the notification process. Add rows to the table as needed.

Table 20. Plan to inform customers regarding conservation requests, water use restrictions, and suspensions

Notification Trigger(s)	Methods (select all that apply)	Update Frequency	Partners
☒ Short-term demand reduction declared (< 1 year)	☒ Website ☐ Email list serve ☐ Social media (e.g. Twitter, Facebook) ☒ Direct customer mailing, ☒ Press release (TV, radio, newspaper), ☒ Meeting with large water users (> 10% of total city use) ☐ Other: _____	☐ Daily ☒ Weekly ☐ Monthly ☐ Annually	City of Spring Park
☒ Long-term Ongoing demand reduction declared	☒ Website ☐ Email list serve ☐ Social media (e.g. Twitter, Facebook) ☒ Direct customer mailing, ☒ Press release (TV, radio, newspaper), ☒ Meeting with large water users (> 10% of total city use) ☐ Other: _____	☐ Daily ☐ Weekly ☒ Monthly ☐ Annually	City of Spring Park
☒ Governor's critical water deficiency declared	☒ Website ☐ Email list serve ☐ Social media (e.g. Twitter, Facebook)	☐ Daily ☐ Weekly ☒ Monthly ☐ Annually	City of Spring Park

Notification Trigger(s)	Methods (select all that apply)	Update Frequency	Partners
	☒ Direct customer mailing, ☒ Press release (TV, radio, newspaper), ☒ Meeting with large water users (> 10% of total city use) ☐ Other: _____		

Enforcement

Prior to a water emergency, municipal water suppliers must adopt regulations that restrict water use and outline the enforcement response plan. The enforcement response plan must outline how conditions will be monitored to know when enforcement actions are triggered, what enforcement tools will be used, who will be responsible for enforcement, and what timelines for corrective actions will be expected.

Affected operations, communications, and enforcement staff must then be trained to rapidly implement those provisions during emergency conditions.

Important Note:

Disregard of critical water deficiency orders, even though total appropriation remains less than permitted, is adequate grounds for immediate modification of a public water supply authority's water use permit (2013 MN Statutes 103G.291)

Does the city have a critical water deficiency restriction/official control in place that includes provisions to restrict water use and enforce the restrictions? (This restriction may be an ordinance, rule, regulation, policy under a council directive, or other official control) Yes ☒ No ☐

If yes, attach the official control document to this WSP as **Appendix 7**.

If no, the municipality must adopt such an official control within 6 months of submitting this WSP and submit it to the DNR as an amendment to this WSP.

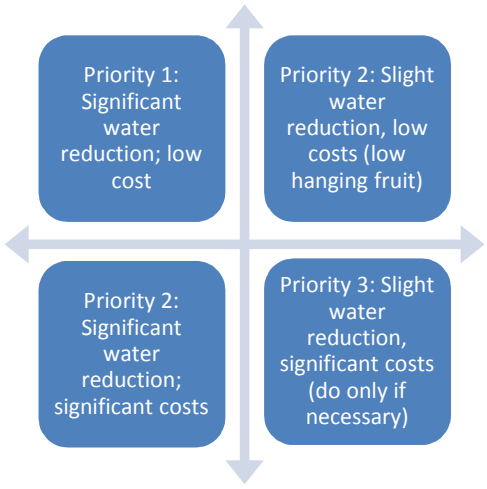
Irrespective of whether a critical water deficiency control is in place, does the public water supply utility, city manager, mayor, or emergency manager have standing authority to implement water restrictions? Yes ☒ No ☐

If yes, cite the regulatory authority reference: Administrator City Code Sec. 34-166.

If no, who has authority to implement water use restrictions in an emergency?

PART 3. WATER CONSERVATION PLAN

Minnesotans have historically benefited from the state's abundant water supplies, reducing the need for conservation. There are however, limits to the available supplies of water and increasing threats to the quality of our drinking water. Causes of water supply limitation may include: population increases, economic trends, uneven statewide availability of groundwater, climatic changes, and degraded water quality. Examples of threats to drinking water quality include: the presence of contaminant plumes from past land use activities, exceedances of water quality standards from natural and human sources, contaminants of emerging concern, and increasing pollutant trends from nonpoint sources.



There are many incentives for conserving water; conservation:

- reduces the potential for pumping-induced transfer of contaminants into the deeper aquifers, which can add treatment costs
- reduces the need for capital projects to expand system capacity
- reduces the likelihood of water use conflicts, like well interference, aquatic habitat loss, and declining lake levels
- conserves energy, because less energy is needed to extract, treat and distribute water (and less energy production also conserves water since water is used to produce energy)
- maintains water supplies that can then be available during times of drought

It is therefore imperative that water suppliers implement water conservation plans. The first step in water conservation is identifying opportunities for behavioral or engineering changes that could be made to reduce water use by conducting a thorough analysis of:

- Water use by customer
- Extraction, treatment, distribution and irrigation system efficiencies
- Industrial processing system efficiencies
- Regulatory and barriers to conservation
- Cultural barriers to conservation
- Water reuse opportunities

Once accurate data is compiled, water suppliers can set achievable goals for reducing water use. A successful water conservation plan follows a logical sequence of events. The plan should address both conservation on the supply side (leak detection and repairs, metering), as well as on the demand side (reductions in usage). Implementation should be conducted in phases, starting with the most obvious and lowest-cost options. In some cases, one of the early steps will be reviewing regulatory constraints to water conservation, such as lawn irrigation requirements. Outside funding and grants may be available for implementation of projects. Engage water system operators and maintenance staff and customers in brainstorming opportunities to reduce water use. Ask the question: "How can I help save water?"

Progress since 2006

Is this your community's first Water Supply Plan? Yes ☐ No ☒

If yes, describe conservation practices that you are already implementing, such as: pricing, system improvements, education, regulation, appliance retrofitting, enforcement, etc.

If no, complete Table 21 to summarize conservation actions taken since the adoption of the 2006 water supply plan.

Table 21. Implementation of previous ten-year Conservation Plan

2006 Plan Commitments	Action Taken?
Change water rates structure to provide conservation pricing	☒ Yes ☐ No
Water supply system improvements (e.g. leak repairs, valve replacements, etc.)	☐ Yes ☒ No
Educational efforts	☒ Yes ☐ No
New water conservation ordinances	☐ Yes ☒ No
Rebate or retrofitting Program (e.g. for toilet, faucets, appliances, showerheads, dish washers, washing machines, irrigation systems, rain barrels, water softeners, etc.	☐ Yes ☒ No
Enforcement	☐ Yes ☒ No
Describe other	☐ Yes ☐ No

What are the results you have seen from the actions in Table 21 and how were results measured?

A utility rate survey has been presented to the council to determine where we rate in comparison to other communities.

A. Triggers for Allocation and Demand Reduction Actions

Complete table 22 by checking each trigger below, as appropriate, and the actions to be taken at various levels or stages of severity. Add in additional rows to the table as needed.

Table 22. Short and long-term demand reduction conditions, triggers and actions

Objective	Triggers	Actions
Protect surface water flows	☐ Low stream flow conditions	☐ Increase promotion of conservation

Objective	Triggers	Actions
	☐ Reports of declining wetland and lake levels ☐ Other: _____	measures ☐ Other: _____
Short-term demand reduction (less than 1 year	☐ Extremely high seasonal water demand (more than double winter demand) ☒ Loss of treatment capacity ☒ Lack of water in storage ☒ State drought plan ☐ Well interference ☐ Other: _____	☒ Adopt (if not already) and enforce the critical water deficiency ordinance to restrict or prohibit lawn watering, vehicle washing, golf course and park irrigation & other nonessential uses. ☒ Supply augmentation through interconnections. ☐ Water allocation through____ ☐ Meet with large water users to discuss user's contingency plan.
Long-term demand reduction (>1 year)	☒ Per capita demand increasing ☒ Total demand increase (higher population or more industry). Water level in well(s) below elevation of _____ ☐ Other: _____	☐ Develop a critical water deficiency ordinance that is or can be quickly adopted to penalize lawn watering, vehicle washing, golf course and park irrigation & other nonessential uses. ☐ Enact a water waste ordinance that targets overwatering (causing water to flow off the landscape into streets, parking lots, or similar), watering impervious surfaces (streets, driveways or other hardscape areas), and negligence of known leaks, breaks, or malfunctions. ☐ Meet with large water users to discuss user's contingency plan. ☒ Enhanced monitoring and reporting: audits, meters, billing, etc.
Governor's "Critical Water Deficiency Order" declared	☐ Describe	☐ Describe

B. Conservation Objectives and Strategies – *Key benchmark for DNR*

This section establishes water conservation objectives and strategies for eight major areas of water use.

Objective 1: Reduce Unaccounted (Non-Revenue) Water loss to Less than 10%

The Minnesota Rural Water Association, the Metropolitan Council and the Department of Natural Resources recommend that all water uses be metered. Metering can help identify high use locations and times, along with leaks within buildings that have multiple meters.

It is difficult to quantify specific unmetered water use such as that associated with firefighting and system flushing or system leaks. Typically, water suppliers subtract metered water use from total water pumped to calculate unaccounted or non-revenue water loss.

Is your five-year average (2012-2016) unaccounted Water Use in Table 2 higher than 10%?

Yes ☐ No ☒

What is your leak detection monitoring schedule? (e.g. Monitor 1/3rd of the city lines per year)

NA

Water Audits - are designed to help quantify and track water losses associated with water distribution systems and identify areas for improved efficiency and cost recovery. The American Water Works Association (AWWA) has a recommended water audit methodology which is presented in AWWA's M36 Manual of Water Supply Practices: Water Audits and Loss Control Programs. AWWA also provides a free spreadsheet-based water audit tool that water suppliers can use to conduct their own water audits. This free water audit tool can be found on AWWA's Water Loss Control webpage. Another resource for water audit and water loss control information is Minnesota Rural Water Association.

What is the date of your most recent water audit? _____

Frequency of water audits: ☐ **yearly** ☐ **other (specify frequency) _____**
Leak detection and survey: ☐ **every year** ☐ **every other year** ☒ **periodic as needed**
Year last leak detection survey completed: _____

If Table 2 shows annual water losses over 10% or an increasing trend over time, describe what actions will be taken to reach the <10% loss objective and within what timeframe

City is reviewing distribution system for future watermain improvements.

Metering -AWWA recommends that every water supplier install meters to account for all water taken into its system, along with all water distributed from its system at each customer's point of service. An effective metering program relies upon periodic performance testing, repair, maintenance or replacement of all meters. Drinking Water Revolving Loan Funds are available for purchase of new meters when new plants are built. AWWA also recommends that water suppliers conduct regular water audits to account for unmetered unbilled consumption, metered unbilled consumption and source water and customer metering inaccuracies. Some cities install separate meters for interior and exterior water use, but some research suggests that this may not result in water conservation.

Complete Table 23 by adding the requested information regarding the number, types, testing and maintenance of customer meters.

Table 23. Information about customer meters

Customer Category	Number of Customers	Number of Metered Connections	Number of Automated Meter Readers	Meter testing intervals (years)	Average age/meter replacement schedule (years
Residential	296	296	296	As Needed	6 yrs/As needed
Irrigation meters	6	6	6	As Needed	6 yrs/As needed
Institutional	1	1	1	As Needed	6 yrs/As needed
Commercial	57	57	57	As Needed	6 yrs/As needed
Industrial					___ / ___
Public facilities	2	2	2	As Needed	6 yrs/As needed
TOTALS				NA	NA

For unmetered systems, describe any plans to install meters or replace current meters with advanced technology meters. Provide an estimate of the cost to implement the plan and the projected water savings from implementing the plan.

Table 24. Water source meters

	Number of Meters	Meter testing schedule (years)	Number of Automated Meter Readers	Average age/meter replacement schedule (years
Water source (wells/intakes)	3	As needed	3	__As needed_ / ___
Treatment plant	2	As needed	2	___As needed / ___

Objective 2: Achieve Less than 75 Residential Gallons per Capita Demand (GPCD)

The 2002 average residential per capita demand in the Twin Cities Metropolitan area was 75 gallons per capita per day.

Is your average 2010-2015 residential per capita water demand in Table 2 more than 75? Yes ☐ No ☒

What was your 2010 – 2015 six-year average residential per capita water demand?60.52 g/person/day

Describe the water use trend over that timeframe:

Fluctuated up and down, but fairly consistent.

Complete Table 25 by checking which strategies you will use to continue reducing residential per capita demand and project a likely timeframe for completing each checked strategy (Select all that apply and add rows for additional strategies):

Table 25. Strategies and timeframe to reduce residential per capita demand

Strategy to reduce residential per capita demand	Timeframe for completing work
☐ Revise city ordinances/codes to encourage or require water efficient landscaping.	
☐ Revise city ordinance/codes to permit water reuse options, especially for non-potable purposes like irrigation, groundwater recharge, and industrial use. Check with plumbing authority to see if internal buildings reuse is permitted	
☐ Revise ordinances to limit irrigation. Describe the restricted irrigation plan:	
☐ Revise outdoor irrigation installations codes to require high efficiency systems (e.g. those with soil moisture sensors or programmable watering areas) in new installations or system replacements.	
☒ Make water system infrastructure improvements	As needed

Strategy to reduce residential per capita demand	Timeframe for completing work
☐ Offer free or reduced cost water use audits) for residential customers.	
☐ Implement a notification system to inform customers when water availability conditions change.	
☐ Provide rebates or incentives for installing water efficient appliances and/or fixtures indoors (e.g., low flow toilets, high efficiency dish washers and washing machines, showerhead and faucet aerators, water softeners, etc.)	
☐ Provide rebates or incentives to reduce outdoor water use (e.g., turf replacement/reduction, rain gardens, rain barrels, smart irrigation, outdoor water use meters, etc.)	
☐ Identify supplemental Water Resources	
☒ Conduct audience-appropriate water conservation education and outreach.	Varies
☐ Describe other plans	

Objective 3: Achieve at least 1.5% annual reduction in non-residential per capita water use (For each of the next ten years, or a 15% total reduction over ten years.) This includes commercial, institutional, industrial and agricultural water users.

Complete Table 26 by checking which strategies you will used to continue reducing non-residential customer use demand and project a likely timeframe for completing each checked strategy (add rows for additional strategies).

Where possible, substitute recycled water used in one process for reuse in another. (For example, spent rinse water can often be reused in a cooling tower.) Keep in mind the true cost of water is the amount on the water bill PLUS the expenses to heat, cool, treat, pump, and dispose of/discharge the water. Don't just calculate the initial investment. Many conservation retrofits that appear to be prohibitively expensive are actually very cost-effective when amortized over the life of the equipment. Often reducing water use also saves electrical and other utility costs. Note: as of 2015, water reuse, and is not allowed by the state plumbing code, M.R. 4715 (a variance is needed). However, several state agencies are addressing this issue.

Table 26. Strategies and timeframe to reduce institutional, commercial industrial, and agricultural and non-revenue use demand

Strategy to reduce total business, industry, agricultural demand	Timeframe for completing work
☐ Conduct a facility water use audit for both indoor and outdoor use, including system components	
☐ Install enhanced meters capable of automated readings to detect spikes in consumption	
☐ Compare facility water use to related industry benchmarks, if available (e.g., meat processing, dairy, fruit and vegetable, beverage, textiles, paper/pulp, metals, technology, petroleum refining etc.)	
☐ Install water conservation fixtures and appliances or change processes to conserve water	
☒ Repair leaking system components (e.g., pipes, valves)	As Needed
☐ Investigate the reuse of reclaimed water (e.g., stormwater,	

Strategy to reduce total business, industry, agricultural demand	Timeframe for completing work
wastewater effluent, process wastewater, etc.)	
☒ Reduce outdoor water use (e.g., turf replacement/reduction, rain gardens, rain barrels, smart irrigation, outdoor water use meters, etc.)	Ongoing
☒ Train employees how to conserve water	Ongoing
☐ Implement a notification system to inform non-residential customers when water availability conditions change.	
☐ Nonpotable rainwater catchment systems intended to supply uses such as water closets, urinals, trap primers for floor drains and floor sinks, industrial processes, water features, vehicle washing facilities, cooling tower makeup, and similar uses shall be approved by the commissioner. Plumbing code 4714.1702, Published October 31, 2016	
☐ Describe other plans:	

Objective 4: Achieve a Decreasing Trend in Total Per Capita Demand

Include as **Appendix 8** one graph showing total per capita water demand for each customer category (i.e., residential, institutional, commercial, industrial) from 2005-2014 and add the calculated/estimated linear trend for the next 10 years.

Describe the trend for each customer category; explain the reason(s) for the trends, and where trends are increasing.

Residential water usage spiked in 2011 and then again in 2014 but has generally been steady. Commercial, Industrial, Institutional and Water used for Non-essential have been generally steady over observed years. We predict that the water use per capita will decrease 0.5% annually, following the national trend. This 0.5% annual reduction was applied to all customer categories.

Objective 5: Reduce Ratio of Maximum day (peak day) to the Average Day Demand to Less Than 2.6

Is the ratio of average 2009-2016 maximum day demand to average 2009-2016 average day demand reported in Table 2 more than 2.6? Yes ☐ No ☒

Calculate a eight-year average (2009 – 2016) of the ratio of maximum day demand to average day demand: 1.83

The position of the DNR has been that a peak day/average day ratio that is above 2.6 for in summer indicates that the water being used for irrigation by the residents in a community is too large and that efforts should be made to reduce the peak day use by the community.

It should be noted that by reducing the peak day use, communities can also reduce the amount of infrastructure that is required to meet the peak day use. This infrastructure includes new wells, new water towers which can be costly items.

Objective 6: Implement Demand Reduction Measures

Water Conservation Program

Municipal water suppliers serving over 1,000 people are required to adopt demand reduction measures that include a conservation rate structure, or a uniform rate structure with a conservation program that achieves demand reduction. These measures must achieve demand reduction in ways that reduce water demand, water losses, peak water demands, and nonessential water uses. These measures must be approved before a community may request well construction approval from the Department of Health or before requesting an increase in water appropriations permit volume (Minnesota Statutes, section 103G.291, subd. 3 and 4). Rates should be adjusted on a regular basis to ensure that revenue of the system is adequate under reduced demand scenarios. If a municipal water supplier intends to use a Uniform Rate Structure, a community-wide Water Conservation Program that will achieve demand reduction must be provided.

Current Water Rates

Include a copy of the actual rate structure in **Appendix 9** or list current water rates including base/service fees and volume charges below.

Volume included in base rate or service charge: __X___ gallons or ____ cubic feet ___ other

Frequency of billing: ☐ Monthly ☐ Bimonthly ☒ Quarterly ☐ Other: _____

Water Rate Evaluation Frequency: ☐ every year ☐ every ___ years ☒ no schedule

Date of last rate change: January 2016

Table 27. Rate structures for each customer category (Select all that apply and add additional rows as needed)

Customer Category	Conservation Billing Strategies in Use *	Conservation Neutral Billing Strategies in Use **	Non-Conserving Billing Strategies in Use ***
Residential	☐ Monthly billing ☒ Increasing block rates (volume tiered rates) ☐ Seasonal rates ☐ Time of use rates ☒ Water bills reported in gallons ☐ Individualized goal rates ☐ Excess use rates ☐ Drought surcharge ☐ Use water bill to provide comparisons ☐ Service charge not based on water volume ☐ Other (describe)	☐ Uniform ☐ Odd/even day watering	☐ Service charge based on water volume ☐ Declining block ☐ Flat ☐ Other (describe)
Commercial/ Industrial/ Institutional	☐ Monthly billing ☒ Increasing block rates (volume tiered rates) ☐ Seasonal rates ☐ Time of use rates	☐ Uniform	☐ Service charge based on water volume ☐ Declining block ☐ Flat ☐ Other (describe)

Customer Category	Conservation Billing Strategies in Use *	Conservation Neutral Billing Strategies in Use **	Non-Conserving Billing Strategies in Use ***
	☒ Water bills reported in gallons ☐ Individualized goal rates ☐ Excess use rates ☐ Drought surcharge ☐ Use water bill to provide comparisons ☐ Service charge not based on water volume ☐ Other (describe)		
☐ Other			

*** Rate Structures components that may promote water conservation:**

- **Monthly billing:** is encouraged to help people see their water usage so they can consider changing behavior.
- **Increasing block rates (also known as a tiered residential rate structure):** Typically, these have at least three tiers: should have at least three tiers.
    - The first tier is for the winter average water use.
    - The second tier is the year-round average use, which is lower than typical summer use. This rate should be set to cover the full cost of service.
    - The third tier should be above the average annual use and should be priced high enough to encourage conservation, as should any higher tiers. For this to be effective, the difference in block rates should be significant.
- **Seasonal rate:** higher rates in summer to reduce peak demands
- **Time of Use rates:** lower rates for off peak water use
- **Bill water use in gallons:** this allows customers to compare their use to average rates
- **Individualized goal rates:** typically used for industry, business or other large water users to promote water conservation if they keep within agreed upon goals. **Excess Use rates**: if water use goes above an agreed upon amount this higher rate is charged
- **Drought surcharge:** an extra fee is charged for guaranteed water use during drought
- **Use water bill to provide comparisons**: simple graphics comparing individual use over time or compare individual use to others.
- **Service charge or base fee that does not include a water volume** – a base charge or fee to cover universal city expenses that are not customer dependent and/or to provide minimal water at a lower rate (e.g., an amount less than the average residential per capita demand for the water supplier for the last 5 years)
- **Emergency rates** -A community may have a separate conservation rate that only goes into effect when the community or governor declares a drought emergency. These higher rates can help to protect the city budgets during times of significantly less water usage.

****Conservation Neutral****

- **Uniform rate**: rate per unit used is the same regardless of the volume used
- **Odd/even day watering** –This approach reduces peak demand on a daily basis for system operation, but it does not reduce overall water use.

***** Non-Conserving *****

- **Service charge or base fee with water volume:** an amount of water larger than the average residential per capita demand for the water supplier for the last 5 years
- **Declining block rate:** the rate per unit used decreases as water use increases.
- **Flat rate:** one fee regardless of how much water is used (usually unmetered).

Provide justification for any conservation neutral or non-conserving rate structures. If intending to adopt a conservation rate structure, include the timeframe to do so:

Objective 7: Additional strategies to Reduce Water Use and Support Wellhead Protection Planning

Development and redevelopment projects can provide additional water conservation opportunities, such as the actions listed below. If a Uniform Rate Structure is in place, the water supplier must provide a Water Conservation Program that includes at least two of the actions listed below. Check those actions that you intent to implement within the next 10 years.

Table 28. Additional strategies to Reduce Water Use & Support Wellhead Protection

☐	Participate in the GreenStep Cities Program, including implementation of at least one of the 20 "Best Practices" for water
☐	Prepare a master plan for smart growth (compact urban growth that avoids sprawl)
☐	Prepare a comprehensive open space plan (areas for parks, green spaces, natural areas)
☐	Adopt a water use restriction ordinance (lawn irrigation, car washing, pools, etc.)
☐	Adopt an outdoor lawn irrigation ordinance
☐	Adopt a private well ordinance (private wells in a city must comply with water restrictions)
☐	Implement a stormwater management program
☐	Adopt non-zoning wetlands ordinance (can further protect wetlands beyond state/federal laws- for vernal pools, buffer areas, restrictions on filling or alterations)
☐	Adopt a water offset program (primarily for new development or expansion)
☐	Implement a water conservation outreach program
☐	Hire a water conservation coordinator (part-time)
☐	Implement a rebate program for water efficient appliances, fixtures, or outdoor water management
☐	Other

Objective 8: Tracking Success: How will you track or measure success through the next ten years?

Tip: The process to monitor demand reduction and/or a rate structure includes:

a) The DNR Hydrologist will call or visit the community the first 1-3 years after the water supply plan is completed.
b) They will discuss what activities the community is doing to conserve water and if they feel their actions are successful. The Water Supply Plan, Part 3 tables and responses will guide the discussion. For example, they will discuss efforts to reduce unaccounted for water loss if that is a problem, or go through Tables 33, 34 and 35 to discuss new initiatives.
c) The city representative and the hydrologist will discuss total per capita water use, residential per capita water use, and business/industry use. They will note trends.

d) They will also discuss options for improvement and/or collect case studies of success stories to share with other communities. One option may be to change the rate structure, but there are many other paths to successful water conservation.
e) If appropriate, they will cooperatively develop a simple work plan for the next few years, targeting a couple areas where the city might focus efforts.

C. Regulation

Complete Table 29 by selecting which regulations are used to reduce demand and improve water efficiencies. Add additional rows as needed.

Copies of adopted regulations or proposed restrictions or should be included in **Appendix 10** (a list with hyperlinks is acceptable).

Table 29. Regulations for short-term reductions in demand and long-term improvements in water efficiencies

Regulations Utilized	When is it applied (in effect)?
☐ Rainfall sensors required on landscape irrigation systems	☐ Ongoing ☐ Seasonal ☐ Only during declared Emergencies
☐ Water efficient plumbing fixtures required	☐ New development ☐ Replacement ☐ Rebate Programs
☒ Critical/Emergency Water Deficiency ordinance	☒ Only during declared Emergencies
☒ Watering restriction requirements (time of day, allowable days, etc.)	☐ Odd/even ☐ 2 days/week ☒ Only during declared Emergencies
☒ Water waste prohibited (for example, having a fine for irrigators spraying on the street)	☐ Ongoing ☐ Seasonal ☒ Only during declared Emergencies
☐ Limitations on turf areas (requiring lots to have 10% - 25% of the space in natural areas)	☐ New development ☐ Shoreland/zoning ☐ Other
☐ Soil preparation requirement s (after construction, requiring topsoil to be applied to promote good root growth)	☐ New Development ☐ Construction Projects ☐ Other
☐ Tree ratios (requiring a certain number of trees per square foot of lawn)	☐ New development ☐ Shoreland/zoning ☐ Other
☐ Permit to fill swimming pool and/or requiring pools to be covered (to prevent evaporation)	☐ Ongoing ☐ Seasonal ☐ Only during declared Emergencies
☐ Ordinances that permit stormwater irrigation, reuse of water, or other alternative water use (Note: be sure to check current plumbing codes for updates)	☐ Describe

D. Retrofitting Programs

Education and incentive programs aimed at replacing inefficient plumbing fixtures and appliances can help reduce per capita water use, as well as energy costs. It is recommended that municipal water

suppliers develop a long-term plan to retrofit public buildings with water efficient plumbing fixtures and appliances. Some water suppliers have developed partnerships with organizations having similar conservation goals, such as electric or gas suppliers, to develop cooperative rebate and retrofit programs.

A study by the AWWA Research Foundation (Residential End Uses of Water, 1999) found that the average indoor water use for a non-conserving home is 69.3 gallons per capita per day (gpcd). The average indoor water use in a conserving home is 45.2 gpcd and most of the decrease in water use is related to water efficient plumbing fixtures and appliances that can reduce water, sewer and energy costs. In Minnesota, certain electric and gas providers are required (Minnesota Statute 216B.241) to fund programs that will conserve energy resources and some utilities have distributed water efficient showerheads to customers to help reduce energy demands required to supply hot water.

Retrofitting Programs

Complete Table 30 by checking which water uses are targeted, the outreach methods used, the measures used to identify success, and any participating partners.

Table 30. Retrofitting programs (Select all that apply)

Water Use Targets	Outreach Methods	Partners
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A

Briefly discuss measures of success from the above table (e.g. number of items distributed, dollar value of rebates, gallons of water conserved, etc.):

N/A

E. Education and Information Programs

Customer education should take place in three different circumstances. First, customers should be provided information on how to conserve water and improve water use efficiencies. Second, information should be provided at appropriate times to address peak demands. Third, emergency notices and educational materials about how to reduce water use should be available for quick distribution during an emergency.

Proposed Education Programs

Complete Table 31 by selecting which methods are used to provide water conservation and information, including the frequency of program components. Select all that apply and add additional lines as needed.

Table 31. Current and Proposed Education Programs

Education Methods	General summary of topics	#/Year	Frequency
Billing inserts or tips printed on the actual bill	Conservation tips on water bill when space is available	Varies	☒ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Consumer Confidence Reports	Description of source water and treatment results of monitoring	1	☒ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Press releases to traditional local news outlets (e.g., newspapers, radio and TV)			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Social media distribution (e.g., emails, Facebook, Twitter)			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Paid advertisements (e.g., billboards, print media, TV, radio, web sites, etc.)			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Presentations to community groups			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Staff training	Water treatment and conservation training	3	☒ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Facility tours			☒ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Displays and exhibits			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Marketing rebate programs (e.g., indoor fixtures & appliances and outdoor practices)			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Community news letters	Hydrant flushing	2	☒ Ongoing ☐ Seasonal ☐ Only during declared emergencies

Education Methods	General summary of topics	#/Year	Frequency
Direct mailings (water audit/retrofit kits, showerheads, brochures)			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Information kiosk at utility and public buildings			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Public service announcements			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Cable TV Programs			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Demonstration projects (landscaping or plumbing)			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
K-12 education programs (Project Wet, Drinking Water Institute, presentations)			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Community events (children's water festivals, environmental fairs)			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Community education classes			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Water week promotions			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Website (http://www.ci.spring-park.mn.us/)	Water conservation and watershed education notices		☐ Ongoing ☒ Seasonal ☐ Only during declared emergencies
Targeted efforts (large volume users, users with large increases)			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Notices of ordinances	All ordinances are available on the website (http://www.ci.spring-park.mn.us/)		☒ Ongoing ☐ Seasonal ☐ Only during declared emergencies

Education Methods	General summary of topics	#/Year	Frequency
Emergency conservation notices			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Other:			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies

Briefly discuss what future education and information activities your community is considering in the future:

Continue to add water conservation tips on newsletters and the website.

PART 4. ITEMS FOR METROPOLITAN AREA COMMUNITIES

Minnesota Statute 473.859 requires WSPs to be completed for all local units of government in the seven-county Metropolitan Area as part of the local comprehensive planning process.

Much of the information in Parts 1-3 addresses water demand for the next 10 years. However, additional information is needed to address water demand through 2040, which will make the WSP consistent with the Metropolitan Land Use Planning Act, upon which the local comprehensive plans are based.

This Part 4 provides guidance to complete the WSP in a way that addresses plans for water supply through 2040.

A. Water Demand Projections through 2040

Complete Table 7 in Part 1D by filling in information about long-term water demand projections through 2040. Total Community Population projections should be consistent with the community's system statement, which can be found on the Metropolitan Council's website and which was sent to the community in September 2015.

Projected Average Day, Maximum Day, and Annual Water Demands may either be calculated using the method outlined in *Appendix 2* of the *2015 Master Water Supply Plan* or by a method developed by the individual water supplier.

B. Potential Water Supply Issues

Complete Table 10 in Part 1E by providing information about the potential water supply issues in your community, including those that might occur due to 2040 projected water use.

The Master Water Supply Plan provides information about potential issues for your community in *Appendix 1 (Water Supply Profiles).* This resource may be useful in completing Table 10.

You may document results of local work done to evaluate impact of planned uses by attaching a feasibility assessment or providing a citation and link to where the plan is available electronically.

C. Proposed Alternative Approaches to Meet Extended Water Demand Projections

Complete Table 12 in Part 1F with information about potential water supply infrastructure impacts (such as replacements, expansions or additions to wells/intakes, water storage and treatment capacity, distribution systems, and emergency interconnections) of extended plans for development and redevelopment, in 10-year increments through 2040. It may be useful to refer to information in the community's local Land Use Plan, if available.

Complete Table 14 in Part 1F by checking each approach your community is considering to meet future demand. For each approach your community is considering, provide information about the amount of

future water demand to be met using that approach, the timeframe to implement the approach, potential partners, and current understanding of the key benefits and challenges of the approach.

As challenges are being discussed, consider the need for: evaluation of geologic conditions (mapping, aquifer tests, modeling), identification of areas where domestic wells could be impacted, measurement and analysis of water levels & pumping rates, triggers & associated actions to protect water levels, etc.

D. Value-Added Water Supply Planning Efforts (Optional)

The following information is not required to be completed as part of the local water supply plan, but completing this can help strengthen source water protection throughout the region and help Metropolitan Council and partners in the region to better support local efforts.

Source Water Protection Strategies

Does a Drinking Water Supply Management Area for a neighboring public water supplier overlap your community? Yes ☐ No ☐

If you answered no, skip this section. If you answered yes, please complete Table 32 with information about new water demand or land use planning-related local controls that are being considered to provide additional protection in this area.

Table 32. Local controls and schedule to protect Drinking Water Supply Management Areas

Local Control	Schedule to Implement	Potential Partners
☐ None at this time		
☐ Comprehensive planning that guides development in vulnerable drinking water supply management areas		
☐ Zoning overlay		
☐ Other:		

Technical assistance

From your community's perspective, what are the most important topics for the Metropolitan Council to address, guided by the region's Metropolitan Area Water Supply Advisory Committee and Technical Advisory Committee, as part of its ongoing water supply planning role?

☐ Coordination of state, regional and local water supply planning roles
☐ Regional water use goals
☐ Water use reporting standards
☐ Regional and sub-regional partnership opportunities
☐ Identifying and prioritizing data gaps and input for regional and sub-regional analyses
☐ Others: _____

GLOSSARY

Agricultural/Irrigation Water Use - Water used for crop and non-crop irrigation, livestock watering, chemigation, golf course irrigation, landscape and athletic field irrigation.

Average Daily Demand - The total water pumped during the year divided by 365 days.

Calcareous Fen - Calcareous fens are rare and distinctive wetlands dependent on a constant supply of cold groundwater. Because they are dependent on groundwater and are one of the rarest natural communities in the United States, they are a protected resource in MN. Approximately 200 have been located in Minnesota. They may not be filled, drained or otherwise degraded.

Commercial/Institutional Water Use - Water used by motels, hotels, restaurants, office buildings, commercial facilities and institutions (both civilian and military). Consider maintaining separate institutional water use records for emergency planning and allocation purposes. Water used by multi-family dwellings, apartment buildings, senior housing complexes, and mobile home parks should be reported as Residential Water Use.

Commercial/Institutional/Industrial (C/I/I) Water Sold - The sum of water delivered for commercial/institutional or industrial purposes.

Conservation Rate Structure - A rate structure that encourages conservation and may include increasing block rates, seasonal rates, time of use rates, individualized goal rates, or excess use rates. If a conservation rate is applied to multifamily dwellings, the rate structure must consider each residential unit as an individual user. A community may have a separate conservation rate that only goes into effect when the community or governor declares a drought emergency. These higher rates can help to protect the city budgets during times of significantly less water usage.

Date of Maximum Daily Demand - The date of the maximum (highest) water demand. Typically this is a day in July or August.

Declining Rate Structure - Under a declining block rate structure, a consumer pays less per additional unit of water as usage increases. This rate structure does not promote water conservation.

Distribution System - Water distribution systems consist of an interconnected series of pipes, valves, storage facilities (water tanks, water towers, reservoirs), water purification facilities, pumping stations, flushing hydrants, and components that convey drinking water and meeting fire protection needs for cities, homes, schools, hospitals, businesses, industries and other facilities.

Flat Rate Structure - Flat fee rates do not vary by customer characteristics or water usage. This rate structure does not promote water conservation.

Industrial Water Use - Water used for thermonuclear power (electric utility generation) and other industrial use such as steel, chemical and allied products, paper and allied products, mining, and petroleum refining.

Low Flow Fixtures/Appliances - Plumbing fixtures and appliances that significantly reduce the amount of water released per use are labeled “low flow”. These fixtures and appliances use just enough water to be effective, saving excess, clean drinking water that usually goes down the drain.

Maximum Daily Demand - The maximum (highest) amount of water used in one day.

Metered Residential Connections - The number of residential connections to the water system that have meters. For multifamily dwellings, report each residential unit as an individual user.

Percent Unmetered/Unaccounted For - Unaccounted for water use is the volume of water withdrawn from all sources minus the volume of water delivered. This value represents water “lost” by miscalculated water use due to inaccurate meters, water lost through leaks, or water that is used but unmetered or otherwise undocumented. Water used for public services such as hydrant flushing, ice skating rinks, and public swimming pools should be reported under the category “Water Supplier Services”.

Population Served - The number of people who are served by the community's public water supply system. This includes the number of people in the community who are connected to the public water supply system, as well as people in neighboring communities who use water supplied by the community's public water supply system. It should not include residents in the community who have private wells or get their water from neighboring water supply.

Residential Connections - The total number of residential connections to the water system. For multifamily dwellings, report each residential unit as an individual user.

Residential Per Capita Demand - The total residential water delivered during the year divided by the population served divided by 365 days.

Residential Water Use - Water used for normal household purposes such as drinking, food preparation, bathing, washing clothes and dishes, flushing toilets, and watering lawns and gardens. Should include all water delivered to single family private residences, multi-family dwellings, apartment buildings, senior housing complexes, mobile home parks, etc.

Smart Meter - Smart meters can be used by municipalities or by individual homeowners. Smart metering generally indicates the presence of one or more of the following:

- Smart irrigation water meters are controllers that look at factors such as weather, soil, slope, etc. and adjust watering time up or down based on data. Smart controllers in a typical summer will reduce water use by 30%-50%. Just changing the spray nozzle to new efficient models can reduce water use by 40%.
- Smart Meters on customer premises that measure consumption during specific time periods and communicate it to the utility, often on a daily basis.
- A communication channel that permits the utility, at a minimum, to obtain meter reads on demand, to ascertain whether water has recently been flowing through the meter and onto the premises, and to issue commands to the meter to perform specific tasks such as disconnecting or restricting water flow.

Total Connections - The number of connections to the public water supply system.

Total Per Capita Demand - The total amount of water withdrawn from all water supply sources during the year divided by the population served divided by 365 days.

Total Water Pumped - The cumulative amount of water withdrawn from all water supply sources during the year.

Total Water Delivered - The sum of residential, commercial, industrial, institutional, water supplier services, wholesale and other water delivered.

Ultimate (Full Build-Out) - Time period representing the community's estimated total amount and location of potential development, or when the community is fully built out at the final planned density.

Unaccounted (Non-revenue) Loss - See definitions for "percent unmetered/unaccounted for loss".

Uniform Rate Structure - A uniform rate structure charges the same price-per-unit for water usage beyond the fixed customer charge, which covers some fixed costs. The rate sends a price signal to the customer because the water bill will vary by usage. Uniform rates by class charge the same price-per-unit for all customers within a customer class (e.g. residential or non-residential). This price structure is generally considered less effective in encouraging water conservation.

Water Supplier Services - Water used for public services such as hydrant flushing, ice skating rinks, public swimming pools, city park irrigation, back-flushing at water treatment facilities, and/or other uses.

Water Used for Nonessential Purposes - Water used for lawn irrigation, golf course and park irrigation, car washes, ornamental fountains, and other non-essential uses.

Wholesale Deliveries - The amount of water delivered in bulk to other public water suppliers.

Acronyms and Initialisms

AWWA – American Water Works Association
C/I/I – Commercial/Institutional/Industrial
CIP – Capital Improvement Plan
GIS – Geographic Information System
GPCD – Gallons per capita per day
GWMA – Groundwater Management Area – North and East Metro, Straight River, Bonanza,
MDH – Minnesota Department of Health
MGD – Million gallons per day
MG – Million gallons
MGL – Maximum Contaminant Level
MnTAP – Minnesota Technical Assistance Program (University of Minnesota)
MPARS – MN/DNR Permitting and Reporting System (new electronic permitting system)
MRWA – Minnesota Rural Waters Association
SWP – Source Water Protection
WHP – Wellhead Protection

APPENDICES TO BE SUBMITTED BY THE WATER SUPPLIER

Appendix 1: Well records and maintenance summaries
Go to Part 1C for information on what to include in appendix

Appendix 2: Water level monitoring plan
Go to Part 1E for information on what to include in appendix

Appendix 3: Water level graphs for each water supply well
Go to Part 1E for information on what to include in appendix

Appendix 4: Capital Improvement Plan
Go to Part 1E for information on what to include in appendix

Appendix 5: Emergency Telephone List
Go to Part 2C for information on what to include in appendix

Appendix 6: Cooperative Agreements for Emergency Services
Go to Part 2C for information on what to include in appendix

Appendix 7: Municipal Critical Water Deficiency Ordinance
Go to Part 2C for information on what to include in appendix

Appendix 8: Graph of Ten Years of Annual Per Capita Water Demand for Each Customer Category
Go to Objective 4 in Part 3B for information on what to include in appendix

Appendix 9: Water Rate Structure
Go to Objective 6 in Part 3B for information on what to include in appendix

Appendix 10: Ordinances or Regulations Related to Water Use
Go to Objective 7 in Part 3B for information on what to include in appendix

Appendix 11: Implementation Checklist
Provide a table that summarizes all the actions that the public water supplier is doing, or proposes to do, with estimated implementation dates.

Appendix 12: Sources of Information for Table 10
Provide links or references to the information used to complete Table 10. If the file size is reasonable, provide source information as attachments to the plan.

Appendix 1

Well records and maintenance summaries

OF TEST: Performance

JECT: Spring Park 1 & 2

Test By: Matt & Mark C

Is this well being used to monitor another well? NO

Well # 1

Uniq # 224642

Uniq # wzc/å'/z

Job # xonrzo

Meter Reading Beginning:

Meter Reading Ending:

Well Information:

Transducer set at: ft. (From Grade)

Length of Casing:

Length of Screen: HP of Pump: z-5h/2

Total Well Depth: Model of Pump: •zce(c

Static Water Level: 63.61 ft (From Grade)

Well Capacity: GPM @ PWL G.P.F.D.D.

Page 1 of

Date	Time	AM	PM	GPM	PWL	Sand/Gal		AMP	COKqMENQS
1/2/2001	12:34	x		123	12'3"				is a sample
5-17-16						@ 50.5			
						3/8"C/9			.2 mils top, .1 mils bottom
					97.76				to system
5-26-16					81.5	@ 50.41			I/Pt,c 1st-sp, 0 mils bottom

The data stated above is representative of the time spent pumping at the capacities stated. Deviation from either time spent pumping or both could change

the outcome if these results.

NOTE: on RECOVERY need: 5-1 minute checks

5-5 minute checks

2-30 minute checks

NOTES:

d—nor tras needed

The data stated above is representative of the time spent pumping at the capacities stated. Deviation from either time spent pumping or both could change

the outcome if these results.

NOTE: On RECOVERY need: 5-1 minute checks

5-5 minute checks

2-30 minute checks

NOTES:

—per line pipe

10-inch pipe

…F TEST: performance

Is this well being used to monitor another well? No

…JECT: Spring park 1&2

Well # 2

Test By: Matt C, Mark L

Uniq # 226643

Job # 8011526

Meter Reading Beginning: —

Meter Reading Ending: —

WellInformation:

Transducer set at: Well #

ft. (From Grade)

Length of Casing:

Length of Pump:

Screen:HP of 25 hp

Total Well Depth:

Model of Pump: 7CHC

Static Water Level: 60.98 ft (From Grade)

Well Capacity: GPM @ PWL G.P.F.D.D.

Page 1 of

Date	Time	AM	PM	GPM	PWL	Sand/Gal			cori ENTS
1/2/2001	iå:34	x	x	123	12'3'4				This is sämèle
5-17-16	8:45			start		2.			
					75.53	3/8"c/a		1713 a 2 m	, 1mils bottom
					insdoc	er bad			
					ffrW4		7		system
5-26-16				1 70	7 5@1340			fib	0mils top, 0mils bottom

10-inch pipe

Spring Park 1 & 2 SCH 5 & 10

Condition Report

Item	well 1	well 2
Motor	- oil level & clarity is good - electrically tests good - Minor filings in Ratchet due to ramp up - adjusted (see pics)	- oil level & clarity is good - electrically tests good
pump	- spins free & lifts. - Castings are very sound (no flaking) - endplay @ ± .015" good - Minor sand grooving	- spins free & lifts - castings are very sound (no flaking) - endplay @ ± .015" good - Minor sand grooving
shafts	- Shaft & threads good - Minor grooving on journals (see pics) approx .010"	- shaft & threads good - journals good
riders	- Brass has no visible cracks - inserts are not torn - acceptable tolerance	- Brass has no visible cracks - inserts are not torn - acceptable tolerance

Item	well 1	well 2
pipe	~~- minor pitting on~~ - no real concern for 5 yr. span - seats starting to flake on 3-4 pcs. replace in 5 yrs. (see pics)	- minor pitting on 4 pcs. approx 10% through, may need replacement in future pull, no real concern for 5 yr span. - seats starting to flake on 5-6 pcs. replace in 5 yrs
packing box	- bearing is .030" oversized in need of replacement but does not affect performance - rope packing is not salvageable (see pics)	- bearing is .020" oversized in need of replacement but does not affect performance - Rope packing is not salvageable
headshaft	- some wear in packing box area approx .005" minor and does not indicate early failure (see pics)	- some wear in packing box area approx .010", minor and does not indicate early failure

141 28th Ave South
Waite Park, MN 56387
www.trautwells.com
320-251-5090

Owner Information: Project Name Spring Park well 3

Project Description 801526

Job Description: ☑ Install ☑ Pull ☐ In Shop Repair
☐ Irrigation ☑ Municipal ☐ Industrial

Scope of Work: Pull pump 3, reinstall

Technician Description: -No performance Jneeds asper DJ (6-6-16) use scada history. -no Perf Aqæe (em; noted, store all parts off site a e u pump condition report. r 14 ce- pprved by reinstall. test run chlorinate

Qty	Parts Description	Price	Amount

Equipment #'s Used: Matte, Mark Field Technician/s: 348, 103

LF TEST: performance

Is this well being used to monitor another well? No

JECT: Spring Park 1&2 Well # 1 Uniq # 224642

Test By: Matt C, Mark C Job # 8011526

Meter Reading Beginning: -

Meter Reading Ending: -

Well Information:

Transducer set at: _____ ft. (From Grade)

Length of Casing: _____

Length of Screen: _____ Hp of Pump: 25 hp.

Total Well Depth: _____ Model of Pump: 7CHC

Static Water Level: 63.61 ft (From Grade)

Well Capacity: _____ GPM @ _____ PWL _____ G.P.F.D.D.

Page 1 of

Date	Time	AM	PM	GPM	PWL	Sand/Gal	Psi	Amp	Vibration COMMENTS
1/2/2001	12:34	X	X	123	12'3"	4" c/g			This is a sample
5-17-16	9:03	✓		startup	@ 50.5 Hz				
	9:10	✓		180	88.08	3/8" c/g	9 meter 22 line	18.3	.2 mi is top, .1 mi is bottom
				245	97.76		7		to system
5-26-16	4:48		✓	175	81.5	@ 50.4 Hz	10 psi 25 line	8.3	.1 mi is top, 0 mi is bottom

The data stated above is representative of the time spent pumping at the capacities stated. Deviation from either time spent pumping or both could change the outcome if these results.

NOTE: On RECOVERY need: 5-1 minute checks 2-30 minute checks NOTES:

5-5 minute checks 1-per hour as needed

h

10-inch pipe

OF TEST: performance

JECT: Spring Park 1&2 Well # 2 Uniq # 221643

rest By: Matte, Mark C Job # 8011526

Is this well being used to monitor another well? No

Meter Reading Beginning: —

Meter Reading Ending: —

Well Information:

Transducer set at: _____ ft. (From Grade)

Length of Casing: _____

Length of Screen: _____ Hp of Pump: 25 hp

Total Well Depth: _____ Model of Pump: Tchc

Static Water Level: 60.98 ft (From Grade)

Well Capacity: _____ GPM @ _____ PWL _____ G.P.F.D.D.

Page 1 of

Date	Time	AM	PM	GPM	PWL	Sand/Gal	Psi	Amp	COMMENTS (Vibration)
1/2/2001	12:34	X	X	123	12'3"	4" c/g			This is a sample
5-17-16	8:45	✓		startup @ 48	H2				
	8:52			170	75.53	3/8" c/g	7 meter 22 line	17.8	.2 mils top, .1 mils bottom
				note; transducer bad					
				283	85.44		7		to system
5-26-16	425		✓	170	75.75 ~~75.48~~	48 H2	11 meter 22 line	17.6	.0 mils top, .0 mils bottom

The data stated above is representative of the time spent pumping at the capacities stated. Deviation from either time spent pumping or both could change the outcome if these results.

NOTE: On RECOVERY need: 5-1 minute checks 2-30 minute checks

5-5 minute checks 1-per hour as needed

NOTES:

10-inch pipe

Spring Park 1 & 2 Sciscio

Condition Report

Item	well 1	well 2
Motor	- oil level & clarity is good - electrically tests good - minor filings in Ratchet due to ramp up - adjusted (see pics)	- oil level & clarity is good - electrically tests good
pump	- spins free & lifts. - castings are very sound (no flaking) - endplay @ ± .015" good - minor sand grooving	- spins free & lifts - castings are very sound (no flaking) - endplay @ ± .015" good - minor sand grooving
shafts	- shaft & threads good - minor grooving on journals (see pics) approx .010"	- shaft & threads good - journals good
spiders	- brass has no visible cracks - inserts are not torn - acceptable tolerance	- Brass has no visible cracks - inserts are not torn - acceptable tolerance

Item	well 1	well 2
pipe	~~- minor pitting on~~ - no real concern for 5 yr. span - seats starting to flake on 3-4 pcs. replace in 5 yrs. (see pics)	- minor pitting on 4 pcs. approx 10% through, may need replacement in future pull, no real concern for 5 yr span. - seats starting to flake on 5-6 pcs. replace in 5 yrs
packing box	- bearing is .030" oversized in need of replacement but does not affect performance - rope packing is not salvageable (see pics)	- bearing is .020" oversized. in need of replacement but does not affect performance - Rope packing is not salvageable
headshaft	- some wear in packing box area approx .005" minor and does not indicate early failure (see pics)	- some wear in packing box area approx .010". minor and does not indicate early failure

TRAUT COMPANIES

141 28th Ave South
Waite Park, MN 56387
www.trautwells.com
320-251-5090

Owner Information: Project Name Spring Park well 3

Project Description 8011526

Job Description:

- [x] Install
- [x] Pull
- [ ] In Shop Repair
- [ ] Irrigation
- [x] Municipal
- [ ] Industrial

Scope of Work: pull pump 3, reinstall

Technician Description: -No performance issues as per DJ (6-6-16) use scada history, -no performance problems noted, store all parts off-site as per DJ. pull pump condition report, replace parts approved by city, reinstall, test run & chlorinate

Qty	Parts Description	Price	Amount

Equipment #'s Used: Matte, Markl Field Technician/s: 348, 103

TURBINE PUMP
(MOTOR, PUMP, PERFORMANCE RECORD)

(AS PULLED) (AS INSTALLED) **(AS TESTED)** DATE: January 27, 2017

GENERAL INFO:

Customer/Owner: City of Spring Park Well/Pump 1

Address/Location: Warren Ave Spring Park

Persons on Job Site: Dallas/Jerry

MOTOR INFO:

Horsepower 25 Stand Still Volts 499/500/50 Running Volt 251

Manufacturer GE R.P.M 1765 Full Load Amps 32 S.F.Amps

BOWL DESIGN: G.P.M. T.D.H. Megger Readin

PERFORMANCE TEST: Static Water Level 62' Well Diameter 16"-416' Well Depth 567'
RPM 135

Test #1: HZ 45 AMPS 16.3 G.P.M. N/A Water Level 80.9 P.S.I. 23 T.D.H. 134'

Test #2: HZ AMPS G.P.M. Water Level P.S.I. T.D.H.

Test #3: HZ AMPS G.P.M. Water Level P.S.I. T.D.H.

T.D.H. = Pumping Water Level in Feet + (P.S.I. reading x 2.31) + Friction Loss In Column + Fittings
Example: Information Given: 1000 G.P.M., 150' Water Level, 50 P.S.I.,3.5' Friction Loss
Therefore: 150' + (50# x 2.31 or 115.5') + 3.5' = 269' T.G.H.
OR
The pump is producing 1000 G.P.M. at 269' T.D.H.

Does Well Pump Sand? Yes / No If So, How Much? Test #1 1/8" " in Gallon Jar
Test #2 " in Gallon Jar
Test #3 " in Gallon Jar

Closed Valve Test: P.S.I. Reading Water Level

Vibration Record: Vibration in Mils:

A	.4	90° from Discharge
B	.4	In Line with Discharge
C	.2	90° from Discharge
D	.2	In Line with Discharge

Tested By: Tom D.

Problems/Comments: Flush to waste. Starting for 1st time since treatment plant modifications. This is an open hole constructed well from 416'-567'. This pump was running extremely smooth.

Customer/Owner Comment:

TURBINE PUMP
(MOTOR, PUMP, PERFORMANCE RECORD)

(AS PULLED) (AS INSTALLED) **(AS TESTED)** DATE: January 27, 2017

GENERAL INFO:

Customer/Owner: City of Spring Park Well/Pump 2

Address/Location: Warren Ave. Spring Park

Persons on Job Site: Dallas-People Service / Jerry -Quality Control

MOTOR INFO:

Horsepower 25 Stand Still Volts 497/499/500 Running Volt 212

Manufacturer GE R.P.M 1765 Full Load Amps 32 S.F.Amps

BOWL DESIGN: G.P.M. T.D.H. Megger Readin

PERFORMANCE TEST: Static Water Level 15' Well Diameter 16"-261' Well Depth 375'
RPM 1262

Test #1: HZ 42 AMPS 14.6 G.P.M. N/A Water Level 29 P.S.I. 11 T.D.H. 54.5

Test #2: HZ AMPS G.P.M. Water Level P.S.I. T.D.H.

Test #3: HZ AMPS G.P.M. Water Level P.S.I. T.D.H.

T.D.H. = Pumping Water Level in Feet + (P.S.I. reading x 2.31) + Friction Loss In Column + Fittings
Example: Information Given: 1000 G.P.M., 150' Water Level, 50 P.S.I.,3.5' Friction Loss
Therefore: 150' + (50# x 2.31 or 115.5') + 3.5' = 269' T.G.H.
OR
The pump is producing 1000 G.P.M. at 269' T.D.H.

Does Well Pump Sand? Yes / No If So, How Much? Test #1 0 " in Gallon Jar
Test #2 " in Gallon Jar
Test #3 " in Gallon Jar

Closed Valve Test: P.S.I. Reading Water Level

Vibration Record: Vibration in Mils:

A	.6	90° from Discharge
B	.6	In Line with Discharge
C	.3	90° from Discharge
D	.3	In Line with Discharge

Tested By: Tom D.

Problems/Comments: Pumping to waste. Staring for 1st time since modifications performed to the treatment plant. This well is a screened well construction leader from 261'-292'. Screened from 292' to 375'. This pump was running very smoothly

Customer/Owner Comment:

8-17-82

Submersible Pump - Reclaim #1

Pump: Valley Pump Co.
model 44 MHO. 2A
Serial 14. 12 449
GPM - HEAD - RPM = Blank
(from TAG)

T 206
2D , HPC
T 208A
(stamped/cast ON Bowls)

Motor:
Franklin Electric
model : 2343242013
HP : 1½ - 3 PH - Date Code C-80
RPM : 3450/2875 MAX AMP 3.2
KVA : K/F - S.F. 1.3/1.0
Continuous Duty
(Printed ON TAG)

33485 9903
460 V
1½
3Ø C80
(STAMPED IN Frame)

8-17-82

Submersible Pump - Reclaim #2

Pump: Valley Pump Co.
Model : 44 HHO.2 A
Serial : 14.12450
GPM - HEAD - RPM = Blank
Code L-82
~
2D , HPC
T 208 A

} TAG

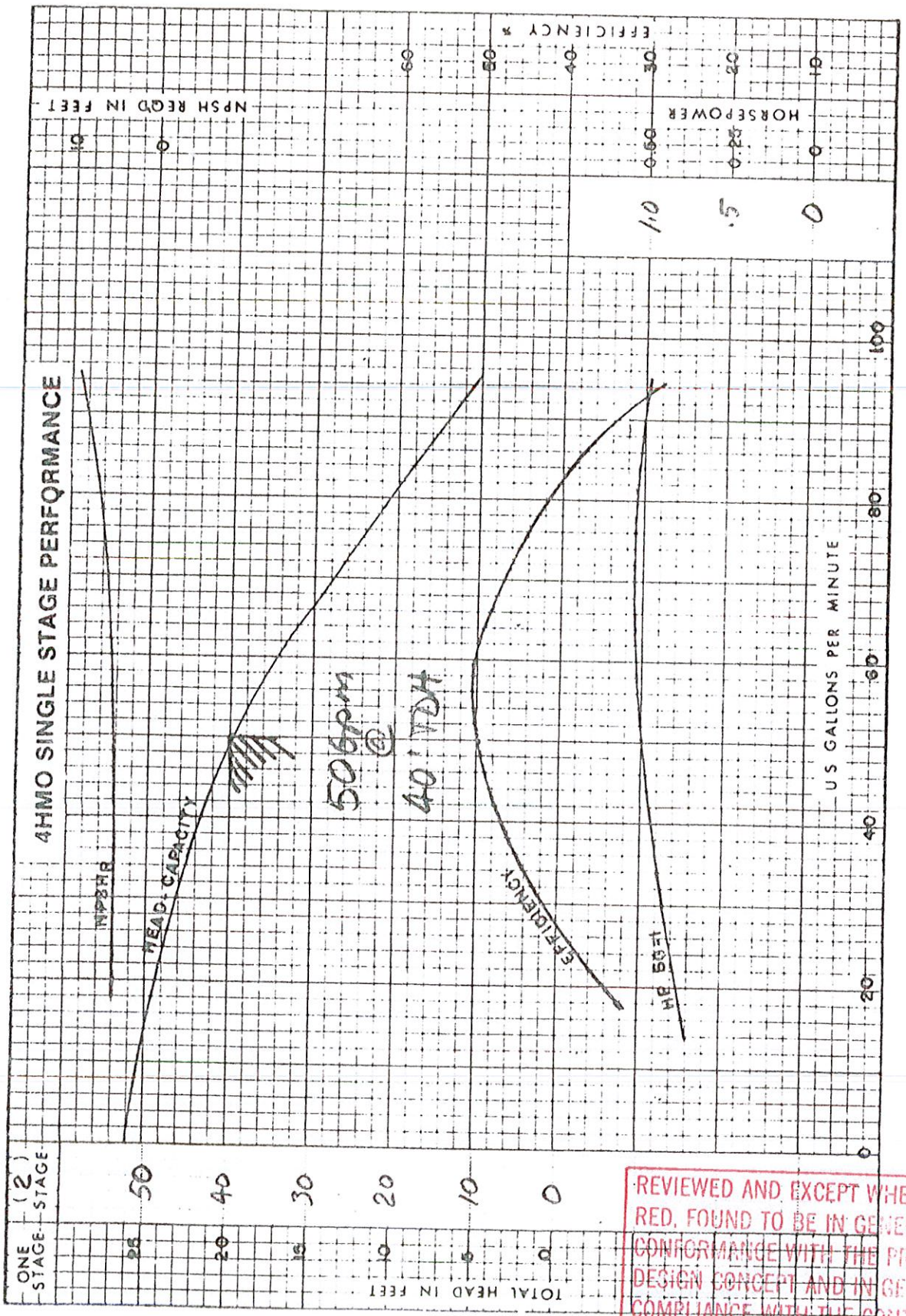
} Stamped/Cast on Bowls

MOTOR: Franklin Electric
Model 2343252013
HP 2 ; 3 PH
Volts 460/380 HZ 60/50
S.F. 1.25/1.0
RPM 3450/2875; MAX AMP 4.1
KVA L/G, Continuous Duty
MIN Flow FT/Sec .25
DATE Code C 81

} Printed on TAG

334815902
460 V
2 30 C 81

} Stamped



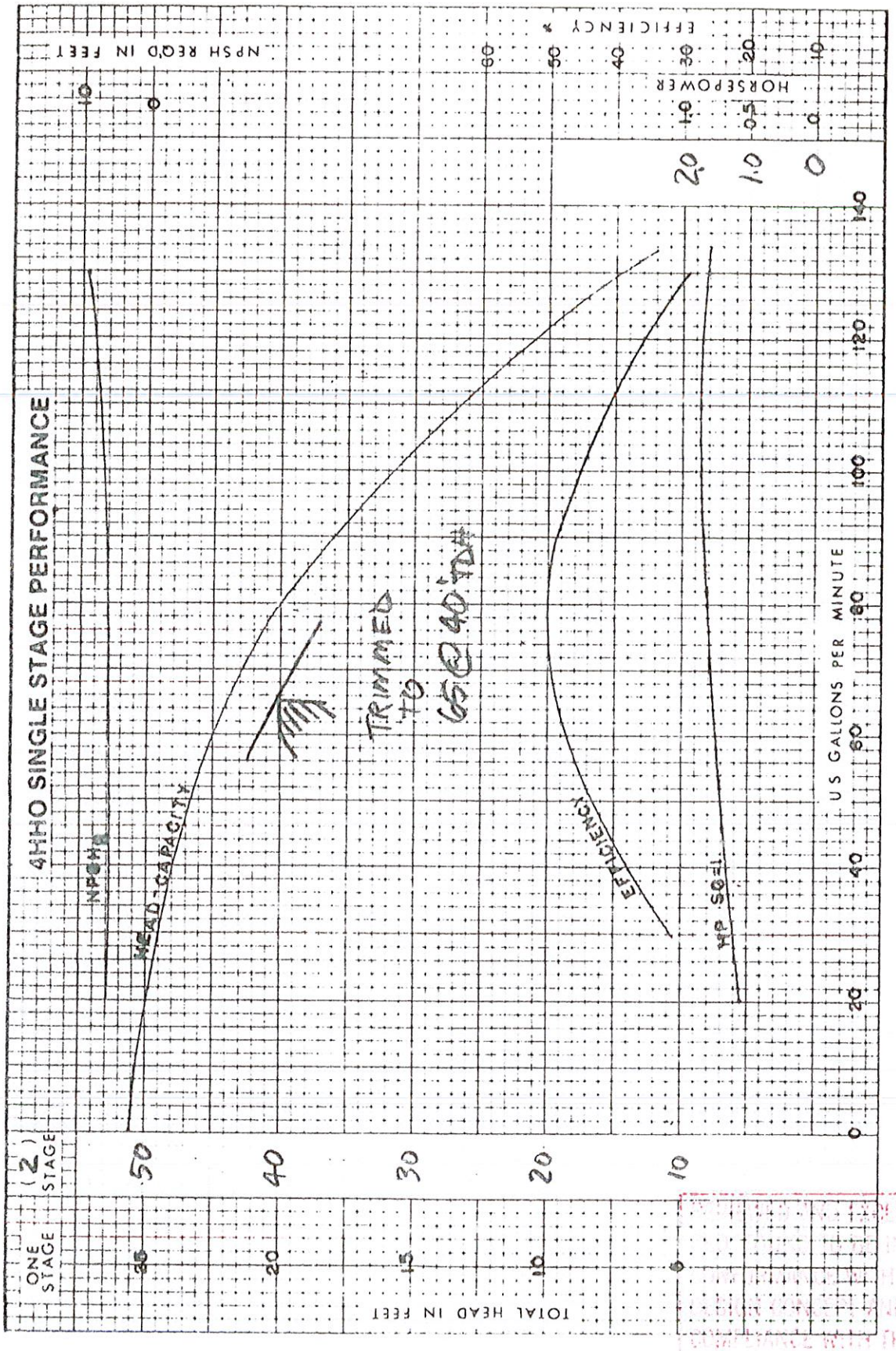
REVIEWED AND EXCEPT WHERE NOTED IN RED, FOUND TO BE IN GENERAL CONFORMANCE WITH THE PROJECT DESIGN CONCEPT AND IN GENERAL COMPLIANCE WITH THE CONTRACT DOCUMENTS.

SCHOELL & MADSON, INC.
ENGINEERS & SURVEYORS

BY K Adey DATE 5-26-82

VALLEY PUMP
A Division of Valley Industries, Inc

Curve No.
L-0101



VALLEY PUMP
A Division of Valley Industries, Inc

Curve No.
L-0102

Franklin Electric
Bluffton, Indiana 46714

PRICE SHEET
PAGE 220.011
Date: JAN. 22, 1982
Supersedes: 12-7-81
Discount: See Table

SUBMERSIBLE MOTORS

4" WATER WELL • 900 lbs. THRUST

Single and three phase • 200 to 575 volts • 60 ② Hz • 3450 rpm

900 LBS.
THRUST

hp.	downward thrust lbs.	volts	service factor	DISCOUNT II-C* motor model number	list price	DISCOUNT II-F* control box ① model number	list price
SINGLE PHASE, CAPACITOR START							
1-1/2	900	230	1.30	224 30020	$521.74	282 30072	$ 86.18
2	900	230	1.25	224 30120	577.07	282 30182	112.40
3	900	230	1.15	224 30220	678.45	282 30282	144.38*
5	900	230	1.15	224 11320	840.87	282 11392	210.12
THREE PHASE (Special controls required ①)							
1-1/2	900	200	1.30	234 30420	$493.64		
	900	230	1.30	234 31420			
	900	②460/380	1.30/1.0	234 32420			
	900	575	1.30	234 33420			
2	900	200	1.25	234 30520	524.98		
	900	230	1.25	234 31520			
	900	②460/380	1.25/1.0	234 32520			
	900	575	1.25	234 33520			
3	900	200	1.15	234 10620	598.11		
	900	230	1.15	234 11620			
	900	②460/380	1.15/1.0	234 12620			
	900	575	1.15	234 13620			
5	900	200	1.15	234 10720	756.80		
	900	230	1.15	234 11720			
	900	②460/380	1.15/1.0	234 12720			
	900	575	1.15	234 13720			
THREE PHASE "UNI-STRUC" (Special controls required ①)							
7-1/2	900	200	1.15	234 10828	$2255.97		
	900	230	1.15	234 11828			
	900	②460/380	1.15/1.0	234 12828			
	900	575	1.15	234 13828			
10	900	②460/380	1.15/1.0	234 12928	2870.65		
	900	575	1.15	234 13928			

APPLICATIONS

These motors are built for dependable operation in 4" diameter or larger water wells. The "Uni-Struc" motor design utilizes a twin rotor and stator arrangement to provide higher horsepower ratings for 4" diameter wells.

SPECIFICATIONS

Temperature and Time Rating: Continuous.
Enclosure: Hermetically sealed stator, corrosion resistant outer shell.
Shaft: Splined, stainless steel.
Bearings: Water lubricated sleeve and kingsbury type thrust bearings.
Control Box: Separate for 1 ϕ, special for 3 ϕ units ①.
Leads: Removable type, not furnished with motor (see page 220.303 for leads).
Protection: Manual reset overload in 1 ϕ control box; SPECIAL for 3 ϕ ①.
Rotation: 1 ϕ, CCW facing shaft end.
3 ϕ, Electrically and mechanically reversible.

FOOTNOTES:

① Franklin does not manufacture 3 ϕ controls. Standard 3 ϕ magnetic starter with special extra-quick trip overload relays in all three legs is required for positive motor protection. WARRANTY IS VOID where this protection is not employed.

② 60/50 Hz, 3450/2875 rpm.

WARNING: If these motors are tested or used outside a well, the motor frame must be connected to the power supply grounding terminal with a copper conductor no smaller than the circuit conductors to prevent electrical shock hazard.

MODIFICATIONS

Corrosion resistant construction see pages 220.033 & 220.035

Voltage, hertz, and ratings not listed here are available at additional price

NOTE: Refer to page 220.321 for 5 hp, 1 ϕ Deluxe Control Box with magnetic contactor.

SUBMERSIBLE MOTORS

E N G I N E E R I N G M A N U A L

4-INCH THREE-WIRE SUBMERSIBLE WATER WELL MOTORS
60 Hertz Representative Loading and Performance Data

Rated HP	Volts	PH.	Service Factor	Winding Number	Rated HP Input Amps	Rated HP Input Watts	Maximum Input (S.F. Load) Amps	Maximum Input (S.F. Load) Watts	Max. Thrust Load Pounds	Circ. Brk. or Std. Fuse	Dual Element Fuse	KVA Code	Locked Rotor Amps
1/4	115	1	1.65	334253	5.6	375	7.2	620	300	20	8	N	27.2
	230	1	1.85	334254	2.8	375	3.6	620	300	15	4	N	13.6
1/3	115	1	1.75	334255	7.0	500	8.9	770	300	25	10	N	32.8
	230	1	1.75	334256	3.5	500	4.4	770	300	15	5	N	16.4
1/2	115	1	1.6	334257	9.6	700	11.9	1040	300	30	15	M	46.0
	230	1	1.6	334258	4.8	700	5.9	1040	300	15	7	M	23.1
3/4	230	1	1.5	334260	6.4	980	8.0	1400	300	20	9	M	33.1
1	230	1	1.4	334261	8.0	1240	9.6	1700	400	25	12	L	42
1-1/2	230	1	1.3	334493	9.1	1680	11.5	2200	400	30	15	J	52
	230	1	1.3	334493	9.2	1740	11.6	2250	900	30	15	J	52
2	230	1	1.25	334602	10.0	2100	13.2	2800	900	35	15	G	51
3	230	1	1.15	334597	14.0	3150	16.5	3700	900	45	20	F	71
5	230	1	1.15	334517	23.0	5200	27.5	6100	900	80	30	F	118
1-1/2	200	3	1.3	334857	6.0	1520	7.3	2000	400	20	9	K	39
	200	3	1.3	334857	6.1	1570	7.4	2050	900	20	9	K	39
	230	3	1.3	334835	5.2	1520	6.3	2000	400	20	8	K	34
	230	3	1.3	334835	5.3	1570	6.4	2050	900	20	8	K	34
	460	3	1.3	334859	2.6	1520	3.1	2000	400	15	4	K	17
	460	3	1.3	334859	2.7	1570	3.2	2050	900	15	4	K	17
	575	3	1.3	334860	2.1	1520	2.5	2000	400	15	3	K	14
	575	3	1.3	334860	2.2	1570	2.6	2050	900	15	3	K	14
2	200	3	1.25	334814	8.0	2100	9.4	2630	900	25	10	L	53
	230	3	1.25	334603	7.0	2100	8.2	2630	900	20	10	L	46
	460	3	1.25	334815	3.5	2100	4.1	2630	900	15	5	L	23
	575	3	1.25	334816	2.8	2100	3.3	2630	900	15	4	L	18
3	200	3	1.15	333350	11.5	3130	13.1	3700	900	35	15	K	70
	230	3	1.15	332250	10.0	3130	11.4	3700	900	30	15	K	61
	460	3	1.15	334862	5.0	3130	5.7	3700	900	15	7	K	31
	575	3	1.15	332993	4.0	3130	4.6	3700	900	15	6	K	24
5	200	3	1.15	333381	17.5	5000	20.0	5800	900	50	25	K	120
	230	3	1.15	332251	15.2	5000	17.4	5800	900	45	20	K	104
	460	3	1.15	332903	7.6	5000	8.7	5800	900	25	10	K	52
	575	3	1.15	332994	6.1	5000	7.0	5800	900	20	8	K	42
7-1/2	200	3	1.15	334066	27.0	7700	30.8	9000	900	80	35	J	158
	230	3	1.15	333625	23.5	7700	26.8	9000	900	70	30	J	143
	460	3	1.15	333005	11.7	7700	13.4	9000	900	35	15	J	72
	575	3	1.15	333732	9.3	7700	10.7	9000	900	30	12	J	57
10	460	3	1.15	332992	15.6	10100	17.6	11700	900	45	20	K	103
	575	3	1.15	333734	12.5	10100	14.1	11700	900	40	20	K	86

Franklin Electric
Bluffton, Indiana 46714

APPLICATION DATA
PAGE 260.155
Date: JAN. 22, 1982
Supersedes: 1-15-81

SUBMERSIBLE MOTORS

CONSTRUCTION MATERIALS — ENVIRONMENTS

4-INCH SUPER STAINLESS				4-INCH 900 LB. THRUST		
Environment Type	Std. Water Well	Saltwater	Chemical	Std. Water Well	Saltwater ①②	Chemical
Representative Model 7th &8th Digits	-31, -41, -42	-47		-20, -21	-76	-86
Castings	304 S.S. Over Iron Alum.	304 S.S. Over Iron		Gray Iron	Ni-Resist Type 1B	316 S.S.
Shell	201 S.S.	Same as Std		201 S.S.	316 S.S.	316 S.S.
Shaft Extension	303 S.S.	Same as Std		303 S.S. Except 17-4 S.S. 5-10 HP	Same as Std	Same as Std.
Fasteners	305 S.S.	316 S.S.		400 Series S.S.	316 S.S.	316 S.S.
Seal Cover	Acetal	Same as Std		304 S.S.	316 S.S.	316 S.S.
Seal	Nitrile Rubber Lip	Same as Std		Nitrile Rubber Lip Seal	Nitrile, Carbide, Ceramic Face Seal	Nitrile, Carbide, Ceramic Face Seal
Diaphragm	Nitrile Rubber,	Same as Std		Nitrile Rubber Rubber	Type 100 Hydrin	Type 100 Hydrin
Plate	304 S.S.			304 or 201	304 S.S.	304 S.S.
Spring	302 S.S.			302 S.S.	302 S.S.	302 S.S.
Cover				201 S.S.	316 S.S.	316 S.S.
Slinger	Nitrile Rubber	Same as Std		Nitrile Rubber	Nitrile Rubber	Nitrile Rubber
Lead Sleeve	Nickel Plated SAE 330 Brass	Same as Std		Nickel Plated SAE 330 Brass	Same as Std	Same as Std
Lead Jam Nut	Brass SAE 360	Same as Std		Brass SAE 360	316 S.S.	316 S.S.
Lead Potting	Epoxy	Same as Std		Epoxy	Same as Std	Same as Std
Lead Wire	Neoprene	Same as Std		Neoprene	Same as Std	Same as Std
Coupling	416 S.S.	Same as Std		416 S.S.	316 S.S.	316 S.S.

FOOTNOTES:

① Ni-Resist saltwater motors replace previous types with 85-15 bronze castings and 201 S.S. shells.

② Special 900 lb. models with 7th and 8th digits of -85 for non-acid uranium leach mining are like saltwater except gray iron castings and nylon jacket PVC lead wire.

CONTINUED ON OPPOSITE SIDE

Mailed to:

8-17-82

Submersible Pump - Reclaim #1

Pump: Valley Pump Co.
model 44 MHO. 2A
Serial 14. 12 449
GPM - HEAD - RPM = Blank
(from TAG)

T 206
2D , HPC
T 208A
(stamped/cast ON Bowls)

Motor:
Franklin Electric
model : 2343242013
HP : 1½ - 3 PH - Date Code C-80
RPM : 3450/2875 MAX AMP 3.2
KVA : K/F - S.F. 1.3/1.0
Continuous Duty
(Printed ON Tag)

33485 9903
460 V
1½
3Ø C80
(STAMPED IN Frame)

8-17-82

Submersible Pump - Reclaim #2

Pump: Valley Pump Co.
Model : 44 HHO.2 A
Serial : 14.12450
GPM - HEAD - RPM = Blank
Code L-82
~
2D , HPC
T 208 A

TAG

Stamped/Cast on Bowls

MOTOR: Franklin Electric
Model 2343252013
HP 2 j 3 PH
Volts 460/380 HZ 60/50
S.F. 1.25/1.0
RPM 3450/2875; MAX AMP 4.1
KVA L/G , Continuous Duty
MIN Flow FT/Sec .25
DATE CODE C 81

Printed on TAG

334815902
460V
2 30 C 81

stamped

TURBINE PUMP
(MOTOR, PUMP, PERFORMANCE RECORD)

(AS PULLED) (AS INSTALLED) **(AS TESTED)** DATE: January 27, 2017

GENERAL INFO:

Customer/Owner: City of Spring Park Well/Pump 1

Address/Location: Warren Ave Spring Park

Persons on Job Site: Dallas/Jerry

MOTOR INFO:

Horsepower 25 Stand Still Volts 499/500/50 Running Volt 251

Manufacturer GE R.P.M 1765 Full Load Amps 32 S.F.Amps

BOWL DESIGN: G.P.M. T.D.H. Megger Readin

PERFORMANCE TEST: Static Water Level 62' Well Diameter 16"-416' Well Depth 567'
RPM 135

Test #1: HZ 45 AMPS 16.3 G.P.M. N/A Water Level 80.9 P.S.I. 23 T.D.H. 134'

Test #2: HZ AMPS G.P.M. Water Level P.S.I. T.D.H.

Test #3: HZ AMPS G.P.M. Water Level P.S.I. T.D.H.

T.D.H. = Pumping Water Level in Feet + (P.S.I. reading x 2.31) + Friction Loss In Column + Fittings
Example: Information Given: 1000 G.P.M., 150' Water Level, 50 P.S.I.,3.5' Friction Loss
Therefore: 150' + (50# x 2.31 or 115.5') + 3.5' = 269' T.G.H.
OR
The pump is producing 1000 G.P.M. at 269' T.D.H.

Does Well Pump Sand? Yes / No If So, How Much? Test #1 1/8" " in Gallon Jar

Test #2 " in Gallon Jar
Test #3 " in Gallon Jar

Closed Valve Test: P.S.I. Reading Water Level

Vibration Record: Vibration in Mils:

A	.4	90° from Discharge
B	.4	In Line with Discharge
C	.2	90° from Discharge
D	.2	In Line with Discharge

Tested By: Tom D.

Problems/Comments: Flush to waste. Starting for 1st time since treatment plant modifications. This is an open hole constructed well from 416'-567'. This pump was running extremely smooth.

Customer/Owner Comment:

TURBINE PUMP
(MOTOR, PUMP, PERFORMANCE RECORD)

(AS PULLED) (AS INSTALLED) **(AS TESTED)** DATE: January 27, 2017

GENERAL INFO:

Customer/Owner: City of Spring Park Well/Pump 2

Address/Location: Warren Ave. Spring Park

Persons on Job Site: Dallas-People Service / Jerry -Quality Control

MOTOR INFO:

Horsepower 25 Stand Still Volts 497/499/500 Running Volt 212

Manufacturer GE R.P.M 1765 Full Load Amps 32 S.F.Amps

BOWL DESIGN: G.P.M. T.D.H. Megger Readin

PERFORMANCE TEST: Static Water Level 15' Well Diameter 16"-261' Well Depth 375'
RPM 1262

Test #1: HZ 42 AMPS 14.6 G.P.M. N/A Water Level 29 P.S.I. 11 T.D.H. 54.5

Test #2: HZ AMPS G.P.M. Water Level P.S.I. T.D.H.

Test #3: HZ AMPS G.P.M. Water Level P.S.I. T.D.H.

T.D.H. = Pumping Water Level in Feet + (P.S.I. reading x 2.31) + Friction Loss In Column + Fittings
Example: Information Given: 1000 G.P.M., 150' Water Level, 50 P.S.I.,3.5' Friction Loss
Therefore: 150' + (50# x 2.31 or 115.5') + 3.5' = 269' T.G.H.
OR
The pump is producing 1000 G.P.M. at 269' T.D.H.

Does Well Pump Sand? Yes / No If So, How Much? Test #1 0 " in Gallon Jar
Test #2 " in Gallon Jar
Test #3 " in Gallon Jar

Closed Valve Test: P.S.I. Reading Water Level

Vibration Record: Vibration in Mils:

A	.6	90° from Discharge
B	.6	In Line with Discharge
C	.3	90° from Discharge
D	.3	In Line with Discharge

Tested By: Tom D.

Problems/Comments: Pumping to waste. Staring for 1st time since modifications performed to the treatment plant. This well is a screened well construction leader from 261'-292'. Screened from 292' to 375'. This pump was running very smoothly

Customer/Owner Comment:

Open Dripproof or Weather Protected	444 and Larger	1800 and Below	6C thru 40C (42-104F)	150	Mineral or Synthetic
			41C thru 50C (105-122F)		Synthetic Only
Totally Enclosed or Explosionproof	449 and Larger		-15C thru 25C (5-77F)	68	Mineral or Synthetic
			6C thru 40C (42-104F)	150	Synthetic Only
			41C thru 50C (105-122F)	Refer to Office	

Notes:
1. If lower guide bearing is oil lubricated, it should use the same oil as the thrust bearing.
2. If lower guide bearing is grease-lubricated, refer to TABLE 2 for recommended greases.
3. Refer to Emerson Motor Co. for ambient temperatures other than those listed.

Table 4

Emerson Motor Co. Approved Oil Specifications For Use With Anti-Friction Bearings

Oil Manufacturer	ISO VG 32		ISO VG 68		ISO VG 150	
	Viscosity: 130-165 SSU @ 100F		Viscosity: 284-347 SSU @ 100F		Viscosity: 620-765 SSU @ 100F	
	Mineral Base Oil	Synthetic Base Oil	Mineral Base Oil	Synthetic Base Oil	Mineral Base Oil	Synthetic Base Oil
Chevron USA Inc	GST Turbine Oil 32	Tegra 32	GST Turbine Oil 68	Tegra 68	R&O Machine Oil 150	Tegra 150
Conoco Oil Co.	Hydroclear Turbine Oil 32	Syncon 32	Hydroclear Turbine Oil 68	Syncon 68	Hydroclear AW Hyd Fluid 150	N/A
ExxonMobil	Teresstic 32	Synnestic 32	Teresstic 68	Synnestic 68	Teresstic 150	Synnestic 150
ExxonMobil	DTE Oil Light	SHC 624	DTE Oil Heavy Medium	SHC 626	DTE Oil Extra Heavy	SHC 629
Pennzoil Co., Inc	Pennzbell TO 32	Pennzbell SHD 32	Pennzbell TO 68	Pennzbell SHD 68	Pennzbell TO 150	Pennzbell SHD 150
Phillips Petroleum Co.	Magnus 32	Syndustrial "E" 32	Magnus 68	Syndustrial "E" 68	Magnus 150	N/A
Shell Oil Co.	Tellus HD Oil AW SHF 32		Tellus 68	Tellus HD Oil AW SHF 68	Tellus 150	N/A
Texaco Lubricants Co.	Regal 32	Cetus PAO 32	Regal 68	Cetus PAO 68	Regal 150	N/A

Dallas Roggeman

From: Tim Berquam <tim.berquam@bergersoncaswell.com>
Sent: Wednesday, November 23, 2016 1:03 PM
To: Dallas Roggeman
Subject: FW: Spring Park Wells 1 and 2
Attachments: Spring Park Wells 1 and 2 Boring Records.pdf

Dallas I am sending you some information that was assembled from engineers and others, so you have available. This attachment is two well logs on file with MDH.

Tim Berquam
(612) 369-3652

From: Darin L. Ellingson [mailto:DEllingson@mfra.com]
Sent: Wednesday, April 11, 2012 8:59 AM
To: Tim Berquam
Cc: DJ Goman
Subject: Spring Park Wells 1 and 2

Tim,

I looked over the videos of the wells, and I have questions for you.

Well #1:

1. From 72' to 99' it looks like there are spirals or circles on the casing. Does it look to you like the casing has been brushed before?
2. At the bottom of the hole, it looks like there is a large chunk of material (shale or sandstone) laying along the side of the hole that the camera runs into and alongside of to the bottom of the hole. I would say it is about 4' tall, from 563' to the bottom at 567' and could possibly extend further. I assume this would not break up with airlifting and would need to be drilled. What do you think? Before I watched the video, I was expecting to see a flat bottom at the bottom of the hole that was filled with accumulated sand. And then based on your past records, would have expected to find large chunks like is in the video further down in the hole covered by sand. Based on this video and your past records, it would seem likely that drilling might be needed all the way down from 567' to 640'. What do you think?
3. DJ found a VHS copy of televising of Well #1 from 1993. Would you still have a copy of that video on hand that you could transfer to DVD? Otherwise DJ could get it to you to transfer, or I could transfer it on a machine I have at home. It doesn't really have a bearing on the work we need to do, but it would be interesting to see what has changed since then at the bottom of the hole.

Well #2:

1. From 85' to 95' it looks like there are spirals or circles on the casing like Well #1. Does it look to you like the casing has been brushed before?
2. According to the attached drill records, I was expecting to see 16" casing to 295', 8" casing to 341', and a 50' screen from 341' to 391'. But based on the televising, it is 16" casing to 261', 8" casing to 292', a 5' screen section from 292' to 297', 8" casing from 297' to 330', then screen from 330' to 372' (42'). Would it be correct to assume the bottom screen is 50' in length and extends to 380' (meaning only 8' of fill in the screen) or does the screen extend to 391' (meaning 20' of fill and a total screen length of 60')? It probably doesn't matter either

way, because when we remove the scale/debris that comes off the casing from the brushing, whatever fill is in the bottom of the screen will get removed anyway, correct? What do you think? I need to clarify what our expectations will be for removing material from this well.

Thanks,

Darin Ellingson, PE (MN)
Project Manager

MFRA, Inc. | 14800 28th Ave N, Ste. 140, Plymouth, MN 55447 | www.mfra.com
(763) 259.6697 **Direct** | (612) 978.8469 **Cell** | (763) 476.8532 **Fax**

From: Tim Berquam [mailto:tim@bergersoncaswell.com]
Sent: Tuesday, April 10, 2012 2:02 PM
To: Darin L. Ellingson
Subject: Pump curve for 9 CLC 4 stage Goulds pump

Darin attached is two pump curves of the same bowl assembly running at two different speeds The first one is the design I used 350 Gpm @ 175'TDH – 1770 rpm 60 HZ, the second is that pump slowed down to 1590 Rpm (53.8 Hz), where I marked the curve with a point 250 Gpm @ 150'TDH This shows that when the pump motor slows down to 53.8 hz this pump will produce the quantity of water and head as it was designed. Therefore this 9 CLC 4 stage goulds bowl assembly is a good pick for a replacement pump. The list price is $100.00 less than the 7CHC 6 stage pump I checked on this morning

The wording I would use on the brushing item is "brush interior of well casing spending adequate time to clean mineral deposit and loose scale, and plan on brushing at a rate of 50'/hr.

Please review and let me know if you need anything else. I will b e dropping off the DVD's this afternoon.

Tim Berquam
Project Manager/ Geologist
BERGERSON CASWELL INC.
5115 Industrial Street
Maple Plain, MN 55359
(952) 255-7003
(763) 479-2183 fax
(612) 369-3652 cell
Bergerson Caswell is an equal opportunity contractor/ employer

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From: BERGERSON-CASWELL INC. [mailto:copy_center@bergersoncaswell.com]
Sent: Tuesday, April 10, 2012 1:39 PM
To: Tim Berquam
Subject: Scanned Document from Copy Center

Unique Well Number: 224642

County: Hennepin
Quad: Mound
Quad Id: 105B

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
MINNESOTA STATUTES CHAPTER 1031

Entry Date: 1991/08/24
Update Date: 2004/12/29
Received Date:

Wellname: SPRING PARK 1

Township	Range	Dir	Section	Subsection	Field Located	MGS Elevation
117	23	W	18	DCCADA		957.00 ft.

Well Depth	Depth Completed	Date Well Completed
640.00 ft	640.00 ft	1964/06/22

Contact: SPRING PARK 1
4349 WARREN AV
SPRING PARK MN
Changed

Drilling Method:
Drilling Fluid:
Well Hydrofractured? ☐ YES ☐ NO
From ft. to

Use: Community Supply

Casing: Type Steel (black or low Drive Shoe? ☐ YES ☐ NO
Diameter 16 Depth 418
16.00 in. from 0.00 to 418.00 ft. lbs/ft
Hole Diameter (in.)

Screen: No
Make Type
Diamter Slot Length Set
Open Hole(ft.) From 418.0 to 640.0

Description	Color	Hardness	From	To (ft.)
GLACIAL DRIFT			0	275
WHITE SHALE			275	278
SHALEY SANDSTONE			278	288
WHITE SHALE			288	290
SANDSTONE			290	294
SHALE			294	297
SANDSTONE			297	302
SHALE			302	305
SANDSTONE + SHALE LENSES			305	322
SANDSTONE			322	348
SANDSTONE			348	395
SHALEY SANDSTONE			395	410
SANDSTONE			410	415
SHALE + SANDSTONE LENSES			415	506
SHALE + SANDSTONE LENSES			506	552
SHALE + SANDSTONE LENSES			552	569
SANDSTONE WITH SHALE LENS			569	605
SHALE + SANDSTONE			605	620
SHALE + SANDSTONE			620	633
SANDSTONE			633	638
SHALE			638	640

Static Water Level
58.00 ft. Land surface Date measured 1964/06/22

Pumping Level (below land surface)
124.00 ft. after hrs. pumping 250.00 g.p.m.

Well Head Completion
Pitless adapter manufacturer: Model:
☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY) ☐ Basement offset

Grouting Information: Well grouted? ☐ YES ☐ NO

Fit for Observation Wells
Not Volunteered

Nearest Known Source of Contamination
feet Direction Type
Well disinfected upon completion? ☐ YES ☐ NO

Pump
☐ Not Installed Date Installed
Manufacture's name
Model number HP 0.00 Volts
Length of drop pipe Material Capacity g.p.m
Type

Abandoned Wells
Does property have any not in use and not sealed well(s)? ☐ YES ☐ NO

Variance
Was a variance granted from the MDH for this well? ☐ YES ☐ NO

Well Contractor Cerfication
Tri-state Well Co. 27118
License Business Name Lic. or Reg No.

Remarks
#1 & #2 150' E. OF CITY HALL

First Bedrock CJDN
Last Strat CMTS
Aquifer Franconia-MtSimon
Depth to Bedrock 275.00 ft.

County Well Index REPORT Printed on 3/23/2009

Name of Driller Date

HE-01205-07 (Rev. 2-99)

Unique Well Number: 224642

County: Hennepin
Quad: Mound
Quad Id: 105B

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
MINNESOTA STATUTES CHAPTER 1031

Entry Date: 1991/08/24
Update Date: 2004/12/29
Received Date:

Wellname	Township	Range	Dir	Section	Subsection	Depth Drilled	Depth Completed	Date Completed	Lic/Reg. No.	Driller Name
SPRING PARK 1	117	23	W	18	DCCADA	640 ft	640 ft	1964/06/22	27118	

Elevation 957.00 ft. Method Calc from DEM (USGS Aquifer Franconia-MtSimon Depth to Bedrock 275 ft. Open Hole 418-640 SWL 58

Field Located Minnesota Geological Survey
Program
Uni No.Verified Information from owner
Geologic Interpretation Bruce Bloomgren

Location Method GPS Code Measurements (Ps Universal Transverse Mercator(UTM) - NAD83 - Zone 15 - Meters
Input Source
Input Date 1999/10/01
Agency MGS

UTM Easting (X): 450028
UTM Northing (Y): 4976022
Interpretation Method: Geologic study 1:24k to 1:100k

Geological Material	Color	Hardness	DEPTH From	DEPTH To	Thick	ELEVATION From	ELEVATION To	Stratigraphy	LITHOLOGY Primary	LITHOLOGY Secondary	LITHOLOGY Minor
GLACIAL DRIFT			0	275	275	957	682	Unknown deposit type	Drift		
WHITE SHALE			275	278	3	682	679	Jordan	Shale		
SHALEY SANDSTONE			278	288	10	679	669	Jordan	Sandstone		
WHITE SHALE			288	290	2	669	667	Jordan	Shale		
SANDSTONE			290	294	4	667	663	Jordan	Sandstone		
SHALE			294	297	3	663	660	Jordan	Sandstone	Shale	
SANDSTONE			297	302	5	660	655	Jordan	Sandstone		
SHALE			302	305	3	655	652	Jordan	Sandstone	Shale	
SANDSTONE + SHALE LENSES			305	322	17	652	635	Jordan	Sandstone	Shale	
SANDSTONE			322	348	26	635	609	Jordan	Sandstone		
SANDSTONE			348	395	47	609	562	St.Lawrence	Shale	Dolomite	
SHALEY SANDSTONE			395	410	15	562	547	Franconia	Sandstone	Dolomite	Shale
SANDSTONE			410	415	5	547	542	Franconia	Sandstone	Dolomite	Shale
SHALE + SANDSTONE LENSES			415	506	91	542	451	Franconia	Sandstone	Dolomite	Shale
SHALE + SANDSTONE LENSES			506	552	46	451	405	Ironton-Galesville	Sandstone		
SHALE + SANDSTONE LENSES			552	569	17	405	388	Eau Claire	Shale	Sandstone	
SANDSTONE WITH SHALE LENSES			569	605	36	388	352	Eau Claire	Shale	Sandstone	
SHALE + SANDSTONE			605	620	15	352	337	Eau Claire	Shale	Sandstone	
SHALE + SANDSTONE			620	633	13	337	324	Mt.Simon	Sandstone		
SANDSTONE			633	638	5	324	319	Mt.Simon	Sandstone		
SHALE			638	640	2	319	317	Mt.Simon	Sandstone	Shale	

Unique Well Number: 224643

County Hennepin
Quad Mound
Quad Id 105B

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
MINNESOTA STATUTES CHAPTER 1031

Entry Date 1991/08/24
Update Date 2003/12/16
Received Date

Wellname SPRING PARK 2

Township	Range	Dir	Section	Subsection	Field Located	MGS Elevation
117	23	W	18	DCCADA		957.00 ft.

Contact SPRING PARK 2

SPRING PARK MN Changed

Well Depth	Depth Completed	Date Well Completed
391.00 ft	391.00 ft	1964/09/04

Drilling Method

Drilling Fluid

Well Hydrofractured? ☐ YES ☐ NO From ft. to

Use Community Supply

Casing Type Steel (black or low Drive Shoe? ☐ YES ☐ NO Hole Diameter (in.)

16.00 in. Diameter B from 0.00 to 295.00 ft. Depth 341 ____ lbs/ft
8.00 in. from 275.00 to 341.00 ft. ____ lbs/ft

Description	Color	Hardness	From	To (ft.)
GLACIAL DRIFT			0	273
DIRTY SANDSTONE			273	297
CLEAN SANDSTONE			297	316
SANDSTONE + SHALE			316	331
CLEAN SANDSTONE		soft	331	384
SHALEY SANDSTONE		soft	384	391

Open well
Vulnerable (No drilling allowed)

Screen Yes Open Hole(ft.) From to

Make JOHNSON Type stainless steel

Diamter	Slot	Length	Set
8.00		50	ft. to ft.

Static Water Level
58.00 ft. Land surface Date measured 1964/09/04

Pumping Level (below land surface)
89.00 ft. after 8.00 hrs. pumping 250.00 g.p.m.

Well Head Completion
Pitless adapter manufacturer ____ Model ____
☐ Casing Protection ☐ 12 in. above grade
☐ At-grate (Environmental Wells and Borings ONLY) ☐ Basement offset

Grouting Information Well grouted? ☐ YES ☐ NO

Nearest Known Source of Contamination
____ feet ____ Direction ____ Type
Well disinfected upon completion? ☐ YES ☐ NO

Pump
☐ Not Installed Date Installed ____
Manufacture's name JACUZZI
Model number 8MSA-10 HP 25.00 Volts 440
Length of drop pipe 180.0 Material ____ Capacity ____ g.p.m.
Type Turbine

Abandoned Wells
Does property have any not in use and not sealed well(s)? ☐ YES ☐ NO

Variance
Was a variance granted from the MDH for this well? ☐ YES ☐ NO

Well Contractor Cerfication
Tri-state Well Co. 27118
License Business Name Lic. or Reg No.
BETHIAUME, M

Remarks
SAME LOCATION AS 224642

First Bedrock CJDN Aquifer Jordan
Last Strat CJDN Depth to Bedrock 273.00 ft.

County Well Index REPORT Printed on 3/23/2009

Name of Driller Date

HE-01205-07 (Rev. 2-99)

Unique Well Number	County	Hennepin	MINNESOTA DEPARTMENT OF HEALTH	Entry Date	1991/08/24
224643	Quad	Mound	WELL AND BORING RECORD	Update Date	2003/12/16
	Quad Id	105B	*MINNESOTA STATUTES CHAPTER 1031*	Received Date	

Wellname	Township	Range	Dir	Section	Subsection	Depth Drilled	Depth Completed	Date Completed	Lic/Reg. No.	Driller Name
SPRING PARK 2	117	23	W	18	DCCADA	391 ft	391 ft	1964/09/04	27118	BETHIAUME, M

Elevation 957.00 ft. Method Calc from DEM (USGS Aquifer Jordan Depth to Bedrock 273 ft. Screen/Open Hole SWL 58

Field Located Minnesota Geological Survey
Program
Uni No.Verified Information from owner
Geologic Interpretation Bruce Bloomgren

Location Method GPS Code Measurements (Ps Universal Transverse Mercator(UTM) - NAD83 - Zone 15 - Meters
Input Source
Input Date 1993/04/22
Agency MGS

UTM Easting (X) 450031
UTM Northing (Y) 4976031
Interpretation Method Geologic study 1:24k to 1:100k

Geological Material	Color	Hardness	DEPTH From	DEPTH To	Thick	ELEVATION From	ELEVATION To	Stratigraphy	LITHOLOGY Primary	LITHOLOGY Secondary	LITHOLOGY Minor
GLACIAL DRIFT			0	273	273	957	684	Unknown deposit type	Drift		
DIRTY SANDSTONE			273	297	24	684	660	Jordan	Sandstone		
CLEAN SANDSTONE			297	316	19	660	641	Jordan	Sandstone		
SANDSTONE + SHALE			316	331	15	641	626	Jordan	Sandstone	Shale	
CLEAN SANDSTONE			331	384	53	626	573	Jordan	Sandstone		
SHALEY SANDSTONE			384	391	7	573	566	Jordan	Sandstone	Shale	

well #1

Calibration Report

Test Date: 05/23/2012
Test Time: 8:47:38
Model No: 320S34B0A092.319014.306A10185B
Serial No: 1204534
Pressure Range: 0.00 to 180.00 ft H2O
Excitation: 9-28 VDC
Output: 4-20 mA

Test Temps: Room = 25.8 DegC

PCU Serial No: TRF043

Target Test Pressure	BFSL Rm Temp Outputs	Run #1 Rm Temp Outputs	Run #1 Error %FSO	Run #2 Rm Temp Outputs	Run #2 Error %FSO
0.00	4.0096	4.0133	0.0231	4.0141	0.0279
36.00	7.1951	7.1966	0.0094	7.1964	0.0084
72.00	10.3815	10.3806	-0.0059	10.3799	-0.0105
108.00	13.5663	13.5648	-0.0092	13.5649	-0.0086
144.00	16.7530	16.7538	0.0051	16.7535	0.0032
180.00	19.9384	19.9443	0.0374	19.9427	0.0274
144.00	16.7525	16.7527	0.0018	16.7520	-0.0027
108.00	13.5670	13.5629	-0.0259	13.5646	-0.0152
72.00	10.3815	10.3762	-0.0330	10.3764	-0.0318
36.00	7.1955	7.1928	-0.0167	7.1930	-0.0153
0.00	4.0098	4.0126	0.0174	4.0121	0.0139

Maximum Static Error: 0.0374 %FSO

Maximum Non-Repeatability: -0.0107 %FSO

Electrical Termination:
RED: +SUPPLY
BLACK: -SUPPLY
BLUE: SHIELD

Slope1:	11.3003	ft H2O / mA
Zero Offset 1:	0.0000	ft H2O
Slope2:	0.0885	mA / ft H2O
Zero Offset2:	1.0888	mA
Conversion Factor:	2.3073	

Calculations:

Method 1: Calculate pressure in desired units, using sensor's output as independent variable.
ft H2O = 11.3003 (mA - 1.0888) + 0.0000

Method 2: Calculate predicted sensor output in desired units using pressure as the independent variable.
mA = 0.0885 (ft H2O - 0.0000) + 1.0888

well #2

Calibration Report

Test Date: 05/23/2012
Test Time: 9:06:04
Model No: 320S34B0A092.319014.306A10185B
Serial No: 1204533
Pressure Range: 0.00 to 180.00 ft H2O
Excitation: 9-28 VDC
Output: 4-20 mA

Test Temps: Room = 26.4 DegC

PCU Serial No: TRF043

Target Test Pressure	BFSL Rm Temp Outputs	Run #1 Rm Temp Outputs	Run #1 Error %FSO	Run #2 Rm Temp Outputs	Run #2 Error %FSO
0.00	3.9900	3.9920	0.0125	3.9945	0.0282
36.00	7.1822	7.1804	-0.0110	7.1826	0.0029
72.00	10.3741	10.3695	-0.0287	10.3749	0.0051
108.00	13.5649	13.5613	-0.0227	13.5663	0.0086
144.00	16.7575	16.7562	-0.0079	16.7599	0.0153
180.00	19.9496	19.9522	0.0160	19.9551	0.0345
144.00	16.7571	16.7563	-0.0052	16.7598	0.0168
108.00	13.5655	13.5612	-0.0268	13.5633	-0.0137
72.00	10.3732	10.3687	-0.0284	10.3701	-0.0197
36.00	7.1820	7.1813	-0.0042	7.1806	-0.0090
0.00	3.9896	3.9932	0.0223	3.9920	0.0152

Maximum Static Error: 0.0345 %FSO

Maximum Non-Repeatability: -0.0338 %FSO

Electrical Termination:
RED: +SUPPLY
BLACK: -SUPPLY
BLUE: SHIELD

Slope1:	11.2787	ft H2O / mA
Zero Offset 1:	0.0000	ft H2O
Slope2:	0.0887	mA / ft H2O
Zero Offset2:	1.0636	mA
Conversion Factor:	2.3073	

Calculations:

Method 1: Calculate pressure in desired units, using sensor's output as independent variable.
ft H2O = 11.2787 (mA - 1.0636) + 0.0000

Method 2: Calculate predicted sensor output in desired units using pressure as the independent variable.
mA = 0.0887 (ft H2O - 0.0000) + 1.0636

well #3

Calibration Report

Test Date: 05/23/2012
Test Time: 10:40:49
Model No: 320S34B0A178.233014.405A10380B
Serial No: 1204535
Pressure Range: 0.00 to 378.00 ft H2O
Excitation: 9-28 VDC
Output: 4-20 mA

Test Temps: Room = 25.7 DegC

PCU Serial No: TRF093

Target Test Pressure	BFSL Rm Temp Outputs	Run #1 Rm Temp Outputs	Run #1 Error %FSO	Run #2 Rm Temp Outputs	Run #2 Error %FSO
0.00	3.9942	3.9984	0.0264	4.0013	0.0444
75.60	7.1950	7.1944	-0.0037	7.1924	-0.0161
151.26	10.3961	10.3910	-0.0316	10.3887	-0.0461
226.80	13.5946	13.5888	-0.0366	13.5889	-0.0358
302.36	16.7933	16.7941	0.0051	16.7931	-0.0012
378.00	19.9949	20.0066	0.0730	20.0078	0.0804
302.40	16.7947	16.7943	-0.0025	16.7939	-0.0053
226.80	13.5933	13.5871	-0.0392	13.5889	-0.0278
151.24	10.3952	10.3900	-0.0323	10.3881	-0.0445
75.60	7.1939	7.1938	-0.0007	7.1933	-0.0036
0.00	3.9931	4.0026	0.0591	3.9993	0.0386

Maximum Static Error: 0.0804 %FSO

Maximum Non-Repeatability: 0.0204 %FSO

Electrical Termination:
RED: +SUPPLY
BLACK: -SUPPLY
BLUE: SHIELD

Slope1:	23.6236	ft H2O / mA
Zero Offset 1:	0.0000	ft H2O
Slope2:	0.0423	mA / ft H2O
Zero Offset2:	2.5870	mA
Conversion Factor:	2.3073	

Calculations:

Method 1: Calculate pressure in desired units, using sensor's output as independent variable.
ft H2O = 23.6236 (mA - 2.5870) + 0.0000

Method 2: Calculate predicted sensor output in desired units using pressure as the independent variable.
mA = 0.0423 (ft H2O - 0.0000) + 2.5870

WELL RECORD

224643

TRI-STATE DRILLING CO.

117-23-18 dcccaca
DCCADA

Owner Village of Spring Park P.A. 81-6062

Elev. 957 ±5

Date completed September 4, 1964 105-B

Location Spring Park, Minnesota

Driller Max Berthiaume 105-B

Well Designation Number Two (2)

Well Type: ☒ Rock ☐ Screen ☒ Gravel Packed

Total Depth _____ feet.

DRILLER'S LOG

0	to 273	Glacial Drift	
273	to 297	Dirty Sandstone	
297	to 316	Clean Sandstone	
316	to 331	Sandstone, same	
____	to ____	Shale	
331	to 384	Clean Sandstone	
384	to 391	Shaley Sandstone	
____	to ____	M.D.H.	
____	to ____	PWS 1270053S02	
____	to ____		
____	to ____		
____	to ____		
____	to ____		
____	to ____		
____	to ____		
____	to ____		

UNIQUE NUMBER VERIFICATION
1 - ☐ Address Verification
2 - ☐ Name on Mailbox
3 - ☐ Lot-Block
4 - ☐ Plat-Block
5 - ☐ Info. From Owner
6 - ☐ Info. From Neighbor
7 - ☒ Other M.D.H. Bossam Bwat
8 - ☐ EMS Number
9 - ☐ Site Plan
T - ☐ Tag on Well
X - ☐ Tax Records

WELL MATERIALS

295 ft. 16 in. diam. outer casing

66 ft. 8 in. diam. liner pipe

50 ft. 8 in. diam. screen

Screen type Johnson 8" Stainless Steel

Remarks: _____

TEST PUMPING DATA

Static water level 58 feet. Pumped at 250 g.p.m.

with 89 foot level After developing for eight hours

PERMANENT PUMP DATA

Mfg. Jacuzzi Model 8MSA-10

Serial No. _____ Type Line Shaft

25 h.p. Motor, 440 V. 3 Ph.

180 ft. setting 1 in. shaft 5 in. col. pipe

Remarks: _____

CODED

Mound Quad
p.30 4B

WELL RECORD

TRI-STATE DRILLING CO.

224642
224642
117-23-18 DCCACA

P.A. 81-6062

M.O.H
PWS 1270053501

Owner Village of Spring Park

Location Spring Park, Minnesota

Well Designation Number One (1)

Total Depth 638 feet.

Date completed June 22, 1964

Driller Max Bertrieaume

ELEV 957 ±5'
105-B

Well Type: ☒ Rock
☐ Screen NOT CODED
☐ Gravel Packed

DRILLER'S LOG

0 '	to 275 '	Glacial Drift	
275 '	to 278 '	White Shale	
278 '	to 288 '	Shaley Sandstone	
288 '	to 290 '	White Shale	
290 '	to 294 '	Sandstone	
294 '	to 297 '	Shale	
297 '	to 302 '	Sandstone	
302 '	to 305 '	Shale	
305 '	to 322 '	Sandstone, Shale Lenses	
322 '	to 395 '	Sandstone	
395 '	to 410 '	Shaley Sandstone	
410 '	to 415 '	Sandstone	
415 '	to 569 '	Shale, Sandstone lenses	
569 '	to 605 '	Sandstone with Shale lenses	
605 '	to 628 '	Shale and Sandstone	
628 '	to 638 '	Sandstone	
638 '	to T.D.	Shale	

WELL MATERIALS

4-½ ft. 16 in. diam. outer casing

ft. in. diam. liner pipe

ft. in. diam. screen

Screen type

Remarks: Bottom of 16" pipe @ 605'
Pressure grouted

No. 3

0-275 Drift SS
275-280 N.S.
280-330 Es
330-360 Esl
360-505 Ep
505-550 Ei-g
550-585 N.S
585-660 Eec
660-785 Ems
785-790 Perc

G.L. No. 3

0-280 Drift
280-350 Es
350-397 Esl
397-508 Ep
508-554 Ei-g
554-622 Eec
622-780 Ems

PERMANENT PUMP DATA

Mfg. Model

Serial No. Type

2 h.p. Motor, V. Ph.

ft. setting in. shaft in. col. pipe

Remarks:

TEST PUMPING DATA

Static water level 58 feet. Pumped at 250 g.p.m.

with 124 foot level Aqu. CFRN-CMTS

☒ M.D.H. Terry Bouse

CODED

HENNEPIN

Minnesota Statutes 156A.01-.08

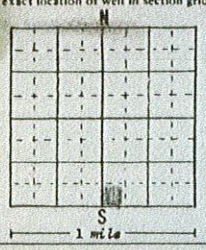
W.L.

Township Name	Township Number	Range Number	Section No.	Fraction
SPRING PARK	117 N or S	24 E or W	18	¼ sw ¼ sw ¼ se

Distance and Direction from Road Intersections or Street Address and City of Well Location

SPRING PARK, WELL#3, PROJECT #79-3 behind city hall

Show exact location of well in section grid with "X."



Sketch map of well location.

Addition Name

Block Number

Lot Number

117-23-18 decACE

Elev 960±5'

Mounds Quad

105-B

3. PROPERTY OWNER'S NAME

CITY OF SPRING PARK

Address 4349 WARREM AVE

SPRING PARK, MN

P.A. 81-6062

4. WELL DEPTH (completed) 790 ft. Date of Completion 27FEB80

5. 1☐ Cable tool 2☐ Hollow rod 3☐ Rotary 4☐ Reverse 5☐ Air 6☐ Jetted 7☐ Driven 8☐ Bored 9☐ Power Auger 10☐ Dug 11☐

6. USE 1☐ Domestic 2☐ Irrigation 3☐ Test Well 4☐ Public Supply 5☒ Municipal 6☐ Air Conditioning 7☐ Industry 8☐ Commercial 9☐

7. CASING

1☒ Black 2☐ Galv. 3☐ Plastic 4☐ Threaded 5☒ Welded 6☐

				HEIGHT: Above/Below	HOLE DIAM
				Surface two ft.	
30	in. to	100	ft.	Drive Shoe? Yes ☒ No ☐	
24	in. to	246	ft.	Weight 94.73 lbs./ft.	in. to ft.
16	in. to	366	ft.	Weight 63.58 lbs./ft.	in. to ft.
10	in. to	660	ft.	Weight 40.48 lbs./ft.	in. to ft.

8. SCREEN Make ____ Type ____ Slot/Gauze ____ Set between ____ and ____ ft. and ____ ft. Dia. ____ in. Pipe ____ Open hole 790 ft.

FITTINGS:

UNIQUE NUMBER VERIFICATION

1 - ☐ Address Verification
2 - ☐ Name on Index
3 - ☐ Lot-Block
4 - ☐ Plat Book
5 - ☐ Info. from Owner
6 - ☐ Info. from Driller
7 - ☒ Other M.P.H.
E - ☐ EMS Number
S - ☐ Site Plan
T - ☐ Tag on Well
X - ☐ Tax Records

Terry Bovee

9. STATIC WATER LEVEL 165 ft. below land surface Measured FEB80

10. PUMPING LEVEL (below land surface) 245 X ft. after ____ hrs. pumping 600 g.p.m.

____ ft. after ____ hrs. pumping ____ g.p.m.

11. WELL HEAD COMPLETION 1☒ Pitless adapter 2☐ Basement offset 3☐ At least 12" above grade

12. Well grouted? ☒ Yes ☐ No Cu. Yds. 39yrd

1☒ Neat Cement 2☐ Bentonite 3☐ ____

Depth: from grouted each liner ft. to surface.

from ____ ft. to ____ ft.

Nearest sources of possible contamination

____ feet ____ direction ____ type

Well disinfected upon completion? Yes ☐ No ☐

14. PUMP

Date installed JUL80

☐ Not installed

Manufacturer's Name VALLEY MOBHIE HITACHI VTI

Model Number ____ HP 100 Volts 460-3

Length of drop pipe 315 ft. capacity 550 g.p.m.

Material of drop pipe 6" R&D

Type: 1☒ Submersible 2☐ Jet 3☐ L. S. Turbine 4☐ Centrifugal 5☐ Reciprocating 6☐ ____

16. WATER WELL CONTRACTOR'S CERTIFICATION

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

E.H. RENNER *& SONS INC 02015

Licensee Business Name License No.

Address ¢#6300 Industry Ave NW ANOKA, MN55303

Signed ____ Authorized Representative Date 6AUG80

GEO SIGAFOOS Name of Driller Date 6AUG80

2. FORMATION LOG	COLOR	HARDNESS OF FORMATION	FROM	TO
CLAY	YELLOW		0	30
SANDY BINDER	YELLOW		30	65
SANDY	GRAY	SEE CUTTINGS GEOPHYSICS	65	75
SANDY CLAY	GRAY		75	125
CLAY	GRAY		125	155
SANDY FINE	GRAY		155	220
PACK GRAVEL	TAN		220	225
SAND FINE, HARD			225	235
DIRTY SANDSTONE	TAN CSDY		235	255
SAND, SHALE-STONE	TAN/GRAY		255	265
SHALE, STONE	GRAY		265	275
SHALE	DARK		275	280
DIRTY SANDSTONE	GRAY		280	300
SANDSTONE	CREAM		300	325
SANDSTONE SHALEY	PINK		325	345
SHALEY	WHITE		345	360
SHALE	RED		360	365
16" OPEN, SHALEY	GRN/WHT		365	490
SHALE	DRK RED		490	495
SJA:E * SAMDSTPME	:T GRM		495	505
SANDSTONE	LIGHT	CI-ES	505	565
SANDSTONE	WHITE	548 ft/sec	565	595
SHALE	CHOCOLATE		595	610
SHALE	GREEN		610	615
SHALEY SANDSTONE	LT GRN		615	640
(all shale, all colors, used rocks, bentonite, stone				
SHALE & SANDSTONE	BROWN		640	643
SANDSTONE	BROWN		643	644
SLATED SHALE	CHOCOLATE		644	660
SANDSTONE	BRN/WHT		660	675
SHALE	BLUE		675	tr
SANDSTONE SHALE	TAN		675	710
SANDSTONE HINKLEY	WHT/PINK		710	760
SANDSTONE	LT TAN		760	770
SANDSTONE	GOLDEN		770	790
RED CLASTICS	REDDISH		790	***

GAMMA Logs 5-27-80
0-280 DR.O.T
280-350 ES
350-397 ESC
397-508 CP
508-541 C-9
541-622 CC
622-790 CMS.

M.G.S. #1544

Aqu. CMTS-CMTS

M.O.H.

PWS 1270053S03

15. REMARKS, ELEVATION, SOURCE OF DATA, etc. Use a second sheet, if needed.

CODED

MINN. GEOLOGICAL SURVEY COPY

165595

5/74 30M
7/76 30M
7/78 30M

INVOICE

INVOICE NO. 13978

BERGERSON-CASWELL, INC.
WELL DRILLING AND PUMPS
5115 Industrial Street
Maple Plain, MN 55359
PH: 763-479-3121
FX: 763-479-2183

BILL TO
City of Spring Park
4349 Warren Avenue
Spring Park, MN 55384-9711

JOB
30103T-Spring Park Well-#1
4349 Warren Avenue
Spring Park, MN 55384-9711

CUSTOMER	PURCHASE ORDER NO.	BILL THRU	TERMS	INVOICE DATE	PAGE
SPRIN PA			Net 30	6/29/12	1

Job #30103T

RE: MUNICIPAL WELL AND PUMP MAINTENANCE - WELL #1

*All applicable State and Federal Taxes have been paid on all Installed Materials for this Installation and are included in the Material Prices.

ITEM NO.	QUANTITY	DESCRIPTION	UNIT PRICE	EXTENDED PRICE
	1	LS Reinstall pump, motor, column pipe and shaft; disinfect well	1750.00	1,750.00*
	0	DISCHARGE HEAD	0.00	0.00*
	1	LS Sandblast and paint	300.00	300.00*
	1	LS Install head bushing	150.00	150.00*
	0	COLUMN PIPE	0.00	0.00*
	4	EA Clean and paint 5" x 10'	50.00	200.00*
	1	EA Clean and paint 5" x 5'	40.00	40.00*
	13	EA Replace 5" x 10' (with coupling)	325.00	4,225.00*
	1	EA Replace 5" x 5' (with coupling)	220.00	220.00*
	0	STAINLESS STEEL LINE SHAFT	0.00	0.00*
	17	EA Clean and straighten 1" x 10'	15.00	255.00*
	1	EA Clean and straighten 1" x 5'	10.00	10.00*
	1	EA Furnish and install 1" x 94 1/4" stainless steel headshaft	300.00	300.00*
	0	SHAFT BEARING RETAINERS	0.00	0.00*
	18	EA Clean and reinstall bearing retainers	10.00	180.00*
	18	EA Replace rubber cutlass	25.00	450.00*
	1	EA Furnish 6" x 10' SCH 40 suction pipe	400.00	400.00*
	180	LF Furnish and install 1" transducer conduit	1.00	180.00*
	0	PUMP ASSEMBLY	0.00	0.00*
	1	LS Replace pump	4250.00	4,250.00*

SALE AMOUNT	
TOTAL	

All payments paid by paper check will be converted to Images and the transaction will be completed as an ACH Transaction, when applicable. Unless Customer notifies Bergerson Caswell not to process Customer's Checks using the Image and ACH Services, those items will be converted to Images and processed using the ACH Services

Equal Opportunity Employer / Contractor

INVOICE

INVOICE NO.
13978

BERGERSON-CASWELL, INC.
WELL DRILLING AND PUMPS
5115 Industrial Street
Maple Plain, MN 55359
PH: 763-479-3121
FX: 763-479-2183

BILL TO
City of Spring Park
4349 Warren Avenue
Spring Park, MN 55384-9711

JOB
30103T-Spring Park Well-#1
4349 Warren Avenue
Spring Park, MN 55384-9711

CUSTOMER	PURCHASE ORDER NO.			BILL THRU	TERMS	INVOICE DATE	PAGE
SPRIN PA					Net 30	6/29/12	2

ITEM NO.	QUANTITY	DESCRIPTION	UNIT PRICE	EXTENDED PRICE
	0	PUMP MOTOR MAINTENANCE	0.00	0.00*
	1	LS Transport and recondition pump motor	450.00	450.00*
	1	LS Replace upper motor bearing	500.00	500.00*
	1	LS Replace ratchet assembly	500.00	500.00*
	14	CY Sand removal	250.00	3,500.00*
	12	HR Operate test pump	175.00	2,100.00*
	1	EA Televise well	850.00	850.00*
	1	EA Bacterilogical test	150.00	150.00*
	1	LS Reassemble discharge piping	150.00	150.00*
	1	LS Setup and removal of equipment for test pumping	1750.00	1,750.00*
	1	LS Settling basin, discharge piping, erosion control, setup and removal	1250.00	1,250.00*
	1	EA Furnish level transducer	1200.00	1,200.00*

* means item is non-taxable
THANK YOU FOR YOUR BUSINESS!

PAST DUE ACCOUNTS SUBJECT TO 1.5% FINANCE CHARGES PER MONTH PLUS ALL COLLECTION COSTS.

SALE AMOUNT	25,310.00
TOTAL	$25,310.00

All payments paid by paper check will be converted to Images and the transaction will be completed as an ACH Transaction, when applicable. Unless Customer notifies Bergerson Caswell not to process Customer's Checks using the Image and ACH Services, those items will be converted to Images and processed using the ACH Services

Equal Opportunity Employer / Contractor

INVOICE

INVOICE NO. 13979

BERGERSON-CASWELL, INC.
WELL DRILLING AND PUMPS
5115 Industrial Street
Maple Plain, MN 55359
PH: 763-479-3121
FX: 763-479-2183

BILL TO
City of Spring Park
4349 Warren Avenue
Spring Park, MN 55384-9711

JOB
30102T-Spring Park Well-#2
4349 Warren Avenue
Spring Park, MN 55384-9711

CUSTOMER	PURCHASE ORDER NO.	BILL THRU	TERMS	INVOICE DATE	PAGE
SPRIN PA			Net 30	6/29/12	1

Job #30102T

RE: MUNICIPAL WELL AND PUMP MAINTENANCE WELL #2

*All applicable State and Federal Taxes have been paid on all Installed Materials for this Installation and are included in the Material Prices.

ITEM NO.	QUANTITY	DESCRIPTION	UNIT PRICE	EXTENDED PRICE
	1	LS Reinstall pump, motor column pipe and shaft; disinfect well	1750.00	1,750.00*
	0	DISCHARGE HEAD	0.00	0.00*
	1	LS Sandblast and paint	300.00	300.00*
	1	LS Install head bushing	150.00	150.00*
	0	COLUMN PIPE	0.00	0.00*
	6	EA Clean and paint 5" x 10'	50.00	300.00*
	1	EA Clean and paint 5" x 5'	40.00	40.00*
	11	EA Replace 5" x 10' (with coupling)	325.00	3,575.00*
	1	EA Replace 5" x 10' (with coupling)	225.00	225.00*
	0	STAINLESS STEEL LINE SHAFT	0.00	0.00*
	17	EA Clean and straighten 1" x 10'	15.00	255.00*
	1	EA Clean and straighten 1" x 5'	10.00	10.00*
	1	EA Replace 1" x 89 1/2" stainless steel headshaft	300.00	300.00*
	0	SHAFT BEARING RETAINERS	0.00	0.00*
	1	EA Replace bronze retainers	40.00	40.00*
	17	EA Clean and reinstall bearing retainers	10.00	170.00*
	17	EA Replace rubber cutlass	25.00	425.00*
	1	EA Furnish 6" x 10' SCH 40 suction pipe	400.00	400.00*
	180	LF Furnish and install 1" transducer conduit	1.00	180.00*

SALE AMOUNT	
TOTAL	

All payments paid by paper check will be converted to Images and the transaction will be completed as an ACH Transaction, when applicable. Unless Customer notifies Bergerson Caswell not to process Customer's Checks using the Image and ACH Services, those items will be converted to Images and processed using the ACH Services

Equal Opportunity Employer / Contractor

INVOICE

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WELL DRILLING AND PUMPS
5115 Industrial Street
Maple Plain, MN 55359
PH: 763-479-3121
FX: 763-479-2183

BILL TO
City of Spring Park
4349 Warren Avenue
Spring Park, MN 55384-9711

JOB
30102T-Spring Park Well-#2
4349 Warren Avenue
Spring Park, MN 55384-9711

CUSTOMER	PURCHASE ORDER NO.	BILL THRU	TERMS	INVOICE DATE	PAGE
SPRIN PA			Net 30	6/29/12	2

ITEM NO.	QUANTITY	DESCRIPTION	UNIT PRICE	EXTENDED PRICE
	0	PUMP ASSEMBLY	0.00	0.00*
	1	LS Replace pump	4250.00	4,250.00*
	0	PUMP MOTOR MAINTENANCE	0.00	0.00*
	1	LS Transport and recondition pump motor	450.00	450.00*
	1	LS Replace upper motor bearing	500.00	500.00*
	1	LS Replace ratcher assembly	500.00	500.00*
	8	HR Operate test pump	175.00	1,400.00*
	1	EA Televise well	850.00	850.00*
	1	EA Bacteriological test	150.00	150.00*
	1	LS Reassemble discharge piping	150.00	150.00*
	1	LS Setup and removal of equipment for test pumping	1750.00	1,750.00*
	1	LS Settling basin, discharge piping, erosion control, setup and removal	1250.00	1,250.00*
	1	EA Furnish level transducer	1200.00	1,200.00*

* means item is non-taxable
THANK YOU FOR YOUR BUSINESS!

PAST DUE ACCOUNTS SUBJECT TO 1.5% FINANCE CHARGES PER MONTH PLUS ALL COLLECTION COSTS.

SALE AMOUNT	20,570.00
TOTAL	$20,570.00

All payments paid by paper check will be converted to Images and the transaction will be completed as an ACH Transaction, when applicable. Unless Customer notifies Bergerson Caswell not to process Customer's Checks using the Image and ACH Services, those items will be converted to Images and processed using the ACH Services

Equal Opportunity Employer / Contractor

2,450.00+
25,310.00+
2,450.00+
14,570.00+
50,780.00*
45,880.00

CHANGE ORDER NO. 1
City of Spring Park
Municipal Well and Pump Maintenance Well #1 and Well #2
MFRA #19254

Part A				
11. Wire Brush Casing	1	LS	$1,750.00/LS	($1,750.00)
DELETE:				
Part B				
10. Wire Brush Casing	1	LS	$1,700.00/LS	($1,700.00)
TOTAL THIS CHANGE ORDER			DEDUCT	($3,450.00)
ORIGINAL CONTRACT AMOUNT				$47,830.00
CHANGE ORDER NO. 1				($3,450.00)
REVISED CONTRACT AMOUNT				$44,380.00

APPROVED:

City of Spring Park

BY:_____

DATE:_____

ACCEPTED:

Bergerson-Caswell, Inc.

BY:_____

DATE:_____

RECOMMENDED:

MFRA

BY:_____

DATE:_____

(1) Day1

BERGERSON-CASWELL, INC.
DEVELOPMENT/TEST PUMPING

DATE: 6/11/12 motor total 290929

OWNER: City of Spring Park

WELL NO: 1 DIAMETER OF WELL: 16"

DEPTH OF WELL: 574' Amps 33.5 MAX 37.5

STATIC WATER LEVEL: 65' 3" TIME: 7:00 AM

LENGTH OF DROP: 160' DIAMETER OF PUMP: 6"

PUMP MODEL NUMBER: 385 250-3 HORSEPOWER: 25

385 ab 178

REMARKS

TIME	GPM	PWL	SAND	PSI	Color Of Water	PWL spec.	PWL	Amps	
7:48 am	110			75	Red				note
752	110	80'6"	Trace	75	Cloudy	7.3		27,27,28	#3
817	110	82'4"	-0-	75	Clear				Runn/Avg
818	260	97'6"	Trace	68	Clear	7.0		28,28,29	
8:30	210	101'6"	1/8"	65	clear				
8:45	210	102'6"	1/8"	65	clear				
9:00	210	103'6"	1/8"	65	clear				
9:02	300	109'6"	1/4"	40	cloudy			29,30,31	
9:15	310	128'	5/8"	35	cloudy	-Dark			
9:30	310	129'	5/8	35	cloudy	dark			
9:40	260	Throttle Back							
942	260	123'6"		44	cloud				
945	260	123	1/2"	45	Cloudy	Dark Tint			
950	260	122	3/8	45	Slight	Tint			
10:15	260	122	3/8	45	light	Tint			

Page 2 Day 1

Spring 6 #1 6/1/12 St Stc 65'3"

TIME	GPM	PUMPING LEVEL	DRAW DOWN	SPEC. CAP.	RPM ~~PMP~~	STACK TEMP.	SAND	DISCH PRESS	COLOR WATER
10:30	260	122'6"	57.5	4.54	28,29,29		3/8	45	Tint
10:45	260	122'6"					3/8	45	HAZY
11:00	260	122'6"					3/8	45	Clear
11:15	260	122'6"					~~3/8~~	45	clear
11:18	310	131'						32	Clear
11:25	310	131'6"					3/8	31	Clear
11:48	310	134'					9/16	28	HAZY
12:00	310	135'			28,28,29		3/4	26	HAZY
12:15 pm	~~310~~	Drop Down 6 P.M.						~~26~~	Hazy
12:15	240	128'						40	
12:30	240	119'					3/8	50	Clear
12:45	240	118'3"	53	4.528			1/4"	50	Clear
1:00	240	118'1"			28,28,29		1/4"	50	Clear
1:15	240	117'11"					3/16	50	Clear
1:30	240	117'9"		~~OFF~~			1/4	50	Clear
		2 min to Recover to 90'							
		~~1:10 min~~ to Recover to 80'							
		4 min 10 sec.							

Page 1
Day 2

BERGERSON-CASWELL, INC.
DEVELOPMENT/TEST PUMPING

DATE: 6/4/12

OWNER: City of Spring Park

WELL NO: 1 DIAMETER OF WELL: 16"

DEPTH OF WELL: 574'

STATIC WATER LEVEL: 65' 9" TIME: 8:30

LENGTH OF DROP: 160' DIAMETER OF PUMP: 6"

PUMP MODEL NUMBER: 385 S250 HORSEPOWER: 25

REMARKS

TIME AM	GPM	PWL	SAND	PSI	Color Of Water	~~PWL~~ Spec	PWL Amps		
8:45	120			90					
8:47	110	79'	1/8"	88	Clear				
9:00	110	82'6"	1/8"	82	Clear	6.56	26,26,26		
9:15	110	83'	-0-	81					
9:20	160	91'	Trace	70	Clear				
9:30	160	92'10"	Trace	70	Clear	5.91	28,27,26		
9:45	160	93'6"	Trace	60	Clear				
9:46	215	102'4"	Trace	60	Clear		27,27,29		
10:00	210	107'	1/8"	60	Clear				
10:15	210	108'9"	1/8"	60	Clear		water samples		
10:16	260	117	3/16	45	Hazy				
10:30	260	118'4"	1/4"	45	Clear	4.94	30,28,27		
10:45	260	119'	1/4"	45	Clear		30,28,27		
10:50	285	124'6"	3/8"	37	Clear	Tint 4.8	30,29,28		
11:00	285	126'11"	1/2"	37	Cl Tint				

Page 2 Day 2

6/4/12 #1 City of Spring, wb Static 65'9"

TIME AM	GPM	PUMPING LEVEL	DRAW DOWN	SPEC. CAP.	~~RPM~~ Amps	STACK TEMP.	SAND	DISCH PRESS	COLOR WATER
11:15	285	127.8	61.91	4.6			1/2"	37	clear
11:30	285	128.3			29,29,30		1/2	36	clear
11:35	310	133'					1/2	30	clear
11:45	310	138'9"					5/8	29	Tinted
11:50	310	139'					~~5/8~~ 1"	29	Tinted
11:55	350						1"		
12:00	350	147'5"	81.75	4.28			3/4	20	Tint
12:10	350	149'					1 1/4+		Cloudy
		Throttle Back Per Engineer			↓ DJ-				
12:15	250								Cloudy
12:17	250	126'11"					1"	42	Cloudy
12:30	250	124'10"					5/8"	43	(lowy
12:45	250	124'6"	58.75	4.25			1/2"	43	stint)
1:00	250	124'4"					1/2	43	Clear
1:15	250	124'6"					1/2"	43	Clear
	150	Throttle Back							
130	150	99.8	To Clean up				3/8	70	clear
145		off							

11100

BERGERSON-CASWELL, INC.
DEVELOPMENT/TEST PUMPING

DATE: 6/5/12

OWNER: City of Spring Park

WELL NO: #2 DIAMETER OF WELL: 16"

DEPTH OF WELL: 380'

STATIC WATER LEVEL: 65' 3" TIME: 8:45 AM

LENGTH OF DROP: 160 DIAMETER OF PUMP: 6"

PUMP MODEL NUMBER: 385 S 250 HORSEPOWER: 25

REMARKS

TIME AM	GPM	PWL	SAND	PSI	Color Of Water	PWL Spec	PWL Amp	D.D.	
8:58	110	74	1/8"	90	Cloudy				
9:15	110	75' 8"	3/8 Sand Scale	90	Black	10.52	25,26,27		
9:30	110	76'	1/8	90	Dark				
9:45	110	76'	Trace	90	Boost up				
9:48	160	81' 5"	Trace	80	Tint		24,27,28		
10:Am	160	82'	3/8 mix	80	Black				
10:15	160	82' 2"	1/8	80	Tinted	9.43		16.95	
10:30	160	82' 2"	Trace	80	Clear				
1031	215 Boost								
10:35	215	88' 10"	3/16	70	Tint		24,27,28		
10:45	215	88' 1"	3/8	70	Black	8			
11:00	215	88' 2"	1/8"	70	B-Tint				
11:15	215	88' 3"	Trace	70	Clear	9.34	Boost up 23		
11:17	265	92' 6"		58					
11:20	265	93	1/4"	58	Tint		28,28,29		

Page 2 Day 1 Well #2 Spring Park 6/5/12 65' 3" Static

TIME Am	GPM	PUMPING LEVEL	DRAW DOWN	SPEC. CAP.	~~RPM~~ Amp	STACK TEMP.	SAND	DISCH PRESS	COLOR WATER
11:30	265	93'11"					3/16	58	Clear
11:45	265	94'2"	29'	9.13				58	Clear
11:50	320	99'6"			29,30,30		3/16	48	HAZY
12:pm	320	100'	34.75	9.20			3/8	48	HAZY
12:15	320	100'			29 30 30		3/16	48	Clear
12:30	320	100'4"		Water Sample			3/16	48	Clear
12:38	Boost-up							36	
1240	370	105'	39.75	9.30	29,30,31		1/4"	36	HAZY
1:00	370	107'					3/16	35	Clear
1:15	370	107'3"	42	8.80			1/8-3/16	35	
1:20	Brook	Pm D.J. Request (Phone call)						22	
121	415	112'8"					1/2"	22	Tint
1:30	415	112'9"	47.5	9.2			3/8	22	Slight Tint
1:45	415	112'11"		Dropped Back			1/4"	22	Slight tint
1:50	385								
1:52	385	110'4"	45.08	8.55			3/16"	30	Slight Tint
215	385'	110'4"			29,30,31		1/8"	30	Slight tint
2:30	385'	1:01					1/8"	30	clear
2:45	385	110'1"						30	Clear
3:00	385				0/0				

TURBINE PUMP
(MOTOR, PUMP, PERFORMANCE RECORD)

(AS PULLED) (AS INSTALLED) **(AS TESTED)** **DATE:** 3/14/07

GENERAL INFO: Customer/Owner: City of Spring Park, MN Well/Pump #: High Service #1
Address/Location: 4349 Warner Street
Persons on Job Site: D.J. Goman

MOTOR INFO: Horsepower 40 Stand Still Volts 460 volts Running Volts 480 volts
Manufacturer General Electric R.P.M. 1755 Full Load Amps 52.3 S.F.Amps/ 60

BOWL DESIGN: G.P.M. 750 gpm T.D.H. 160'TDH Megger Reading 1,000 meg ohms

PERFORMANCE TEST: Static Water Level 5' clear well Well Diameter 11.75" Well Depth 19'

Test #1: AMPS 47 / 44 / 49 Gallons Per Minute 670 Water Level 12' P.S.I. 62 system T.D.H. 155'
P.S.I. 66 pump T.D.H. 164'

T.D.H. = Pumping Water Level in Feet + (P.S.I. reading x 2.31) + Friction Loss In Column + Fittings
Example: Information Given: 1000 G.P.M., 150' Water Level, 50 P.S.I.,3.5' Friction Loss
Therefore: 150' + (50# x 2.31 or 115.5') + 3.5' = 269' T.G.H.
OR
The pump is producing 1000 G.P.M. at 269' T.D.H.

Does Well Pump Sand? YES / NO If So, How Much? Test #1 _____" in Gallon Jar
Test #2 _____" in Gallon Jar
Test #3 _____" in Gallon Jar

Closed Valve Test: P.S.I. Reading _____ Water Level _____

Vibration Record: Vibration in Mils:

A	2.1	90* from Discharge
B	1.3	In Line with Discharge
C	.58	90* from Discharge
D	.40	In Line with Discharge

Tested By: **Terry Feltman**

Problems/Comments: Test performed after installing new motor hub, & head shaft(with (2) retaining bolts.). Service call originated by a drop in capacity from the pump unit. We researched the files on installation and noted these pumps were open impellered pumps (BJ 10 GH), which typically is out of adjustment when flow rate changes quickly. What we discovered was the retaining bolt sheared and the motor hub was elongated. We replaced the worn hub and the head shaft with out removing the installation, then performed this test. We would recommend inspecting this pump unit to determine if there was any damage to the pump when the problem occurred. Based on the performance results above there doesn't appear to be a loss in performance but there could still be damage.

Customer/Owner Comments: _____

BERGERSON-CASWELL
INCORPORATED

Bergerson - Caswell Inc.
5115 Industrial Street
Maple Plain, MN 55359
(763) 479-3121 Fax: (763) 479-2183

December 31, 2013

CITY OF SPRING PARK
Attn: Mr. D.J. Goman
4349 Warren Avenue
Spring Park, MN 55384-9711 Phone # (952) 471-9051

RE: HIGH SERVICE PUMP #1 & & #2 @ TREATMENT PLANT, MAINTENANCE INSPECTION INVOICE

Dear Mr. Goman;
Bergerson-Caswell Inc. Appreciates the opportunity to assist you with your well and pump needs. We have completed the maintenance inspection to the High service pumps. I have itemized the costs for the repairs and services provided below, based on the proposal we originally provided to the City.

PROJECT COST: **HIGH SERVICE PUMPs**

Field Labor & Equipment, 24 hrs $190.00/hr.	$ 4,560.00
(2) Recondition the discharge head, install new bearings, & rebuild packing assembly	$ 900.00
Replace (4) each 8"x 5'T&C column pipe @ $ 650.00/each	$ 2,600.00
Replace (4) each spider bearing assemblies w/inserts @ $70.00/each	$ 280.00
(2) Replace Head shaft assembly	$ 1,100.00
Replace (4) each 1-3/16"x 5' SS line shafts T&C @ $360.00/each	$ 1,400.00
Replace Bowl Bearings & cap Screws (disassemble, reassemble, and epoxy coat bowl assemblies)	$ 3,300.00
Clean & recoat (column pipe, line shafts, bearing retainers) services at shop labor rate at $75.00/hr for 30 hours:	$ 2,250.00
Clean & change oil/grease in 40 HP GE VHS motor (2) each	$ 1,300.00

TOTAL PROJECT INVOICE AMOUNT **$ 17,690.00**

If you have any questions on this invoice, require additional information, or would like to discuss the project, please do not hesitate to contact us at (763) 479-3121 ext210, or cell (612) 369-3652.

Sincerely,
BERGERSON-CASWELL INC.

Tim D. Berquam Project Manager

BERGERSON-CASWELL
INCORPORATED

Bergerson - Caswell Inc.
5115 Industrial Street
Maple Plain, MN 55359
(763) 479-3121 Fax: (763) 479-2183

January 13, 2013

CITY OF SPRING PARK
Attn: Mr. D.J. Goman
4349 Warren Avenue
Spring Park, MN 55384-9711 Phone # (952) 471-9051

RE: HIGH SERVICE PUMP #2 @ TREATMENT PLANT, MAINTENANCE INSPECTION REPORT

Dear Mr. Goman;
Bergerson-Caswell Inc. Appreciates the opportunity to assist you with your well and pump needs. We have removed and inspected High service pump #2 for maintenance. I have itemized our recommended repairs and services below based on the proposal we originally provided to the City.

PROJECT COST: **HIGH SERVICE PUMP #2**

Field Labor & Equipment, 12 hrs $190.00/hr.	$ 2,280.00
Recondition the discharge head, install new bearings, & rebuild packing assembly	$ 450.00
Replace (2) each 8"x 5'T&C column pipe @ $ 650.00/each	$ 1,300.00
Replace (2) each spider bearing assemblies w/inserts @ $70.00/each	$ 140.00
Replace Head shaft assembly	$ 550.00
Replace (2) each 1-3/16"x 5' SS line shafts T&C @ $360.00/each	$ 700.00
Replace Bowl Bearings & cap Screws (disassemble, reassemble, and epoxy coat bowl assembly)	$ 1,650.00
Clean & recoat (column pipe, line shafts, bearing retainers) services at shop labor rate And is estimated at $75.00/hr for 15 hours:	$ 1,125.00
Clean & change oil/grease in 40 HP GE VHS motor	$ 650.00

TOTAL PROJECT AMOUNT **$ 8,845.00**

If you have any questions on this project cost, require additional information, or would like to discuss the project, please do not hesitate to contact us at (763) 479-3121 ext210, or cell (612) 369-3652.

Sincerely,
BERGERSON-CASWELL INC.

Tim D. Berquam Project Manager

BERGERSON-CASWELL
INCORPORATED

Bergerson - Caswell Inc.
5115 Industrial Street
Maple Plain, MN 55359
(763) 479-3121 Fax: (763) 479-2183

January 13, 2013

CITY OF SPRING PARK
Attn: Mr. D.J. Goman
4349 Warren Avenue
Spring Park, MN 55384-9711

Phone # (952) 471-9051

RE: HIGH SERVICE PUMP #1 @ TREATMENT PLANT, MAINTENANCE INSPECTION REPORT

Dear Mr. Goman;
Bergerson-Caswell Inc. Appreciates the opportunity to assist you with your well and pump needs. We have removed and inspected High service pump #1 for maintenance. I have itemized our recommended repairs and services below based on the proposal we originally provided to the City.

PROJECT COST: **HIGH SERVICE PUMP #1**

Field Labor & Equipment, 12 hrs $190.00/hr.	$ 2,280.00
Recondition the discharge head, install new bearings, & rebuild packing assembly	$ 450.00
Replace (2) each 8"x 5'T&C column pipe @ $ 650.00/each	$ 1,300.00
Replace (2) each spider bearing assemblies w/inserts @ $70.00/each	$ 140.00
Replace Head shaft assembly	$ 550.00
Replace (2) each 1-3/16"x 5' SS line shafts T&C @ $360.00/each	$ 700.00
Replace Bowl Bearings & cap Screws (disassemble, reassemble, and epoxy coat bowl assembly)	$ 1,650.00
Clean & recoat (column pipe, line shafts, bearing retainers) services at shop labor rate And is estimated at $75.00/hr for 15 hours:	$ 1,125.00
Clean & change oil/grease in 40 HP GE VHS motor	$ 650.00

TOTAL PROJECT AMOUNT **$ 8,845.00**

If you have any questions on this project cost, require additional information, or would like to discuss the project, please do not hesitate to contact us at (763) 479-3121 ext210, or cell (612) 369-3652.

Sincerely,
BERGERSON-CASWELL INC.

Tim D. Berquam Project Manager

11 ea 5" x 10' new plenty of 5'x5" pipe.
3 ea "good" 5" x 10' used need to be cleaned & repainted

BERGERSON-CASWELL, INC.

PUMP REPAIR SHEET

CUSTOMER Spring Park PUMP # 1 CONTACT PERSON D.J.

MAKE OF PUMP Goulds 7CHC SETTING 180' WELL DEPTH 569'4"

COLUMN SIZE 5" SHAFT SIZE 1" BOWL SIZE 7" CHC

Initial When Complete	Time used				Est. Hrs	Cost
		MOTOR Slow ramp speed on VFD Metal filings & spring parts under bonnett				
		SENT TO MOTOR SHOP		Yes ___ No ___		
		DISCHARGE HEAD Jacuzzi base.				
		drill 1" hole REPAIR 1"x 94¼" (Split, but doesn't Packing even do any good)		Yes ___ No ___		
		REPLACE HEADSHAFT OR CLEAN		Yes X No ___		
		REPAIR HEAD BUSHING AND PACKING May have to cut cup apart.		Yes X No ___		
		SANDBLAST AND PAINT		Yes X No ___		
		COLUMN PIPE HOW MANY:				
		CLEAN OUTSIDE	4ea	Yes X No ___		
		CLEAN INSIDE blow out debris		Yes ___ No X		
		PAINT OUTSIDE	4	Yes X No ___		
		PAINT INSIDE	0.	Yes ___ No X		
		REPLACE COLUMN				
		HOW MANY:	13ea 5"	x 10' T&C		
			1ea 5"	x 5' T&C		
		base pipe is good	0	x 5' TBE		
		BEARING RETAINERS				
		CHANGE RUBBER BEARINGS		Yes X No ___		
		HOW MANY: 18ea TYPE: 2" body				
		CLEAN IN ACID		Yes ___ No X		
		SANDBLAST		Yes X No ___		

PUMP REPAIR SHEET
Page 2

Initial When Complete Time		Est. Hrs.	Cost
SHAFTING			
CLEAN	Yes X No		
REPLACE:	x 10"		
	x 5'		
STRAIGHTEN	Yes X No		
PAINT	Yes ____ No X		
REPLACE SLEEVES			
HOW MANY: 0 SIZE: ____	Yes ____ No X		
SHAFT COUPLINGS			
CLEAN	Yes X No		
PAINT	Yes ____ No X		
REPLACE: QTY: ____ SIZE: ____			
BOWL ASSEMBLY: MAKE Goulds SIZE 7 CHC #STAGES 6 Full			
DISASSEMBLE/ASSEMBLE Glass lined	Yes X No		
REPLACE SHAFT - SS416 Fins are showing wear on bowl	Yes X No		
REPLACE BEARINGS	Yes X No		
RING IMPELLERS Bottom Stg OK wear	Yes X No		
SANDBLAST AND PAINT	Yes X No		
REPLACE LOCK COLLETS don't know till its apart.	Yes ? No M		
REPLACE CAP SCREWS Sleeve 3/8" x 1"	Yes X No		
TAILPIPE			
REPLACE 5" x 10'	Yes X No		
PAINT	Yes ____ No X		
STRAINER REPLACE	Yes ____ No X		
LEAVE OFF	Yes ____ No X		
OTHER REPAIRS:			
Drill hole in bare for 1" poly	Yes X No		
	Yes ____ No		
Motor ratchet needs work	Yes X No		
	Yes ____ No		
	TOTAL SHOP TIME:		
	FRT:		
	TAX:		
	TOTAL:		

LINESHAFT TURBINE PUMP RECORD

(AS PULLED) (AS INSTALLED) DATE: 4/5/12

GENERAL INFO: Customer/Owner: Spring park City of Well/Pump #: 1 north

Address/Location: Warren ave in filter plant Spring park mn

MOTOR INFO: Horsepower 25 Name Plate Voltage 440 Full Load Amps 32

Manufacturer GE Running Voltage 480 R.P.M. 1765

Motor C.D. or Coupling Height 27" Motor B.D. or Base Diameter 12"

Non-Reverse Ratchet? (Yes) / No Megger Reading 1000 Frame Size A324 LVJ

DISCHARGE HEAD INFO: Top Column and Base Length 72 7/8 Column Size 5"

Packing Size 1/4 Headshaft Length(s) 94 1/4 over all m 48 1/4 B45 15/16

Headshaft Diameter 1" Threads Per Inch 12

Discharge Flange Size 6" Manufacturer ~~Richmond~~ Jacuzzi

Bearing Size

Shaft Projection at Discharge Head 7 1/4

PUMP INFO: Setting to Top of Bowls 180' Column Diameter 5" Column Length 119 1/4

Column Thread 8 Spider Thickness 3/4 Spider Hub Diameter 2"

Lineshaft Type: Carbon / (Stainless) Lineshaft Length 10' +or- Thread 12

Lineshaft Diameter 1" Sleeve Diameter 1 3/16

Bottom Shaft Length 60" Shaft Projection at Bowl 7 1/4

BOWL ASSEMBLY INFO: Manufacturer Goulds Bowl Diameter 7 CHC Stages 6

Impeller Type: Open / (Closed) Shaft Diameter 1 3/16 Reduced Bowl Length 48"

Suction Pipe Size 5" Length 10' Thread: Straight / (Tapered)

Strainer Type Length

Bearing Sizes Pin Length

WELL INFO: Well Diameter 16" X 12" Long Casing Depth 418'

Static Water Level 71' 6" Well Depth 569' 4" = 68-70' of fill

Does Well Have Vent Pipe? (Yes) / No

Was Well Chlorinated? Yes / No

JOURNEYMAN'S COMMENTS: Note: Head shaft Coupled Below Base

Motor Ratchet need work

Need to Install 1" poly

1- spider spinning

TURBINE PUMP
(MOTOR, PUMP, PERFORMANCE RECORD)

(AS PULLED) (AS INSTALLED) (AS TESTED) DATE: 4-4-12

GENERAL INFO:

Customer/Owner: Spring Park. MN Well/Pump 1

Address/Location: Filter Plant # 2

Persons on Job Site: D.J.

MOTOR INFO:

Horsepower 25 Stand Still Volts 484/487/490 Running Volt: 484/487/491

Manufacturer GE R.P.M 1765 Full Load Amps 32 S.F.Amps 1.15

BOWL DESIGN: G.P.M. _____ T.D.H. _____ Megger Reading 1000

PERFORMANCE TEST: Static Water Level 71'4" Well Diameter 16" Well Depth 569'4"

Test #1: HZ 60 AMPS 19.3/19.8/19.6 G.P.M. 180 Water Level 89'6" P.S.I. 5 T.D.H. _____

Test #2: HZ 60 AMPS 19.3/19.4/19.4 G.P.M. 150 Water Level 88' — P.S.I. 15 T.D.H. _____

Test #3: HZ 60 AMPS 18.8/18.6/18.8 G.P.M. 100 Water Level 82' — P.S.I. 30 T.D.H. _____

T.D.H. = Pumping Water Level in Feet + (P.S.I. reading x 2.31) + Friction Loss In Column + Fittings

Example: Information Given: 1000 G.P.M., 150' Water Level, 50 P.S.I.,3.5' Friction Loss

Therefore: 150' + (50# x 2.31 or 115.5') + 3.5' = 269' T.G.H.

OR

The pump is producing 1000 G.P.M. at 269' T.D.H.

Does Well Pump Sand? Yes / NO If So, How Much? Test #1 1/16 " in Gallon Jar

Test #2 T " in Gallon Jar

Test #3 T " in Gallon Jar

Closed Valve Test: P.S.I. Reading _____ Water Level _____

Vibration Record: Vibration in Mils:

A	.3	90* from Discharge
B	.3	In Line with Discharge
C	.1	90* from Discharge
D	.1	In Line with Discharge

Tested By: Err F

Problems/Comments: 2½ Fire hose connection has hose available. Key 3876

~~2/8 Red~~ 1/7 Yellow 2/8 Red 3/9 Blue

Springs & iron fillings on top with bonnett 1" above head nut

Customer/Owner Comment: _____

BERGERSON-CASWELL, INC.

PUMP REPAIR SHEET

CUSTOMER Spring Park PUMP # 2 CONTACT PERSON D. J.

MAKE OF PUMP Goulds 7 CHC SETTING 180' WELL DEPTH _____

COLUMN SIZE 5" SHAFT SIZE 1" BOWL SIZE 7 CHC

Initial When Complete	Time used				Est. Hrs	Cost
		MOTOR Slow ramp speed on VFD Metal filings & spring parts under bonnett.				
		SENT TO MOTOR SHOP		Yes ____ No ____		
		DISCHARGE HEAD Jacuzzi base.				
		drill 1" hole REPAIR 1" X 8 9/2" packing wear		Yes ____ No ____		
		REPLACE HEADSHAFT OR CLEAN		Yes X No ____		
		REPAIR HEAD BUSHING AND PACKING		Yes X No ____		
		May have to cut cup apart SANDBLAST AND PAINT		Yes X No ____		
		COLUMN PIPE HOW MANY:				
		CLEAN OUTSIDE	6	Yes X No ____		
		CLEAN INSIDE	blow out debris	Yes ____ No X		
		PAINT OUTSIDE	6	Yes X No ____		
		PAINT INSIDE	0	Yes ____ No X		
		REPLACE COLUMN				
		HOW MANY: 11 ea	5"	x 10' T&C		
		1 ea	5"	x 5' T&C		
		base pipe is good 0		x 5' TBE		
		BEARING RETAINERS 1 ea Spinning spider need replacement (painted blue)				
		CHANGE RUBBER BEARINGS		Yes X No ____		
		HOW MANY: 18 ea TYPE: 2" body				
		CLEAN IN ACID		Yes ____ No X		
		SANDBLAST		Yes X No ____		

PUMP REPAIR SHEET
Page 2

Initial When Complete	Time			Est. Hrs.	Cost
		SHAFTING			
		CLEAN	Yes X No		
		REPLACE:	x 10"		
			x 5'		
		STRAIGHTEN	Yes X No		
		PAINT	Yes ___ No X		
		REPLACE SLEEVES			
		HOW MANY: 0 SIZE: ___	Yes ___ No X		
		SHAFT COUPLINGS			
		CLEAN	Yes X No		
		PAINT	Yes ___ No X		
		REPLACE: QTY: SIZE:			
		BOWL ASSEMBLY: MAKE Goulds SIZE 7 CHC #STAGES 6 · Full.			
		DISASSEMBLE/ASSEMBLE Glass lined	Yes X No		
		REPLACE SHAFT - SS416 Fins are showing wear on bowl	Yes X No		
		REPLACE BEARINGS	Yes X No		
		RING IMPELLERS bottom Stg 0.090	Yes X No		
		SANDBLAST AND PAINT	Yes X No		
		REPLACE LOCK COLLETS don't know till its apart	Yes ? No		
		REPLACE CAP SCREWS Stock 3/8" x 1"	Yes X No		
		TAILPIPE			
		REPLACE 5" x 10'	Yes X No		
		PAINT	Yes ___ No X		
		STRAINER REPLACE	Yes ___ No X		
		~~LEAVE OFF~~	Yes ___ No X		
		OTHER REPAIRS:			
		Drill hole in base for 1" poly.	Yes X No		
		One Spinning spider needs replacing	Yes X No		
		Motor ratchet needs work	Yes X No		
			Yes ___ No		
			TOTAL SHOP TIME:		
			FRT:		
			TAX:		
			TOTAL:		

LINESHAFT TURBINE PUMP RECORD

(AS PULLED) (AS INSTALLED) DATE: 4/4/12

GENERAL INFO: Customer/Owner: City of Spring Park Well/Pump #: #2 South

Address/Location: Warren Ave in filter plant Spring park mn

MOTOR INFO: Horsepower 25 Name Plate Voltage 440 Full Load Amps 32

Manufacturer GE Running Voltage 480 R.P.M. 1765

Motor C.D. or Coupling Height 27" Motor B.D. or Base Diameter 12"

Non-Reverse Ratchet? Yes / No Megger Reading 1000 Frame Size A324UBY

DISCHARGE HEAD INFO: Top Column and Base Length 72 1/2 Column Size 5"

Packing Size 1/4 Headshaft Length(s) 89 1/2

Headshaft Diameter 1" Threads Per Inch 10

Discharge Flange Size 6" Manufacturer ~~Red Head~~ Sacuri

Bearing Size

Shaft Projection at Discharge Head 12"

PUMP INFO: Setting to Top of Bowls 180" Column Diameter 5" Column Length 119 1/4

Column Thread 8 Spider Thickness 3/4 Spider Hub Diameter 2"

Lineshaft Type: ~~Steel~~ / Stainless Lineshaft Length 10' Thread 10

Lineshaft Diameter 1" Sleeve Diameter 1 3/16

Bottom Shaft Length 60" Shaft Projection at Bowl 12 1/4

BOWL ASSEMBLY INFO: Manufacturer Gould's Bowl Diameter ~~8~~ 7 CHC Full Stages 6

7 CHC 6 Stg Full Impeller Type: Open / Closed Shaft Diameter 1 3/16 nickel Bowl Length 48"

Suction Pipe Size 5" Length 10' Thread: Straight / Tapered

Strainer Type Length

Bearing Sizes Pin Length

WELL INFO: Well Diameter 16" 12" Rock Casing Depth

Static Water Level 67' Well Depth

Does Well Have Vent Pipe? Yes / No Leader pipe top 261'

Was Well Chlorinated? Yes / No

JOURNEYMAN'S COMMENTS: Motor Ratchet spring Bad

Need to Install poly

TURBINE PUMP
(MOTOR, PUMP, PERFORMANCE RECORD)

(AS PULLED) (AS INSTALLED) (AS TESTED) DATE: 4-4-12

GENERAL INFO:

Customer/Owner: Spring Park. MN Well/Pump #2

Address/Location: Filter Plant #1

Persons on Job Site: DJ

MOTOR INFO:

Horsepower 25 Stand Still Volts 483/487/490 Running Volt: 482/486/489

Manufacturer GE R.P.M 1765 Full Load Amps 32 S.F.Amps 1.15

BOWL DESIGN: G.P.M. _____ T.D.H. _____ Megger Reading 1000

PERFORMANCE TEST: Static Water Level 67' Well Diameter _____ Well Depth _____

Test #1: HZ 60	AMPS 19.7/19.5/19.8	G.P.M. 280	Water Level 93' 8"	P.S.I. 7	T.D.H.
Test #2: HZ 60	AMPS 19.2/19.2/19.0	G.P.M. 230	Water Level 93' 2"	P.S.I. 18	T.D.H.
Test #3: HZ 60	AMPS 18.5/18.5/18.7	G.P.M. 185	Water Level 89' 10"	P.S.I. 30	T.D.H.

T.D.H. = Pumping Water Level in Feet + (P.S.I. reading x 2.31) + Friction Loss In Column + Fittings

Example: Information Given: 1000 G.P.M., 150' Water Level, 50 P.S.I.,3.5' Friction Loss

Therefore: 150' + (50# x 2.31 or 115.5') + 3.5' = 269' T.G.H.

OR

The pump is producing 1000 G.P.M. at 269' T.D.H.

Does Well Pump Sand? Yes / NO If So, How Much? Test #1 1/16 " in Gallon Jar

Test #2 Trace " in Gallon Jar

Test #3 -0- " in Gallon Jar

Closed Valve Test: P.S.I. Reading _____ Water Level _____

Vibration Record: Vibration in Mils:

A	.50	90* from Discharge
B	.45	In Line with Discharge
C	.15	90* from Discharge
D	.15	In Line with Discharge

Tested By: Eric F.

Problems/Comments: 2½ Fire hose Connection hose Adjustable Key 8862
3/8 Red 1/7 Yellow 3/9 Blue
Filings + Springs on top of motor, under bonnett 1" above head nut

Customer/Owner Comment: Ratchet Springs Coming apart

Water Well Video Information

City of Spring Park **Well # 1**

Casing Dia.: 16" **Screen Dia.:_____**
Casing Depth: ft. 416 **Screen Depth:**
From_____ To ____

Open Hole Dia.:
Open Hole Depth:
From 416' To 567'
___Blasted __x_Bailed

Current Bottom: 567'
Original Bottom (if available): __'

Static Water Level: 64 feet

Video Date: April 6, 2012

Remarks:

Video Log

Time	Depth	Notes
	4'	Lens top of well
	6'	Joint
	10'	Joint
	16'	Joint
	26'	Joint
	34'	Joint
	39'	Joint
	45'	Joint
	51'	Joint
	60'	Joint
	64'	Static—Clear Water
	69'	Joint-Slight Scale
	70'	Joint
	91'	Joint
	112'	Joint-Heavier Scale
	133'	Joint
	145'	Joint-Hazy Water
	182'	Pump Bowl Rubs
	Note:	Can't see Joints
	327'	Possible Joint
	349'	Possible Joint
	371'	Possible Joint
	393'	Possible Joint

Video Log Continued 1

Time	Depth	Notes
	416'	End of Casing Split
	428'	Vert Fractures & voids
	517'	Hole tightens
	545'	Void
	560'	Large Void
	567'	Bottom

Video Log Continued 2

Time	Depth	Notes

Water Well Video Information

City of Spring Park **Well #2**

Casing Dia.: 16" **Screen Dia.:_____**
Casing Depth: ft. ' **Screen Depth:**
From 292' To 297'
330' To 372'
Open Hole Dia.:
Open Hole Depth:
From _____ To _____
___Blasted ___Bailed

Current Bottom: '372'
Original Bottom (if available): __'

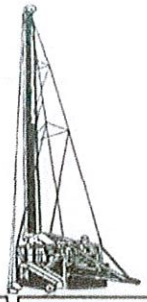
Static Water Level: 62 feet

Video Date: April 6, 2012

Remarks: Leader pipe 8" steel from 261' to 292' and 297' to 330' (two screened intervals)

Video Log

Time	Depth	Notes
	4'	Lens top of well
	13'	Joint
	19'	Joint
	28'	Joint
	43'	Joint
	57'	Joint
	62'	Static water
	67'	Joint-Hazy Water
	85'	Joint-Water Clearing
	103'	Joint
	124'	Joint-Heavier scale
	133'	Possible hole
	144'	Joint-Hazy Water
	165'	Joint
	181'	Jpint
	193'	Joint
	261'	Top of Leader 8" - Heavier Scale
	292'	Top of Screen Clean
	297'	Bottom Screen—Top of Pipe
	330'	Top of Bottom Screen
	346'	Joint in Screens
	361'	Joint in Screens
	372'	Bottom—Fill



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Environmental Drillers

Well Drilling, Abandonment & Repair Since 1948

Certified Well Drillers
Certified Pump Installers

August 30, 2004

CITY OF SPRING PARK Public Works Department
Attn: Mr. D.J. Goman
4349 Warren Avenue
Spring Park, MN 55384-9711 Phone # (952) 471-9051

RE: SUBMERSIBLE WELL PUMP #1 FAILURE & STATUS REPORT

Dear Mr. Goman;

Bergerson-Caswell Inc. Appreciates the opportunity to assist you and your well needs. As you requested, we removed the well pump at well #3. As you suspected the motor had failed most likely due to lightning/ or voltage surge. We were surprised to see the pump in as bad a shape as it was because it had only been installed for a few years. The column assembly should be partially replaced, because there was one joint that had nearly separated, and two more that were only threaded into the coupling with four threads. The separating joint caused the cable to wrap up around the column pipe and ripped the housing, stressing the wire. Based on the rip in the insulation and the motor condition, we would also recommend you replace the wire. Finally the pump castings are soft, and I showed you at site how the steel can scrape away. It can be rebuilt or replaced, but I offered all the costs that pertain to your project as well as three different motor options from differing manufacturers with there efficiency rating.

PROJECT COST: Option #1

Field Labor & Equipment, 6 hrs $165.00/hr.			$ 990.00
Replace 100 Hp 460/3/60- 3454 rpm, 8" Hitachi Submersible Motor, 85.2% eff			*$5,995.00*
Pump assembly, Goulds 8RJHC , 4 stage bowl;			
Designed to operate (600 gpm @ 350' TDH, 79% eff,			
Replace W/Grundfos 625S1000-4 Stanless Steel Bowl Assembly	*$ 3,643.27*		
Rebuild Owners			
Machine bowl and install wear rings 4 each @ $225.00			
Furnish set of Bowl Bearings	*$380.00*		
Furnish bowl shaft	*$425.00*		
Furnish Stainless Steel cap screws	*$ 75.00*	*$1,780.00*	
6"x 21' T & C drop pipe @ 515.00/ea :			$ 1,545.00
2 each 6" Flowmatic Style Check Valve @ $ 525.00/ea			$ 1,050.00
Shop Labor to prepare equipment: Estimate 15 Hrs @ $65.00/hr			$ 975.00
Furnish 240' AWG 2/O, 3-w ground, submersible wire @ $ 14.25/ft			$ 3,420.00
Replace Pitless assembly O-rings			$ 175.00
Misc. installation materials: SS banding & tape, Submersible splice kit, poly			$ 485.00
Reinstall pumping Equipment and test into the system, Est 9 hrs @ $165.00/hr			$ 1,485.00
TOTAL PROJECT COST W/out pump repairs			**$**

*****Your motor can be sent to the factory for rebuilding estimated cost to rebuild was 6,500.00 plus shipping (TX)

ADDITIONAL OPTION'S for submersible motors available:

Replace 100 Hp 460/3/60- 3525 rpm, 8" Franklin Submersible Motor, 89% eff.	*$ 6,468.00*
Replace 100 Hp 460/3/60- 3500 rpm, 8" SME Submersible Motor, 87% eff.	*$ 6,103.00*

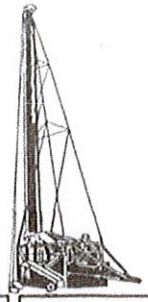
Other services or materials that may be requested;

KPSI water level monitor, for monitoring levels	3,400.00
Video investigate this well	900.00

We probed the well depth to be 776', which would mean it has a few feet of fill, but nothing to worry about.
If you have any questions, require additional information, or would like to visit our facility and go through your equipment, please do not hesitate to contact us at (763) 479-3121. I have been dealing with the factory at Fluid-trax to get #13 level monitor back for so long that I ordered this one specified above instead so I can close that project out. Call me after you read through this letter.

Sincerely,
BERGERSON-CASWELL INC. Tim D. Berquam Project Manager

5115 Industrial St., Maple Plain, MN 55359 (763) 479-3121 Fax (763) 479-2183



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Certified Pump Installers

September 21, 2004

CITY OF SPRING PARK Public Works Department
Attn: Mr. D.J. Goman
4349 Warren Avenue
Spring Park, MN 55384-9711 Phone # (952) 471-9051

RE: SUBMERSIBLE WELL PUMP #3 FAILURE & STATUS REPORT

Dear Mr. Goman;

Bergerson-Caswell Inc. Appreciates the opportunity to assist you and your well needs. As you requested, we removed the well pump at well #3. As you suspected the motor had failed most likely due to lightning/ or voltage surge. We were surprised to see the pump in as bad a shape as it was because it had only been installed for a few years. The column assembly should be partially replaced, because there was one joint that had nearly separated, and two more that were only threaded into the coupling with four threads. The separating joint caused the cable to wrap up around the column pipe and ripped the housing, stressing the wire. Based on the rip in the insulation and the motor condition, we would also recommend you replace the wire. Finally the pump castings are soft, and I showed you at site how the steel can scrape away. It can be rebuilt, but based on our inspection we recommend replacing the pump with one that is more efficient. Below is the breakdown of materials with the corresponding price for each item.

PROJECT COST: to replace your pump/ motor

Field Labor & Equipment, 6 hrs $165.00/hr.	$ 990.00
Replace 75 Hp 460/3/60- 3454 rpm, 8" Franklin Submersible Motor,88% eff	$5,995.00
Pump assembly,Grundfos 625S750-4A which is a 4 stage pump;	
Designed to operate (600 gpm @ 380' TDH, 80% eff,	$3,645.00
(7) each 6"x 21' T & C drop pipe @ 515.00/ea :	$ 3,605.00
1 each 6" Flowmatic Style Check Valve @ $ 525.00/ea	$ 525.00
Shop Labor to prepare equipment: Estimate 15 Hrs @ $65.00/hr	$ 975.00
Furnish 240' AWG #2 flat, 3-w ground, submersible wire @ $ 6.75/ft	$ 1,620.00
Replace Pitless assembly O-rings	$ 175.00
Misc. installation materials: SS banding & tape, Submersible splice kit, poly	$ 485.00
Reinstall pumping Equipment and test into the system, Est 9 hrs @ $165.00/hr	$ 1,485.00
TOTAL PROJECT COST to replace pump unit	**$ 19,500.00**

****Note**I have enclosed the proposed equipment cut sheets.**

Other services or materials that may be requested;

KPSI water level monitor, for monitoring levels	3,400.00
Video investigate this well	900.00

We probed the well depth to be 776', which would mean it has a few feet of fill, but nothing to worry about.
If you have any questions, require additional information, or would like to visit our facility and go through your equipment, please do not hesitate to contact us at (763) 479-3121.

Sincerely,
BERGERSON-CASWELL INC.

Tim D. Berquam Project Manager

Post-It™ brand fax transmittal memo 7671 | # of pages ▸ 6

To D.J. GOMAN	From TIM BERQUAM
Co. CITY OF SPRING PARK.	Co. BERGERSON CASWELL
Dept. PUBLIC WORKS	Phone # (763) - 479-3121
Fax #	~~Fax #~~ cell (612) - 369-3652

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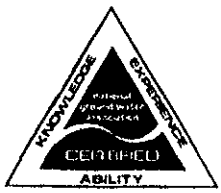


Certified Well Drillers
Certified Pump Installers

December 9, 2004

CITY OF SPRING PARK Public Works Department
Attn: Mr. D.J. Goman
4349 Warren Avenue
Spring Park, MN 55384-9711 Phone # (952) 471-9051

RE: INVOICE FOR SUBMERSIBLE WELL #3, PUMP & MOTOR REPLACEMENT

Dear Mr. Goman;

Bergerson-Caswell Inc. Appreciates the opportunity to assist you with your well and pump needs. We have completed the installation of your new pumping equipment and today we started and tested it into your system. Below is the itemized breakdown of materials and services we supplied in performing this project as per our bid offered in September.

PROJECT COST: to replace your pump/ motor

Field Labor & Equipment, 6 hrs $165.00/hr.	$ 990.00
Replace 75 Hp 460/3/60- 3454 rpm, 8" Franklin Submersible Motor,88% eff	$ 5,995.00
Pump assembly,Grundfos 625S750-4A which is a 4 stage pump;	
Designed to operate (625 gpm @ 357' TDH, 80% eff,)	$ 3,645.00
(9) each 6"x 21' T & C drop pipe @ 515.00/ea :	$ 4,635.00
1 each 6" Flowmatic Style Check Valve @ $ 525.00/ea	$ 525.00
Shop Labor to prepare equipment: Estimate 15 Hrs @ $65.00/hr	$ 975.00
Furnish 385' AWG #2 flat, 3-w ground, submersible wire @ $ 6.75/ft	$ 2,598.75
Replace Pitless assembly O-rings	$ 175.00
Misc. installation materials: SS banding & tape, Submersible splice kit, poly	$ 485.00
Reinstall pumping Equipment and test into the system, 10.25 hrs @ $165.00/hr	$ 1,691.25
Start Up & test pump into system, 2 hrs @ 75.00/hr	$ 150.00

TOTAL PROJECT INVOICE AMOUNT $ 21,865.00

****Note**I have enclosed all project information, test result, and a log for record keeping of the pumping water levels.**

If you have any questions on this invoice, or require additional information, please do not hesitate to contact us at (763) 479-3121. We will arrange a time to deliver your pipe at our earliest convenience, and if this is not soon enough let us know.

Sincerely,
BERGERSON-CASWELL INC.

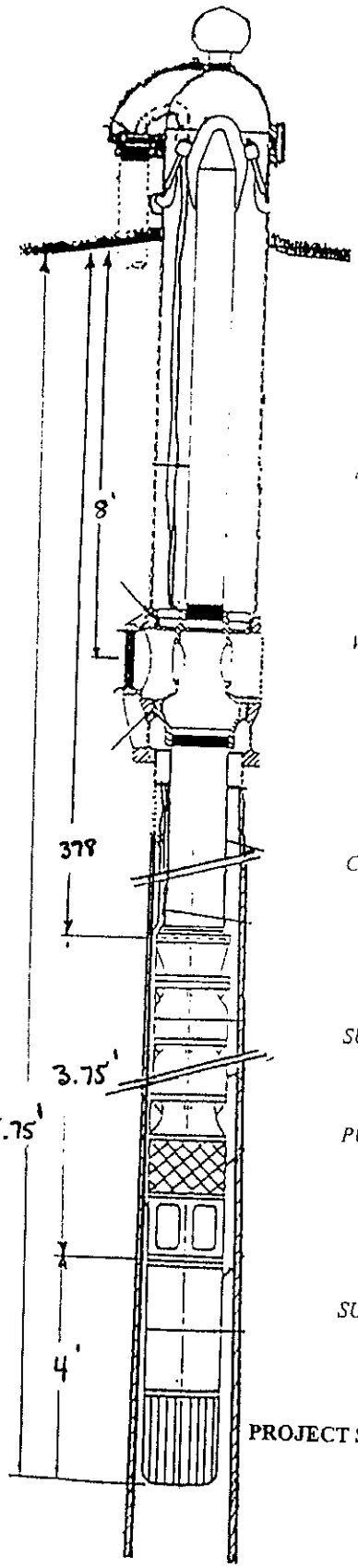
Tim D. Berquam
Project Manager

5115 Industrial St., Maple Plain, MN 55359 (763) 479-3121 Fax (763) 479-2183

BERGERS i CASWELL INC. 5115 Industrial . .et. Maple Plain, MN 55359
Phone (763) 479-3121 Fax (763) 479-2183 (800) 328-6188

SUBMERSIBLE PUMP INSTALLATION

PROJECT City of Spring Park Well Pump #3
OWNER Replacement 2004.
LOCATION Interlachen Road & South of City Hall.
CONTRACTOR Bergerson Caswell. Inc.
DATE 12-9-04



WELL INFORMATION
Casing Size 10" Depth
Open Hole/ Screened
Bottom Of Well 776'
SWL 170', & PWL ___ @ ___ GPM

WATER SYSTEM CONTROL
Treatment Plant

WATER SYSTEM STORAGE
Elevated Tower

MOTOR STARTER / VARIABLE SPEED
Size ___ Coil Voltage ___
VFD Brand
Press. Setting
Start / Stop Pressures
Minimum Frequency

WELL HEAD COMPLETION
Pitless or Fabricated Discharge
Manufacturer Monitor
Model ? 8" Bury 18" Can.
Pull Pipe & Size 6" Pull Pipe.
Well Vent & Size Yes 1½"
Electrical Conduit Size
OTHER 1" Poly installed to cover for H2O Level monitoring. 400' length.

COLUMN PIPE
Size 6" Length (total) 370'
Length's 8 ea. - 20' & 10 ea. - 21'
Material / Special ASTM A53 Grade B. Sch 40.
Check Valve(s) (2) - Pump Discharge Cast 4.
Type/Where 18' above Pump is Flomatic style.

SUBMERSIBLE CABLE
(Flat) ~~Twisted~~ AWG #2 Flat 3 conductor w/ground. #6
AWG# 4(Moberland) Length 385'

PUMP BOWL ASSEMBLY
Manufacturer Grundfos
Model 6SE5750 - 4A Stages
Design 625 GPM @ 357 'TDH
___ GPM @ ___ 'TDH
Intake Screen

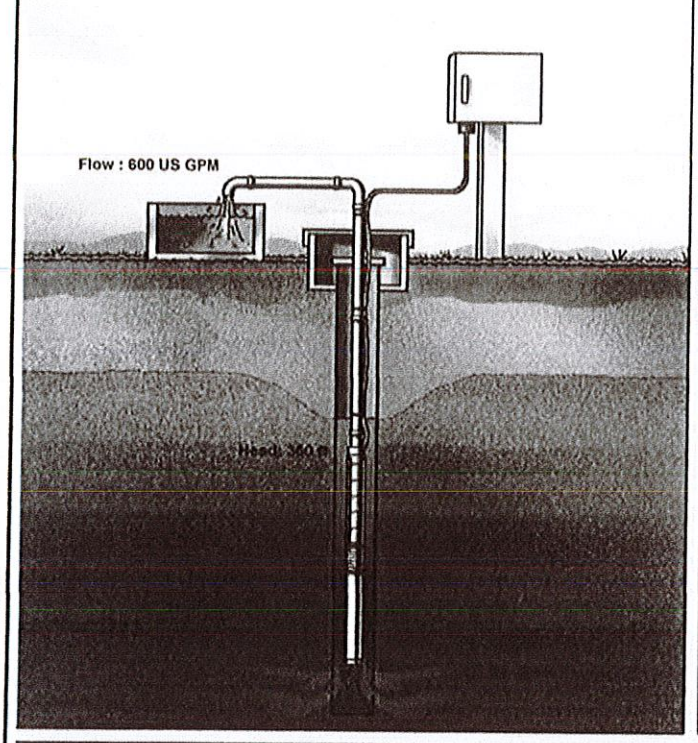
SUBMERSIBLE MOTOR
Manufacturer Franklin Submersible motor 8"
Hp 75 / Phase 3 / Voltage 480 FLA 94 SFA 107
RPM 3525 / Frequency
Sleeve Size Not Required (.5 ft/sec) = 559gpm.

PROJECT SPECIAL ITEMS This Pump was Removed Due to Voltage Surge or Lightning Strike.
- No Previous H2O levels Documents. And Engineer & BC. Assisted New Design Criteria for Summer Fluxuating PWL.
- The City is looking at Possible VFD. controlled start/stop. & Protection. due to Problems Experienced at Pump Start up.

GRUNDFOS

Company name: BERGERSON CASWELL INC.
Created by: Tim Berquam
Phone: (763) 479-3121
Fax: (763) 479-2183
Date: 9/21/2004

Installation and input



Products

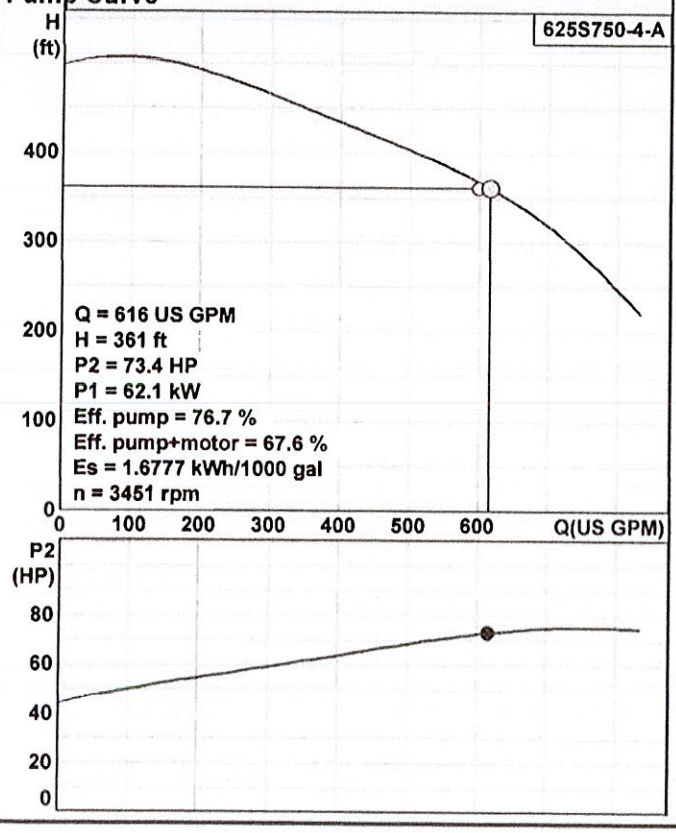
1 x 625S750-4-A

Prod.No.: 17BG19A4

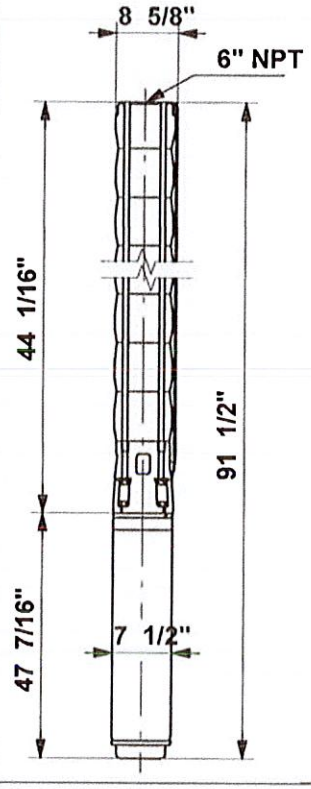
Sizing Results

Flow:	617 US GPM (131148900 US gal/year)
Total head:	361 ft
Power P1:	62.1 kW
Power P2:	73.3 HP
Efficiency pump:	76.7 %
Efficiency motor:	88.1 %
Efficiency total:	67.6 %
Consumption:	220000 kWh/Year
Specific energy consumption:	1.6777 kWh/1000 gal (3.56 kWh/gal/ft)
Energy costs:	15400 $/Year
Motor type:	Super - 8"
Phase:	3
Voltage:	460 V
Frequency:	60 Hz
Current (rated):	107 A
Current (actual):	107 A
Cos phi (actual):	0.88

Pump Curve



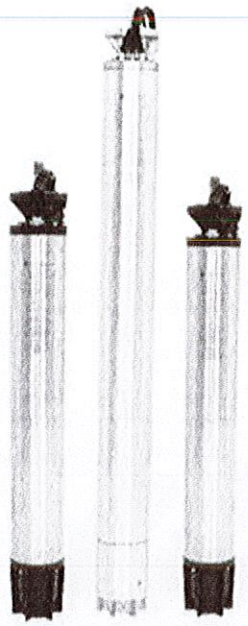
Dimensional Drawing



Franklin Electric

Welcome to Franklin Electric

Click Here for Dimensions
Click Here for Model Listing



Application

These motors are built for dependable operation in vertical 8" diameter or larger water wells.

Basic Features

- Full 3525 RPM 60 Hz Design Point for Superior Pump Head & Flow Yield
- Maximum Temperature Winding Wire NEMA Class 200
- Double Flange Design for Ease of Handling and Pump Mounting
- Splined Shaft for Maximum Shaft and Coupling Contact
- Resin Encapsulated Windings
- Hermetically-sealed Stator
- Copper Bar Rotor Provides Consistent Design Performance
- Carbon Ceramic Rotating Face Seal
- Kingsbury-type Water-lubricated Thrust Bearing
- Pressure-equalizing Diaphragm
- Water Bloc Lead Connection
- 3-Lead & 6-Lead (Wye-delta) Configurations
- Pre-filled with Temperature-resistant Fill Solution
- Sand Fighting Slinger
- Equipped with Subtrol Heat Sensor
- Worldwide Availability

Special Options

- Sand Fighter Models with special Silicon Carbide based sealing system available for applications with sand or other abrasives.
- 316 SS Construction Models vailable. All 316 SS models include Sand Fighter sealing system and Subtrol heat sensor for use with SubMonitor protective devices.
- SubMonitor Motor Protection — A field proven and contractor friendly premium motor protection system. It protects the motor against overload, underload, overheating, and rapid cycling. The use of SubMonitor can also extend the motor warranty. See SubMonitor literature for details.
  NOTE: Motor must be manufactured with Subtrol heat sensor.

Standard 8-Inch Three-phase Motor Specifications

Hz	Hp Range	kW Range	Poles	RPM	Max. Ambient Temp.	Duty Rating
60	40 - 200	30 - 150	2	3525	86°F / 30°C	Continuous at 0.5 ft/sec flow past motor
50	40 - 200	30 - 150	2	2900	86°F / 30°C	Continuous at 0.5 ft/sec flow past motor

Standard 8-Inch Construction Materials

Component	Standard Water Well	Construction Type: Sand Fighter™	Corrosion Resistant(316 SS)
Castings	Gray Iron	Gray Iron	316 SS
Stator Shell	304 SS	304 SS	316 SS
Stator Ends	Carbon Steel	Carbon Steel	316 SS
Shaft Extension	17-4 SS	17-4 SS	17-4 SS
Fasteners	300 Series SS	300 Series SS	316 SS
Seal Cover	304 SS & Sintered Bronze	304 SS & Sintered Bronze	316 SS
Seal	Carbon Ceramic Face	Sand Fighter™ SiC/SiC Seal System	Sand Fighter™ SiC/SiC Seal System
Diaphragm	Type 200 Hydrin	Type 200 Hydrin	Type 200 Hydrin
Diaphragm Plate	304 SS	304 SS	316 SS
Diaphragm Spring	302 SS	302 SS	316 SS
Slinger	Type 100 Hydrin	Type 100 Hydrin	Type 100 Hydrin
Lead Wire (or Cable)	XLPE 125°C	XLPE 125°C	XLPE 125°C
Lead Sleeve	316 SS	316 SS	316 SS
Lead Potting	Epoxy	Epoxy	Epoxy
Filter	Delrin & Polyester	Delrin & Polyester	316 SS Plug

Specifications subject to change without notice. Contact Franklin Electric if current material types are required for bid specifications.

Franklin Electric Co., Inc. 400 E. Spring St., Bluffton, IN, 46714, U.S.A.
E-mail: webmaster@fele.com Tel: 260.824.2900 Fax: 260.824.2909

8" Motors & Leads- Standard

For details click on model number

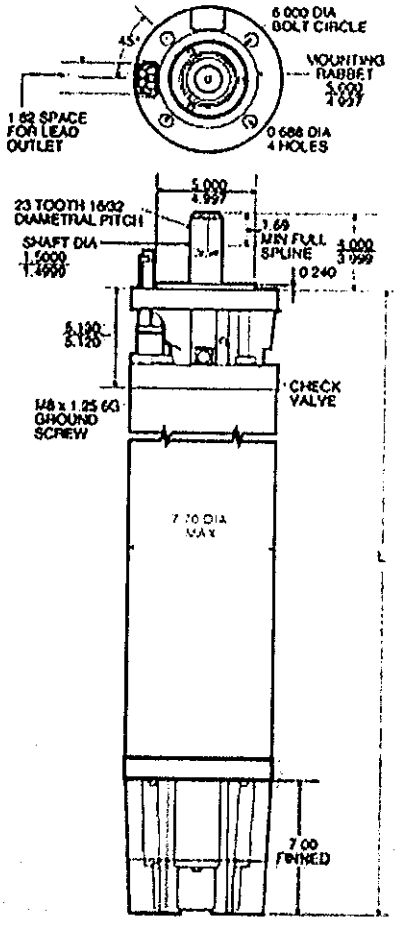
HP (KW)	W/PH	CONSTRUCTION	VOLTS	HZ	SVC FACT	# LEADS	WIRE SIZE	MODEL	STOCK STATUS	DOWNWARD THRUST RATING
75 HP 55 kW	3-Phase	Water Well	460/380	60/50	1.15/1.0	3	AWG 4	239 603 60	Yes	10000 LBS (45000 N)

Franklin Electric

Welcome to Franklin Electric

Click Here for General Information
Click Here for Model Listing

40 Hp to 100 Hp



3-Lead Three-phase Motors

HP	KW	"L" (inches)	SHIPPING WEIGHT LBS	SHIPPING WEIGHT KG	MOTOR CARTON SIZE (in inches)
40	30	36.4	320	146	17 x 9.25 x 51
50	37	39.4	345	157	17 x 9.25 x 51
60	45	42.4	375	171	17 x 9.25 x 51
75	55	47.4	430	196	17 x 9.25 x 64
100	75	54.9	530	241	17 x 9.25 x 64
125	93	68.8	700	318	17 x 9.25 x 79
150	110	77.8	840	382	17 x 9.25 x 96
175	130	85.8	925	421	17 x 9.25 x 96
200	150	94.8	1040	473	17 x 9.25 x 108

3-Lead Three-phase Motors

HP	KW	"L" (inches)	SHIPPING WEIGHT LBS	SHIPPING WEIGHT KG	MOTOR CARTON SIZE (in inches)
40	30	36.4	330	150	17 x 9.25 x 51
50	37	39.4	355	161	17 x 9.25 x 51
60	45	42.4	385	175	17 x 9.25 x 51
75	55	47.4	440	200	17 x 9.25 x 64
100	75	54.9	540	246	17 x 9.25 x 64
125	93	68.8	710	323	17 x 9.25 x 79
150	110	77.8	850	386	17 x 9.25 x 96
175	130	85.8	935	425	17 x 9.25 x 96
200	150	94.8	1050	477	17 x 9.25 x 108

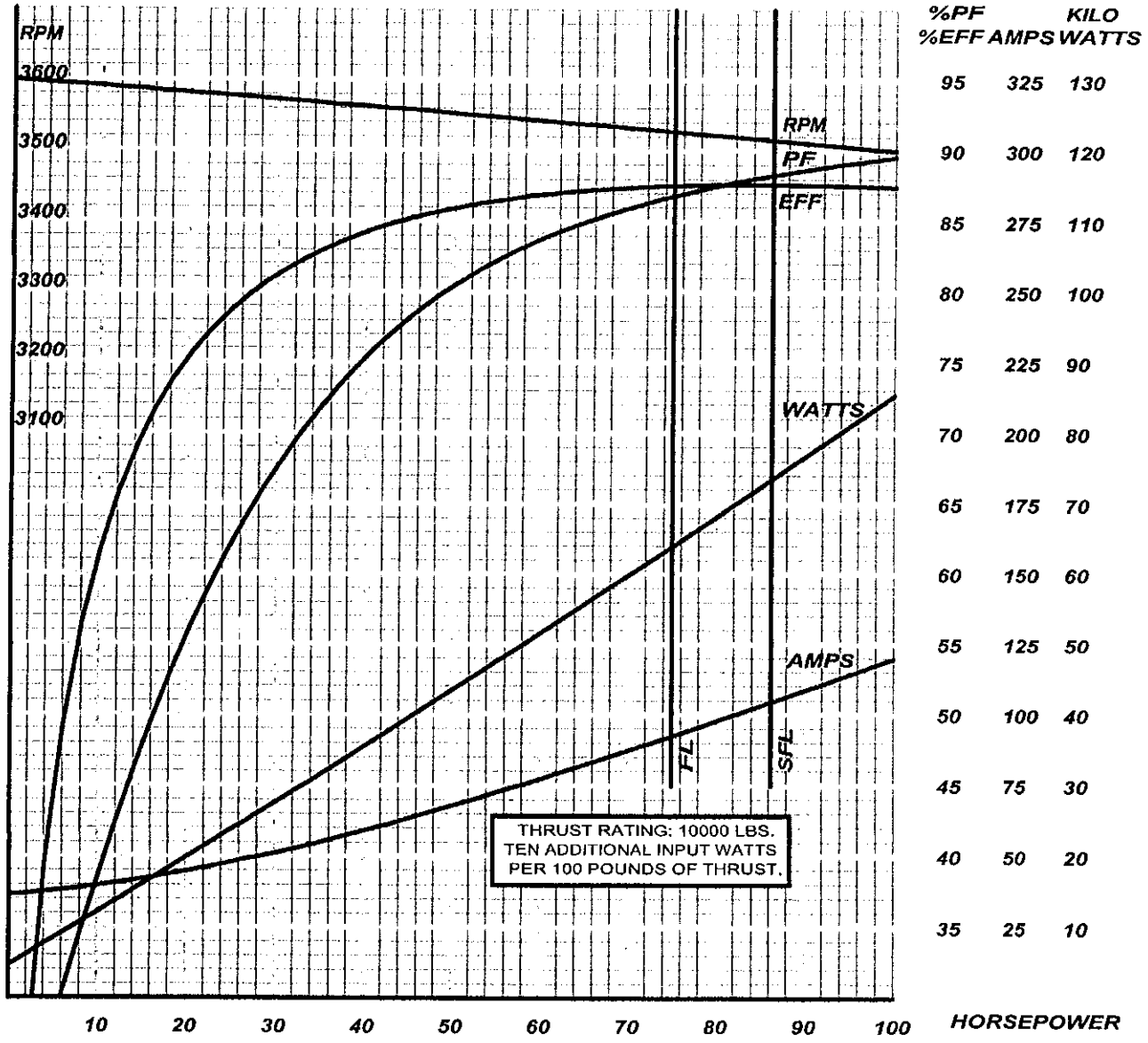
Franklin Electric

MOTOR PERFORMANCE CHARACTERISTICS

TEST				
VOLTS	460	HERTZ	60	
ST.MFD		RUN MFD		
TEST PR	8420	PAGE	9	
APPR BY		DATE		

RATING				
FRAME	8 INCH SUB	HP	75	
MODEL	239603	VOLTS	460	
RPM	3525	PHASE	3	
S.F.	1.15	HERTZ	60	
TYPE	3 PHASE			

REMARKS: TESTED IN WATER, SHAFT UP, WITH NO APPLIED THRUST.
TYPICAL PERFORMANCE. NOT GUARANTEED AS MINIMUM PERFORMANCE.



FULL LOAD TORQUE	112	LB-FT
BREAKDOWN TORQUE	519	LB-FT
LOCKED ROTOR TORQUE	376	LB-FT
LOCKED ROTOR AMPS	864	

CURVE NO. 338385-200

TURBINE PUMP
(MOTOR, PUMP, PERFORMANCE RECORD)

(AS PULLED) (AS INSTALLED) (AS TESTED) **DATE:** 12/9/04

GENERAL INFO: Customer/Owner: City of Spring Park Well/Pump #: 3

Address/Location: Interlaken Rd south of city hall, spring park mn.

Persons on Job Site: (D.J., City)(Ted, Electration)

MOTOR INFO: Horsepower 75 Stand Still Volts 1-2 484, 2-3 484, 1-3 481 Running Volts 1-2 477, 2-3 479, 1-3 479

Manufacturer Franklin R.P.M. 3525 Full Load Amps 94 /S.F. Amps/ 107

BOWL DESIGN: G.P.M. 625 T.D.H. 357 Megger Reading 1000

PERFORMANCE TEST: Static Water Level 166 Well Diameter 10" Well Depth 776'

Waste - Test #1: AMPS 100 / 100 / 97 Gallons Per Minute NA Water Level 229'↓ P.S.I. NA T.D.H. 229' TDH

System - Test #2: AMPS 102 / 101 / 99 Gallons Per Minute 760 Water Level 250'↓ P.S.I. 12 T.D.H. 278' TDH

Test #3: AMPS ____ / ____ / ____ Gallons Per Minute ____ Water Level ____ P.S.I. ____ T.D.H. ____

T.D.H. = Pumping Water Level in feet + (P.S.I. reading x 2.31) + Friction Loss in Column + Fittings

EXAMPLE: Information Given: 1000 G.P.M., 150' Water Level, 50 P.S.I, 3.5' Friction Loss
Therefore: 150' + (50# x 2.31 or 115.5') + 3.5' = 269' T.D.H.
OR
the pump is producing 1000 G.P.M. at 269' T.D.H.

Does Well Pump Sand? Yes / No If So, How Much? Test #1 ~0~ " in Gallon Jar

Test #2 ~0~ " in Gallon Jar

Test #3 _____ " in Gallon Jar

CLOSED VALVE TEST: P.S.I. Reading _____ Water Level _____

VIBRATION RECORD: Vibration in Mils:

A _____ 90° from Discharge

B _____ In Line with Discharge

C _____ 90° from Discharge

D _____ In Line with Discharge

TESTED BY: Tom D.

PROBLEMS/COMMENTS: would like to install Drive to Drop Flow to Control Amps

CUSTOMER/OWNER COMMENTS: _____

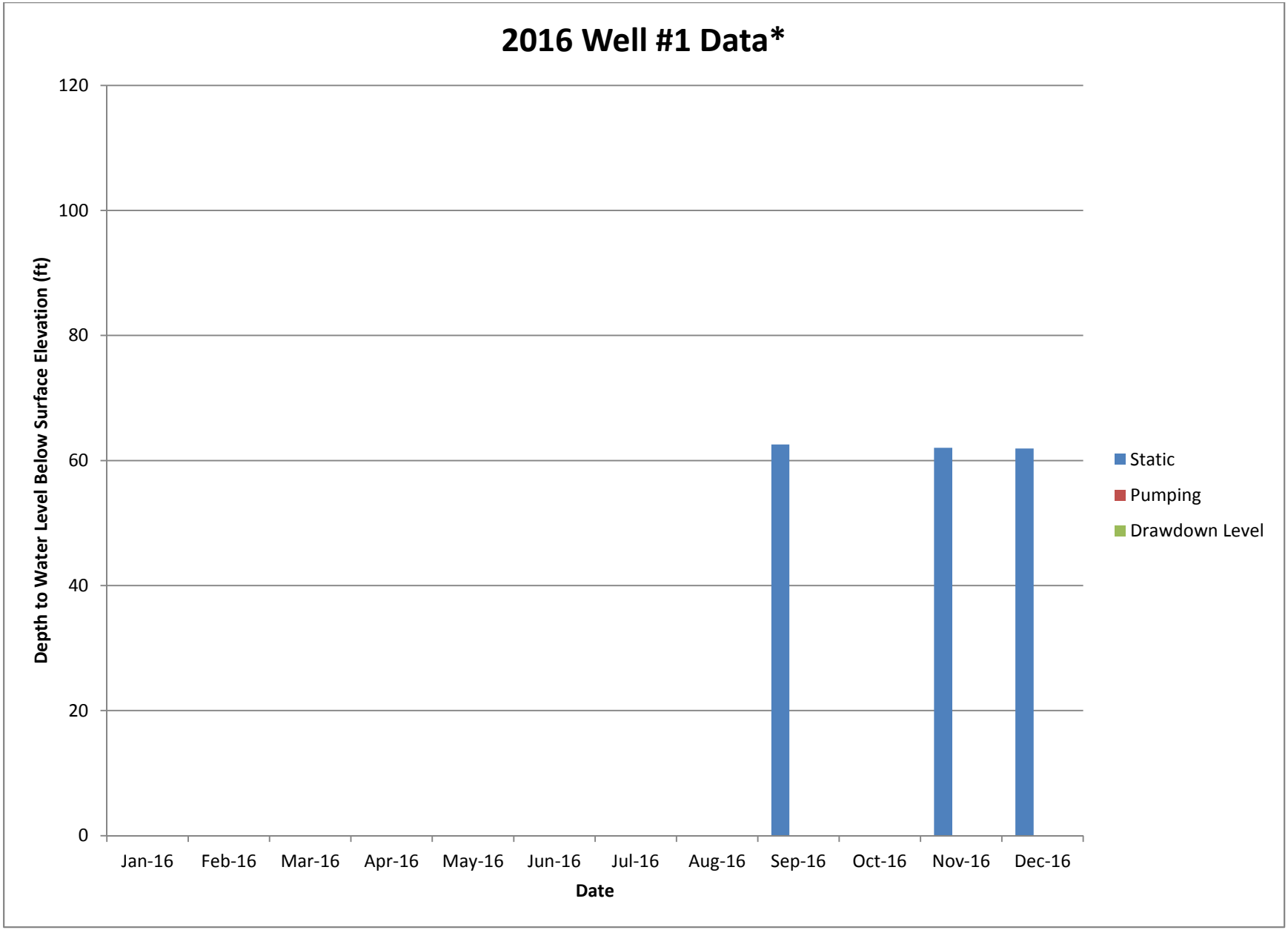
\TPMPREC1.FRM

Appendix 2

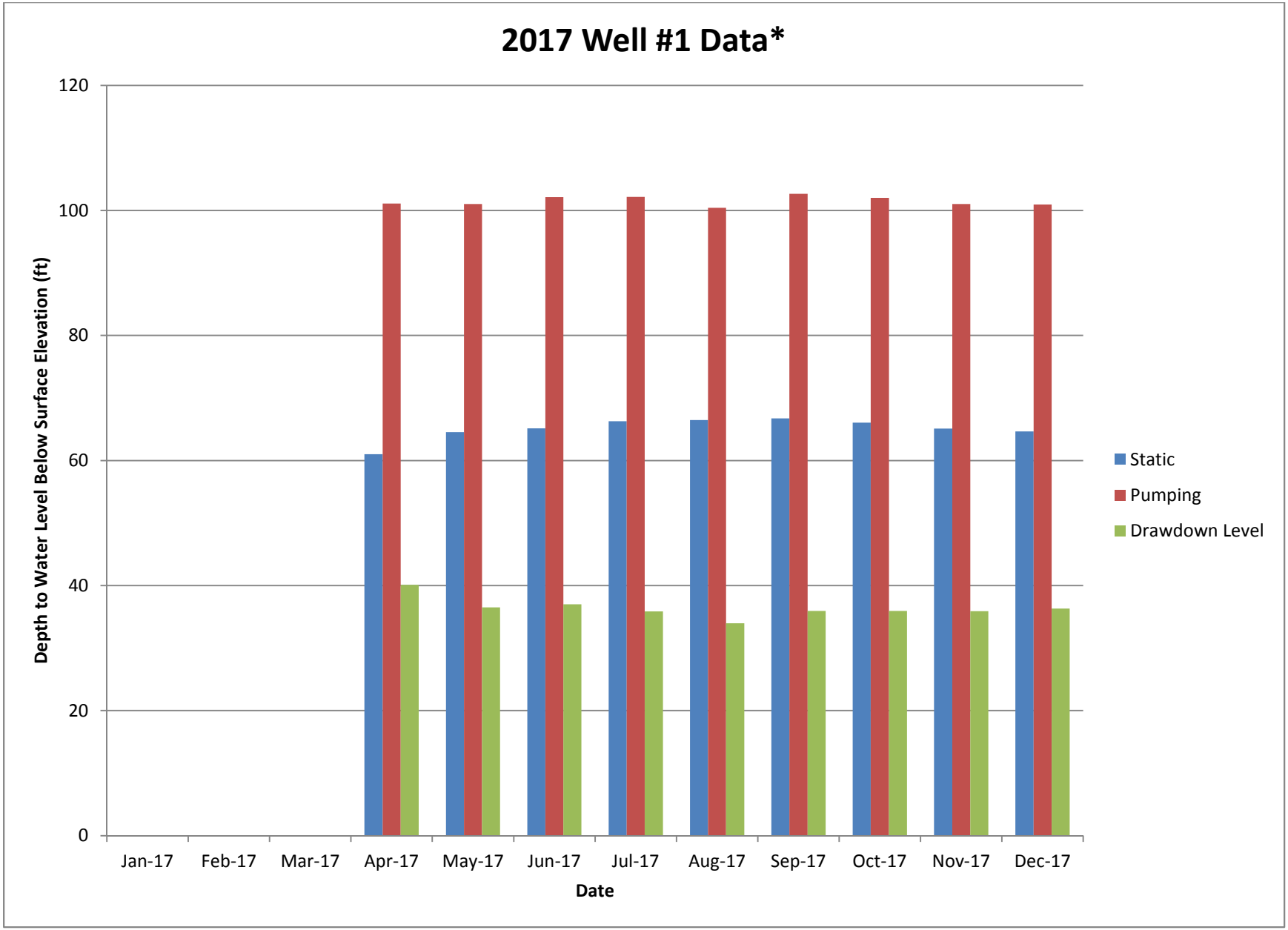
Water level monitoring plan

Appendix 3

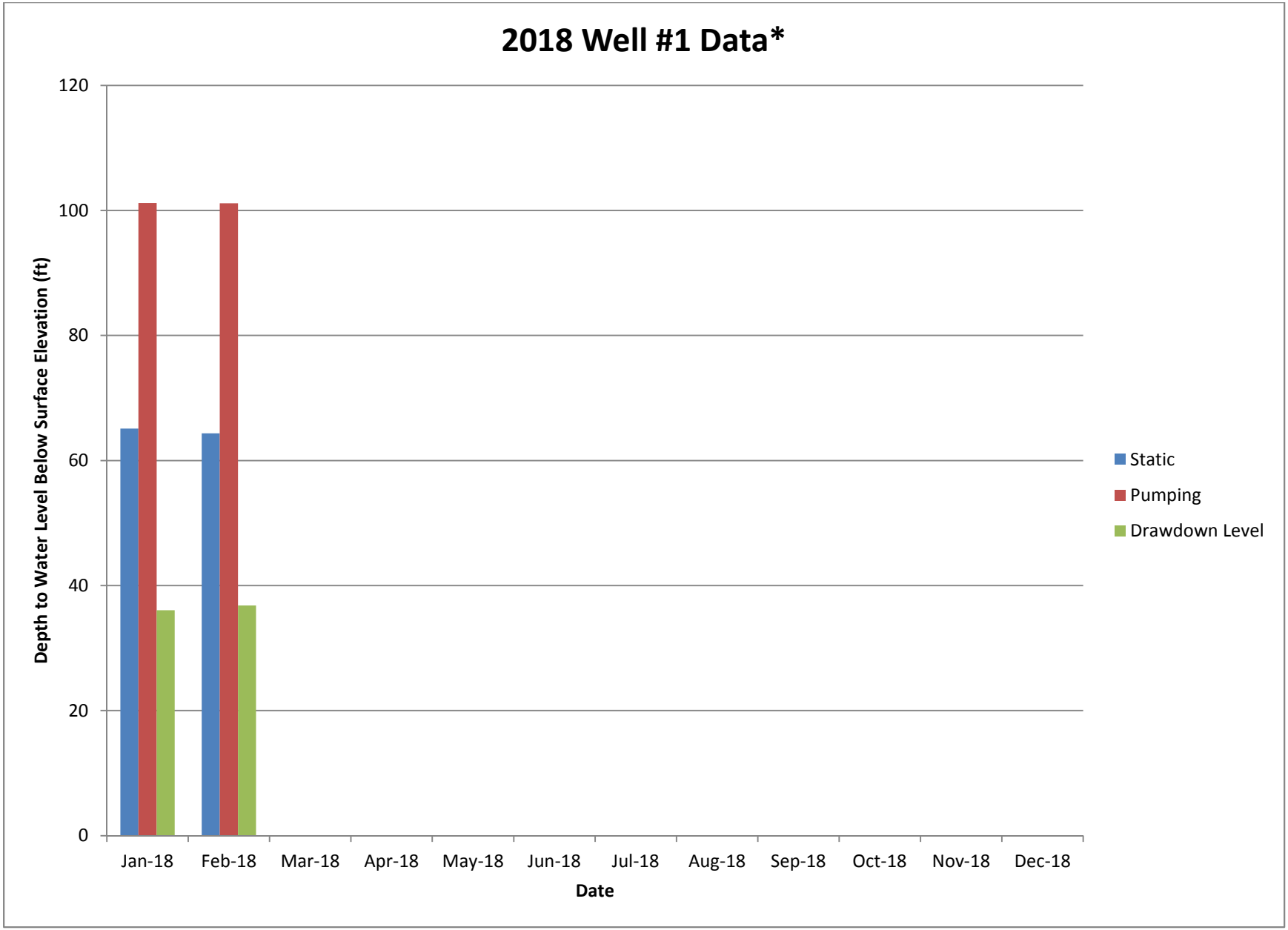
Water level graphs for each water supply well



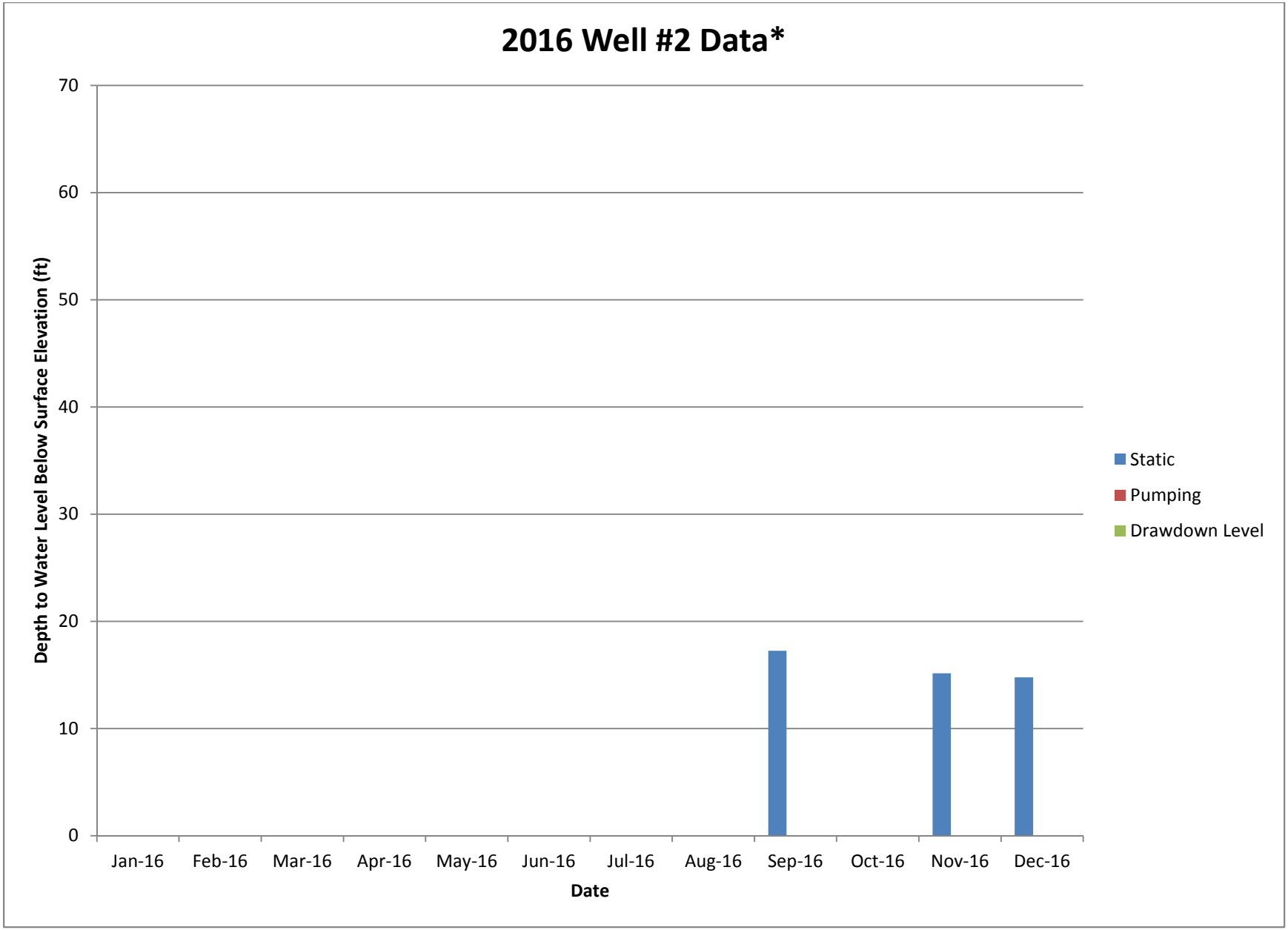
*Records for well water levels are limited and graph represents available historical data.



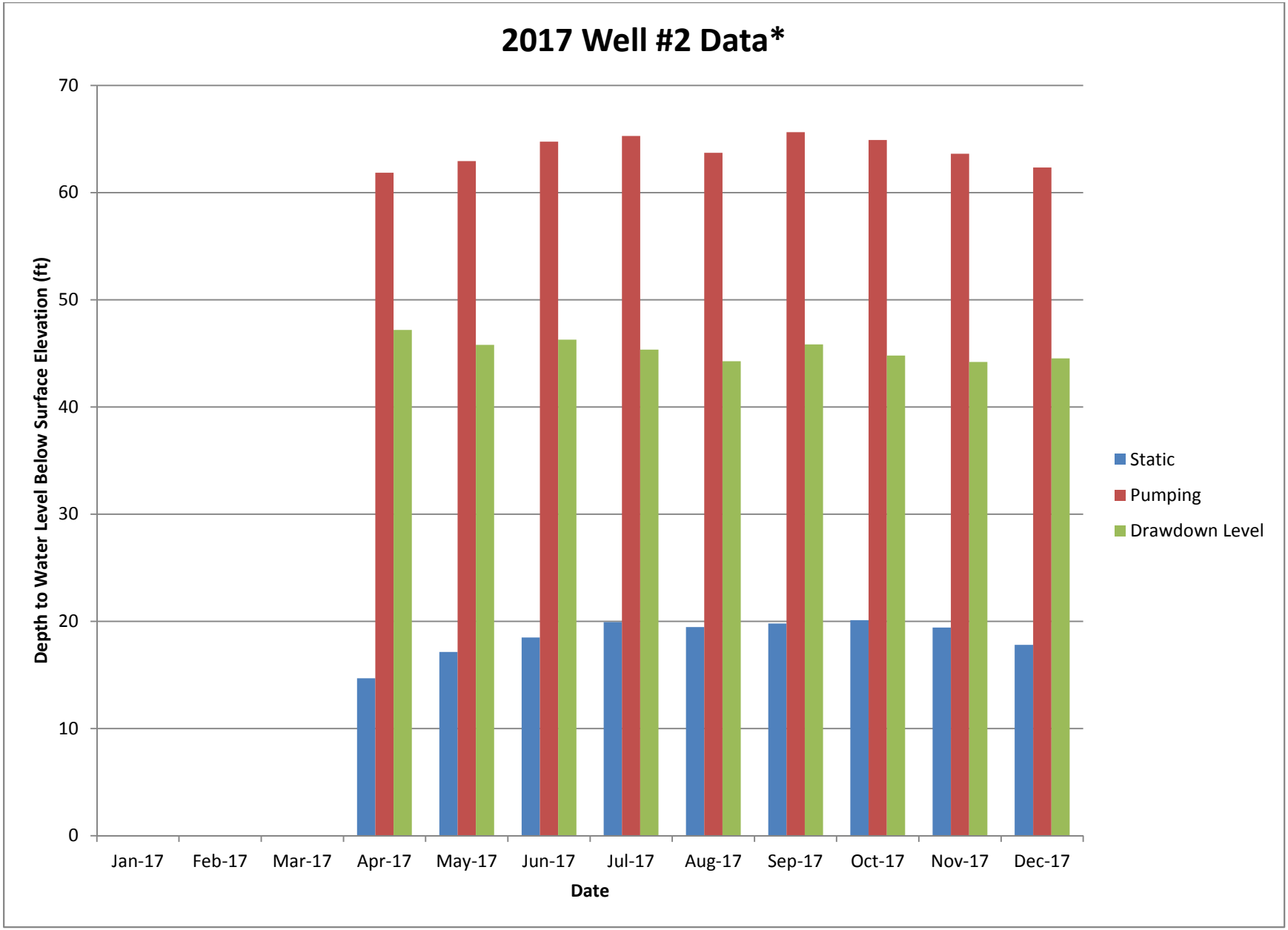
*Records for well water levels are limited and graph represents available historical data.



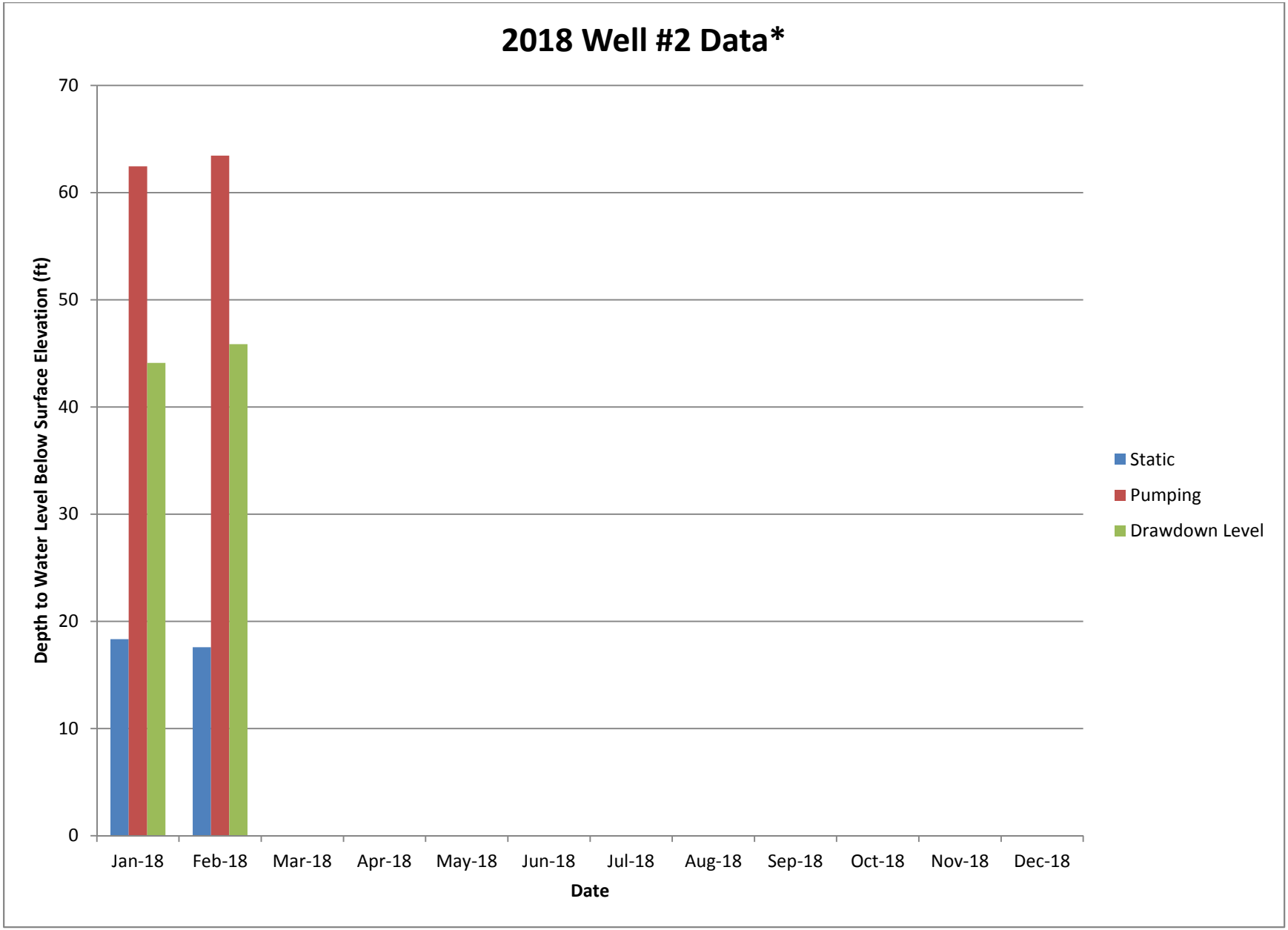
*Records for well water levels are limited and graph represents available historical data.



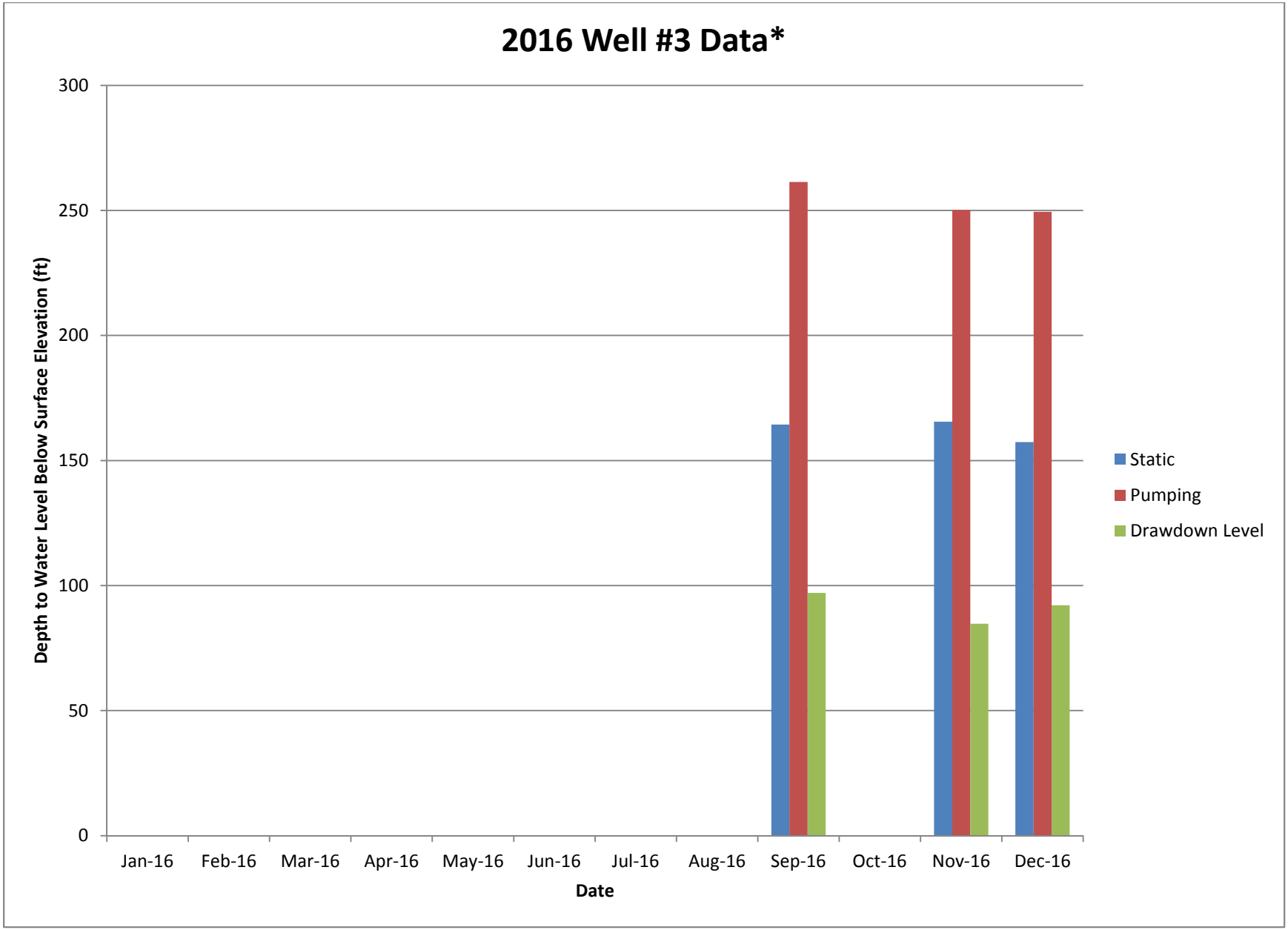
*Records for well water levels are limited and graph represents available historical data.



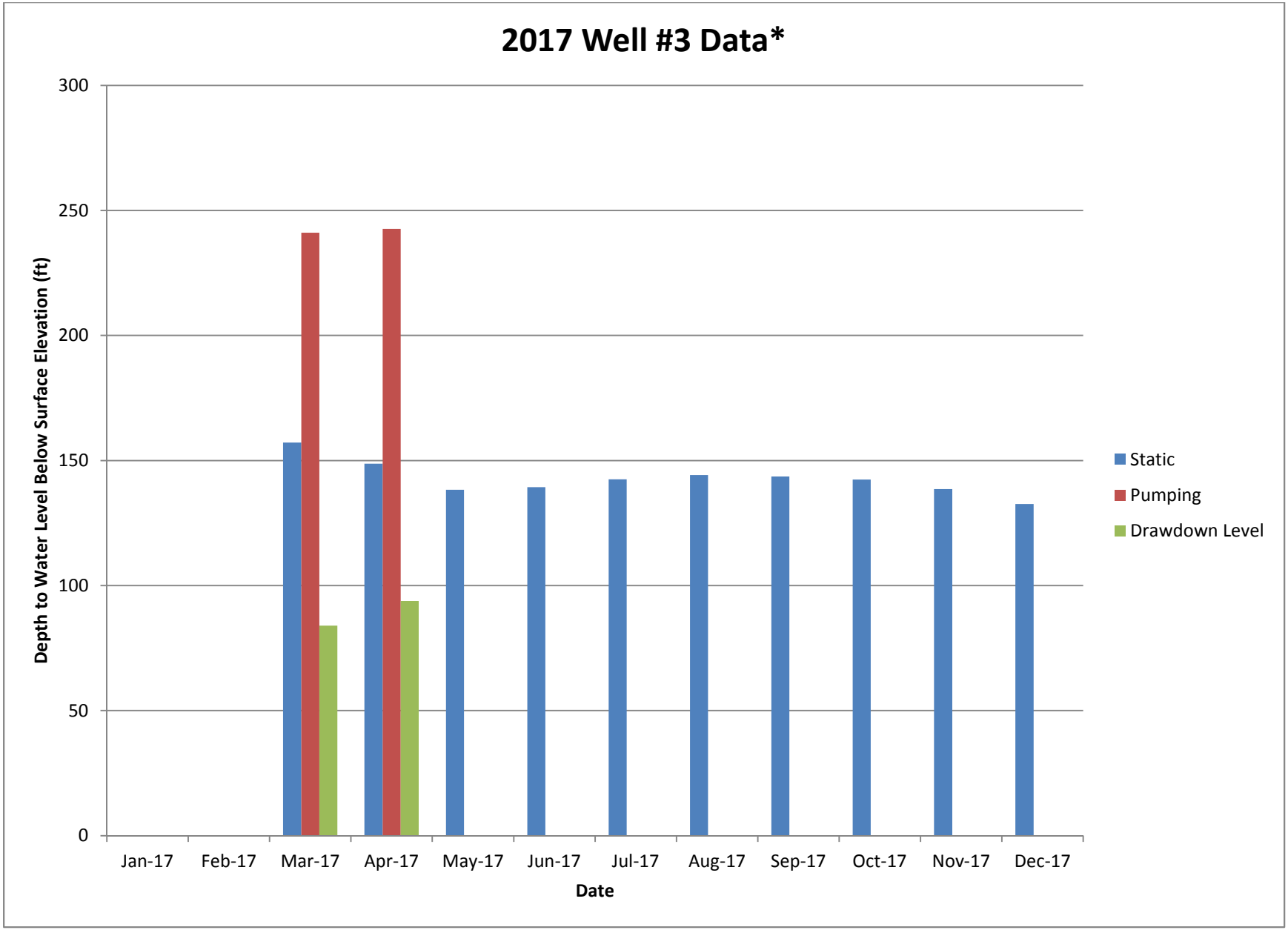
*Records for well water levels are limited and graph represents available historical data.



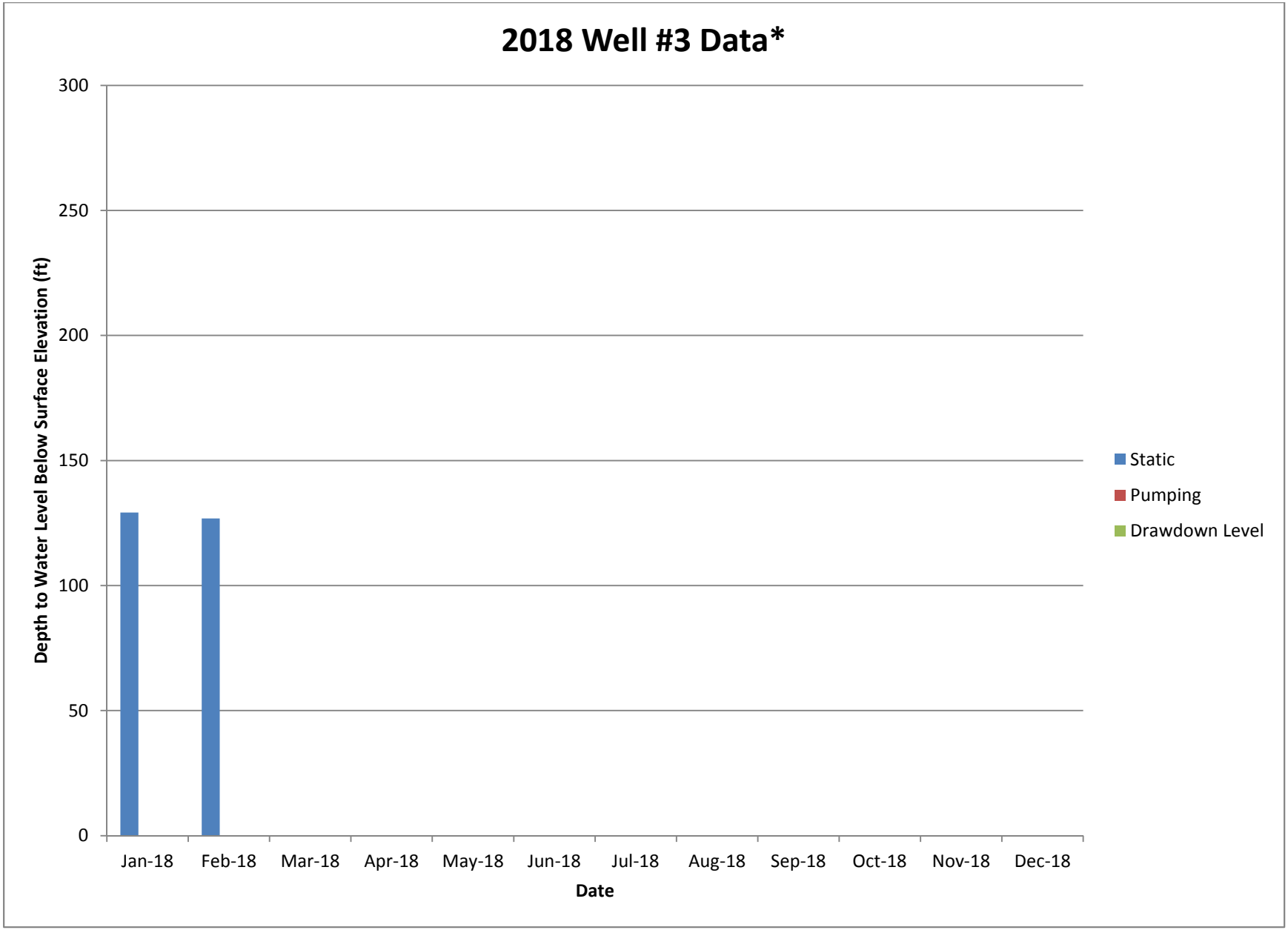
*Records for well water levels are limited and graph represents available historical data.



*Records for well water levels are limited and graph represents available historical data.



*Records for well water levels are limited and graph represents available historical data.



*Records for well water levels are limited and graph represents available historical data.

Appendix 4

Capital Improvement Plan

PROPOSED CAPITAL IMPROVEMENTS

A recommended phasing plan for infrastructure replacement was developed based on the condition assessments of the individual infrastructure groups and replacement cost estimates. The plan prioritizes replacing infrastructure in the areas that are in the worst condition and/or assume a higher level of physical or financial risk if a failure were to result. Based on the individual condition assessments, the phasing plan was largely directed by the needs of the sanitary sewer system, the water distribution system and coordination with the upcoming Hennepin County roadway improvement projects.

The proposed improvements were broken out into 8 separate projects as shown below, in Figure 14 and Appendix Table 7.

Proposed Project	Priority	Estimated Project Cost
Shoreline Drive East Utility Improvements	1/3	$1,845,944
Shoreline Drive East ADA Improvements	1/3	$400,000
West Arm Road West Improvements	2	$1,016,464
Sunset Drive Area Improvements	1	$3,699,858
Black Lake Area Improvements	3	$1,189,117
West Arm Road Central/Warren Ave Area Improvements	4	$1,205,117
Southwest Area Improvements	5	$1,154,477
Shoreline Drive West Improvements	6	$1,506,727
		$12,017,703

The Shoreline Drive East Utility Improvements should be constructed in the summer of 2018, in preparation of the Hennepin County mill and overlay project scheduled for the summer of 2019. The Shoreline Drive ADA Improvements should be constructed in the spring of 2019, in conjunction with the mill and overlay project. The Sunset Drive Improvements should be constructed one year prior to the proposed Hennepin County improvements project on Sunset Drive. The County currently has a mill and overlay planned for 2019 but we have requested that they County consider a full reconstruction of Sunset Drive, which would likely push the project out to 2022-2024 range.

In an effort to receive the most favorable bids, the recommended project schedule for individual projects is as follows (using the Shoreline Drive East Utility Improvements as an example):

- Preliminary Engineering Report (complete Fall 2017)
- Design and Construction Documents (Winter 2017/2018)
- Bid Project (March-April 2018)
- Construct (Summer 2018)

12800 Whitewater Drive, Suite 300, Minnetonka, MN 55343 | 763.476.6010
2401 46th Avenue SE, Suite 202, Mandan, ND 58554 | 701.390.4293
www.sambatek.com

N

W E

S

LEGEND

PROJECT AREA	PROJECT NAME	PRIORITY	PROPOSED IMPROVEMENT	ESTIMATED COST
	SHORELINE DRIVE EAST UTILITY IMPROVEMENTS	1/3	2018	$1,800,000
	SHORELINE DRIVE EAST ADA IMPROVEMENTS	1/3	2019	$400,000
	WEST ARM ROAD WEST IMPROVEMENTS	2	2020	$1,000,000
	SUNSET DRIVE AREA IMPROVEMENTS	1	2022	$3,700,000
	BLACK LAKE AREA IMPROVEMENTS	3	2024	$1,200,000
	WEST ARM ROAD CENTRAL/WARREN AVE AREA IMPROVEMENTS	4	2026	$1,200,000
	SOUTHWEST AREA IMPROVEMENTS	5	2028	$1,200,000
	SHORELINE DRIVE WEST IMPROVEMENTS	6	TBD	$1,500,000
				$12,000,000

LAKE MINNETONKA HARRISONS BAY

CITY OF MOUND
CITY OF SPRING PARK

CITY OF ORONO
CITY OF SPRING PARK

LAKE MINNETONKA (WEST ARM)

HENNEPIN CO. REGIONAL RAILROAD AUTHORITY

WEST ARM RD. CENTRAL

30' WEST ARM ROAD EAST

WARREN AVENUE

SHORELINE DRIVE

COUNTY ROAD NO. 15

LORD FLETCHERS APARTMENTS

LORD FLETCHERS RESTAURANT

DICKSON AVE.

COUNTY ROAD NO. 101

MAPLETON AVENUE

NORTHERN AVE.

HAZELDELL AVE.

CITY OF ORONO

6" ORONO SYSTEM

CITY OF SPRING PARK
CITY OF ORONO

GUARANTY ESCROW INC.

SDH ST. VENTURES

BLUE LAGOON PROPERTIES LLC

WEST TONKA MINI STORAGE

STATE BANK OF MOUND

CITY HALL

ARTHUR PAUL MISSEL

TONKA VENTURES

LAKEVIEW LOFTS

THE MIST NORTH

THE MIST SOUTH

SHORELINE PL.

SHORELINE PLACE

BAYVIEW PLACE

DR. OTERO PL.

SHORELINE DRIVE

THE YACHT CLUB LLC

EDGEWATER APARTMENTS

HENNEPIN CO. WATER PATROL/BOAT ACCESS

BAYVIEW APARTMENTS

RIVERVIEW ROAD

SHORELINE APARTMENTS

APARTMENT GARAGES

MARINA SHOPPING CENTER

MGM

PRESBYTERIAN NURSING HOME

PRESBYTERIAN APARTMENTS

PRESBYTERIAN HOMES

PARK HILL APARTMENTS

PARK ISLAND APARTMENTS

LAFAYETTE LANE

ROSE HILL LANE

CROOK OIL COMPANY

SETON LAKE

BLACK LAKE

LAKE MINNETONKA SPRING PARK BAY

CITY OF SPRING PARK
CITY OF MOUND

CITY OF SPRING PARK
CITY OF SHOREWOOD

NOTICE

The Geographic Information System (GIS) Data to which this notice is attached are made available pursuant to the Minnesota Government Data Practices Act (Minnesota Statutes Chapter 13). The GIS Data are provided to you "AS IS" and without any warranty as to their performance, merchantability, or fitness for any particular purposes. The GIS Data developed and/or maintained by MTKA, Inc for its own internal business purposes. MTKA, Inc. does not represent or warrant that the GIS Data or the data documentation are error-free, complete, current, or accurate. You are responsible for any consequences resulting from your use of the GIS Data or your reliance on the GIS Data. You should consult the data documentation for this particular GIS Data to determine the limitations of the GIS Data and the precision with which the GIS Data may depict distance, direction, location, or other geographic features. If you transmit or provide the GIS Data (or any portion of it) to another user, the GIS Data must include a copy of this disclaimer.

Note: Utilities are shown larger for Display purposes only.

0 250 500 1000
SCALE IN FEET

Sambatek

Client:
CITY OF SPRING PARK
4349 Warren Ave.
Spring Park, MN 55384-9711
(952) 471-9051

Project Name: ASSET MANAGEMENT PLAN

Date: 10/13/17

Sheet Title: PROJECT PRIORITY MAP

Sheet: FIGURE 14

Oct. 16 2017 02:44 pm L:\PROJECTS\20531\CAD\Xrefs\00-PriorityMap.dwg By: bhare

Table 7: Estimated Project Costs
Asset Management Plan
City of Spring Park
October 13, 2017
Sambatek # 20531

Project Name	Priority	Street/Utility	From	To	2018	2020	2022	2024	2026	2028	TBD	Total	Construction Contingency (25%)	Estimated Construction Cost	Engineering, Legal, and Administration (25%)	Total Estimated Project Cost	
Shoreline Drive East Utility Improvements	1/3	Shoreline Drive (CSAH-15)	Interlachen	Orono	$ 546,775							$ 546,775	$ 136,694	$ 683,468	$ 170,867	$ 854,335	
Shoreline Drive East Utility Improvements	1/3	Interlachen Road (CSAH-125)	Shoreline	Shorewood	$ 268,959							$ 268,959	$ 67,240	$ 336,199	$ 84,050	$ 420,249	
Shoreline Drive East Utility Improvements	1/3	Sunset Drive (CSAH-51)															
Shoreline Drive East Utility Improvements	1/3	Spring Street															
Shoreline Drive East Utility Improvements	1/3	Bayview Place	Shoreline Pl	Shoreline Dr	$ 65,124							$ 65,124	$ 16,281	$ 81,406	$ 20,351	$ 101,757	
Shoreline Drive East Utility Improvements	1/3	Shoreline Place	West End	Bayview Pl	$ 110,259							$ 110,259	$ 27,565	$ 137,824	$ 34,456	$ 172,280	
Shoreline Drive East Utility Improvements	1/3	Del Otero Ave	Bayview Pl	Cul de Sac	$ 190,287							$ 190,287	$ 47,572	$ 237,858	$ 59,465	$ 297,323	$ 1,845,944
West Arm Road West Improvements	2	W.A.R.W. D&U Easement				$ 716,348						$ 650,537	$ 162,634	$ 813,171	$ 203,293	$ 1,016,464	$ 1,016,464
Sunset Drive Area Improvements	1	Northern Avenue					$ 669,452					$ 473,073	$ 118,268	$ 591,341	$ 147,835	$ 739,176	
Sunset Drive Area Improvements	1	Mapleton Avenue					$ 251,261					$ 176,448	$ 44,112	$ 220,560	$ 55,140	$ 275,700	
Sunset Drive Area Improvements	1	Lilac Road					$ 174,969					$ 106,792	$ 26,698	$ 133,490	$ 33,373	$ 166,863	
Sunset Drive Area Improvements	1	Hazeldell Avenue					$ 139,902					$ 99,892	$ 24,973	$ 124,865	$ 31,216	$ 156,081	
Sunset Drive Area Improvements	1	Sunset Drive (CSAH-51)					$ 638,687					$ 829,195	$ 207,299	$ 1,036,494	$ 259,123	$ 1,295,617	
Sunset Drive Area Improvements	1	Park Lane					$ 343,106					$ 226,083	$ 56,521	$ 282,604	$ 70,651	$ 353,255	
Sunset Drive Area Improvements	1	Togo Road					$ 274,692					$ 184,961	$ 46,240	$ 231,201	$ 57,800	$ 289,001	
Sunset Drive Area Improvements	1	Budd Lane					$ 97,219					$ 65,001	$ 16,250	$ 81,252	$ 20,313	$ 101,565	
Sunset Drive Area Improvements	1	Dickson Ave					$ 149,756					$ 130,656	$ 32,664	$ 163,320	$ 40,830	$ 204,149	
Sunset Drive Area Improvements	1	Dickson Ave Easement					$ -					$ 54,800	$ 13,700	$ 68,500	$ 17,125	$ 85,625	
Sunset Drive Area Improvements	1	Dickson Ave Extension					$ 44,153					$ 21,008	$ 5,252	$ 26,260	$ 6,565	$ 32,825	$ 3,699,858
Black Lake Area Improvements	3	Channel Road						$ 194,631				$ 204,165	$ 51,041	$ 255,207	$ 63,802	$ 319,008	
Black Lake Area Improvements	3	Black Lake Road						$ 336,239				$ 239,400	$ 59,850	$ 299,250	$ 74,813	$ 374,063	
Black Lake Area Improvements	3	Rose Hill Lane						$ 44,625				$ 75,919	$ 18,980	$ 94,899	$ 23,725	$ 118,624	
Black Lake Area Improvements	3	Kings Road South						$ 70,961				$ 94,025	$ 23,506	$ 117,531	$ 29,383	$ 146,913	
Black Lake Area Improvements	3	Lafayette Lane						$ 231,105				$ 147,525	$ 36,881	$ 184,406	$ 46,102	$ 230,508	$ 1,189,117
West Arm Road Central/Warren Ave Area Improvements	4	Warren Avenue							$ 406,233			$ 256,177	$ 64,044	$ 320,222	$ 80,055	$ 400,277	
West Arm Road Central/Warren Ave Area Improvements	4	W.A.R. Central							$ 164,542			$ 89,311	$ 22,328	$ 111,639	$ 27,910	$ 139,548	
West Arm Road Central/Warren Ave Area Improvements	4	W.A.R.C. D&U Easement							$ -			$ 163,500	$ 40,875	$ 204,375	$ 51,094	$ 255,469	
West Arm Road Central/Warren Ave Area Improvements	4	Interlachen Road	Shoreline Dr	Warren Ave					$ 170,194			$ 109,296	$ 27,324	$ 136,620	$ 34,155	$ 170,774	
West Arm Road Central/Warren Ave Area Improvements	4	Kings Road North							$ 132,392			$ 94,968	$ 23,742	$ 118,710	$ 29,678	$ 148,388	
West Arm Road Central/Warren Ave Area Improvements	4	Patties Lane							$ 101,789			$ 58,023	$ 14,506	$ 72,529	$ 18,132	$ 90,661	$ 1,205,117
Southwest Area Improvements	5	Lafayette Lane Easement								$ -		$ 418,750	$ 104,688	$ 523,438	$ 130,859	$ 654,297	
Southwest Area Improvements	5	Presbyterian Homes WM								$ -		$ 236,655	$ 59,164	$ 295,819	$ 73,955	$ 369,774	
Southwest Area Improvements	5	Island Drive								$ -		$ 83,460	$ 20,865	$ 104,325	$ 26,081	$ 130,406	$ 1,154,477
Shoreline Drive West Improvements	6	Shoreline Drive (CSAH-125)	Mound	Black Lake Rd							$ 1,968,452	$ 964,305	$ 241,076	$ 1,205,381	$ 301,345	$ 1,506,727	$ 1,506,727

Appendix 5

Emergency Telephone List

CITY OF SPRING PARK
PUBLIC WORKS DEPARTMENT EMERGENCY PHONE NUMBERS
**Confidential Not for Public Release **

(Revised 5/3/16)

CH Garage code: 1024

City of Spring Park	Work #	Home #	Mobile #	Shop door code: 0536
DALLAS ROGLMAN	320-305-0748		320-305-0748	
Paul Dhuse	320-223-2634		320-223-2634	

Lift Stations * **Mission Communications Alarm System** 1-877-993-1911 Log In: DJ Password 6590

#1 3790 Sunset Dr.-Ld. Flect Rest		Gen. s/n J080217660 35.0 GGFD
#2 3943 Sunset Dr.-Thor Park		Gen. s/n 4822179/4 35.0 GGPA
#3 4040 Shoreline Dr.-Mist Lofts		Gen. s/n D050768435 35.0 GGFD
#4 4366 Channel Rd.-Wilkes Park	*	
#5 4402 West Arm Rd.-LF Apts		Gen. s/n H140726437 36.0
#6 4786 Shoreline Dr.-Seton Br		Gen. s/n I050826765 85.0 GGHG
Water Plant 4349 Warren Ave	*	Gen. s/n 7537336/E 150 GGLB L080226503?

- LS# 1, 2, 3, 5, 6, Water plant have perm. natural gas standby Cummins generators

Generator Service:

Cummins Service # 651-636-1000 24 Hr cust # 1337542 **Interstate Service # Jason Rice 612-328-2660 24 HR**

Lift Station Repair/Water Plant Controls

Quality Flow Systems	**Work #**	**Home #**	**Mobile #**
Steve Loebertmann	952-758-9445	763-682-4177	612-860-7840
Travis Loebertmann	"	763-238-8869	612-963-2892
Jerry Kastner (Controls)	"		952-380-6252
BJ Toeness (Controls)	"		612-868-8105

Electrical Repairs (Water Plant, City Hall, Lift Station Panels)

A-1 Electric			
Ted Grimm	952-442-5332	952-442-1850	952-200-5641
Rick Schenski			952-200-7914

Widmer Const. (Digging)	**Work #**	**Home #**	**Mobile #**
Tony Vanderlinde	952-955-5062	952-955-1477	612-581-1686
Alex Vanderlinde	"	952-955-1477	612-581-1685
Gene Luck	"		612-581-1684
John Henshal	"	952-657-2428	
Paul Kirsch	"	952-442-5291	612-205-0100

Kenny 612-532-14

Valley Rich (Digging) Water and Sewer			
Ted Olson	952-448-3002		612-839-8510
		Emergency	612-839-8502
Rich Hass	952-448-3002	952-839-8501	651-339-2751

Scott 612-839-8504

Water Leak Detection Tony Schrantz 612-600-8716

Gopher State One Call 651-454-0002 **Emergency #** 1-866-640-3637 **Spring Park ID #3564**

Korweb: User: DGoman **Password:** Super **Customer:** Spring Park

Krahl Plumbing (Water Plant, City Hall)			
Jeff Krahl			612-730-9985
PH Plumbing / Heating			
Paul Henry			612-418-1123
CenterPoint Energy	612-372-5050		**Quality Restoration/Signage (Q3)**
Emergency Dispatch	612-321-5307/5200 Days		651-224-2424
Xcel Energy			**Safety Signs**
Emergency (Govt. Only)	800-641-4400		952-469-1765
Emergency (Public Only)	800-895-1999		**United Rentals**
Century Link	800-954-1211		612-521-4200
Hennepin County Sheriff	763-525-6210 (For OPD)	**Orono Police**	952-249-4700 - 4710 (ByPass)
Hydro klean (24 Hr)	763-428-6488	Jet Vac Lift Station Pumping	Tom Lord Fletch 763-238-8282 Emer
Swedlund (24 Hr)	952-442-5855	(Lord Fletch. Rest. Grease)	
Petersons (24 Hr)	763-972-2420	Lift Station Pumping	
Sullivans (24 Hr)	952-473-4300	Lift Station Pumping	
Roto Rooter (24 Hr)	952-544-9551	Jet Truck – Rodder	

IF ANY CONTRACTOR LISTED IS UNAVAILABLE, IT IS LEFT TO THE STANDBY PERSON'S DISCRETION TO CALL ANY OTHER CONTRACTOR THEY FEEL NECESSARY.

Appendix 6

Cooperative Agreements for Emergency Services

JOINT POWERS AGREEMENT BETWEEN THE CITY OF MOUND AND THE CITY OF SPRING PARK FOR THE INTERCONNECTION OF THEIR WATER SYSTEMS

The City of Mound, Minnesota ("Mound"), and the City of Spring Park, Minnesota ("Spring Park"), under authority of Minnesota Statutes, Section 471.59, hereby conclude the following joint and cooperative agreement for the interconnection of their municipal water systems.

1. Purpose. The purpose of this agreement is to provide for the interconnections ("the Project") of the municipal water systems of Mound and Spring Park so that these Cities and their water utility users will have greater assurance of continuing water service in times of emergency.

2. Interconnections. Mound and Spring Park agree to interconnect their municipal water systems over Seton Channel as soon as possible, and they agree to provide a second interconnection, over Black Lake Channel, as soon as possible following the scheduled 1980 completion by Hennepin County of the bridge at the site, but if that bridge is not completed by January 1, 1981, the Cities agree to accomplished a suitable alternate interconnection at that site.

3. Construction. Mound shall cause the interconnections to be constructed; shall engage and compensate the engineer, Eugene A. Hickok & Associates of Wayzata, Minnesota; shall engage and compensate suitable contractor or contractors; and in general shall take such actions and incur such expenses as are reasonable and necessary to complete the interconnections.

4. Cooperation. While Mound shall be responsible pursuant to paragraph 3 of this agreement for the construction of the Project, both Cities agree to exercise those individual powers, including for example but without limitation the acquisition of easements or the application for necessary permits, if any, which may be necessary to complete the project.

5. Project Costs. Each City shall be responsible for 50% of the total Project costs, which include all acquisition, engineering, construction, and other reasonable and necessary costs. When Mound pays a Project cost, it shall submit a written itemized statement to Spring Park which shall then reimburse Mound for Spring Park's share of that cost, and vice versa.

6. Water Usage. Each interconnection shall have a valve on both sides of the connection and shall be used only in emergencies. In such event, each City's valve shall be opened by its own employees. In the case of an emergency arising from fire or natural disaster, the valves may be opened by order of the Cities' Fire Chiefs or Police Chiefs. In case of an emergency due to loss of water pressure, the use of the interconnections may be authorized by the joint approval of the City Manager of Mound and the City Administrator of Spring Park or by the joint approval of the Cities' Public Works Directors.

If water is needed for more than 24 continuous hours, it can be supplied only upon the request of one City Council and the approval of the other City Council.

7. Charges for Water Usage. The volume of any water used shall be calculated according to the length of time the valves are open, the size

of the pipe and the water pressure flow. Charges for each volume unit of water used will be based upon the average of the water rates charged by the two Cities. For example, if at the time of water usage, Mound charges 70¢ per 1,000 gallons and Spring Park charges 60¢ per 1,000 gallons, then the rate charged will be 65¢ per 1,000 gallons.

8. Maintenance. Each City will maintain the pipes and equipment within its own City limits and will be solely responsible for the cost of such maintenance. If it is impossible to identify a needed repair as being in one City or the other, the repair will be made jointly and the cost of the repair will be shared equally.

9. Indemnification. Each City agrees to indemnify the other, its officers and employees and to save and keep them harmless from all losses and expenses incurred as a result of any claim, demand, action or cause of action, including any claims based on breach of warranty, negligence or product liability, arising out of the construction, operation, maintenance or presence of the water systems interconnection. Each City further agrees to indemnify the other, its officers and employees and to save and keep them harmless for all losses and expenses incurred as a result of any claim, demand, action or cause of action, including any claims based on breach of warranty, negligence or products liability, arising out of the failure by either City for any reason to supply water service to the other.

10. Termination of Agreement. This agreement may be terminated by either City by the City Council of the City desiring termination giving three years (36 months) written notice to the City Council of the other City.

11. In the event of disassembly of the system, each City will be responsible for the disassembly and removal of the pipes and equipment within its boundaries.

IN WITNESS AND EXECUTION of this Agreement, and pursuant to authorization of their respective City Councils, the Cities of Mound and Spring Park have entered into this Agreement and have affixed their corporate seals hereto.

CITY OF MOUND

By Tim Lovaasen
Mayor

By Leonard L Kapp
City Manager

Dated: Dec. 4, 1979

(SEAL)

Res. 79-511

CITY OF SPRING PARK

By
Mayor

By Patricia A Morrison
City Administrator

Dated: Dec 19 1979

(SEAL)

AGREEMENT FOR STANDBY SERVICE

This **AGREEMENT** made and entered into by and between the **CITY OF ORONO**, a Minnesota municipal corporation, and the **CITY OF SPRING PARK**, a Minnesota municipal corporation, is made under and by virtue of Minnesota Statutes Sections 412.221 and 471.59.

WHEREAS, both parties provide and regulate sewer and water services within their respective jurisdictions;

WHEREAS, the City of Spring Park desires to contract with the City of Orono for the performance of the hereinafter specified maintenance and inspection services within the City of Spring Park, and;

WHEREAS, the City of Orono is willing to render such services on the terms and conditions hereinafter set forth.

NOW, THEREFORE, the parties agree as follows:

1. Purpose – The purpose of this Agreement is for the City of Orono to provide standby utility system maintenance and inspection services (hereinafter "Services") for Spring Park and for the City of Spring Park to pay for those Services, subject to the following terms and conditions.

2. Scope and Quality of Services – The level and quality of Services rendered to the City of Spring Park by the City of Orono shall be the same as the service rendered in the City of Orono, except as hereinafter stated. The Services shall include the investigation of the lift stations, the sewer collection system, the water distribution system, and the municipal water plant and, when there is an immediate necessity, the maintenance and repair of said lift stations, systems and the plant. The Services shall be performed by the City of Orono's Public Works Personnel or, where essential, by independent contractors of the City of Orono.

3. Administration Procedures – The purpose of this section is to clarify the responsibilities of each participant and to establish procedures for performing the Services.

    a. Responsibilities of the City of Spring Park
        i. Maintain and make available to the City of Orono all information necessary to perform the Services.
        ii. Pay to the City of Orono all amounts due hereunder in a timely fashion, together with the cost of repair parts and material supplied by Orono and the charges of independent contractors of the City of Orono.

iii. Train Orono personnel, to the extent deemed necessary by the City of Spring Park, at a time to be agreed upon by both cities. Training of persons performing Services for the City of Spring Park shall be the responsibility of the City of Spring Park, or its consultants, and regular time rates shall be paid by the City of Spring Park to the City of Orono for personnel training hours.

b. Responsibilities of the City of Orono

i. Perform all investigation and maintenance of lift stations, the sewer collection system, the water distribution system, and the municipal water plant as necessary and, subject to the requirements of this paragraph, do routine repairs or contract for repairs up to $10,000 without additional specific authority from the City of Spring Park. All such investigation and maintenance shall be performed only in response to emergency call outs, except in cases where the City of Orono determines, in the exercise of prudent judgment, that immediate maintenance or repairs are required. Non-emergency maintenance or repairs shall be deferred such that they may be performed by employees or contractors of the City of Spring Park during their regular working hours to the extent reasonable under the circumstances.

ii. Provide investigation reports, time sheets, invoices, receipts, and other information for the permanent records kept by the City of Spring Park.

iii. At the request of the City of Spring Park, and in response to emergency call out situations, investigate all work done on lift stations, the sewer collection system, the water distribution system, and the municipal water plant performed by others.

iv. The above services will be provided by the City of Orono to the City of Spring Park on an emergency call out basis as requested by the City of Spring Park for the following situations:

a. Regular standby service every other weekend alternating with the current Spring Park utility service employee (not applicable with a contractor);

b. During the vacation time of any Spring Park utility service employee or contractor (not to exceed three weeks per year);

c. During the illness of any Spring Park utility service employee or contractor (not to exceed seven consecutive days per instance);

d. During a transition period due to the retirement or replacement of any Spring Park utility service employee (not to exceed 90 days per year).

4. Administration Responsibility – Services rendered to the City of Spring Park shall be performed in a good and workmanlike manner under the direction of the City of Orono. The manner and means of performing the services are to be determined by the City of Orono, except as specifically provided to the contrary in this agreement. The City of Orono shall submit to the City of Spring Park a monthly report of services rendered and charges due in such detail as the City of Spring Park may reasonably require, as well as periodic suggestions related to the services.

5. Personnel, Employees of the City of Orono – The City of Orono shall assume all obligations with regard to the salary, workers compensation, PERA, withholding tax, health insurance, and other benefits of its employees providing Services to the City of Spring Park under this Agreement. The City of Spring Park shall not be considered or deemed to be the employer of any Orono employees providing Services under this Agreement and shall have none of the responsibilities or obligations which arise out of the employer-employee relationship with respect to personnel assigned by the City of Orono to provide Services hereunder.

6. Cooperation and Assistance – The City of Spring Park shall provide full cooperation and assistance to the City of Orono, its agents and employees in rendering of these Services.

7. Effective Date of Service – The effective date for this Agreement shall be the **28th day of June 2016** and this Agreement shall continue indefinitely until terminated as provided in paragraph 8.

8. Termination of Agreement – This Agreement shall continue in full force and effect until terminated by either party. Notice of termination may be submitted in writing by either party to the other party. If notice of termination is properly given, this Agreement shall terminate as of the date set forth in the notice, which shall not in any event be less than 60 days from the date of said notice. Any amounts due to the City of Orono shall become immediately due and payable on the date this Agreement terminates.

9. Cost to the City of Spring Park – For and in consideration of the provision of the Services, the City of Spring Park shall make payments to the City of Orono as follows:

a. Straight time rates will apply for all Services rendered between the hours of 7:00 a.m. – 3:30 p.m. Monday through Friday, excluding holidays.

Straight time rate: See Exhibit A

b. Overtime rates will apply for all Services rendered during hours other than as noted in paragraph 9(a) and 9(c).

Overtime rate: See Exhibit A

c. Holiday rates will apply for all services rendered on holidays as set forth in the then current City of Orono personnel policy manual.

Holiday rate: See Exhibit A

d. In addition to the payments required above, the City of Spring Park shall pay a charge for fixed costs. The fixed cost for standby personnel is set forth in Exhibit A.

e. The City of Orono may also charge its standard rates for equipment time for equipment used in providing the Services.

All rates are subject to annual Cost-of-Living change as approved by the Orono City Council in December for the following year, without further written agreement of the parties.

The City of Orono shall bill the City of Spring Park within 15 days after the last day of each month for which services were rendered, and the City of Spring Park shall remit payment thereon by the first day of the month following receipt of the bill.

10. Insurance – The City of Orono shall maintain workers compensation insurance as required by law and personal and public liability insurance in the amount of not less than $1,000,000 per occurrence and such insurance shall name the City of Spring Park as an additional insured. The City of Orono shall furnish the City of Spring Park with a certificate of insurance as to the policies in force. In addition, the City of Orono shall require any independent contractors providing services in the City of Spring Park to procure and maintain insurance with limits of liability not less than those provided herein and name the City of Spring Park as an additional insured.

11. Distribution of Property – Any property belonging to or acquired by any party shall remain the property of that party, until and unless ownership of the property is transferred by sale, donation, or other means memorialized in writing.

12. Indemnification – Each party shall defend and hold harmless the other party from any claims arising from any act or omission on the part of its own officers, employees, agents, contractors or representatives pursuant to this Agreement, including any attorney's fees and expenses incurred in defending any such claim. Nothing herein shall change or waive liability limits established under Minn. Stat. Ch. 466. The limits of liability for both parties may not be added together to increase the maximum statutory liability limits for any party.

13. Miscellaneous

a. Non-Discrimination. The parties are committed to the policy that all persons shall have equal access to its programs, facilities, and employment without regard to race, color, creed, religion, national origin, sex, age, marital status, or sexual orientation.
b. Data Practices. Both parties shall comply with the Minnesota Government Data Practices Act. The City of Orono shall be the Responsible Authority and Compliance Official for any requests for data arising out of this Agreement or services performed hereunder. The City of Spring Park shall immediately forward any request for data arising out of this Agreement to the City of Orono.
c. Relationship of the Parties. Nothing in this Agreement will be deemed to create an agency, employment, partnership or fiduciary relationship between the Parties. No party is the representative of another party for any purpose and no party has the power or authority to represent, act for, bind or otherwise create or assume any obligation on behalf of another party for any purpose whatsoever.
d. Applicable Laws. This Agreement shall be interpreted under and in accordance with the laws of the State of Minnesota.
e. Assignment. Neither party to this Agreement may assign its interest in the Agreement without prior written approval of the other party and subject to such conditions and provisions as the other party may deem necessary.
f. Entire Agreement. This Agreement shall constitute the entire agreement of the parties and shall supersede all oral agreements and negotiations between the parties relating to the subject matter herein.

g. Amendment. Any amendments, deletions, or waivers of the provisions of this Agreement shall be valid only when reduced to writing and signed by the parties.

h. Severability. If any term of this Agreement is found to be void or invalid, such invalidity shall not affect the remaining terms of this Agreement, which shall continue in full force and effect.

IN WITNESS WHEREOF, the parties have executed this agreement effective the date written above.

City of Orono

Date: 7/25/16

Mayor

Date: 7/25/16

City Clerk

City of Spring Park

Date: 7-18-16

Mayor

Date: 7/18/16

City Clerk

EXHIBIT A

2016 Rates for Services

Straight time rate:	Public Works Supervisor - $47.57 per hour
	Maintenance Worker - $38.74 per hour
Over-time rate:	Public Works Supervisor - $59.40 per hour
	Maintenance Worker - $46.44 per hour
Holiday rate:	Public Works Supervisor - $59.40 per hour
	Maintenance Worker - $46.44 per hour
Fixed cost charge:	$59.40 per day

Appendix 7

Municipal Critical Water Deficiency Ordinance

Sec. 34-165. - Service reservations and limitations.

The city reserves the right to limit the use of water from the city water supply and distribution system and to prescribe the conditions for any use. The city reserves the right to temporarily discontinue service to any customer without notice when necessary for repairs, and upon reasonable notice to the affected customers, shut off the water for the purpose of extending, replacing, repairing or cleaning mains and appurtenances; and the city shall not be liable for any damage arising from such work. No claim shall be made against the city on account of breakage of any service pipe or connection. The city or the utilities department shall not be liable for any damages to persons or property caused in whole or in part by the discontinuance of water service for whatever reason.

(Ord. No. 32, ch. III, § 5:02, 6-1-1964)

Sec. 34-166. - Lawn sprinkling/watering restrictions.

(a) *Determination of restrictions.* The use of the municipal water system for lawn sprinkling or watering shall be regulated as provided in this section. In the event the city administrator and/or utility superintendent determines that a water shortage exists, the city administrator and/or utility superintendent is authorized to restrict the sprinkling or watering of lawns within the city by posting a notice at city hall setting forth the restrictions. Such restrictions may include a limitation as to which days of the week, dates of the months, or hours of the day during which lawn sprinkling/watering is prohibited. In addition, the city administrator and/or utility superintendent may declare a total sprinkling/watering ban if it is determined that a water shortage of such magnitude as to threaten the public health or safety exists or will likely exist if such ban is not imposed. In the event that the water shortage occurs while supplying water to the communities of Orono or Mound, the supply of water to those communities may be discontinued per the respective agreements with those communities.

(b) *Penalties.* A person found to have violated any provision of this section shall be subject to an administrative fine in an amount to be determined by resolution of the city council and set forth in the city's official fee schedule. After the imposition of a third fine for violation of this section, any violation thereafter shall be subject to misdemeanor prosecution in addition to the imposition of an administrative fine. The violation ticket will be issued immediately.

(c) *Effective date.* This ordinance shall take effect immediately upon its passage by the city council and publication.

(Ord. No. 09-04, 4-20-2009)

Secs. 34-167—34-190. - Reserved.

DIVISION 2. - RATES AND CHARGES

Sec. 34-191. - Determination.

Rates, fees and meter deposits shall be determined by the city council and specified in the utilities department rate schedule.

(Ord. No. 32, ch. III, § 3:00, 6-1-1964)

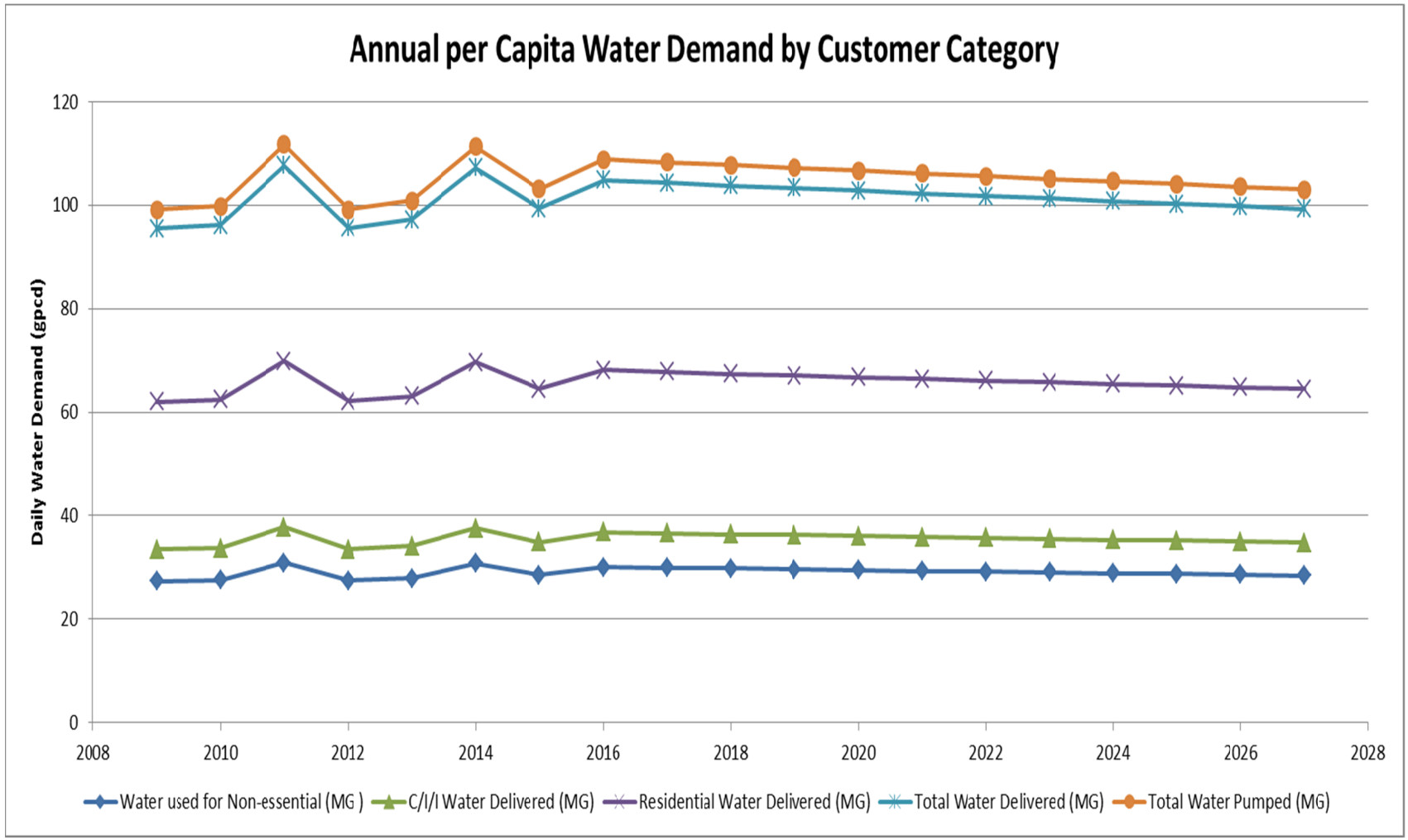
Sec. 34-192. - Charges and methods of payment.

Charges for water service shall be based upon the metered quantity of water which a property owner or occupant draws from the municipal system. The utilities superintendent shall determine the usage (quarterly) of water for each individual connection in accordance with the utilities department rate schedule, adopted by resolution of the city council. Uniform billing procedures shall be established by the administrator/clerk/treasurer.

(Ord. No. 32, ch. III, § 4:00, 6-1-1964)

Appendix 8

Graph of Ten Years of Annual Per Capita Water Demand for Each Customer Category


Annual per Capita Water Demand by Customer Category
Daily Water Demand (gpcd)
120
100
80
60
40
20
0
2008
2010
2012
2014
2016
2018
2020
2022
2024
2026
2028
Water used for Non-essential (MG)
C/I/I Water Delivered (MG)
Residential Water Delivered (MG)
Total Water Delivered (MG)
Total Water Pumped (MG)

Appendix 9

Water Rate Structure

CITY OF SPRING PARK
SPRING PARK, MINNESOTA

RESOLUTION 16-06

PUBLIC UTILITIES RATE SCHEDULE

PERMIT FEES	
Water Connection (New or Replace Existing)	50.00
Sewer Connection (New or Replace Existing)	50.00
WATER MAINTENANCE FEES	
Turn on or off	30.00
Installation or removal of meter	35.00
Replacement of frost plate	25.00
Repair of Meter/Mounting horn	40.00
Test Fee, residential per year	6.40
Test Fee, commercial per year	6.40
WATER RATES	
Minimum charge per quarter	12.00
Per 1,000 gallons	
0-8,999 gallons	2.50
9,000-17,999 gallons	3.75
18,000 + gallons	5.00
SEWER RATES	
Minimum charge per quarter	7.50
Per 1,000 gallons	3.25 City Charge
Per 1,000 gallons	2.50 Met Council charge to treat sewer
SAC (Sewer Accessibility Charge)	$2,485.00 per new unit
Equalization Connection Fee (WAC)	$3,132.00 per new unit

PENALTIES

Delinquent Bills: Bills are due 30 days after presentation, after which, if unpaid a 10% penalty will be added. A 5% penalty will also be added to an unpaid balance on the next quarter's billing statement.

Dishonored Checks: Whoever issues a check that is dishonored is liable for a $35.00 service charge.

Damage To Meters: There is a $200 minimum service charge for any repairs the City makes on water meters due to damage.

Appendix 10

Ordinances or Regulations Related to Water Use

Sec. 34-165. - Service reservations and limitations.

The city reserves the right to limit the use of water from the city water supply and distribution system and to prescribe the conditions for any use. The city reserves the right to temporarily discontinue service to any customer without notice when necessary for repairs, and upon reasonable notice to the affected customers, shut off the water for the purpose of extending, replacing, repairing or cleaning mains and appurtenances; and the city shall not be liable for any damage arising from such work. No claim shall be made against the city on account of breakage of any service pipe or connection. The city or the utilities department shall not be liable for any damages to persons or property caused in whole or in part by the discontinuance of water service for whatever reason.

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(b) *Penalties.* A person found to have violated any provision of this section shall be subject to an administrative fine in an amount to be determined by resolution of the city council and set forth in the city's official fee schedule. After the imposition of a third fine for violation of this section, any violation thereafter shall be subject to misdemeanor prosecution in addition to the imposition of an administrative fine. The violation ticket will be issued immediately.

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Charges for water service shall be based upon the metered quantity of water which a property owner or occupant draws from the municipal system. The utilities superintendent shall determine the usage (quarterly) of water for each individual connection in accordance with the utilities department rate schedule, adopted by resolution of the city council. Uniform billing procedures shall be established by the administrator/clerk/treasurer.

(Ord. No. 32, ch. III, § 4:00, 6-1-1964)

Appendix 11

Implementation Checklist

Appendix 12

Sources of Information for Table 10

2015 System Statement for the City of Spring Park (September 17, 2015)

Wellhead Protection Plan Part 2 (October 20, 2012)