SEARCH, INC.

SYSTEMS ENGINEERING & RESEARCH

Water Distribution System Study

For

Proposed

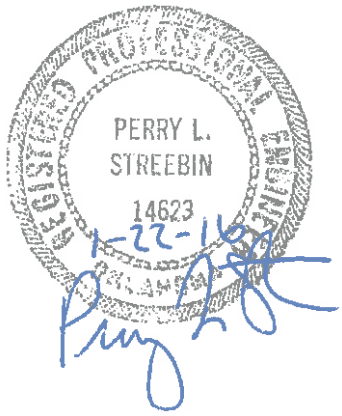
Destin Landing

760 Acre Development
Located in the

SW ¼ Sec. 10, T8N, R2W, IM
E ½ Sec. 15, T8N, R2W, IM
S. ½ Sec. 14, T8N, R2W, IM
Norman, OK

Prepared By:

Search, Inc.
6730 E. Cedar Lane
Norman, OK 73026



January 22, 2016

6730 E. Cedar Lane • Norman, Oklahoma 73026-5516
Phone (405) 364-0900 streebin@seachinc.us

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Located in the

SW ¼ Sec. 10, T8N, R2W, IM
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January 22, 2016

Table of Contents

Water Distribution Study
Proposed Destin Landing Development
in SE Norman, OK

Introduction

The purpose of this study is to determine the requirements for providing a water distribution system to serve Destin Landing, a proposed 760 acre Residential/Commercial Development located in South East Norman, Oklahoma. Specifically the development is located in the SW ¼ Sec. 10, T8N, R2W; E ½ Sec. 15, T8N, R2W; and S. ½ Sec. 14, T8N, R2W, IM, Cleveland County. For exact location see Attachment #1 – System Layout.

The development will contain single family homes, multi-family homes, service areas, parks, and commercial areas supporting the community. This development is located in an area not presently served by the City of Norman's water distribution system. This study develops a plan for obtaining water from the City of Norman's water supply system and distributing it throughout the development.

Available Water

The first step will be to determine the available water in the Norman water distribution system. The three fire hydrants closest to the Destin Landing development were tested to determine the available pressure and flow. These fire hydrants are located as follows:

1. Saxon – SW corner of Hwy 9 and John Saxon Blvd.
2. Cedar Lane – South of the intersection of Cedar Lane and Black Locust Ct.
3. 24th – ½ mile South of the intersection of Cedar Lane and 24th St. SE.

See Attachment #1 – System Layout for exact locations.

On the morning of November 13, 2015 Search, Inc. personnel, accompanied by an employee of the City of Norman Utility Division preformed Fire Hydrant Flow testing on the three hydrants. Below are the results of the tests.

Table 1 – Summary of Fire Hydrant Testing

Node	Static Pressure (psi)	Residual Pressure (psi)	Pitot Pressure (psi)	Flow (gpm)
Saxon	62	58	50	1190
Cedar Lane	56	48	46	1136
24th SE	56	49	46	1136

The second step was to install pressure recording devices on each of the three fire hydrants. After each of the fire hydrant tests, a pressure gauge/recorder was installed on each of the hydrants. The pressure recorders were left in place for one week. The graphs of the pressures are included in Attachment #3 - Water Distribution Pressure Graphs. The results of these reading are given in the following table:

Table 2 – Summary of Pressure Gauge/Recorder Readings

Hydrant	Low Pressure (psi)	Average Pressure (psi)	Maximum Pressure (psi)	%Time below 50 psi
Saxon	52	54	70	0
Cedar Lane	49	57	67.5	2.5
24th SE	47	54	65	8.1

The information in Table 1 and 2 will be used in the KYPipe model of the water distribution system.

Water Requirements

The average daily water requirements for the entire area is based on the Land Uses provided by the Developer in the Master Plan (Attachment #4 – Land Use Map). The average daily water flows were calculated using the area of each land use in the basin, density of housing units and the average number of residents in each unit. The areas of each land use are given on the Master Plan.

As an example, the average water usage for Area #1 in Sec. 10 would be calculated as follows. Area #1 is 36.5 acres of Single Family – High Density homes. Reference data and experience tells us that the Unit Density is 5 units/ac and that an average of 3.0 people live in each home. The Oklahoma Department of Environmental Qualities' regulations dictate that all water distribution and storage systems will be designed based on a water usage of 100 gallons/capita/day (gpcpd). The average daily water usage for this one area would be 36.5 ac x 5 units/ac x 3.0 people per home x 100 gpcpd = 54,750 gpd or 38.02 gpm.

For the purposes of this study the "peak seasonal" usage must be established. The City of Norman's Utility Department has established a peaking factor of 1.73 to convert Average Daily Usages to Peak Daily Usages. They have also established a peaking factor of 1.9 for seasonally adjusted values. This factor takes Average Daily Usage and converts them to Peak Average Daily Usage during the summer months. To calculate the Peak Average Daily Usage during the summer months the Average Daily Usage must be multiplied by both peaking factors. The Peak Seasonal water usage for

this area would be 38.02 gpm x 1.73 x 1.9 = 12.97 gpm or 125 gpm. These calculations for each area are summarized in Attachment #5 – Calculations for Water Demands.

After the development is fully constructed the estimated average daily water usage will be 896,200 gpd. The peak seasonal water usage will be 2,045 gpm, with a Fire Flow of 1,500 gpm, for a total peak usage of 3,545 gpm.

Existing System

There are no existing water distribution or storage systems on the proposed 760-acre development. The three closest points of supply from the City of Norman's collection are the three fire hydrant locations described under Available Water. All of the water used in this development will be supplied at these three locations.

Project Description

The City of Norman requires developers to install a minimum of a 12-inch water distribution lines along the section line roads throughout the development. These main trunk lines will be used for all development in the area. In the final designs there will be arterial and feeder lines running along secondary and residential roads. This study is focused on the main trunk lines.

Destin Landing is a long term project that will be completed over several years. The water distribution system must be flexible and constructed in steps to allow for an economical project. The purpose of this study is twofold. The first is to determine the most cost effective system for suppling to and distributing water throughout the development. The second is to determine a stepped approach and the areas that can be served in each step.

Modeling

Source

The source of water for this project will be the City of Norman's water distribution system. The Destin Landing water system will be connected to the City's system at three locations. Each of these locations are described under Available Water above.

To model the water available at each location, Fire Hydrant Flow tests were performed. This information was used to develop a system curve for each hydrant. The system curve gives a relationship between the pressure and flow at the point where the hydrant is connected into the distribution system.

We used the two points measured during the fire hydrant flow test and the Hazen-William's equation to develop the system curve. The two points are, static pressure and zero flow, and residual pressure and the hydrant flow. These two points are entered into the Hazen-William's equation, the constants were determined and new points on the system curve were developed. The summary of the System Curves for the three fire hydrants is included in Attachment #2 – Fire Hydrant Flow Model. This information will be used in the model for the water distribution system.

Usage

The water usage for the development has been calculated under Water Requirements above. These usages were grouped into subareas and entered into the model. The subareas and input nodes are show on Attachment #4 – Land Use Map. The sub-totaled water usages and the input nodes are shown on Attachment #5 – Calculations for Water Demands.

Distribution System Modeling

The program KYPipe 2016, was used for modeling the water distribution system. Five different models were run. Below is a description and a summary of findings for each:

A. Cedar Lane connection only with no stand pipe. This model assumes the construction of a 14" water line from ½ mile west of 36th Ave. SE on Cedar Lane to 36th Ave. SE. The purpose is to determine how much of the Development can be served with just this one water line.

   Findings:
   This section of distribution system can supply a fire flow of 1,500 gpm and a domestic flow of 325 gpm. Any higher domestic flows and the pressure in the system will drop below the minimum 25 psi required by the Oklahoma Department of Water Quality. This 325 gpm will serve approximately 475 homes in this area.

   There is one area not hatched in red that is too high in elevation and homes built in that area will not have the minimum required water pressure. Construction in this area will have to wait until additional trunk lines are constructed.

The pressures and flows in the proposed water system are shown in Attachment #6 – Water Distribution Modeling – KYPipe 2016 Output, A and C. The section of the water distribution system that can be served is shown in red on Attachment 7 – Service Area Maps, Exhibit A.

B. Cedar Lane and Saxon connections only with no stand pipe. This model assumes the construction of a 14" water line from ½ mile west of 36th Ave. SE on Cedar Lane to 36th Ave. SE, north on 36th Ave. SE ½ miles and East to the existing 12" water line running along the west side of John Saxon Blvd. The purpose is to determine how much of the Development can be served with just this one water line loop.

Findings:
With the addition of the Saxon connection and the 14" water line loop there is no longer a restriction on construction. The entire service area can be developed.

The pressures and flows in the proposed water system are shown in Attachment #6 – Water Distribution Modeling – KYPipe 2016 Output, B. The section of the water distribution system that can be served is shown in red on Attachment E – Service Area Maps, Exhibit B.

C. 24th Ave. SE connection only with no stand pipe. This model assumes the construction of a 12" water line from ½ mile south of Cedar Lane on 24th Ave. SE south to Post Oak, east to the west edge of the development. Then a 14" line from there to the east edge of the development. The purpose is to determine how much of the Development can be served with just this one water line.

Findings:
The entire service area can be developed.

The pressures and flows in the proposed water system are shown in Attachment #6 – Water Distribution Modeling – KYPipe 2016 Output, A and C. The section of the water distribution system that can be served is shown in red on Attachment E – Service Area Maps, Exhibit C.

D. Saxon, Cedar Lane, and 24th Ave. SE connections with no stand pipe. This model assumes the construction of a 14" water line from ½ mile west of 36th Ave. SE on Cedar Lane to 36th Ave. SE, on 36th Street SE from ½ mile south of Hwy 9 to Post Oak and from 24th Ave. SE. to just west of 48th Ave. SE. The

purpose is to determine how much of the Development can be served with all the trunk water lines installed, but still no Standpipe.

Findings:
With all the trunk water lines installed and connected into all three connections the entire service area can be developed, however the area not hatched in red will have marginal service. Due to the varying pressures measured in the City of Norman's water distribution system it is recommended that construction in these areas be postponed until improvements in the distribution system can be made.

The pressures and flows in the proposed water system is shown in Attachment #6 – Water Distribution Modeling – KYPipe 2016 Output, D. The section of the water distribution system that can be served is shown in red on Attachment E – Service Area Maps, Exhibit D.

E. Cedar Lane connection with stand pipe. This model assumes the construction of a 14" water line from ½ mile west of 36th Ave. SE on Cedar Lane to 36th Ave. SE, on 36th Street SE from ½ mile south of Hwy 9 to Post Oak and from ½ mile west of 36th Ave. SE to just west of 48th Ave. SE. The purpose is to determine how much of the Development can be served with all the trunk water lines installed, only the Cedar Lane connection, and a 30' x 115' standpipe.

Findings:
With all the trunk water lines installed and connected into only the Cedar Lane connection the entire service area can be developed. There are no areas of marginal service.

The pressures and flows in the proposed water system is shown in Attachment #6 – Water Distribution Modeling – KYPipe 2016 Output, E. The section of the water distribution system that can be served is shown in red on Attachment E – Service Area Maps, Exhibit E.

Conclusions and Recommendations

1. The City of Norman has sufficient water volume and pressure to serve the Destin Landing development.

2. The pressures measured in the City of Norman's water distribution system vary as much as 15 psi. These variations can be controlled with modifications to the control system and replacement of the water storage tank located at Lindsey St. and Porter Ave.

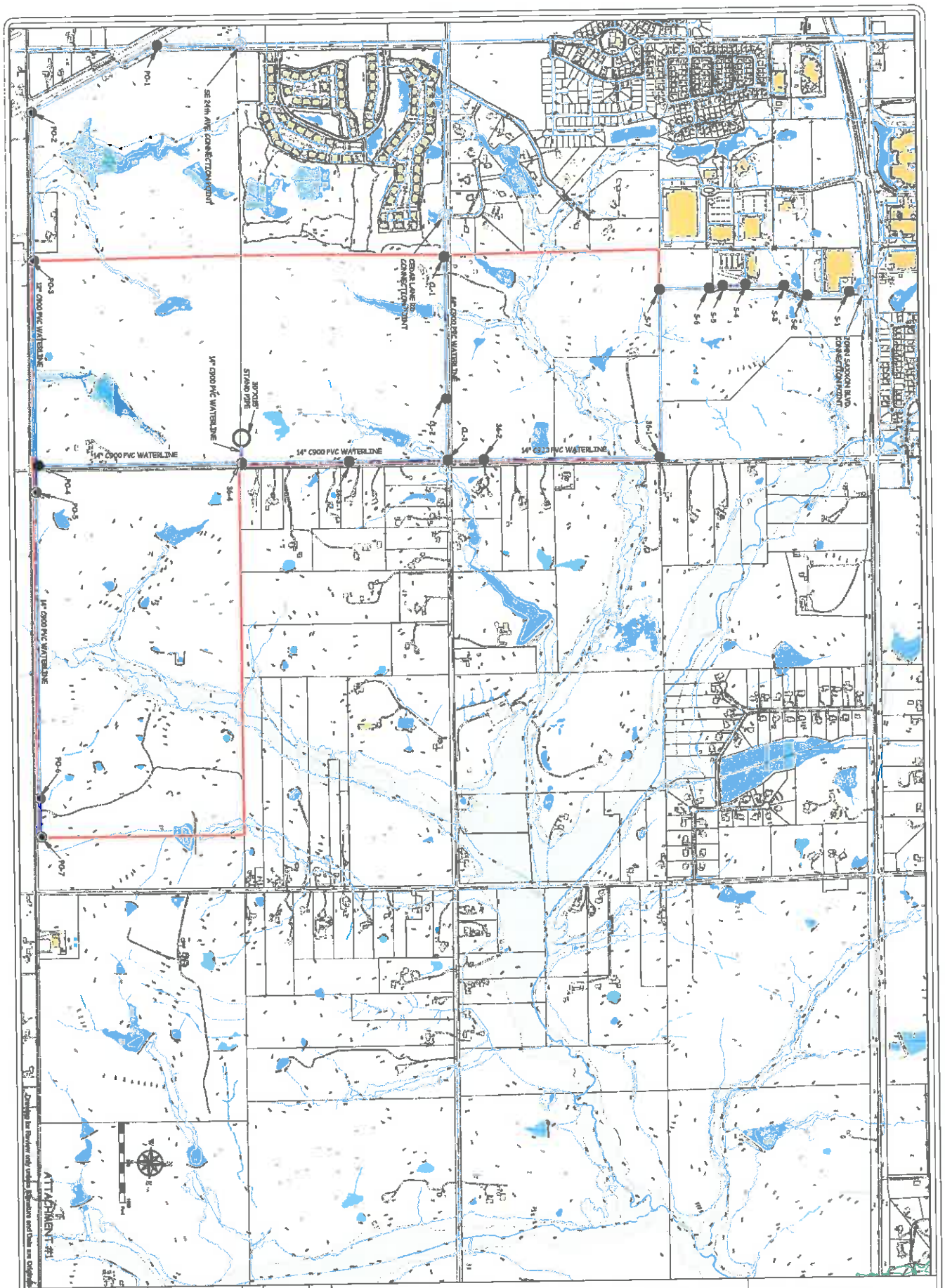
If the variation in pressure were controlled, the areas in the Destin Landing Development that are marginal now, would have sufficient water pressure to allow construction without the construction of a standpipe.

3. This is a preliminary study using available information. The pressure and volume of water available for Destin Landing will change with every improvement made to the City of Norman's water distribution system. Each phase of development should be reviewed separately when final plans are submitted.

4. This study is based on only the trunk lines. The addition of secondary lines and residential lines will only improve the water flow through the system reducing friction and increasing pressures.

Attachment #1

System Layout Map / Destin Landing



ATTACHMENT #1

Drawings for Review only unless Signature and Date are Originals

SHEET 1 OF 1

DESIGNED:	P. Streeter
DRAWN:	L. Brewer
APPROVED:	P. Streeter
DATE:	11/04/2015

REV.	DATE	NAME

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SYSTEM LAYOUT

DESTIN LANDING

NORMAN, CLEVELAND CO., OK

Attachment #2

Fire Hydrant Flow Modeling

Fire Hydrant Flow Model

System Curve
Saxon Fire Hydrant
Norman, Oklahoma

Nominal Pipe Size	12		
ID (in.)	11.734	Suction Head	0
OD (in.)	13.2	Discharge Head	0
SDR	16.01	Other	0
Area (ft^2)	0.75	Static Head (psi)	62
Increment	200.00		

Flow (gpm)	Flow (ft^3/s)	Velocity (ft/s)	Velocity Head (ft)	Friction Loss (ft/100ft.)	Total Friction Loss (ft/100ft.)	Minor Losses (ft)	Dynamic Head (ft)	Dynamic Head (psi)	Residual Head (psi)
0									62.0
100.00	0.2228	0.297	0.001	0.000	0.08	0.01	0.1	0.0	62.0
300.00	0.6684	0.890	0.012	0.004	0.63	0.07	0.7	0.3	61.7
500.00	1.1141	1.484	0.034	0.009	1.62	0.21	1.8	0.8	61.2
700.00	1.5597	2.077	0.067	0.018	3.02	0.40	3.4	1.5	60.5
900.00	2.0053	2.670	0.111	0.028	4.82	0.66	5.5	2.4	59.6
1100.00	2.4510	3.264	0.165	0.041	6.98	0.99	8.0	3.5	58.5
1190.00	2.6515	3.531	0.194	0.047	8.08	1.16	9.2	4.0	58.0
1300.00	2.8966	3.857	0.231	0.055	9.52	1.39	10.9	4.7	57.3
1500.00	3.3422	4.451	0.308	0.072	12.40	1.85	14.2	6.2	55.8
1700.00	3.7879	5.044	0.395	0.091	15.64	2.37	18.0	7.8	54.2
1900.00	4.2335	5.637	0.493	0.112	19.22	2.96	22.2	9.6	52.4
2100.00	4.6791	6.231	0.603	0.135	23.13	3.62	26.7	11.6	50.4
2300.00	5.1248	6.824	0.723	0.160	27.37	4.34	31.7	13.7	48.3
2500.00	5.5704	7.418	0.854	0.186	31.94	5.13	37.1	16.0	46.0
2700.00	6.0160	8.011	0.997	0.215	36.84	5.98	42.8	18.5	43.5
2900.00	6.4617	8.604	1.150	0.245	42.05	6.90	48.9	21.2	40.8
3100.00	6.9073	9.198	1.314	0.277	47.57	7.88	55.5	24.0	38.0
3300.00	7.3529	9.791	1.489	0.311	53.41	8.93	62.3	27.0	35.0
3500.00	7.7986	10.385	1.675	0.347	59.56	10.05	69.6	30.1	31.9
3700.00	8.2442	10.978	1.871	0.385	66.02	11.23	77.2	33.4	28.6
3905.26	8.7015	11.587	2.085	0.425	72.96	12.51	85.5	37.0	25.0

Fire Hydrant Flow Model

System Curve
Cedar Lane and Black Locus
Norman, Oklahoma

Nominal Pipe Size	12		
ID (in.)	11.734	Suction Head	0
OD (in.)	13.2	Discharge Head	0
SDR	16.01	Other	0
Area (ft^2)	0.75	Static Head (psi)	56
Increment	200.00		

Flow (gpm)	Flow (ft^3/s)	Velocity (ft/s)	Velocity Head (ft)	Friction Loss (ft/100ft.)	Total Friction Loss (ft/100ft.)	Minor Losses (ft)	Dynamic Head (ft)	Dynamic Head (psi)	Residual Head (psi)
0									56.0
100.00	0.2228	0.297	0.001	0.001	0.19	0.01	0.2	0.1	55.9
300.00	0.6684	0.890	0.012	0.009	1.48	0.07	1.6	0.7	55.3
500.00	1.1141	1.484	0.034	0.022	3.81	0.21	4.0	1.7	54.3
700.00	1.5597	2.077	0.067	0.041	7.11	0.40	7.5	3.3	52.7
900.00	2.0053	2.670	0.111	0.066	11.32	0.66	12.0	5.2	50.8
1100.00	2.4510	3.264	0.165	0.096	16.41	0.99	17.4	7.5	48.5
1136.00	2.5312	3.371	0.176	0.102	17.42	1.06	18.5	8.0	48.0
1300.00	2.8966	3.857	0.231	0.130	22.36	1.39	23.7	10.3	45.7
1500.00	3.3422	4.451	0.308	0.170	29.15	1.85	31.0	13.4	42.6
1700.00	3.7879	5.044	0.395	0.214	36.75	2.37	39.1	16.9	39.1
1900.00	4.2335	5.637	0.493	0.263	45.16	2.96	48.1	20.8	35.2
2100.00	4.6791	6.231	0.603	0.317	54.36	3.62	58.0	25.1	30.9
2300.00	5.1248	6.824	0.723	0.375	64.33	4.34	68.7	29.7	26.3
2352.44	5.2416	6.980	0.756	0.391	67.07	4.54	71.6	31.0	25.0
2500.00	5.5704	7.418	0.854	0.437	75.07	5.13	80.2	34.7	21.3
2700.00	6.0160	8.011	0.997	0.504	86.57	5.98	92.5	40.1	15.9
2900.00	6.4617	8.604	1.150	0.576	98.82	6.90	105.7	45.8	10.2
3100.00	6.9073	9.198	1.314	0.652	111.81	7.88	119.7	51.8	4.2
3300.00	7.3529	9.791	1.489	0.732	125.53	8.93	134.5	58.2	-2.2
3500.00	7.7986	10.385	1.675	0.816	139.98	10.05	150.0	64.9	-8.9
3700.00	8.2442	10.978	1.871	0.904	155.15	11.23	166.4	72.0	-16.0

Fire Hydrant Flow Model

System Curve
24th Street SE
Norman, Oklahoma

Nominal Pipe Size	12		
ID (in.)	11.734	Suction Head	0
OD (in.)	13.2	Discharge Head	0
SDR	16.01	Other	0
Area (ft^2)	0.75	Static Head (psi)	56
Increment	200.00		

Flow (gpm)	Flow (ft^3/s)	Velocity (ft/s)	Velocity Head (ft)	Friction Loss (ft/100ft.)	Total Friction Loss (ft/100ft.)	Minor Losses (ft)	Dynamic Head (ft)	Dynamic Head (psi)	Residual Head (psi)
0									56.0
100.00	0.2228	0.297	0.001	0.001	0.17	0.01	0.2	0.1	55.9
300.00	0.6684	0.890	0.012	0.007	1.28	0.07	1.4	0.6	55.4
500.00	1.1141	1.484	0.034	0.019	3.31	0.21	3.5	1.5	54.5
700.00	1.5597	2.077	0.067	0.036	6.16	0.40	6.6	2.8	53.2
900.00	2.0053	2.670	0.111	0.057	9.82	0.66	10.5	4.5	51.5
1100.00	2.4510	3.264	0.165	0.083	14.24	0.99	15.2	6.6	49.4
1136.00	2.5312	3.371	0.176	0.088	15.11	1.06	16.2	7.0	49.0
1300.00	2.8966	3.857	0.231	0.113	19.40	1.39	20.8	9.0	47.0
1500.00	3.3422	4.451	0.308	0.147	25.28	1.85	27.1	11.7	44.3
1700.00	3.7879	5.044	0.395	0.186	31.88	2.37	34.3	14.8	41.2
1900.00	4.2335	5.637	0.493	0.228	39.17	2.96	42.1	18.2	37.8
2100.00	4.6791	6.231	0.603	0.275	47.15	3.62	50.8	22.0	34.0
2300.00	5.1248	6.824	0.723	0.325	55.80	4.34	60.1	26.0	30.0
2500.00	5.5704	7.418	0.854	0.379	65.12	5.13	70.2	30.4	25.6
2526.03	5.6284	7.495	0.872	0.387	66.38	5.23	71.6	31.0	25.0
2726.03	6.0740	8.088	1.016	0.445	76.44	6.10	82.5	35.7	20.3
2926.03	6.5197	8.682	1.170	0.508	87.14	7.02	94.2	40.8	15.2
3126.03	6.9653	9.275	1.336	0.574	98.49	8.02	106.5	46.1	9.9
3326.03	7.4109	9.869	1.512	0.644	110.48	9.07	119.6	51.8	4.2
3526.03	7.8566	10.462	1.700	0.717	123.10	10.20	133.3	57.7	-1.7
3726.03	8.3022	11.055	1.898	0.795	136.34	11.39	147.7	64.0	-8.0

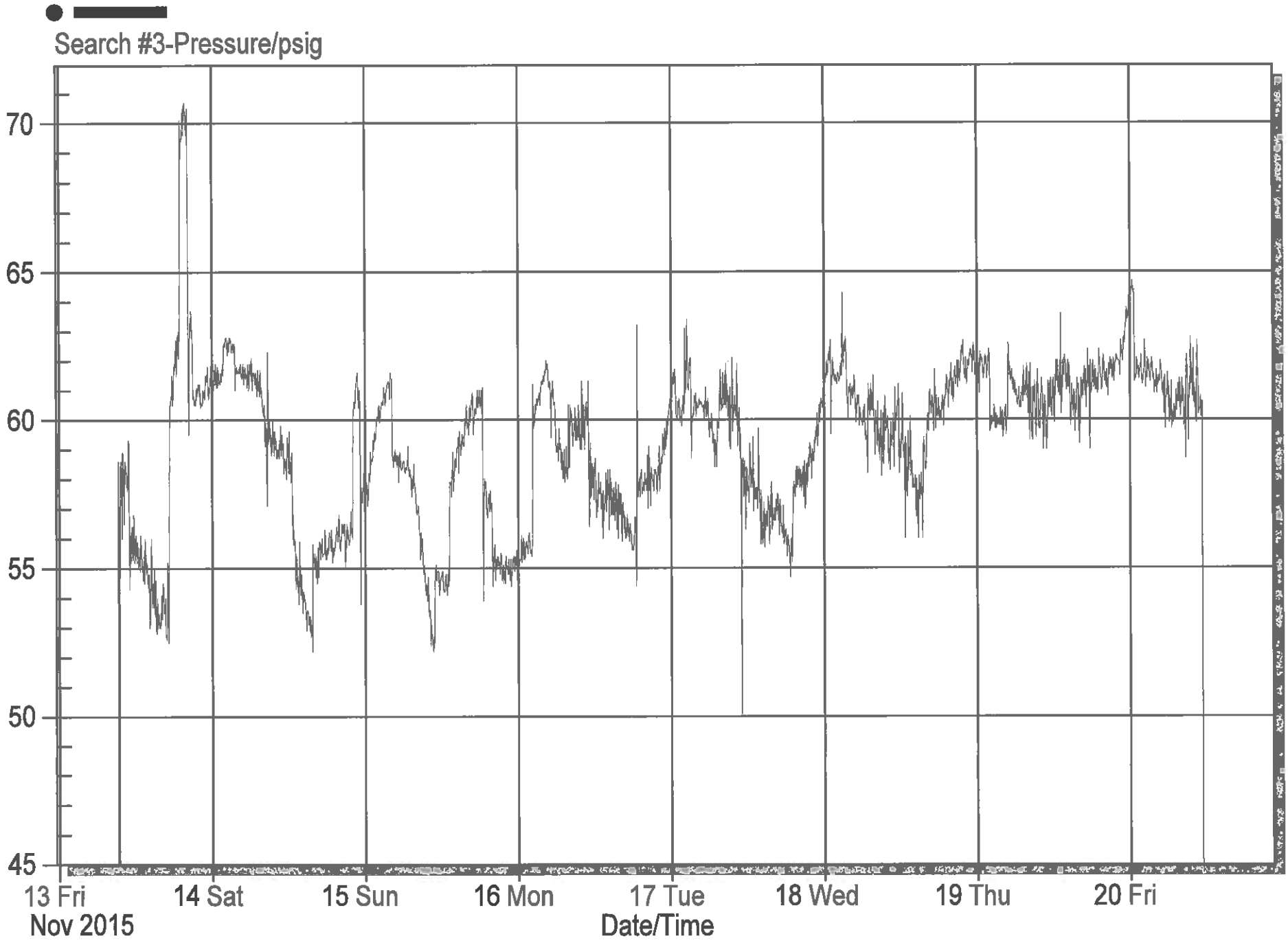
Attachment #3

Water Distribution Pressure Graphs

(Friday November 13 to Friday November 20, 2015)

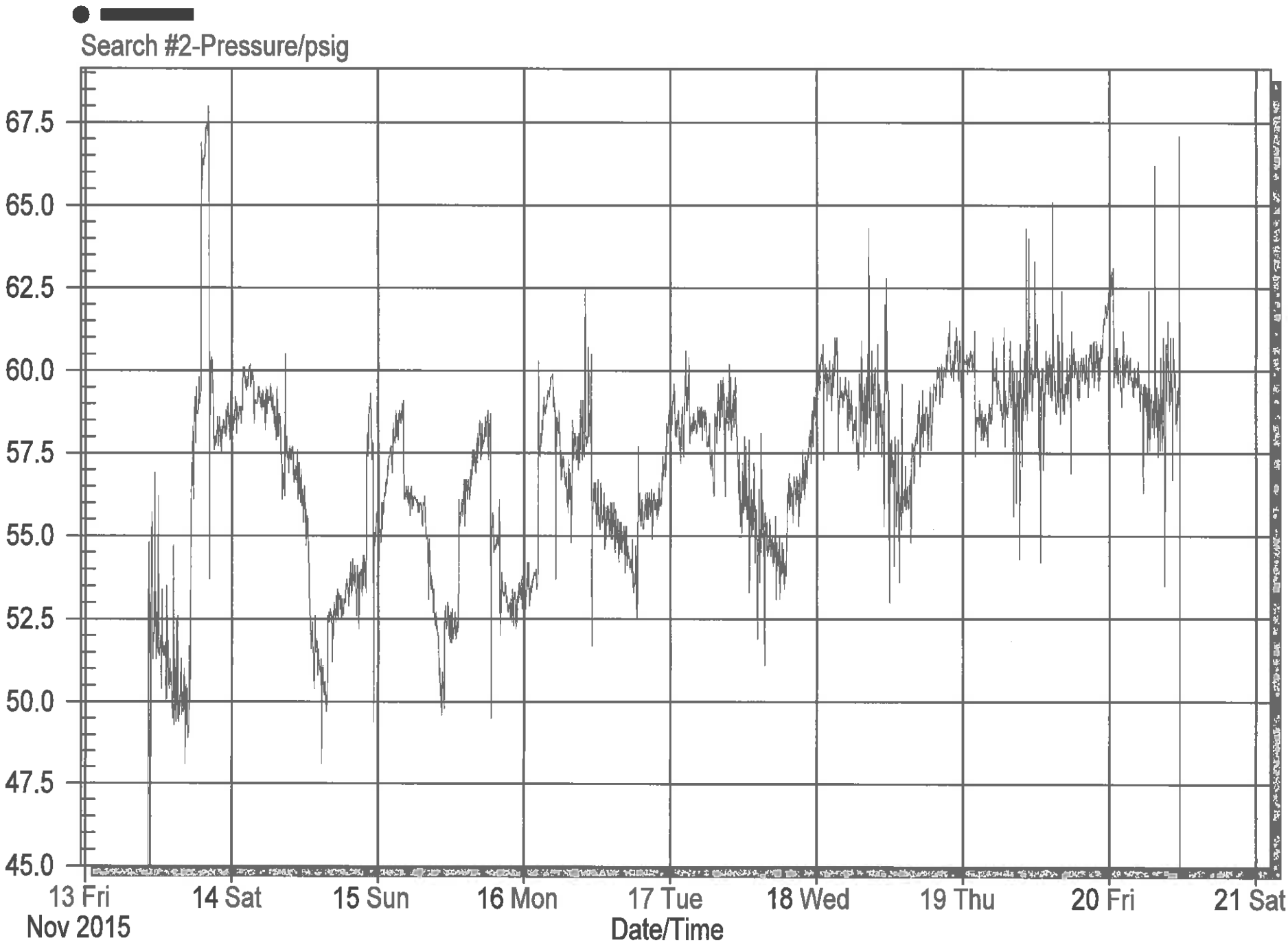
Friday November 13 - Friday, November 20, 2015

John Saxon Blvd. - Attachment 3-A



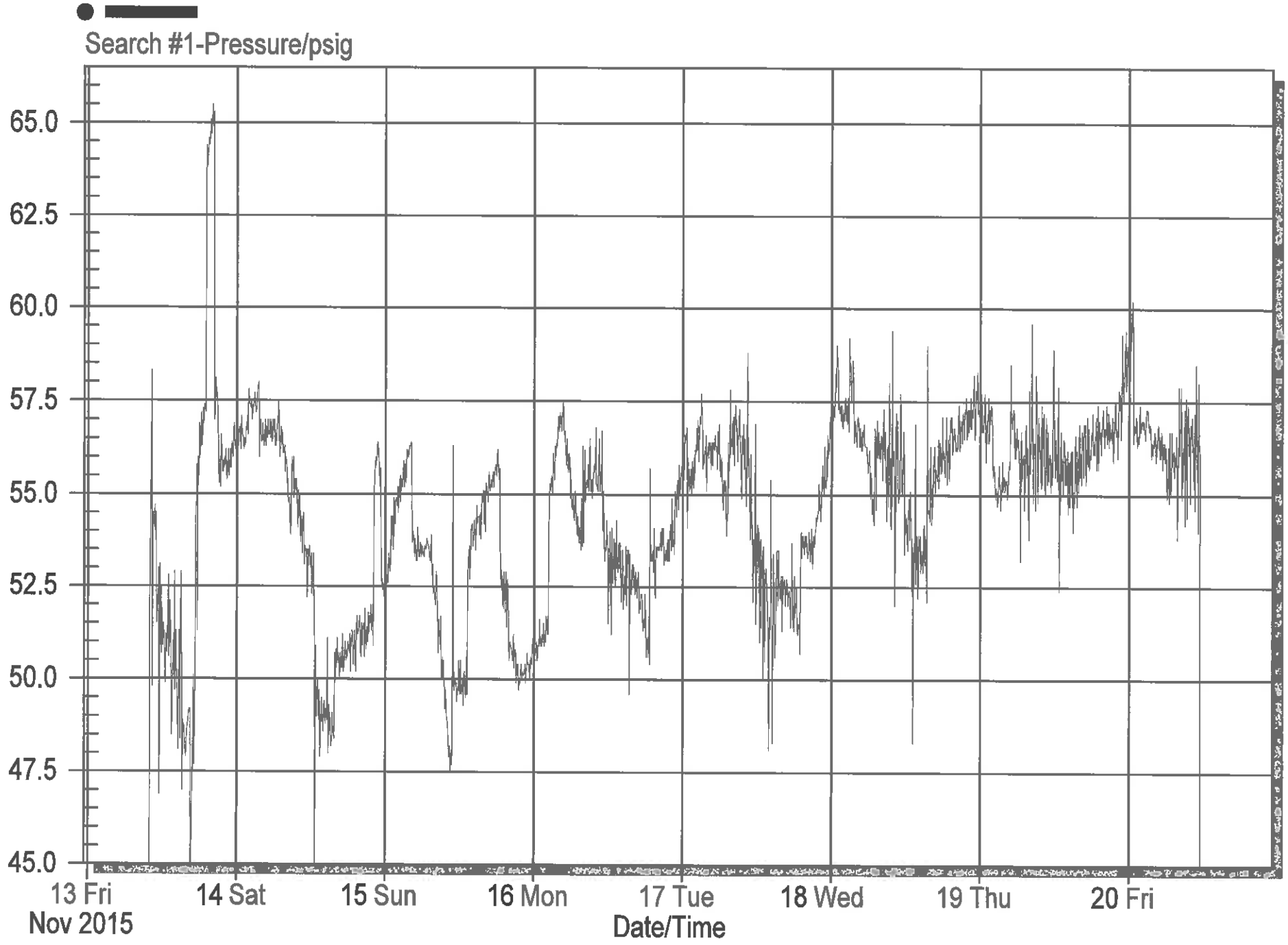
Friday, November 13th - Friday, November 20th

36th Avenue - ATTACHMENT 3-B



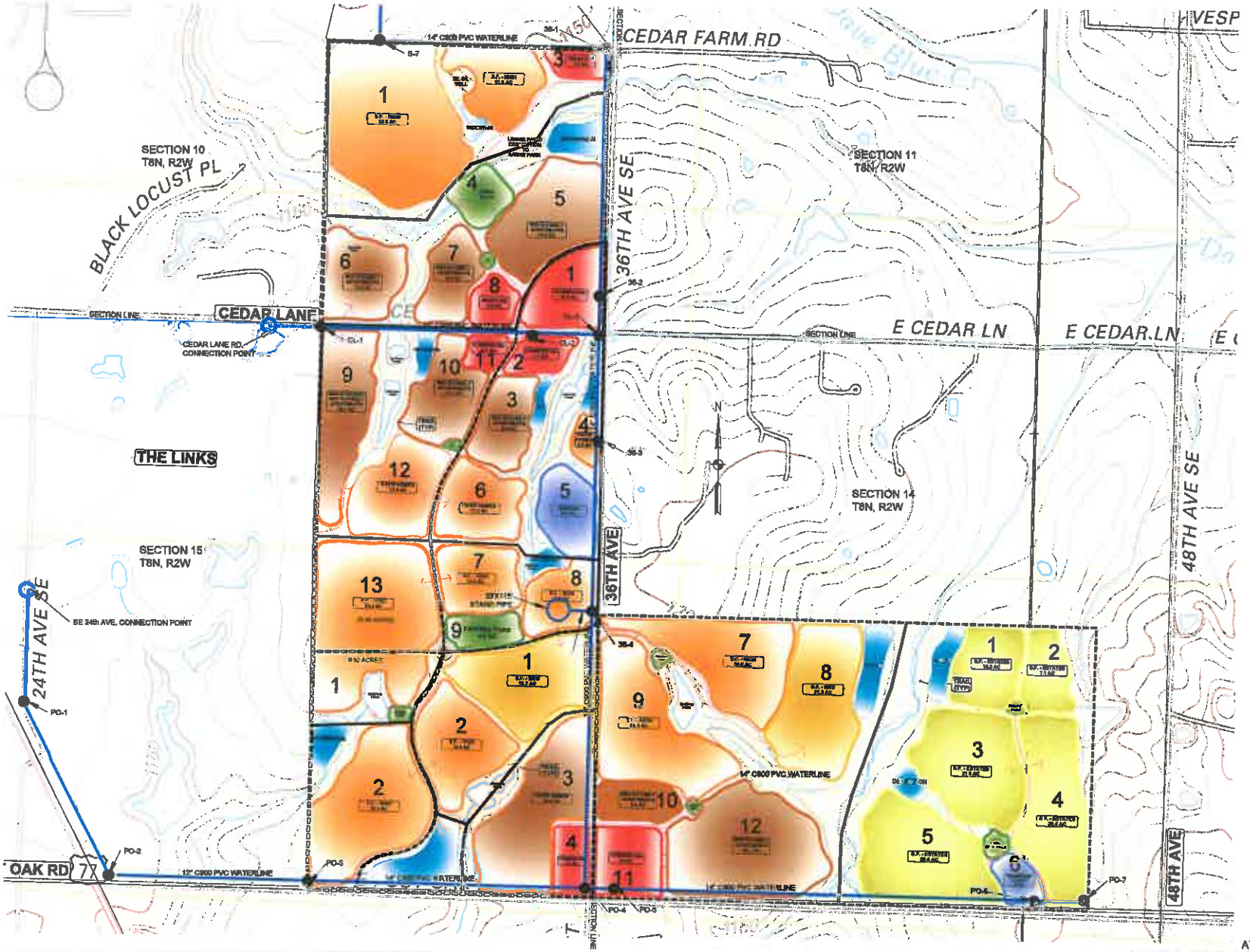
Friday, November 13th - Friday, November 20th

24th Avenue - ATTACHMENT 3-C



Attachment #4

Land Usage Map / Destin Landing



ATTACHMENT #4

WASTEWATER COLLECTION SYSTEM STUDY
Land Usage Map
S.E. Development - Norman, Oklahoma

SHEET 1 OF 1

Attachment #5

Calculations for Water Demands

Drainage Basin #	Equestrian Facility	Service	Commerical / Mixed Use	Open Space	Multi-Family	Single Family Estate	Single Family Low	Single Family Med	Single Family High	Patio Homes	Total
Dwelling Density (units/acre)		13			15	1	3	4	5	6	
Dwelling Population (people/dwelling)		1.5			2.5	3	3	3	3	2.5	
PE/ac	5	19.5	10	0.5	37.5	3	9	12	15	15	
Flow per Acre (gpapd)	500	1950	1000	50	3750	300	900	1200	1500	1500	
Sec. 14 - 1	0.0	0.0	0.0	0.0	0.0	10.3	0.0	0.0	0.0	0.0	10.3
Sec. 14 - 2	0.0	0.0	0.0	0.0	0.0	7.1	0.0	0.0	0.0	0.0	7.1
Sec. 14 - 3	0.0	0.0	0.0	0.0	0.0	21.0	0.0	0.0	0.0	0.0	21.0
Sec. 14 - 4	0.0	0.0	0.0	0.0	0.0	20.4	0.0	0.0	0.0	0.0	20.4
Sec. 14 - 5	0.0	0.0	0.0	0.0	0.0	22.6	0.0	0.0	0.0	0.0	22.6
Sec. 14 - 6	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.8
Sec. 14 - 7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.5	0.0	20.5
Sec. 14 - 8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	21.3	0.0	0.0	21.3
Sec. 14 - 9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24.0	0.0	24.0
Sec. 14 - 10	0.0	0.0	0.0	0.0	5.8	0.0	0.0	0.0	0.0	0.0	5.8
Sec. 14 - 11	0.0	0.0	10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0
Sec. 14 - 12	0.0	0.0	0.0	0.0	28.7	0.0	0.0	0.0	0.0	0.0	28.7
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	3.8	0.0	10.0	0.0	34.5	81.4	0.0	21.3	44.5	0.0	195.5

Basin Area PE (# of People)

Drainage Basin #	Equestrian Facility	Service	Commerical / Mixed Use	Open Space	Multi-Family	Single Family Estate	Single Family Low	Single Family Med	Single Family High	Patio Homes High	PE per Basin
Sec. 14 - 1	0	0	0	0	0	31	0	0	0	0	31
Sec. 14 - 2	0	0	0	0	0	21	0	0	0	0	21
Sec. 14 - 3	0	0	0	0	0	63	0	0	0	0	63
Sec. 14 - 4	0	0	0	0	0	61	0	0	0	0	61
Sec. 14 - 5	0	0	0	0	0	68	0	0	0	0	68
Sec. 14 - 6	19	0	0	0	0	0	0	0	0	0	19
Sec. 14 - 7	0	0	0	0	0	0	0	0	308	0	308
Sec. 14 - 8	0	0	0	0	0	0	0	256	0	0	256
Sec. 14 - 9	0	0	0	0	0	0	0	0	360	0	360
Sec. 14 - 10	0	0	0	0	218	0	0	0	0	0	218
Sec. 14 - 11	0	0	100	0	0	0	0	0	0	0	100
Sec. 14 - 12	0	0	0	0	1,076	0	0	0	0	0	1,076
0	0	0	0	0	0	0	0	0	0	0	0
Total	19	0	100	0	1,294	244	0	256	668	0	2,580

Flow (gpcpd)	100	Average Flow to Peak Flow Daily	1.73	Seasonal Flow Peaking Factor	1.9

Basin Area Flow (gpm)

Drainage Basin #	Equestrian Facility	Service	Commerical / Mixed Use	Open Space	Multi-Family	Single Family Estate	Single Family Low	Single Family Med	Single Family High	Patio Homes High	Flow per Basin (gpm)	Flow at Node (gpm)	Node
Sec. 14 - 1	0.0	0.0	0.0	0.0	0.0	10.3	0.0	0.0	0.0	0.0	10.3		
Sec. 14 - 2	0.0	0.0	0.0	0.0	0.0	7.1	0.0	0.0	0.0	0.0	7.1		
Sec. 14 - 3	0.0	0.0	0.0	0.0	0.0	21.0	0.0	0.0	0.0	0.0	21.0		
Sec. 14 - 4	0.0	0.0	0.0	0.0	0.0	20.4	0.0	0.0	0.0	0.0	20.4		
Sec. 14 - 5	0.0	0.0	0.0	0.0	0.0	22.6	0.0	0.0	0.0	0.0	22.6		
Sec. 14 - 6	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.8	60.1	PO-7
Sec. 14 - 7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	70.2	0.0	70.2		
Sec. 14 - 8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	58.3	0.0	0.0	58.3		
Sec. 14 - 9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	82.2	0.0	82.2		
Sec. 14 - 10	0.0	0.0	0.0	0.0	49.6	0.0	0.0	0.0	0.0	0.0	49.6		
Sec. 14 - 11	0.0	0.0	22.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22.8		
Sec. 14 - 12	0.0	0.0	0.0	0.0	245.7	0.0	0.0	0.0	0.0	0.0	245.7	528.9	PO-5
Total	4.3	0.0	22.8	0.0	295.3	55.7	0.0	58.3	152.4	0.0	588.9		

Basin Area and Usages (ac)

Drainage Basin #	Equestrian Facility	Service	Commerical / Mixed Use	Open Space	Multi-Family	Single Family Estate	Single Family Low	Single Family Med	Single Family High	Patio Homes	Total
Dwelling Density (units/acre)		13			15	1	3	4	5	6	
Dwelling Population (people/dwelling)		1.5			2.5	3	3	3	3	2.5	
PE/ac	5	19.5	10	0.5	37.5	3	9	12	15	15	
Sec. 15 NE - 1	0.0	0.0	10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0
Sec. 15 NE - 2	0.0	0.0	4.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.1
Sec. 15 NE - 3	0.0	0.0	0.0	0.0	9.2	0.0	0.0	0.0	0.0	0.0	9.2
Sec. 15 NE - 4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	2.2
Sec. 15 NE - 5	0.0	8.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.7
Sec. 15 NE - 6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.2	11.2
Sec. 15 NE - 7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.5	0.0	10.5
Sec. 15 NE - 8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.3	0.0	8.3
Sec. 15 NE - 9	0.0	0.0	0.0	4.4	0.0	0.0	0.0	0.0	0.0	0.0	4.4
Total	0.0	8.7	14.1	4.4	9.2	0.0	0.0	0.0	18.8	13.4	68.6

Basin Area PE (# of People)

Drainage Basin #	Equestrian Facility	Service	Commerical / Mixed Use	Open Space	Multi-Family	Single Family Estate	Single Family Low	Single Family Med	Single Family High	Patio Homes High	PE per Basin
Sec. 15 NE - 1	0	0	100	0	0	0	0	0	0	0	100
Sec. 15 NE - 2	0	0	41	0	0	0	0	0	0	0	41
Sec. 15 NE - 3	0	0	0	0	345	0	0	0	0	0	345
Sec. 15 NE - 4	0	0	0	0	0	0	0	0	0	33	33
Sec. 15 NE - 5	0	170	0	0	0	0	0	0	0	0	170
Sec. 15 NE - 6	0	0	0	0	0	0	0	0	0	168	168
Sec. 15 NE - 7	0	0	0	0	0	0	0	0	158	0	158
Sec. 15 NE - 8	0	0	0	0	0	0	0	0	125	0	125
Sec. 15 NE - 9	0	0	0	2	0	0	0	0	0	0	2
0	0	0	0	0	0	0	0	0	0	0	0
Total	0	170	141	2	345	0	0	0	282	201	1,141

Flow (gpcpd)	100	Average Flow to Peak Flow Daily	1.73	Seasonal Flow Peaking Factor	1.9

Basin Area Flow (gpm)

Drainage Basin #	Equestrian Facility	Service	Commerical / Mixed Use	Open Space	Multi-Family	Single Family Estate	Single Family Low	Single Family Med	Single Family High	Patio Homes High	Flow per Basin (gpm)	Flow at Node (gpm)	Node
Sec. 15 NE - 1	0.0	0.0	22.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22.8		
Sec. 15 NE - 2	0.0	0.0	9.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.4		
Sec. 15 NE - 3	0.0	0.0	0.0	0.0	20.9	0.0	0.0	0.0	0.0	0.0	20.9		
Sec. 15 NE - 4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.5	7.5		
Sec. 15 NE - 5	0.0	38.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	38.7		
Sec. 15 NE - 6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	38.2	38.2	195.5	61-2
Sec. 15 NE - 7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36.0	0.0	36.0		
Sec. 15 NE - 8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28.4	0.0	28.4		
Sec. 15 NE - 9	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.5	64.9	36-3
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total	0.0	38.7	32.2	0.5	78.8	0.0	0.0	0.0	64.4	45.9	260.4		

Drainage Basin #	Equestrian Facility	Service	Commerical / Mixed Use	Open Space	Multi-Family	Single Family Estate	Single Family Low	Single Family Med	Single Family High	Patio Homes	Total
Dwelling Density (units/acre)		13			15	1	3	4	5	6	
Dwelling Population (people/dwelling)		1.5			2.5	3	3	3	3	2.5	
PE/ac	5	19.5	10	0.5	37.5	3	9	12	15	15	
Sec. 10 - 1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36.5	0.0	36.5
Sec. 10 - 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.0	0.0	11.0
Sec. 10 - 3	0.0	0.0	3.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.2
Sec. 10 - 4	0.0	0.0	0.0	5.3	0.0	0.0	0.0	0.0	0.0	0.0	5.3
Sec. 10 - 5	0.0	0.0	0.0	0.0	17.8	0.0	0.0	0.0	0.0	0.0	17.8
Sec. 10 - 6	0.0	0.0	0.0	0.0	12.2	0.0	0.0	0.0	0.0	0.0	12.2
Sec. 10 - 7	0.0	0.0	0.0	0.0	8.5	0.0	0.0	0.0	0.0	0.0	8.5
Sec. 10 - 8	0.0	0.0	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.8
Sec. 10 - 9	0.0	0.0	0.0	0.0	16.1	0.0	0.0	0.0	0.0	0.0	16.1
Sec. 10 - 10	0.0	0.0	0.0	0.0	11.4	0.0	0.0	0.0	0.0	0.0	11.4
Sec. 10 - 11	0.0	0.0	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5
Sec. 10 - 12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.9	13.9
Sec. 10 - 13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25.5	0.0	25.5
Total	0.0	0.0	9.5	5.3	66.0	0.0	0.0	0.0	73.0	13.9	167.7

Basin Area PE (# of People)

Drainage Basin #	Equestrian Facility	Service	Commerical / Mixed Use	Open Space	Multi-Family	Single Family Estate	Single Family Low	Single Family Med	Single Family High	Patio Homes High	PE per Basin
Sec. 10 - 1	0	0	0	0	0	0	0	0	548	0	548
Sec. 10 - 2	0	0	0	0	0	0	0	0	165	0	165
Sec. 10 - 3	0	0	32	0	0	0	0	0	0	0	32
Sec. 10 - 4	0	0	0	3	0	0	0	0	0	0	3
Sec. 10 - 5	0	0	0	0	668	0	0	0	0	0	668
Sec. 10 - 6	0	0	0	0	458	0	0	0	0	0	458
Sec. 10 - 7	0	0	0	0	319	0	0	0	0	0	319
Sec. 10 - 8	0	0	38	0	0	0	0	0	0	0	38
Sec. 10 - 9	0	0	0	0	604	0	0	0	0	0	604
Sec. 10 - 10	0	0	0	0	428	0	0	0	0	0	428
Sec. 10 - 11	0	0	25	0	0	0	0	0	0	0	25
Sec. 10 - 12	0	0	0	0	0	0	0	0	0	209	209
Sec. 10 - 13	0	0	0	0	0	0	0	0	382	0	382
Total	0	0	95	3	2,475	0	0	0	713	0	3,876

Flow (gpcpd)	100	Average Flow to Peak Flow Daily	1.73	Seasonal Flow Peaking Factor	1.9

Basin Area Flow (gpm)

Drainage Basin #	Equestrian Facility	Service	Commerical / Mixed Use	Open Space	Multi-Family	Single Family Estate	Single Family Low	Single Family Med	Single Family High	Patio Homes High	Flow per Basin (gpm)	Flow at Node (gpm)	Node
Sec. 10 - 1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	125.0	0.0	125.0		
Sec. 10 - 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	37.7	0.0	37.7		
Sec. 10 - 3	0.0	0.0	7.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.3	169.9	36-1
Sec. 10 - 4	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.6		
Sec. 10 - 5	0.0	0.0	0.0	0.0	152.1	0.0	0.0	0.0	0.0	0.0	152.1		
Sec. 10 - 6	0.0	0.0	0.0	0.0	104.4	0.0	0.0	0.0	0.0	0.0	104.4		
Sec. 10 - 7	0.0	0.0	0.0	0.0	72.8	0.0	0.0	0.0	0.0	0.0	72.8		
Sec. 10 - 8	0.0	0.0	8.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.7		
Sec. 10 - 9	0.0	0.0	0.0	0.0	137.8	0.0	0.0	0.0	0.0	0.0	137.8		
Sec. 10 - 10	0.0	0.0	0.0	0.0	97.6	0.0	0.0	0.0	0.0	0.0	97.6		
Sec. 10 - 11	0.0	0.0	5.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.7		
Sec. 10 - 12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	47.6	47.6	627.5	CL-2
Sec. 10 - 13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	87.2	0.0	87.2	87.2	36-3
Total	0.0	0.0	21.7	0.6	565.0	0.0	0.0	0.0	249.9	47.6	884.7		

Attachment #5

Drainage Basin #	Equestrian Facility	Service	Commerical / Mixed Use	Open Space	Multi-Family	Single Family Estate	Single Family Low	Single Family Med	Single Family High	Patio Homes	Total
Dwelling Density (units/acre)		13			15	1	3	4	5	6	
Dwelling Population (people/dwelling)		1.5			2.5	3	3	3	3	2.5	
PE/ac	5	19.5	10	0.5	37.5	3	9	12	15	15	
Sec. 15 S - 1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.7	0.0	0.0	18.7
Sec. 15 S - 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.9	0.0	14.9
Sec. 15 S - 3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22.8	22.8
Sec. 15 S - 4	0.0	0.0	4.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.7
Total	0.0	0.0	4.7	0.0	0.0	0.0	0.0	18.7	14.9	22.8	61.1

Basin Area PE (# of People)

Drainage Basin #	Equestrian Facility	Service	Commerical / Mixed Use	Open Space	Multi-Family	Single Family Estate	Single Family Low	Single Family Med	Single Family High	Patio Homes High	PE per Basin
Sec. 15 S - 1	0	0	0	0	0	0	0	224	0	0	224
Sec. 15 S - 2	0	0	0	0	0	0	0	0	224	0	224
Sec. 15 S - 3	0	0	0	0	0	0	0	0	0	342	342
Sec. 15 S - 4	0	0	47	0	0	0	0	0	0	0	47
0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	47	0	0	0	0	224	224	342	837

Flow (gpcpd)	100	Average Flow to Peak Flow Daily	1.73	Seasonal Flow Peaking Factor	1.9

Basin Area Flow (gpm)

Drainage Basin #	Equestrian Facility	Service	Commerical / Mixed Use	Open Space	Multi-Family	Single Family Estate	Single Family Low	Single Family Med	Single Family High	Patio Homes High	Flow per Basin (gpm)	Flow at Node (gpm)	Node
Sec. 15 S - 1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	51.2	0.0	0.0	51.2		
Sec. 15 S - 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	51.0	0.0	51.0	102.2	35-3
Sec. 15 S - 3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	78.1	78.1		
Sec. 15 S - 4	0.0	0.0	10.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.7	88.8	PO-4
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total	0.0	0.0	10.7	0.0	0.0	0.0	0.0	51.2	51.0	78.1	191.0		

Basin Area and Usages (ac)

Drainage Basin #	Equestrian Facility	Service	Commerical / Mixed Use	Open Space	Multi-Family	Single Family Estate	Single Family Low	Single Family Med	Single Family High	Patio Homes	Total
Dwelling Density (units/acre)		13			15	1	3	4	5	6	
Dwelling Population (people/dwelling)		1.5			2.5	3	3	3	3	2.5	
PE/ac	5	19.5	10	0.5	37.5	3	9	12	15	15	
Flow per Person (gpdpc)		100			100	100	100	100	100	100	
Flow per Unit (gpd)	500	150	1000	50	250	300	300	300	300	250	
Inflow and Infiltration (gpa)	0	0	0	0	0	0	0	0	0	0	
Flow per Acre (gpapd)	500	1950	1000	50	3750	300	900	1200	1500	1500	
Ex. Post Oak - 1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.9	0.0	9.9
Ex. Post Oak - 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25.3	0.0	25.3
Total	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	35.2	0.0	35.2

Basin Area PE (# of People)

Drainage Basin #	Equestrian Facility	Service	Commerical / Mixed Use	Open Space	Multi-Family	Single Family Estate	Single Family Low	Single Family Med	Single Family High	Patio Homes High	PE per Basin
Ex. Post Oak - 1	0	0	0	0	0	0	0	0	149	0	149
Ex. Post Oak - 2	0	0	0	0	0	0	0	0	380	0	380
0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	528	0	528

Flow (gpcpd)	100	Average Flow to Peak Flow Daily	1.73	Seasonal Flow Peaking Factor	1.9

Basin Area Flow (gpm)

Drainage Basin #	Equestrian Facility	Service	Commerical / Mixed Use	Open Space	Multi-Family	Single Family Estate	Single Family Low	Single Family Med	Single Family High	Patio Homes High	Flow per Basin (gpm)	Flow at Node (gpm)	Node
Ex. Post Oak - 1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	31.8	0.0	31.8		
Ex. Post Oak - 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	88.8	0.0	88.8	120.5	PO-3
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	120.5	0.0	120.5		

Node	Total Flow (gpm)
CL-2	823.1
PO-3	120.5
PO-4	88.8
PO-5	528.9
PO-7	60.1
36-1	169.9
36-3	239.4

Attachment #6

Water Distribution Modeling – KYPipe 2016 Output

A – Cedar Lane connection, No Stand Pipe
B – Cedar Lane and Saxon connections, No Stand Pipe
C – 24th Ave SE connections, No Stand Pipe
D – Cedar Lane, Saxon, and 24th Ave SE connections, No Stand Pipe
E – Cedar Lane and 30' x 115' Stand Pipe

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* * * * * * * * * * * * KYPIPE * * * * * * * * * * * *
*                                                      *
*  Pipe Network Modeling Software                      *
*                                                      *
*  CopyRighted by KYPIPE LLC (www.kypipe.com)          *
*  Version: 8.010 (vr8)  11/20/2015                    *
*  Serial #:  6-5045996                                *
*  Interface:  KYnetic                                 *
*  Licensed for Pipe2016                               *
*                                                      *
* * * * * * * * * * * * * * * * * * * * * * * * * * * *
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Date & Time: Thu Jan 21 20:42:16 2016

SUMMARY OF ORIGINAL DATA

UNITS SPECIFIED

FLOWRATE ..... = gallons/minute
HEAD (HGL) ..... = feet
PRESSURE ..... = psig

PIPELINE DATA

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NAMES #1	#2	LENGTH (ft)	DIAMETER (in)	ROUGHNESS COEFF.	MINOR LOSS COEFF.
P-1	CL-2	CL-3	450.70	14.08	139.0000	0.00
P-2	CL-3	36-2	380.30	14.08	139.0000	0.00
P-3	PO-4	36-4	1560.40	14.08	139.0000	0.00
P-4	PO-4	PO-5	242.50	14.08	139.0000	0.00
P-5	PO-4	PO-3	1468.60	11.73	139.0000	0.00
P-6	PO-3	PO-2	1051.10	11.73	139.0000	0.00
P-7	24 th Stre	PO-1	607.70	11.73	139.0000	0.00
P-8	PO-2	PO-1	1032.80	11.73	139.0000	0.00
P-9	Saxon	S-1	85.20	11.73	139.0000	0.00
P-10-XX	36-3	CL-3	676.20	14.08	139.0000	0.00
P-11	S-7	36-1	1201.20	14.08	139.0000	0.00
P-12	S-6	S-7	398.00	14.08	139.0000	0.00
P-13	S-5	S-6	57.70	11.73	139.0000	0.00
P-14	S-4	S-5	203.00	11.73	139.0000	0.00
P-15	Cedar Lane	CL-1	293.70	11.73	139.0000	0.00
P-16	CL-1	CL-2	1054.00	14.08	139.0000	0.00
P-17	PO-6	PO-7	218.90	11.73	139.0000	0.00
P-18	PO-5	PO-6	2181.40	14.08	139.0000	0.00
P-19	S-1	S-2	236.40	11.73	139.0000	0.00
P-20	Saxon	S-1	85.20	11.73	139.0000	0.00
P-21	S-2	S-3	142.40	11.73	139.0000	0.00
P-22	S-3	S-4	281.70	11.73	139.0000	0.00
P-23	36-4	36-3	708.10	14.08	139.0000	0.00
P-24-XX	36-4	Standpipe	96.80	14.08	139.0000	0.00
P-25-XX	36-2	36-1	1133.60	14.08	139.0000	0.00

PUMP/LOSS ELEMENT DATA

THERE IS A DEVICE AT NODE 24 th Street DESCRIBED BY THE FOLLOWING DATA: (ID= 3)

HEAD (ft)	FLOWRATE (gpm)	EFFICIENCY (%)
129.23	0.00	75.00 (Default)
113.08	1136.00	75.00 (Default)
9.69	3326.03	75.00 (Default)

THERE IS A DEVICE AT NODE Cedar Lane DESCRIBED BY THE FOLLOWING DATA: (ID= 1)

HEAD (ft)	FLOWRATE (gpm)	EFFICIENCY (%)
129.23	0.00	100.00
110.77	1136.00	100.00
9.69	3100.00	100.00

THERE IS A DEVICE AT NODE Saxon DESCRIBED BY THE FOLLOWING DATA: (ID= 2)

HEAD (ft)	FLOWRATE (gpm)	EFFICIENCY (%)
143.08	0.00	75.00 (Default)
133.85	1190.00	75.00 (Default)
57.69	3905.26	75.00 (Default)

N O D E D A T A

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	JUNCTION ELEVATION (ft)	EXTERNAL GRADE (ft)
24 th Street		----	1173.70	1173.70
Cedar Lane		----	1171.80	1171.80
Saxon		----	1164.70	1164.70
Standpipe		----	1195.00	1280.00
36-1		1500.00	1135.40	
36-2		0.00	1173.20	
36-3		0.00	1177.90	
36-4		0.00	1194.40	
CL-1		0.00	1170.60	
CL-2		325.00	1192.80	
CL-3		1500.00	1136.80	
PO-1		0.00	1163.90	
PO-2		0.00	1155.90	
PO-3		120.50	1167.60	
PO-4		1500.00	1177.50	
PO-5		0.00	1185.10	
PO-6		0.00	1206.10	
PO-7		0.00	1188.30	
S-1		0.00	1168.40	
S-2		0.00	1156.10	
S-3		0.00	1159.10	
S-4		0.00	1184.40	
S-5		0.00	1201.00	
S-6		0.00	1202.00	
S-7		0.00	1181.70	

O U T P U T O P T I O N D A T A

OUTPUT SELECTION: ALL RESULTS ARE INCLUDED IN THE TABULATED OUTPUT

MAXIMUM AND MINIMUM PRESSURES	=	5
MAXIMUM AND MINIMUM VELOCITIES	=	5
MAXIMUM AND MINIMUM HEAD LOSS/1000	=	5

S Y S T E M C O N F I G U R A T I O N

NUMBER OF PIPES	(P) =	25
NUMBER OF END NODES	(J) =	21
NUMBER OF PRIMARY LOOPS	(L) =	1
NUMBER OF SUPPLY NODES	(F) =	4
NUMBER OF SUPPLY ZONES	(Z) =	1

Case: 0

RESULTS OBTAINED AFTER 3 TRIALS: ACCURACY = 0.00000E+00

S I M U L A T I O N D E S C R I P T I O N (L A B E L)

P I P E L I N E R E S U L T S

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS #1	#2	FLOWRATE gpm	HEAD LOSS ft	MINOR LOSS ft	LINE VELO. ft/s	HL+ML/ 1000 ft/f	HL/ 1000 ft/f
P-1	CL-2	CL-3	1500.00	0.98	0.00	3.09	2.18	2.18
P-2	CL-3	36-2	0.00	0.00	0.00	0.00	0.00	0.00
P-3	PO-4	36-4	0.00	0.00	0.00	0.00	0.00	0.00
P-4	PO-4	PO-5	0.00	0.00	0.00	0.00	0.00	0.00
P-5	PO-4	PO-3	-1500.00	7.78	0.00	4.45	5.29	5.29
P-6	PO-3	PO-2	-1620.50	6.42	0.00	4.81	6.11	6.11
P-7	24 th Stre	PO-1	1620.50	3.71	0.00	4.81	6.11	6.11
P-8	PO-2	PO-1	-1620.50	6.31	0.00	4.81	6.11	6.11
P-9	Saxon	S-1	750.00	0.12	0.00	2.23	1.47	1.47
P-10-XX	36-3	CL-3						
P-11	S-7	36-1	1500.00	2.62	0.00	3.09	2.18	2.18
P-12	S-6	S-7	1500.00	0.87	0.00	3.09	2.18	2.18
P-13	S-5	S-6	1500.00	0.31	0.00	4.45	5.29	5.29
P-14	S-4	S-5	1500.00	1.07	0.00	4.45	5.29	5.29
P-15	Cedar Lane	CL-1	1825.00	2.24	0.00	5.41	7.61	7.61
P-16	CL-1	CL-2	1825.00	3.30	0.00	3.76	3.13	3.13
P-17	PO-6	PO-7	0.00	0.00	0.00	0.00	0.00	0.00
P-18	PO-5	PO-6	0.00	0.00	0.00	0.00	0.00	0.00
P-19	S-1	S-2	1500.00	1.25	0.00	4.45	5.29	5.29
P-20	Saxon	S-1	750.00	0.12	0.00	2.23	1.47	1.47
P-21	S-2	S-3	1500.00	0.75	0.00	4.45	5.29	5.29
P-22	S-3	S-4	1500.00	1.49	0.00	4.45	5.29	5.29
P-23	36-4	36-3	0.00	0.00	0.00	0.00	0.00	0.00
P-24-XX	36-4	Standpipe						
P-25-XX	36-2	36-1						

P U M P/L O S S E L E M E N T R E S U L T S

NAME	FLOWRATE gpm	INLET HEAD ft	OUTLET HEAD ft	PUMP HEAD ft	EFFIC- ENCY %	USEFUL POWER Hp	INCREMTL COST $	TOTAL COST $	#PUMPS PARALLEL	#PUMPS SERIES	NPSH Avail. ft
24 th Stre	1620.50	0.00	97.92	97.9	75.00	0.	0.0	0.0	**	**	33.2
Cedar Lane	1825.00	0.00	84.63	84.6	75.00	0.	0.0	0.0	**	**	33.2
Saxon	1500.00	0.00	128.84	128.8	75.00	0.	0.0	0.0	**	**	33.2

N O D E R E S U L T S

NODE NAME	NODE TITLE	EXTERNAL DEMAND gpm	HYDRAULIC GRADE ft	NODE ELEVATION ft	PRESSURE HEAD ft	NODE PRESSURE psi	
24 th Stre		----	1271.62	1173.70	97.92	42.43	
Cedar Lane		----	1256.43	1171.80	84.63	36.67	
Saxon		----	1293.54	1164.70	128.84	55.83	
Standpipe		----	1280.00	1195.00	85.00	36.83	
36-1		1500.00	1285.05	1135.40	149.65	64.85	
36-2		0.00	1249.91	1173.20	76.71	33.24	
36-3		0.00	1247.40	1177.90	69.50	30.12	
36-4		0.00	1247.40	1194.40	53.00	22.97	
CL-1		0.00	1254.19	1170.60	83.59	36.22	"A"
CL-2		325.00	1250.89	1192.80	58.09	25.17	
CL-3		1500.00	1249.91	1136.80	113.11	49.01	
PO-1		0.00	1267.91	1163.90	104.01	45.07	"C"
PO-2		0.00	1261.60	1155.90	105.70	45.80	
PO-3		120.50	1255.18	1167.60	87.58	37.95	
PO-4		1500.00	1247.40	1177.50	69.90	30.29	
PO-5		0.00	1247.40	1185.10	62.30	27.00	
PO-6		0.00	1247.40	1206.10	41.30	17.90	
PO-7		0.00	1247.40	1188.30	59.10	25.61	
S-1		0.00	1293.41	1168.40	125.01	54.17	
S-2		0.00	1292.16	1156.10	136.06	58.96	
S-3		0.00	1291.41	1159.10	132.31	57.33	
S-4		0.00	1289.92	1184.40	105.52	45.72	
S-5		0.00	1288.84	1201.00	87.84	38.06	
S-6		0.00	1288.54	1202.00	86.54	37.50	
S-7		0.00	1287.67	1181.70	105.97	45.92	

M A X I M U M A N D M I N I M U M V A L U E S

P R E S S U R E S

JUNCTION NUMBER	MAXIMUM PRESSURES psi	JUNCTION NUMBER	MINIMUM PRESSURES psi
36-1	64.85	PO-6	17.90
S-2	58.96	36-4	22.97
S-3	57.33	CL-2	25.17
Saxon	55.83	PO-7	25.61
S-1	54.17	PO-5	27.00

V E L O C I T I E S

PIPE NUMBER	MAXIMUM VELOCITY (ft/s)	PIPE NUMBER	MINIMUM VELOCITY (ft/s)
P-15	5.41	P-9	2.23
P-6	4.81	P-20	2.23
P-7	4.81	P-1	3.09
P-8	4.81	P-11	3.09
P-5	4.45	P-12	3.09

S U M M A R Y O F I N F L O W S A N D O U T F L O W S

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
(-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE gpm	NODE TITLE
24 th Stree	1620.50	
Cedar Lane	1825.00	
Saxon	1500.00	
Standpipe	0.00	

NET SYSTEM INFLOW = 4945.50
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 4945.50

***** HYDRAULIC ANALYSIS COMPLETED *****

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* * * * * * * * * * * * KYPIPE * * * * * * * * * * * *
*                                                      *
*  Pipe Network Modeling Software                      *
*                                                      *
*  CopyRighted by KYPIPE LLC (www.kypipe.com)          *
*  Version: 8.010 (vr8)  11/20/2015                    *
*  Serial #:  6-5045996                                *
*  Interface:  KYnetic                                 *
*  Licensed for Pipe2016                               *
*                                                      *
* * * * * * * * * * * * * * * * * * * * * * * * * * * *
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Date & Time: Thu Jan 21 21:16:04 2016

SUMMARY OF ORIGINAL DATA

UNITS SPECIFIED

FLOWRATE ..... = gallons/minute
HEAD (HGL) ..... = feet
PRESSURE ..... = psig

PIPELINE DATA

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NAMES #1	#2	LENGTH (ft)	DIAMETER (in)	ROUGHNESS COEFF.	MINOR LOSS COEFF.
P-1	CL-2	CL-3	461.20	14.08	139.0000	0.00
P-2	CL-3	36-2	381.00	14.08	139.0000	0.00
P-3	PO-4	36-4	1560.40	14.08	139.0000	0.00
P-4	PO-4	PO-5	242.50	14.08	139.0000	0.00
P-5	PO-4	PO-3	1468.60	11.73	139.0000	0.00
P-6	PO-3	PO-2	1051.10	11.73	139.0000	0.00
P-7	24 th Stre	PO-1	607.70	11.73	139.0000	0.00
P-8	PO-2	PO-1	1032.80	11.73	139.0000	0.00
P-9	Saxon	S-1	85.20	11.73	139.0000	0.00
P-10-XX	36-3	CL-3	676.60	14.08	139.0000	0.00
P-11	S-7	36-1	1211.70	14.08	139.0000	0.00
P-12	S-6	S-7	398.00	14.08	139.0000	0.00
P-13	S-5	S-6	57.70	11.73	139.0000	0.00
P-14	S-4	S-5	203.00	11.73	139.0000	0.00
P-15	Cedar Lane	CL-1	293.70	11.73	139.0000	0.00
P-16	CL-1	CL-2	1054.00	14.08	139.0000	0.00
P-17	PO-6	PO-7	218.90	11.73	139.0000	0.00
P-18	PO-5	PO-6	2181.40	14.08	139.0000	0.00
P-19	S-1	S-2	236.40	11.73	139.0000	0.00
P-20	Saxon	S-1	85.20	11.73	139.0000	0.00
P-21	S-2	S-3	142.40	11.73	139.0000	0.00
P-22	S-3	S-4	281.70	11.73	139.0000	0.00
P-23	36-4	36-3	708.10	14.08	139.0000	0.00
P-24-XX	36-4	Standpipe	96.80	14.08	139.0000	0.00
P-25	36-2	36-1	1133.70	14.08	139.0000	0.00

PUMP/LOSS ELEMENT DATA

THERE IS A DEVICE AT NODE 24 th Stre DESCRIBED BY THE FOLLOWING DATA: (ID= 3)

HEAD (ft)	FLOWRATE (gpm)	EFFICIENCY (%)	
129.23	0.00	75.00	(Default)
113.08	1136.00	75.00	(Default)
9.69	3326.03	75.00	(Default)

THERE IS A DEVICE AT NODE Cedar Lane DESCRIBED BY THE FOLLOWING DATA: (ID= 1)

HEAD (ft)	FLOWRATE (gpm)	EFFICIENCY (%)
129.23	0.00	100.00
110.77	1136.00	100.00
9.69	3100.00	100.00

THERE IS A DEVICE AT NODE Saxon DESCRIBED BY THE FOLLOWING DATA: (ID= 2)

HEAD (ft)	FLOWRATE (gpm)	EFFICIENCY (%)
143.08	0.00	75.00 (Default)
133.85	1190.00	75.00 (Default)
57.69	3905.26	75.00 (Default)

N O D E D A T A

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	JUNCTION ELEVATION (ft)	EXTERNAL GRADE (ft)
24 th Stre		----	1173.70	1173.70
Cedar Lane		----	1171.80	1171.80
Saxon		----	1164.70	1164.70
Standpipe		----	1195.00	1280.00
36-1		169.90	1135.40	
36-2		0.00	1173.20	
36-3		0.00	1177.90	
36-4		0.00	1194.40	
CL-1		0.00	1170.60	
CL-2		823.10	1192.80	
CL-3		1500.00	1136.80	
PO-1		0.00	1163.90	
PO-2		0.00	1155.90	
PO-3		120.50	1167.60	
PO-4		1500.00	1177.50	
PO-5		0.00	1185.10	
PO-6		0.00	1206.10	
PO-7		0.00	1188.30	
S-1		0.00	1168.40	
S-2		0.00	1156.10	
S-3		0.00	1159.10	
S-4		0.00	1184.40	
S-5		0.00	1201.00	
S-6		0.00	1202.00	
S-7		0.00	1181.70	

O U T P U T O P T I O N D A T A

OUTPUT SELECTION: ALL RESULTS ARE INCLUDED IN THE TABULATED OUTPUT

MAXIMUM AND MINIMUM PRESSURES	=	5
MAXIMUM AND MINIMUM VELOCITIES	=	5
MAXIMUM AND MINIMUM HEAD LOSS/1000	=	5

S Y S T E M C O N F I G U R A T I O N

NUMBER OF PIPES .....(P)	=	25
NUMBER OF END NODES .....(J)	=	21
NUMBER OF PRIMARY LOOPS .....(L)	=	1
NUMBER OF SUPPLY NODES .....(F)	=	4
NUMBER OF SUPPLY ZONES .....(Z)	=	1

Case: 0

RESULTS OBTAINED AFTER 4 TRIALS: ACCURACY = 0.18915E-06

S I M U L A T I O N D E S C R I P T I O N (L A B E L)

P I P E L I N E R E S U L T S

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS #1	#2	FLOWRATE gpm	HEAD LOSS ft	MINOR LOSS ft	LINE VELO. ft/s	HL+ML/ 1000 ft/f	HL/ 1000 ft/f
P-1	CL-2	CL-3	209.19	0.03	0.00	0.43	0.06	0.06
P-2	CL-3	36-2	-1290.81	0.63	0.00	2.66	1.65	1.65
P-3	PO-4	36-4	0.00	0.00	0.00	0.00	0.00	0.00
P-4	PO-4	PO-5	0.00	0.00	0.00	0.00	0.00	0.00
P-5	PO-4	PO-3	-1500.00	7.78	0.00	4.45	5.29	5.29
P-6	PO-3	PO-2	-1620.50	6.42	0.00	4.81	6.11	6.11
P-7	24 th Stre	PO-1	1620.50	3.71	0.00	4.81	6.11	6.11
P-8	PO-2	PO-1	-1620.50	6.31	0.00	4.81	6.11	6.11
P-9	Saxon	S-1	730.35	0.12	0.00	2.17	1.40	1.40
P-10-XX	36-3	CL-3						
P-11	S-7	36-1	1460.71	2.51	0.00	3.01	2.07	2.07
P-12	S-6	S-7	1460.71	0.83	0.00	3.01	2.07	2.07
P-13	S-5	S-6	1460.71	0.29	0.00	4.33	5.04	5.04
P-14	S-4	S-5	1460.71	1.02	0.00	4.33	5.04	5.04
P-15	Cedar Lane	CL-1	1032.29	0.78	0.00	3.06	2.65	2.65
P-16	CL-1	CL-2	1032.29	1.15	0.00	2.13	1.09	1.09
P-17	PO-6	PO-7	0.00	0.00	0.00	0.00	0.00	0.00
P-18	PO-5	PO-6	0.00	0.00	0.00	0.00	0.00	0.00
P-19	S-1	S-2	1460.71	1.19	0.00	4.33	5.04	5.04
P-20	Saxon	S-1	730.35	0.12	0.00	2.17	1.40	1.40
P-21	S-2	S-3	1460.71	0.72	0.00	4.33	5.04	5.04
P-22	S-3	S-4	1460.71	1.42	0.00	4.33	5.04	5.04
P-23	36-4	36-3	0.00	0.00	0.00	0.00	0.00	0.00
P-24-XX	36-4	Standpipe						
P-25	36-2	36-1	-1290.81	1.87	0.00	2.66	1.65	1.65

P U M P/L O S S E L E M E N T R E S U L T S

NAME	FLOWRATE gpm	INLET HEAD ft	OUTLET HEAD ft	PUMP HEAD ft	EFFIC- ENCY %	USEFUL POWER Hp	INCREMTL COST $	TOTAL COST $	#PUMPS PARALLEL	#PUMPS SERIES	NPSH Avail. ft
24 th Stre	1620.50	0.00	97.92	97.9	75.00	0.	0.0	0.0	**	**	33.2
Cedar Lane	1032.29	0.00	113.78	113.8	75.00	0.	0.0	0.0	**	**	33.2
Saxon	1460.71	0.00	129.53	129.5	75.00	0.	0.0	0.0	**	**	33.2

NODE RESULTS

NODE NAME	NODE TITLE	EXTERNAL DEMAND gpm	HYDRAULIC GRADE ft	NODE ELEVATION ft	PRESSURE HEAD ft	NODE PRESSURE psi	
24 th Stre		----	1271.62	1173.70	97.92	42.43	
Cedar Lane		----	1285.58	1171.80	113.78	49.31	
Saxon		----	1294.23	1164.70	129.53	56.13	
Standpipe		----	1280.00	1195.00	85.00	36.83	
36-1		169.90	1286.13	1135.40	150.73	65.31	"B-S"
36-2		0.00	1284.26	1173.20	111.06	48.12	
36-3		0.00	1247.40	1177.90	69.50	30.12	
36-4		0.00	1247.40	1194.40	53.00	22.97	
CL-1		0.00	1284.80	1170.60	114.20	49.49	"B-S"
CL-2		823.10	1283.65	1192.80	90.85	39.37	
CL-3		1500.00	1283.63	1136.80	146.83	63.63	
PO-1		0.00	1267.91	1163.90	104.01	45.07	
PO-2		0.00	1261.60	1155.90	105.70	45.80	
PO-3		120.50	1255.18	1167.60	87.58	37.95	
PO-4		1500.00	1247.40	1177.50	69.90	30.29	
PO-5		0.00	1247.40	1185.10	62.30	27.00	
PO-6		0.00	1247.40	1206.10	41.30	17.90	
PO-7		0.00	1247.40	1188.30	59.10	25.61	
S-1		0.00	1294.11	1168.40	125.71	54.47	
S-2		0.00	1292.92	1156.10	136.82	59.29	
S-3		0.00	1292.20	1159.10	133.10	57.68	
S-4		0.00	1290.78	1184.40	106.38	46.10	
S-5		0.00	1289.76	1201.00	88.76	38.46	
S-6		0.00	1289.47	1202.00	87.47	37.90	
S-7		0.00	1288.64	1181.70	106.94	46.34	

MAXIMUM AND MINIMUM VALUES

PRESSURES

JUNCTION NUMBER	MAXIMUM PRESSURES psi
36-1	65.31
CL-3	63.63
S-2	59.29
S-3	57.68
Saxon	56.13

JUNCTION NUMBER	MINIMUM PRESSURES psi
PO-6	17.90
36-4	22.97
PO-7	25.61
PO-5	27.00
36-3	30.12

VELOCITIES

PIPE NUMBER	MAXIMUM VELOCITY (ft/s)
P-6	4.81
P-7	4.81
P-8	4.81
P-5	4.45
P-13	4.33

PIPE NUMBER	MINIMUM VELOCITY (ft/s)
P-1	0.43
P-16	2.13
P-20	2.17
P-9	2.17
P-2	2.66

HL+ML / 1000

PIPE NUMBER	MAXIMUM HL+ML/1000 (ft/ft)
P-7	6.11
P-6	6.11
P-8	6.11
P-5	5.29
P-14	5.04

PIPE NUMBER	MINIMUM HL+ML/1000 (ft/ft)
P-1	0.06
P-16	1.09
P-20	1.40
P-9	1.40
P-25	1.65

H L / 1 0 0 0

PIPE NUMBER	MAXIMUM HL/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL/1000 (ft/ft)
P-7	6.11	P-1	0.06
P-6	6.11	P-16	1.09
P-8	6.11	P-20	1.40
P-5	5.29	P-9	1.40
P-14	5.04	P-25	1.65

S U M M A R Y O F I N F L O W S A N D O U T F L O W S

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
(-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE gpm	NODE TITLE
24 th Stree	1620.50	
Cedar Lane	1032.29	
Saxon	1460.71	
Standpipe	0.00	

NET SYSTEM INFLOW = 4113.50
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 4113.50

***** HYDRAULIC ANALYSIS COMPLETED *****

```
* * * * * * * * * * * * KYPIPE * * * * * * * * * * * *
*                                                      *
*  Pipe Network Modeling Software                      *
*                                                      *
*  CopyRighted by KYPIPE LLC (www.kypipe.com)          *
*  Version: 8.010 (vr8)  11/20/2015                    *
*  Serial #:  6-5045996                                *
*  Interface:  KYnetic                                 *
*  Licensed for Pipe2016                               *
*                                                      *
* * * * * * * * * * * * * * * * * * * * * * * * * * * *

 Date & Time:  Thu Jan 21 21:05:44 2016

              ***********************************************
               S U M M A R Y   O F   O R I G I N A L   D A T A
              ***********************************************

 U N I T S   S P E C I F I E D

    FLOWRATE ..... = gallons/minute
    HEAD (HGL) ..... = feet
    PRESSURE ..... = psig

 P I P E L I N E   D A T A

   STATUS CODE:   XX -CLOSED PIPE    CV -CHECK VALVE

   P I P E              NODE NAMES       LENGTH  DIAMETER  ROUGHNESS    MINOR
   N A M E             #1        #2       (ft)     (in)      COEFF.  LOSS COEFF.
 ---------------------------------------------------------------------------------
       P-1           CL-2      CL-3      461.20    14.08  139.0000       0.00
       P-2           CL-3      36-2      381.00    14.08  139.0000       0.00
       P-3           PO-4      36-4     1560.40    14.08  139.0000       0.00
       P-4           PO-4      PO-5      242.50    14.08  139.0000       0.00
       P-5           PO-4      PO-3     1468.60    11.73  139.0000       0.00
       P-6           PO-3      PO-2     1051.10    11.73  139.0000       0.00
       P-7     24 th Stre      PO-1      607.70    11.73  139.0000       0.00
       P-8           PO-2      PO-1     1032.80    11.73  139.0000       0.00
       P-9         Saxon        S-1       85.20    11.73  139.0000       0.00
     P-10-XX        36-3      CL-3      676.60    14.08  139.0000       0.00
      P-11           S-7      36-1     1201.20    14.08  139.0000       0.00
      P-12           S-6       S-7      398.00    14.08  139.0000       0.00
      P-13           S-5       S-6       57.70    11.73  139.0000       0.00
      P-14           S-4       S-5      203.00    11.73  139.0000       0.00
      P-15     Cedar Lane      CL-1      293.70    11.73  139.0000       0.00
      P-16           CL-1      CL-2     1054.00    14.08  139.0000       0.00
      P-17           PO-6      PO-7      218.90    11.73  139.0000       0.00
      P-18           PO-5      PO-6     2181.40    14.08  139.0000       0.00
      P-19           S-1        S-2      236.40    11.73  139.0000       0.00
      P-20         Saxon        S-1       85.20    11.73  139.0000       0.00
      P-21           S-2        S-3      142.40    11.73  139.0000       0.00
      P-22           S-3        S-4      281.70    11.73  139.0000       0.00
      P-23          36-4       36-3      708.10    14.08  139.0000       0.00
     P-24-XX        36-4 Standpipe       96.80    14.08  139.0000       0.00
      P-25          36-2       36-1     1133.60    14.08  139.0000       0.00


 P U M P/L O S S   E L E M E N T   D A T A

 THERE IS A DEVICE AT NODE  24 th Stre DESCRIBED BY THE FOLLOWING DATA: (ID=  3)

          HEAD         FLOWRATE         EFFICIENCY
          (ft)           (gpm)            (%)
        129.23            0.00          75.00 (Default)
        113.08         1136.00          75.00 (Default)
          9.69         3326.03          75.00 (Default)
```

THERE IS A DEVICE AT NODE Cedar Lane DESCRIBED BY THE FOLLOWING DATA: (ID= 1)

HEAD (ft)	FLOWRATE (gpm)	EFFICIENCY (%)
129.23	0.00	100.00
110.77	1136.00	100.00
9.69	3100.00	100.00

THERE IS A DEVICE AT NODE Saxon DESCRIBED BY THE FOLLOWING DATA: (ID= 2)

HEAD (ft)	FLOWRATE (gpm)	EFFICIENCY (%)
143.08	0.00	75.00 (Default)
133.85	1190.00	75.00 (Default)
57.69	3905.26	75.00 (Default)

N O D E D A T A

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	JUNCTION ELEVATION (ft)	EXTERNAL GRADE (ft)
24 th Stre		----	1173.70	1173.70
Cedar Lane		----	1171.80	1171.80
Saxon		----	1164.70	1164.70
Standpipe		----	1195.00	1280.00
36-1		1669.90	1135.40	
36-2		0.00	1173.20	
36-3		0.00	1177.90	
36-4		0.00	1194.40	
CL-1		0.00	1170.60	
CL-2		823.10	1192.80	
CL-3		0.00	1136.80	
PO-1		0.00	1163.90	
PO-2		0.00	1155.90	
PO-3		120.50	1167.60	
PO-4		1500.00	1177.50	
PO-5		0.00	1185.10	
PO-6		0.00	1206.10	
PO-7		0.00	1188.30	
S-1		0.00	1168.40	
S-2		0.00	1156.10	
S-3		0.00	1159.10	
S-4		0.00	1184.40	
S-5		0.00	1201.00	
S-6		0.00	1202.00	
S-7		0.00	1181.70	

O U T P U T O P T I O N D A T A

OUTPUT SELECTION: ALL RESULTS ARE INCLUDED IN THE TABULATED OUTPUT
MAXIMUM AND MINIMUM PRESSURES = 5
MAXIMUM AND MINIMUM VELOCITIES = 5
MAXIMUM AND MINIMUM HEAD LOSS/1000 = 5

S Y S T E M C O N F I G U R A T I O N

NUMBER OF PIPES .....(P) = 25
NUMBER OF END NODES .....(J) = 21
NUMBER OF PRIMARY LOOPS .....(L) = 1
NUMBER OF SUPPLY NODES .....(F) = 4
NUMBER OF SUPPLY ZONES .....(Z) = 1

Case: 0

RESULTS OBTAINED AFTER 4 TRIALS: ACCURACY = 0.80207E-06

S I M U L A T I O N D E S C R I P T I O N (L A B E L)

P I P E L I N E R E S U L T S

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS #1	#2	FLOWRATE gpm	HEAD LOSS ft	MINOR LOSS ft	LINE VELO. ft/s	HL+ML/ 1000 ft/f	HL/ 1000 ft/f
P-1	CL-2	CL-3	165.45	0.02	0.00	0.34	0.04	0.04
P-2	CL-3	36-2	165.45	0.01	0.00	0.34	0.04	0.04
P-3	PO-4	36-4	0.00	0.00	0.00	0.00	0.00	0.00
P-4	PO-4	PO-5	0.00	0.00	0.00	0.00	0.00	0.00
P-5	PO-4	PO-3	-1500.00	7.78	0.00	4.45	5.29	5.29
P-6	PO-3	PO-2	-1620.50	6.42	0.00	4.81	6.11	6.11
P-7	24 th Stre	PO-1	1620.50	3.71	0.00	4.81	6.11	6.11
P-8	PO-2	PO-1	-1620.50	6.31	0.00	4.81	6.11	6.11
P-9	Saxon	S-1	752.23	0.13	0.00	2.23	1.47	1.47
P-10-XX	36-3	CL-3						
P-11	S-7	36-1	1504.45	2.63	0.00	3.10	2.19	2.19
P-12	S-6	S-7	1504.45	0.87	0.00	3.10	2.19	2.19
P-13	S-5	S-6	1504.45	0.31	0.00	4.46	5.32	5.32
P-14	S-4	S-5	1504.45	1.08	0.00	4.46	5.32	5.32
P-15	Cedar Lane	CL-1	988.55	0.72	0.00	2.93	2.45	2.45
P-16	CL-1	CL-2	988.55	1.06	0.00	2.04	1.01	1.01
P-17	PO-6	PO-7	0.00	0.00	0.00	0.00	0.00	0.00
P-18	PO-5	PO-6	0.00	0.00	0.00	0.00	0.00	0.00
P-19	S-1	S-2	1504.45	1.26	0.00	4.46	5.32	5.32
P-20	Saxon	S-1	752.23	0.13	0.00	2.23	1.47	1.47
P-21	S-2	S-3	1504.45	0.76	0.00	4.46	5.32	5.32
P-22	S-3	S-4	1504.45	1.50	0.00	4.46	5.32	5.32
P-23	36-4	36-3	0.00	0.00	0.00	0.00	0.00	0.00
P-24-XX	36-4	Standpipe						
P-25	36-2	36-1	165.45	0.04	0.00	0.34	0.04	0.04

P U M P/L O S S E L E M E N T R E S U L T S

NAME	FLOWRATE gpm	INLET HEAD ft	OUTLET HEAD ft	PUMP HEAD ft	EFFIC- ENCY %	USEFUL POWER Hp	INCREMTL COST $	TOTAL COST $	#PUMPS PARALLEL	#PUMPS SERIES	NPSH Avail. ft
24 th Stre	1620.50	0.00	97.92	97.9	75.00	0.	0.0	0.0	**	**	33.2
Cedar Lane	988.55	0.00	114.98	115.0	75.00	0.	0.0	0.0	**	**	33.2
Saxon	1504.45	0.00	128.76	128.8	75.00	0.	0.0	0.0	**	**	33.2

NODE RESULTS

NODE NAME	NODE TITLE	EXTERNAL DEMAND gpm	HYDRAULIC GRADE ft	NODE ELEVATION ft	PRESSURE HEAD ft	NODE PRESSURE psi	
24 th Stre		----	1271.62	1173.70	97.92	42.43	
Cedar Lane		----	1286.78	1171.80	114.98	49.82	
Saxon		----	1293.46	1164.70	128.76	55.80	
Standpipe		----	1280.00	1195.00	85.00	36.83	
36-1		1669.90	1284.93	1135.40	149.53	64.79	"B-N"
36-2		0.00	1284.97	1173.20	111.77	48.43	
36-3		0.00	1247.40	1177.90	69.50	30.12	
36-4		0.00	1247.40	1194.40	53.00	22.97	
CL-1		0.00	1286.06	1170.60	115.46	50.03	"B-N"
CL-2		823.10	1285.00	1192.80	92.20	39.95	
CL-3		0.00	1284.98	1136.80	148.18	64.21	
PO-1		0.00	1267.91	1163.90	104.01	45.07	
PO-2		0.00	1261.60	1155.90	105.70	45.80	
PO-3		120.50	1255.18	1167.60	87.58	37.95	
PO-4		1500.00	1247.40	1177.50	69.90	30.29	
PO-5		0.00	1247.40	1185.10	62.30	27.00	
PO-6		0.00	1247.40	1206.10	41.30	17.90	
PO-7		0.00	1247.40	1188.30	59.10	25.61	
S-1		0.00	1293.33	1168.40	124.93	54.14	
S-2		0.00	1292.08	1156.10	135.98	58.92	
S-3		0.00	1291.32	1159.10	132.22	57.29	
S-4		0.00	1289.82	1184.40	105.42	45.68	
S-5		0.00	1288.74	1201.00	87.74	38.02	
S-6		0.00	1288.43	1202.00	86.43	37.45	
S-7		0.00	1287.56	1181.70	105.86	45.87	

MAXIMUM AND MINIMUM VALUES

PRESSURES

JUNCTION NUMBER	MAXIMUM PRESSURES psi	JUNCTION NUMBER	MINIMUM PRESSURES psi
36-1	64.79	PO-6	17.90
CL-3	64.21	36-4	22.97
S-2	58.92	PO-7	25.61
S-3	57.29	PO-5	27.00
Saxon	55.80	36-3	30.12

VELOCITIES

PIPE NUMBER	MAXIMUM VELOCITY (ft/s)	PIPE NUMBER	MINIMUM VELOCITY (ft/s)
P-6	4.81	P-2	0.34
P-7	4.81	P-25	0.34
P-8	4.81	P-1	0.34
P-13	4.46	P-16	2.04
P-14	4.46	P-9	2.23

HL+ML / 1000

PIPE NUMBER	MAXIMUM HL+ML/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL+ML/1000 (ft/ft)
P-7	6.11	P-25	0.04
P-6	6.11	P-2	0.04
P-8	6.11	P-1	0.04
P-21	5.32	P-16	1.01

P-13	5.32	P-9	1.47

H L / 1 0 0 0

PIPE NUMBER	MAXIMUM HL/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL/1000 (ft/ft)
P-7	6.11	P-25	0.04
P-6	6.11	P-2	0.04
P-8	6.11	P-1	0.04
P-21	5.32	P-16	1.01
P-13	5.32	P-9	1.47

S U M M A R Y O F I N F L O W S A N D O U T F L O W S

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
(-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE gpm	NODE TITLE
24 th Stree	1620.50	
Cedar Lane	988.55	
Saxon	1504.45	
Standpipe	0.00	

NET SYSTEM INFLOW = 4113.50
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 4113.50

***** HYDRAULIC ANALYSIS COMPLETED *****

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* * * * * * * * * * * * KYPIPE * * * * * * * * * * *
*                                                     *
*  Pipe Network Modeling Software                     *
*                                                     *
*  CopyRighted by KYPIPE LLC (www.kypipe.com)         *
*  Version: 8.010 (vr8)  11/20/2015                   *
*  Serial #:  6-5045996                               *
*  Interface:  KYnetic                                *
*  Licensed for Pipe2016                              *
*                                                     *
* * * * * * * * * * * * * * * * * * * * * * * * * * * *
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Date & Time: Thu Jan 21 21:25:55 2016

SUMMARY OF ORIGINAL DATA

UNITS SPECIFIED

FLOWRATE ..... = gallons/minute
HEAD (HGL) ..... = feet
PRESSURE ..... = psig

PIPELINE DATA

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NAMES #1	#2	LENGTH (ft)	DIAMETER (in)	ROUGHNESS COEFF.	MINOR LOSS COEFF.
P-1	CL-2	CL-3	471.80	14.08	139.0000	0.00
P-2	CL-3	36-2	381.90	14.08	139.0000	0.00
P-3	PO-4	36-4	1560.40	14.08	139.0000	0.00
P-4	PO-4	PO-5	242.50	14.08	139.0000	0.00
P-5	PO-4	PO-3	1468.60	11.73	139.0000	0.00
P-6	PO-3	PO-2	1051.10	11.73	139.0000	0.00
P-7	24 th Stre	PO-1	607.70	11.73	139.0000	0.00
P-8	PO-2	PO-1	1032.80	11.73	139.0000	0.00
P-9	Saxon	S-1	85.20	11.73	139.0000	0.00
P-10	36-3	CL-3	677.10	14.08	139.0000	0.00
P-11	S-7	36-1	1211.70	14.08	139.0000	0.00
P-12	S-6	S-7	398.00	14.08	139.0000	0.00
P-13	S-5	S-6	57.70	11.73	139.0000	0.00
P-14	S-4	S-5	203.00	11.73	139.0000	0.00
P-15	Cedar Lane	CL-1	293.70	11.73	139.0000	0.00
P-16	CL-1	CL-2	1054.00	14.08	139.0000	0.00
P-17	PO-6	PO-7	218.90	11.73	139.0000	0.00
P-18	PO-5	PO-6	2181.40	14.08	139.0000	0.00
P-19	S-1	S-2	236.40	11.73	139.0000	0.00
P-20	Saxon	S-1	85.20	11.73	139.0000	0.00
P-21	S-2	S-3	142.40	11.73	139.0000	0.00
P-22	S-3	S-4	281.70	11.73	139.0000	0.00
P-23	36-4	36-3	708.10	14.08	139.0000	0.00
P-24-XX	36-4	Standpipe	96.80	14.08	139.0000	0.00
P-25	36-2	36-1	1133.70	14.08	139.0000	0.00

PUMP/LOSS ELEMENT DATA

THERE IS A DEVICE AT NODE 24 th Stre DESCRIBED BY THE FOLLOWING DATA: (ID= 3)

HEAD (ft)	FLOWRATE (gpm)	EFFICIENCY (%)
129.23	0.00	75.00 (Default)
113.08	1136.00	75.00 (Default)
9.69	3326.03	75.00 (Default)

THERE IS A DEVICE AT NODE Cedar Lane DESCRIBED BY THE FOLLOWING DATA: (ID= 1)

HEAD (ft)	FLOWRATE (gpm)	EFFICIENCY (%)
129.23	0.00	100.00
110.77	1136.00	100.00
9.69	3100.00	100.00

THERE IS A DEVICE AT NODE Saxon DESCRIBED BY THE FOLLOWING DATA: (ID= 2)

HEAD (ft)	FLOWRATE (gpm)	EFFICIENCY (%)
143.08	0.00	75.00 (Default)
133.85	1190.00	75.00 (Default)
57.69	3905.26	75.00 (Default)

N O D E D A T A

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	JUNCTION ELEVATION (ft)	EXTERNAL GRADE (ft)
24 th Stre		----	1173.70	1173.70
Cedar Lane		----	1171.80	1171.80
Saxon		----	1164.70	1164.70
Standpipe		----	1195.00	1280.00
36-1		169.90	1135.40	
36-2		0.00	1173.20	
36-3		239.40	1177.90	
36-4		0.00	1194.40	
CL-1		0.00	1170.60	
CL-2		823.10	1192.80	
CL-3		0.00	1136.80	
PO-1		0.00	1163.90	
PO-2		0.00	1155.90	
PO-3		120.50	1167.60	
PO-4		88.80	1177.50	
PO-5		528.90	1185.10	
PO-6		0.00	1206.10	
PO-7		60.10	1188.30	
S-1		0.00	1168.40	
S-2		0.00	1156.10	
S-3		0.00	1159.10	
S-4		0.00	1184.40	
S-5		0.00	1201.00	
S-6		0.00	1202.00	
S-7		0.00	1181.70	

O U T P U T O P T I O N D A T A

OUTPUT SELECTION: ALL RESULTS ARE INCLUDED IN THE TABULATED OUTPUT
MAXIMUM AND MINIMUM PRESSURES = 5
MAXIMUM AND MINIMUM VELOCITIES = 5
MAXIMUM AND MINIMUM HEAD LOSS/1000 = 5

S Y S T E M C O N F I G U R A T I O N

NUMBER OF PIPES .....(P) = 25
NUMBER OF END NODES .....(J) = 21
NUMBER OF PRIMARY LOOPS .....(L) = 1
NUMBER OF SUPPLY NODES .....(F) = 4
NUMBER OF SUPPLY ZONES .....(Z) = 1

Case: 0

RESULTS OBTAINED AFTER 5 TRIALS: ACCURACY = 0.61890E-06

S I M U L A T I O N D E S C R I P T I O N (L A B E L)

P I P E L I N E R E S U L T S

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS #1	#2	FLOWRATE gpm	HEAD LOSS ft	MINOR LOSS ft	LINE VELO. ft/s	HL+ML/ 1000 ft/f	HL/ 1000 ft/f
P-1	CL-2	CL-3	-313.11	0.06	0.00	0.65	0.12	0.12
P-2	CL-3	36-2	-811.45	0.27	0.00	1.67	0.70	0.70
P-3	PO-4	36-4	-258.94	0.13	0.00	0.53	0.08	0.08
P-4	PO-4	PO-5	589.00	0.09	0.00	1.21	0.39	0.39
P-5	PO-4	PO-3	-418.86	0.73	0.00	1.24	0.50	0.50
P-6	PO-3	PO-2	-539.36	0.84	0.00	1.60	0.80	0.80
P-7	24 th Stre	PO-1	539.36	0.48	0.00	1.60	0.80	0.80
P-8	PO-2	PO-1	-539.36	0.82	0.00	1.60	0.80	0.80
P-9	Saxon	S-1	490.68	0.06	0.00	1.46	0.67	0.67
P-10	36-3	CL-3	-498.34	0.19	0.00	1.03	0.28	0.28
P-11	S-7	36-1	981.35	1.20	0.00	2.02	0.99	0.99
P-12	S-6	S-7	981.35	0.40	0.00	2.02	0.99	0.99
P-13	S-5	S-6	981.35	0.14	0.00	2.91	2.41	2.41
P-14	S-4	S-5	981.35	0.49	0.00	2.91	2.41	2.41
P-15	Cedar Lane	CL-1	509.99	0.21	0.00	1.51	0.72	0.72
P-16	CL-1	CL-2	509.99	0.31	0.00	1.05	0.30	0.30
P-17	PO-6	PO-7	60.10	0.00	0.00	0.18	0.01	0.01
P-18	PO-5	PO-6	60.10	0.01	0.00	0.12	0.01	0.01
P-19	S-1	S-2	981.35	0.57	0.00	2.91	2.41	2.41
P-20	Saxon	S-1	490.68	0.06	0.00	1.46	0.67	0.67
P-21	S-2	S-3	981.35	0.34	0.00	2.91	2.41	2.41
P-22	S-3	S-4	981.35	0.68	0.00	2.91	2.41	2.41
P-23	36-4	36-3	-258.94	0.06	0.00	0.53	0.08	0.08
P-24-XX	36-4	Standpipe						
P-25	36-2	36-1	-811.45	0.79	0.00	1.67	0.70	0.70

P U M P/L O S S E L E M E N T R E S U L T S

NAME	FLOWRATE gpm	INLET HEAD ft	OUTLET HEAD ft	PUMP HEAD ft	EFFIC- ENCY %	USEFUL POWER Hp	INCREMTL COST $	TOTAL COST $	#PUMPS PARALLEL	#PUMPS SERIES	NPSH Avail. ft
24 th Stre	539.36	0.00	125.20	125.2	75.00	0.	0.0	0.0	**	**	33.2
Cedar Lane	509.99	0.00	125.07	125.1	75.00	0.	0.0	0.0	**	**	33.2
Saxon	981.35	0.00	136.64	136.6	75.00	0.	0.0	0.0	**	**	33.2

NODE RESULTS

NODE NAME	NODE TITLE	EXTERNAL DEMAND gpm	HYDRAULIC GRADE ft	NODE ELEVATION ft	PRESSURE HEAD ft	NODE PRESSURE psi
24 th Stre		----	1298.90	1173.70	125.20	54.25
Cedar Lane		----	1296.87	1171.80	125.07	54.20
Saxon		----	1301.34	1164.70	136.64	59.21
Standpipe		----	1280.00	1195.00	85.00	36.83
36-1		169.90	1297.46	1135.40	162.06	70.23
36-2		0.00	1296.67	1173.20	123.47	53.50
36-3		239.40	1296.21	1177.90	118.31	51.27
36-4		0.00	1296.15	1194.40	101.75	44.09
CL-1		0.00	1296.66	1170.60	126.06	54.63
CL-2		823.10	1296.35	1192.80	103.55	44.87
CL-3		0.00	1296.41	1136.80	159.61	69.16
PO-1		0.00	1298.41	1163.90	134.51	58.29
PO-2		0.00	1297.59	1155.90	141.69	61.40
PO-3		120.50	1296.75	1167.60	129.15	55.97
PO-4		88.80	1296.02	1177.50	118.52	51.36
PO-5		528.90	1295.93	1185.10	110.83	48.03
PO-6		0.00	1295.92	1206.10	89.82	38.92
PO-7		60.10	1295.91	1188.30	107.61	46.63
S-1		0.00	1301.29	1168.40	132.89	57.58
S-2		0.00	1300.71	1156.10	144.61	62.67
S-3		0.00	1300.37	1159.10	141.27	61.22
S-4		0.00	1299.69	1184.40	115.29	49.96
S-5		0.00	1299.20	1201.00	98.20	42.55
S-6		0.00	1299.06	1202.00	97.06	42.06
S-7		0.00	1298.67	1181.70	116.97	50.69

MAXIMUM AND MINIMUM VALUES

PRESSURES

JUNCTION NUMBER	MAXIMUM PRESSURES psi	JUNCTION NUMBER	MINIMUM PRESSURES psi
36-1	70.23	Standpipe	36.83
CL-3	69.16	PO-6	38.92
S-2	62.67	S-6	42.06
PO-2	61.40	S-5	42.55
S-3	61.22	36-4	44.09

VELOCITIES

PIPE NUMBER	MAXIMUM VELOCITY (ft/s)	PIPE NUMBER	MINIMUM VELOCITY (ft/s)
P-13	2.91	P-18	0.12
P-14	2.91	P-17	0.18
P-19	2.91	P-3	0.53
P-21	2.91	P-23	0.53
P-22	2.91	P-1	0.65

HL + ML / 1000

PIPE NUMBER	MAXIMUM HL+ML/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL+ML/1000 (ft/ft)
P-14	2.41	P-18	0.01
P-21	2.41	P-17	0.01
P-13	2.41	P-3	0.08
P-19	2.41	P-23	0.08

P-22	2.41	P-1	0.12

H L / 1 0 0 0

PIPE NUMBER	MAXIMUM HL/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL/1000 (ft/ft)
P-14	2.41	P-18	0.01
P-21	2.41	P-17	0.01
P-13	2.41	P-3	0.08
P-19	2.41	P-23	0.08
P-22	2.41	P-1	0.12

S U M M A R Y O F I N F L O W S A N D O U T F L O W S

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
(-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE gpm	NODE TITLE
24 th Stree	539.36	
Cedar Lane	509.99	
Saxon	981.35	
Standpipe	0.00	

NET SYSTEM INFLOW = 2030.70
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 2030.70

***** HYDRAULIC ANALYSIS COMPLETED *****

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* * * * * * * * * * * * KYPIPE * * * * * * * * * * * *
*                                                      *
*  Pipe Network Modeling Software                      *
*                                                      *
*  CopyRighted by KYPIPE LLC (www.kypipe.com)          *
*  Version: 8.010 (vr8)  11/20/2015                    *
*  Serial #:  6-5045996                                *
*  Interface:  KYnetic                                 *
*  Licensed for Pipe2016                               *
*                                                      *
* * * * * * * * * * * * * * * * * * * * * * * * * * * *
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Date & Time: Thu Jan 21 21:30:22 2016

SUMMARY OF ORIGINAL DATA

UNITS SPECIFIED

FLOWRATE ..... = gallons/minute
HEAD (HGL) ..... = feet
PRESSURE ..... = psig

PIPELINE DATA

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NAMES #1	#2	LENGTH (ft)	DIAMETER (in)	ROUGHNESS COEFF.	MINOR LOSS COEFF.
P-1	CL-2	CL-3	471.80	14.08	139.0000	0.00
P-2	CL-3	36-2	381.90	14.08	139.0000	0.00
P-3	PO-4	36-4	1560.40	14.08	139.0000	0.00
P-4	PO-4	PO-5	242.50	14.08	139.0000	0.00
P-5	PO-4	PO-3	1468.60	11.73	139.0000	0.00
P-6	PO-3	PO-2	1051.10	11.73	139.0000	0.00
P-7	24 th Stre	PO-1	607.70	11.73	139.0000	0.00
P-8	PO-2	PO-1	1032.80	11.73	139.0000	0.00
P-9	Saxon	S-1	85.20	11.73	139.0000	0.00
P-10	36-3	CL-3	677.10	14.08	139.0000	0.00
P-11	S-7	36-1	1211.70	14.08	139.0000	0.00
P-12	S-6	S-7	398.00	14.08	139.0000	0.00
P-13	S-5	S-6	57.70	11.73	139.0000	0.00
P-14	S-4	S-5	203.00	11.73	139.0000	0.00
P-15	Cedar Lane	CL-1	293.70	11.73	139.0000	0.00
P-16	CL-1	CL-2	1054.00	14.08	139.0000	0.00
P-17	PO-6	PO-7	218.90	11.73	139.0000	0.00
P-18	PO-5	PO-6	2181.40	14.08	139.0000	0.00
P-19	S-1	S-2	236.40	11.73	139.0000	0.00
P-20	Saxon	S-1	85.20	11.73	139.0000	0.00
P-21	S-2	S-3	142.40	11.73	139.0000	0.00
P-22	S-3	S-4	281.70	11.73	139.0000	0.00
P-23	36-4	36-3	708.10	14.08	139.0000	0.00
P-24-XX	36-4	Standpipe	96.80	14.08	139.0000	0.00
P-25	36-2	36-1	1133.70	14.08	139.0000	0.00

PUMP/LOSS ELEMENT DATA

THERE IS A DEVICE AT NODE 24 th Stre DESCRIBED BY THE FOLLOWING DATA: (ID= 3)

HEAD (ft)	FLOWRATE (gpm)	EFFICIENCY (%)
129.23	0.00	75.00 (Default)
113.08	1136.00	75.00 (Default)
9.69	3326.03	75.00 (Default)

THERE IS A DEVICE AT NODE Cedar Lane DESCRIBED BY THE FOLLOWING DATA: (ID= 1)

HEAD (ft)	FLOWRATE (gpm)	EFFICIENCY (%)
129.23	0.00	100.00
110.77	1136.00	100.00
9.69	3100.00	100.00

THERE IS A DEVICE AT NODE Saxon DESCRIBED BY THE FOLLOWING DATA: (ID= 2)

HEAD (ft)	FLOWRATE (gpm)	EFFICIENCY (%)
143.08	0.00	75.00 (Default)
133.85	1190.00	75.00 (Default)
57.69	3905.26	75.00 (Default)

N O D E D A T A

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	JUNCTION ELEVATION (ft)	EXTERNAL GRADE (ft)
24 th Stre		----	1173.70	1173.70
Cedar Lane		----	1171.80	1171.80
Saxon		----	1164.70	1164.70
Standpipe		----	1195.00	1280.00
36-1		169.90	1135.40	
36-2		0.00	1173.20	
36-3		239.40	1177.90	
36-4		0.00	1194.40	
CL-1		0.00	1170.60	
CL-2		823.10	1192.80	
CL-3		0.00	1136.80	
PO-1		0.00	1163.90	
PO-2		0.00	1155.90	
PO-3		120.50	1167.60	
PO-4		88.80	1177.50	
PO-5		528.90	1185.10	
PO-6		0.00	1206.10	
PO-7		1560.10	1188.30	
S-1		0.00	1168.40	
S-2		0.00	1156.10	
S-3		0.00	1159.10	
S-4		0.00	1184.40	
S-5		0.00	1201.00	
S-6		0.00	1202.00	
S-7		0.00	1181.70	

O U T P U T O P T I O N D A T A

OUTPUT SELECTION: ALL RESULTS ARE INCLUDED IN THE TABULATED OUTPUT

MAXIMUM AND MINIMUM PRESSURES	=	5
MAXIMUM AND MINIMUM VELOCITIES	=	5
MAXIMUM AND MINIMUM HEAD LOSS/1000	=	5

S Y S T E M C O N F I G U R A T I O N

NUMBER OF PIPES	(P) =	25
NUMBER OF END NODES	(J) =	21
NUMBER OF PRIMARY LOOPS	(L) =	1
NUMBER OF SUPPLY NODES	(F) =	4
NUMBER OF SUPPLY ZONES	(Z) =	1

Case: 0

RESULTS OBTAINED AFTER 4 TRIALS: ACCURACY = 0.23420E-05

S I M U L A T I O N D E S C R I P T I O N (L A B E L)

P I P E L I N E R E S U L T S

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS #1	#2	FLOWRATE gpm	HEAD LOSS ft	MINOR LOSS ft	LINE VELO. ft/s	HL+ML/ 1000 ft/f	HL/ 1000 ft/f
P-1	CL-2	CL-3	206.31	0.03	0.00	0.43	0.06	0.06
P-2	CL-3	36-2	-1287.87	0.63	0.00	2.65	1.64	1.64
P-3	PO-4	36-4	-1254.79	2.44	0.00	2.59	1.57	1.57
P-4	PO-4	PO-5	2089.00	0.98	0.00	4.30	4.02	4.02
P-5	PO-4	PO-3	-923.01	3.16	0.00	2.74	2.15	2.15
P-6	PO-3	PO-2	-1043.51	2.84	0.00	3.10	2.70	2.70
P-7	24 th Stre	PO-1	1043.51	1.64	0.00	3.10	2.70	2.70
P-8	PO-2	PO-1	-1043.51	2.79	0.00	3.10	2.70	2.70
P-9	Saxon	S-1	728.89	0.12	0.00	2.16	1.39	1.39
P-10	36-3	CL-3	-1494.19	1.47	0.00	3.08	2.16	2.16
P-11	S-7	36-1	1457.77	2.50	0.00	3.00	2.07	2.07
P-12	S-6	S-7	1457.77	0.82	0.00	3.00	2.07	2.07
P-13	S-5	S-6	1457.77	0.29	0.00	4.32	5.02	5.02
P-14	S-4	S-5	1457.77	1.02	0.00	4.32	5.02	5.02
P-15	Cedar Lane	CL-1	1029.41	0.77	0.00	3.05	2.64	2.64
P-16	CL-1	CL-2	1029.41	1.14	0.00	2.12	1.09	1.09
P-17	PO-6	PO-7	1560.10	1.25	0.00	4.63	5.69	5.69
P-18	PO-5	PO-6	1560.10	5.11	0.00	3.21	2.34	2.34
P-19	S-1	S-2	1457.77	1.19	0.00	4.32	5.02	5.02
P-20	Saxon	S-1	728.89	0.12	0.00	2.16	1.39	1.39
P-21	S-2	S-3	1457.77	0.72	0.00	4.32	5.02	5.02
P-22	S-3	S-4	1457.77	1.41	0.00	4.32	5.02	5.02
P-23	36-4	36-3	-1254.79	1.11	0.00	2.59	1.57	1.57
P-24-XX	36-4	Standpipe						
P-25	36-2	36-1	-1287.87	1.86	0.00	2.65	1.64	1.64

P U M P/L O S S E L E M E N T R E S U L T S

NAME	FLOWRATE gpm	INLET HEAD ft	OUTLET HEAD ft	PUMP HEAD ft	EFFIC- ENCY %	USEFUL POWER Hp	INCREMTL COST $	TOTAL COST $	#PUMPS PARALLEL	#PUMPS SERIES	NPSH Avail. ft
24 th Stre	1043.51	0.00	115.44	115.4	75.00	0.	0.0	0.0	**	**	33.2
Cedar Lane	1029.41	0.00	113.86	113.9	75.00	0.	0.0	0.0	**	**	33.2
Saxon	1457.77	0.00	129.58	129.6	75.00	0.	0.0	0.0	**	**	33.2

N O D E R E S U L T S

NODE NAME	NODE TITLE	EXTERNAL DEMAND gpm	HYDRAULIC GRADE ft	NODE ELEVATION ft	PRESSURE HEAD ft	NODE PRESSURE psi
24 th Stre		----	1289.14	1173.70	115.44	50.02
Cedar Lane		----	1285.66	1171.80	113.86	49.34
Saxon		----	1294.28	1164.70	129.58	56.15
Standpipe		----	1280.00	1195.00	85.00	36.83
36-1		169.90	1286.21	1135.40	150.81	65.35
36-2		0.00	1284.34	1173.20	111.15	48.16
36-3		239.40	1282.25	1177.90	104.35	45.22
36-4		0.00	1281.14	1194.40	86.74	37.59
CL-1		0.00	1284.89	1170.60	114.29	49.52
CL-2		823.10	1283.74	1192.80	90.94	39.41
CL-3		0.00	1283.72	1136.80	146.92	63.66
PO-1		0.00	1287.50	1163.90	123.60	53.56
PO-2		0.00	1284.71	1155.90	128.81	55.82
PO-3		120.50	1281.86	1167.60	114.26	49.51
PO-4		88.80	1278.70	1177.50	101.20	43.85
PO-5		528.90	1277.72	1185.10	92.62	40.14
PO-6		0.00	1272.61	1206.10	66.51	28.82
PO-7		1560.10	1271.36	1188.30	83.06	35.99
S-1		0.00	1294.16	1168.40	125.76	54.50
S-2		0.00	1292.97	1156.10	136.87	59.31
S-3		0.00	1292.26	1159.10	133.16	57.70
S-4		0.00	1290.84	1184.40	106.44	46.13
S-5		0.00	1289.82	1201.00	88.82	38.49
S-6		0.00	1289.54	1202.00	87.54	37.93
S-7		0.00	1288.71	1181.70	107.01	46.37

M A X I M U M A N D M I N I M U M V A L U E S

P R E S S U R E S

JUNCTION NUMBER	MAXIMUM PRESSURES psi	JUNCTION NUMBER	MINIMUM PRESSURES psi
36-1	65.35	PO-6	28.82
CL-3	63.66	PO-7	35.99
S-2	59.31	Standpipe	36.83
S-3	57.70	36-4	37.59
Saxon	56.15	S-6	37.93

V E L O C I T I E S

PIPE NUMBER	MAXIMUM VELOCITY (ft/s)	PIPE NUMBER	MINIMUM VELOCITY (ft/s)
P-17	4.63	P-1	0.43
P-19	4.32	P-16	2.12
P-13	4.32	P-20	2.16
P-14	4.32	P-9	2.16
P-21	4.32	P-3	2.59

H L + M L / 1 0 0 0

PIPE NUMBER	MAXIMUM HL+ML/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL+ML/1000 (ft/ft)
P-17	5.69	P-1	0.06
P-19	5.02	P-16	1.09
P-21	5.02	P-20	1.39
P-14	5.02	P-9	1.39
P-22	5.02	P-3	1.57

H L / 1 0 0 0

PIPE NUMBER	MAXIMUM HL/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL/1000 (ft/ft)
P-17	5.69	P-1	0.06
P-19	5.02	P-16	1.09
P-21	5.02	P-20	1.39
P-14	5.02	P-9	1.39
P-22	5.02	P-3	1.57

S U M M A R Y O F I N F L O W S A N D O U T F L O W S

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
(-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE gpm	NODE TITLE
24 th Stree	1043.51	
Cedar Lane	1029.41	
Saxon	1457.77	
Standpipe	0.00	

NET SYSTEM INFLOW = 3530.70
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 3530.70

***** HYDRAULIC ANALYSIS COMPLETED *****

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* * * * * * * * * * * * K Y P I P E * * * * * * * * * * * *
*                                                           *
*  Pipe Network Modeling Software                           *
*                                                           *
*  CopyRighted by KYPIPE LLC (www.kypipe.com)               *
*  Version: 8.010 (vr8)  11/20/2015                         *
*  Serial #:  6-5045996                                     *
*  Interface:  KYnetic                                      *
*  Licensed for Pipe2016                                    *
*                                                           *
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
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Date & Time: Thu Jan 21 22:23:08 2016

SUMMARY OF ORIGINAL DATA

UNITS SPECIFIED

FLOWRATE ..... = gallons/minute
HEAD (HGL) ..... = feet
PRESSURE ..... = psig

PIPELINE DATA

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NAMES #1	#2	LENGTH (ft)	DIAMETER (in)	ROUGHNESS COEFF.	MINOR LOSS COEFF.
P-1	CL-2	CL-3	471.80	14.08	139.0000	0.00
P-2	CL-3	36-2	381.90	14.08	139.0000	0.00
P-3	PO-4	36-4	1560.40	14.08	139.0000	0.00
P-4	PO-4	PO-5	242.50	14.08	139.0000	0.00
P-5	PO-4	PO-3	1468.60	11.73	139.0000	0.00
P-6-XX	PO-3	PO-2	1051.10	11.73	139.0000	0.00
P-7	24 th Stre	PO-1	607.70	11.73	139.0000	0.00
P-8	PO-2	PO-1	1032.80	11.73	139.0000	0.00
P-9	Saxon	S-1	85.20	11.73	139.0000	0.00
P-10	36-3	CL-3	677.10	14.08	139.0000	0.00
P-11-XX	S-7	36-1	1211.70	14.08	139.0000	0.00
P-12	S-6	S-7	398.00	14.08	139.0000	0.00
P-13	S-5	S-6	57.70	11.73	139.0000	0.00
P-14	S-4	S-5	203.00	11.73	139.0000	0.00
P-15	Cedar Lane	CL-1	293.70	11.73	139.0000	0.00
P-16	CL-1	CL-2	1054.00	14.08	139.0000	0.00
P-17	PO-6	PO-7	218.90	11.73	139.0000	0.00
P-18	PO-5	PO-6	2181.40	14.08	139.0000	0.00
P-19	S-1	S-2	236.40	11.73	139.0000	0.00
P-20	Saxon	S-1	85.20	11.73	139.0000	0.00
P-21	S-2	S-3	142.40	11.73	139.0000	0.00
P-22	S-3	S-4	281.70	11.73	139.0000	0.00
P-23	36-4	36-3	708.10	14.08	139.0000	0.00
P-24	36-4	Standpipe	96.80	14.08	139.0000	0.00
P-25	36-2	36-1	1133.70	14.08	139.0000	0.00

PUMP/LOSS ELEMENT DATA

THERE IS A DEVICE AT NODE 24 th Stre DESCRIBED BY THE FOLLOWING DATA: (ID= 3)

HEAD (ft)	FLOWRATE (gpm)	EFFICIENCY (%)
129.23	0.00	75.00 (Default)
113.08	1136.00	75.00 (Default)
9.69	3326.03	75.00 (Default)

THERE IS A DEVICE AT NODE Cedar Lane DESCRIBED BY THE FOLLOWING DATA: (ID= 1)

HEAD (ft)	FLOWRATE (gpm)	EFFICIENCY (%)
129.23	0.00	100.00
110.77	1136.00	100.00
9.69	3100.00	100.00

THERE IS A DEVICE AT NODE Saxon DESCRIBED BY THE FOLLOWING DATA: (ID= 2)

HEAD (ft)	FLOWRATE (gpm)	EFFICIENCY (%)
143.08	0.00	75.00 (Default)
133.85	1190.00	75.00 (Default)
57.69	3905.26	75.00 (Default)

N O D E D A T A

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	JUNCTION ELEVATION (ft)	EXTERNAL GRADE (ft)
24 th Stre		----	1173.70	1173.70
Cedar Lane		----	1171.80	1171.80
Saxon		----	1164.70	1164.70
Standpipe		----	1195.00	1280.00
36-1		169.90	1135.40	
36-2		0.00	1173.20	
36-3		239.40	1177.90	
36-4		0.00	1194.40	
CL-1		0.00	1170.60	
CL-2		823.10	1192.80	
CL-3		0.00	1136.80	
PO-1		0.00	1163.90	
PO-2		0.00	1155.90	
PO-3		120.50	1167.60	
PO-4		88.80	1177.50	
PO-5		528.90	1185.10	
PO-6		0.00	1206.10	
PO-7		1560.10	1188.30	
S-1		0.00	1168.40	
S-2		0.00	1156.10	
S-3		0.00	1159.10	
S-4		0.00	1184.40	
S-5		0.00	1201.00	
S-6		0.00	1202.00	
S-7		0.00	1181.70	

O U T P U T O P T I O N D A T A

OUTPUT SELECTION: ALL RESULTS ARE INCLUDED IN THE TABULATED OUTPUT

MAXIMUM AND MINIMUM PRESSURES	=	5
MAXIMUM AND MINIMUM VELOCITIES	=	5
MAXIMUM AND MINIMUM HEAD LOSS/1000	=	5

S Y S T E M C O N F I G U R A T I O N

NUMBER OF PIPES .....(P)	=	25
NUMBER OF END NODES .....(J)	=	21
NUMBER OF PRIMARY LOOPS .....(L)	=	1
NUMBER OF SUPPLY NODES .....(F)	=	4
NUMBER OF SUPPLY ZONES .....(Z)	=	1

Case: 0

RESULTS OBTAINED AFTER 5 TRIALS: ACCURACY = 0.42948E-06

S I M U L A T I O N D E S C R I P T I O N (L A B E L)

P I P E L I N E R E S U L T S

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS #1	#2	FLOWRATE gpm	HEAD LOSS ft	MINOR LOSS ft	LINE VELO. ft/s	HL+ML/ 1000 ft/f	HL/ 1000 ft/f
P-1	CL-2	CL-3	332.76	0.06	0.00	0.69	0.13	0.13
P-2	CL-3	36-2	169.90	0.01	0.00	0.35	0.04	0.04
P-3	PO-4	36-4	-2298.30	7.49	0.00	4.74	4.80	4.80
P-4	PO-4	PO-5	2089.00	0.98	0.00	4.30	4.02	4.02
P-5	PO-4	PO-3	120.50	0.07	0.00	0.36	0.05	0.05
P-6-XX	PO-3	PO-2						
P-7	24 th Stre	PO-1	0.00	0.00	0.00	0.00	0.00	0.00
P-8	PO-2	PO-1	0.00	0.00	0.00	0.00	0.00	0.00
P-9	Saxon	S-1	0.00	0.00	0.00	0.00	0.00	0.00
P-10	36-3	CL-3	-162.86	0.02	0.00	0.34	0.04	0.04
P-11-XX	S-7	36-1						
P-12	S-6	S-7	0.00	0.00	0.00	0.00	0.00	0.00
P-13	S-5	S-6	0.00	0.00	0.00	0.00	0.00	0.00
P-14	S-4	S-5	0.00	0.00	0.00	0.00	0.00	0.00
P-15	Cedar Lane	CL-1	1155.86	0.96	0.00	3.43	3.27	3.27
P-16	CL-1	CL-2	1155.86	1.42	0.00	2.38	1.34	1.34
P-17	PO-6	PO-7	1560.10	1.25	0.00	4.63	5.69	5.69
P-18	PO-5	PO-6	1560.10	5.11	0.00	3.21	2.34	2.34
P-19	S-1	S-2	0.00	0.00	0.00	0.00	0.00	0.00
P-20	Saxon	S-1	0.00	0.00	0.00	0.00	0.00	0.00
P-21	S-2	S-3	0.00	0.00	0.00	0.00	0.00	0.00
P-22	S-3	S-4	0.00	0.00	0.00	0.00	0.00	0.00
P-23	36-4	36-3	76.54	0.01	0.00	0.16	0.01	0.01
P-24	36-4	Standpipe	-2374.84	0.49	0.00	4.89	5.10	5.10
P-25	36-2	36-1	169.90	0.04	0.00	0.35	0.04	0.04

P U M P/L O S S E L E M E N T R E S U L T S

NAME	FLOWRATE gpm	INLET HEAD ft	OUTLET HEAD ft	PUMP HEAD ft	EFFIC- ENCY %	USEFUL POWER Hp	INCREMTL COST $	TOTAL COST $	#PUMPS PARALLEL	#PUMPS SERIES	NPSH Avail. ft
24 th Stre	0.00	0.00	129.23	129.2	75.00	0.	0.0	0.0	**	**	33.2
Cedar Lane	1155.86	0.00	110.16	110.2	75.00	0.	0.0	0.0	**	**	33.2
Saxon	0.00	0.00	143.08	143.1	75.00	0.	0.0	0.0	**	**	33.2

N O D E R E S U L T S

NODE NAME	NODE TITLE	EXTERNAL DEMAND gpm	HYDRAULIC GRADE ft	NODE ELEVATION ft	PRESSURE HEAD ft	NODE PRESSURE psi	
24 th Stre		----	1302.93	1173.70	129.23	56.00	
Cedar Lane		----	1281.96	1171.80	110.16	47.74	
Saxon		----	1307.78	1164.70	143.08	62.00	
Standpipe		----	1280.00	1195.00	85.00	36.83	
36-1		169.90	1279.47	1135.40	144.07	62.43	"E"
36-2		0.00	1279.51	1173.20	106.31	46.07	
36-3		239.40	1279.50	1177.90	101.60	44.03	
36-4		0.00	1279.51	1194.40	85.11	36.88	
CL-1		0.00	1281.00	1170.60	110.40	47.84	
CL-2		823.10	1279.59	1192.80	86.79	37.61	
CL-3		0.00	1279.52	1136.80	142.72	61.85	
PO-1		0.00	1302.93	1163.90	139.03	60.25	
PO-2		0.00	1302.93	1155.90	147.03	63.71	
PO-3		120.50	1271.92	1167.60	104.32	45.21	"E"
PO-4		88.80	1272.01	1177.50	94.51	40.95	
PO-5		528.90	1271.04	1185.10	85.94	37.24	
PO-6		0.00	1265.92	1206.10	59.82	25.92	
PO-7		1560.10	1264.68	1188.30	76.38	33.10	
S-1		0.00	1307.78	1168.40	139.38	60.40	
S-2		0.00	1307.78	1156.10	151.68	65.73	
S-3		0.00	1307.78	1159.10	148.68	64.43	
S-4		0.00	1307.78	1184.40	123.38	53.46	
S-5		0.00	1307.78	1201.00	106.78	46.27	
S-6		0.00	1307.78	1202.00	105.78	45.84	
S-7		0.00	1307.79	1181.70	126.09	54.64	

M A X I M U M A N D M I N I M U M V A L U E S

P R E S S U R E S

JUNCTION NUMBER	MAXIMUM PRESSURES psi	JUNCTION NUMBER	MINIMUM PRESSURES psi
S-2	65.73	PO-6	25.92
S-3	64.43	PO-7	33.10
PO-2	63.71	Standpipe	36.83
36-1	62.43	36-4	36.88
Saxon	62.00	PO-5	37.24

V E L O C I T I E S

PIPE NUMBER	MAXIMUM VELOCITY (ft/s)	PIPE NUMBER	MINIMUM VELOCITY (ft/s)
P-24	4.89	P-23	0.16
P-3	4.74	P-10	0.34
P-17	4.63	P-2	0.35
P-4	4.30	P-25	0.35
P-15	3.43	P-5	0.36

H L + M L / 1 0 0 0

PIPE NUMBER	MAXIMUM HL+ML/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL+ML/1000 (ft/ft)
P-17	5.69	P-23	0.01
P-24	5.10	P-10	0.04
P-3	4.80	P-2	0.04
P-4	4.02	P-25	0.04
P-15	3.27	P-5	0.05

H L / 1 0 0 0

PIPE NUMBER	MAXIMUM HL/1000 (ft/ft)	PIPE NUMBER	MINIMUM HL/1000 (ft/ft)
P-17	5.69	P-23	0.01
P-24	5.10	P-10	0.04
P-3	4.80	P-2	0.04
P-4	4.02	P-25	0.04
P-15	3.27	P-5	0.05

S U M M A R Y O F I N F L O W S A N D O U T F L O W S

(+) INFLOWS INTO THE SYSTEM FROM SUPPLY NODES
(-) OUTFLOWS FROM THE SYSTEM INTO SUPPLY NODES

NODE NAME	FLOWRATE gpm	NODE TITLE
24 th Stree	0.00	
Cedar Lane	1155.86	
Saxon	0.00	
Standpipe	2374.84	

NET SYSTEM INFLOW = 3530.70
NET SYSTEM OUTFLOW = 0.00
NET SYSTEM DEMAND = 3530.70

***** HYDRAULIC ANALYSIS COMPLETED *****

Attachment #7

Service Area Maps

Exhibit A – Cedar Lane connection, No Stand Pipe
Exhibit B – Cedar Lane and Saxon connections, No Stand Pipe
Exhibit C – 24th Ave SE connections, No Stand Pipe
Exhibit D – Cedar Lane, Saxon, and 24th Ave SE connections, No Stand Pipe
Exhibit E – Cedar Lane and 30' x 115' Stand Pipe

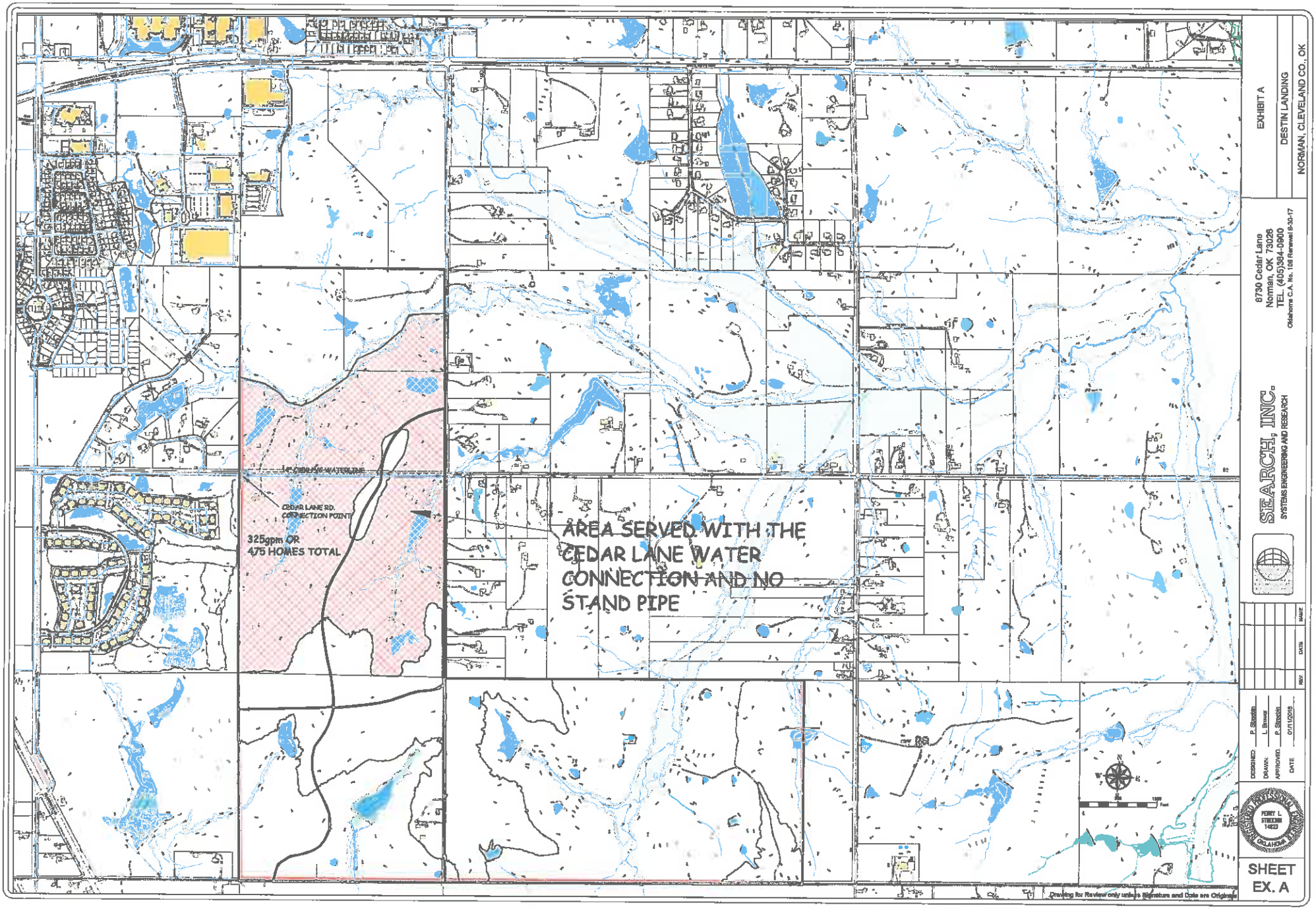


EXHIBIT A

DESTIN LANDING

NORMAN, CLEVELAND CO., OK

SEARCH, INC.

SYSTEMS ENGINEERING AND RESEARCH

6730 Cedar Lane
Norman, OK 73026
TEL. (405)364-0800
Oklahoma C.A. No. 108 Renewal 6-30-17

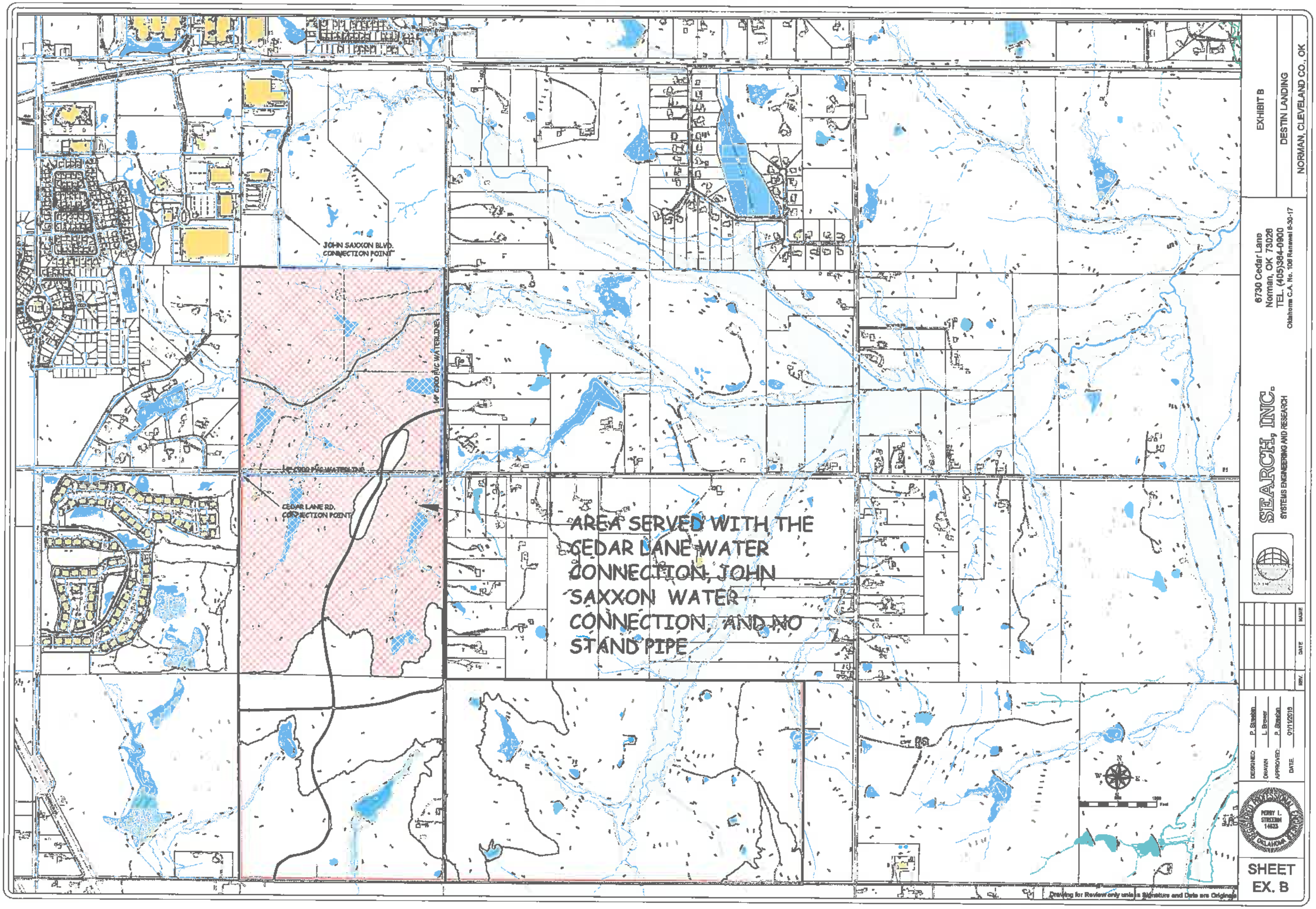
REV	DATE	MAP

DESIGNED: P. Stockton
DRAWN: L. Brewer
APPROVED: P. Stockton
DATE: 01/11/2018

PERRY L. STOCKTON 14823 OKLAHOMA

SHEET
EX. A

Drawing for Review only unless Signature and Date are Original


JOHN SAXXON BLVD. CONNECTION POINT
CEDAR LANE RD. CONNECTION POINT
AREA SERVED WITH THE CEDAR LANE WATER CONNECTION, JOHN SAXXON WATER CONNECTION, AND NO STAND PIPE
Drawing for Review only unless Signature and Date are Originals
EXHIBIT B
DESTIN LANDING
NORMAN, CLEVELAND CO., OK
6730 Cedar Lane
Norman, OK 73026
TEL. (405)364-0900
Oklahoma C.A. No. 108 Renewal 6-30-17
SEARCH, INC.
SYSTEMS ENGINEERING AND RESEARCH
REV.
DATE
NAME
DESIGNED: P. Streetman
DRAWN: L. Brewer
APPROVED: P. Streetman
DATE: 01/11/2018
PERRY L. STREETMAN 14623
OKLAHOMA
SHEET
EX. B

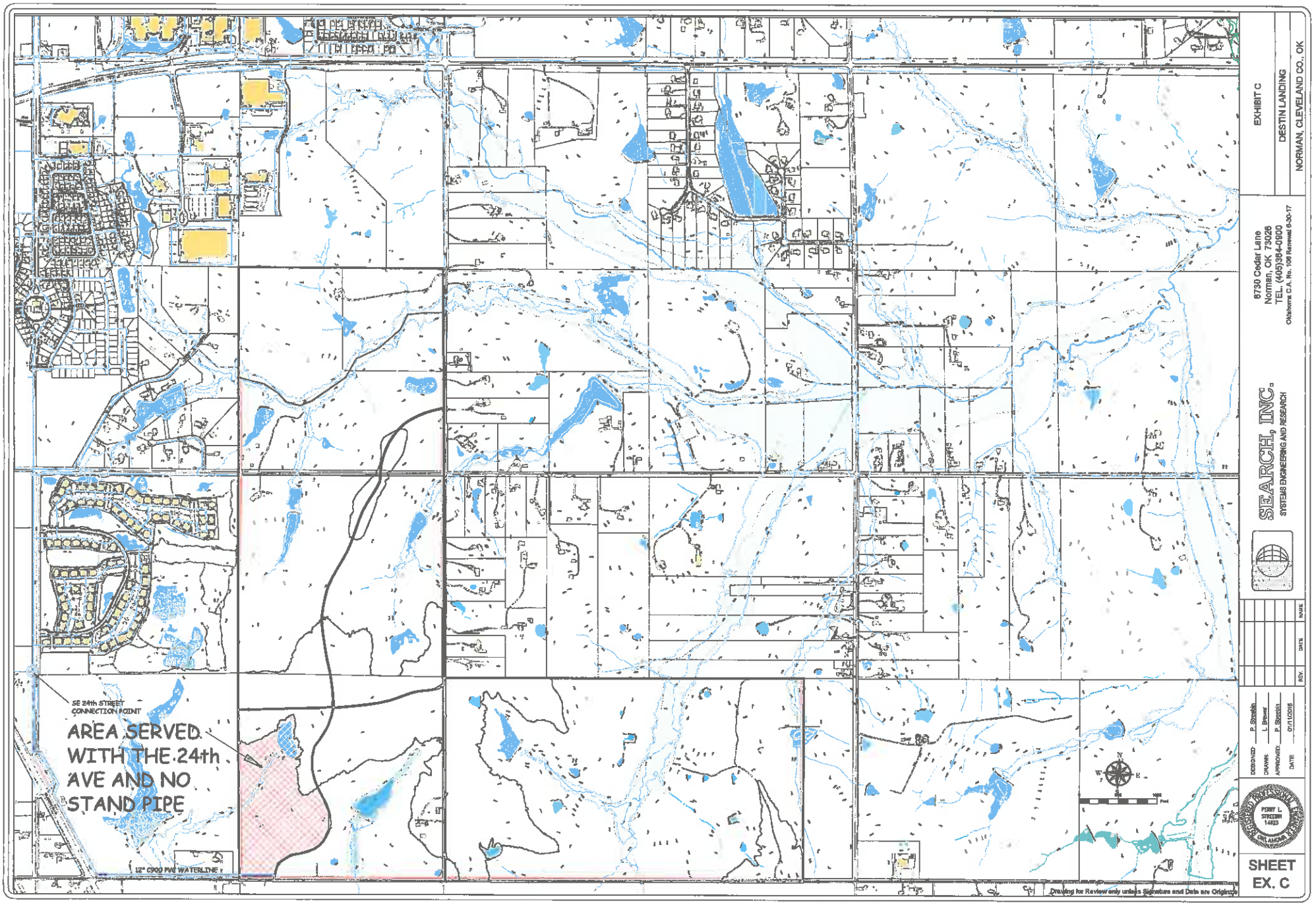


EXHIBIT C

DESTIN LANDING

NORMAN, CLEVELAND CO., OK

SEARCH, INC.
SYSTEMS ENGINEERING AND RESEARCH
6730 Cedar Lane
Norman, OK 73026
TEL (405)364-0900
Oklahoma C.A. No. 108 Renewal 6-30-17

REV.	DATE	NOTES

DESIGNED P. Stricklin
DRAWN L. Brewer
APPROVED P. Stricklin
DATE 01/15/2016

PERRY L. STRICKLIN 14825

SHEET
EX. C

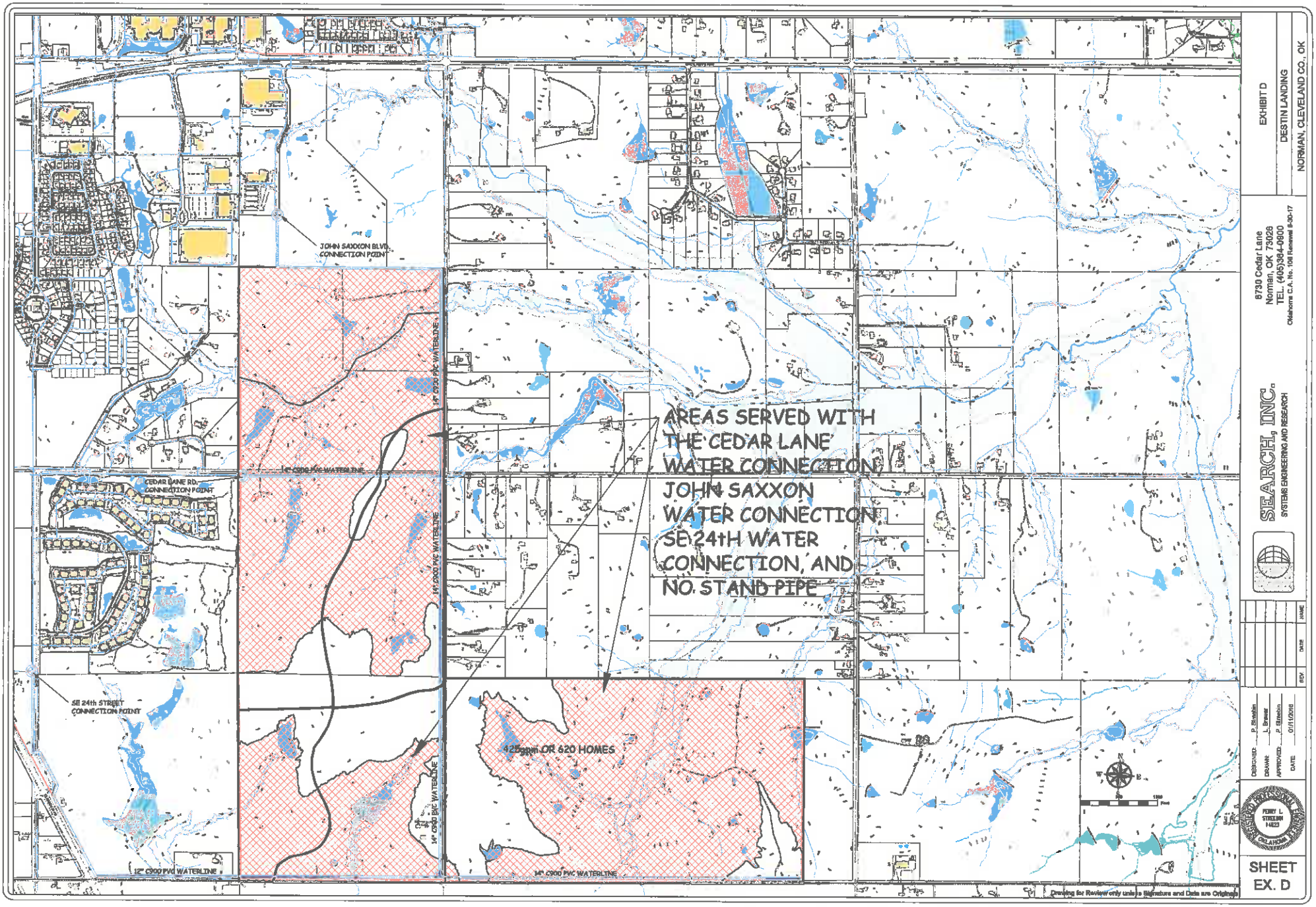


EXHIBIT D

DESTIN LANDING

NORMAN, CLEVELAND CO., OK

SEARCH, INC.
SYSTEMS ENGINEERING AND RESEARCH
8730 Cedar Lane
Norman, OK 73026
TEL. (405)364-0900
Oklahoma C.A. No. 168 Renewal 6-30-17

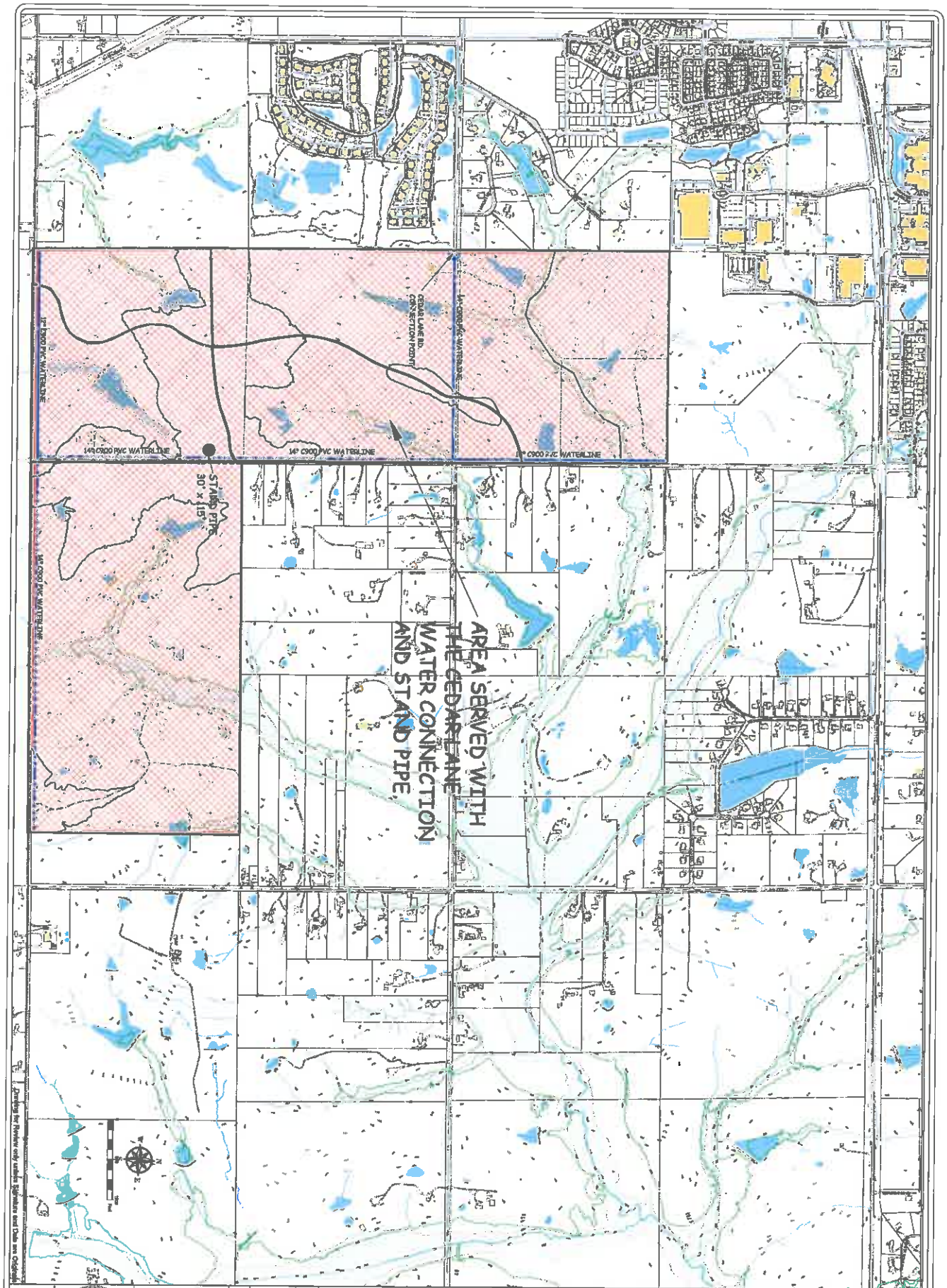
REV	DATE	NAME

DESIGNED P. Stretlin
DRAWN L. Brewer
APPROVED P. Stretlin
DATE 01/11/2016

PERRY L. STRETLIN 14823 OKLAHOMA REGISTERED ENGINEER

SHEET EX. D

Drawing for Review only unless Signature and Date are Originals



SHEET EX. E

DESIGNED: P. Stratton
DRAWN: L. Brewer
APPROVED: P. Stratton
DATE: 01/11/2018

REV.	DATE	NAME

SEARCH, INC.
SYSTEMS ENGINEERING AND RESEARCH

6730 Cedar Lane
Norman, OK 73026
TEL. (405)364-0900
Oklahoma C.A. No. 108 Renewal 6-30-17

EXHIBIT E
DESTIN LANDING
NORMAN, CLEVELAND CO., OK