

TECHNICAL MEMORANDUM NO. LS-45: RESULTS OF INVENTORY, SURVEY, AND DRAWDOWN TESTING AT HEARN ROAD LIFT STATION

990 Hammond Drive, Suite 400
Atlanta, Georgia 30328

DeKalb Contract No: 06-900397
BC Project No.: 131343
Project Title: Study of the Water Distribution and Wastewater Collection System
Inclusive of Inspection, Evaluation, Geographic Location, and
Inventory
To: Nadine Maghsoudlou, Department of Watershed Management
From: Rob Bocarro, Brown and Caldwell
Date: October 20, 2008

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ATTACHMENTS

- Attachment A: CD containing the following electronic deliverables:
1. Updated Access database containing inventory of all lift stations surveyed by the BC and Long Engineering team to date.
 2. MicroStation and Adobe files of survey drawings.
 3. An electronic copy of Technical Memorandum No. LS-45 and attachments.
- Attachment B: Locality and Site Map of Hearn Road Lift Station
- Attachment C: Copy of Lift Station Inspection Form
- Attachment D: Photos of Hearn Road Lift Station
- Attachment E: Boundary and Topographic Survey of Hearn Road Lift Station
- Attachment F: Drawdown Test Results from Isco 4501 Pump Station Flow Monitor

Prepared by:	_____	Date	_____
	Bobby Sauer, P.E., Project Engineer		
Checked by:	_____	Date	_____
	Rob Bocarro, Ph.D., Project Manager		
Approved by:	_____	Date	_____
	Nadine Maghsoudlou, Client Project Manager		

1. INTRODUCTION AND BACKGROUND

The Study of the Water Distribution and Wastewater Collection System Inclusive of Inspection, Evaluation, Geographic Location, and Inventory (DeKalb County Contract No. 06-900397) involves the inspection, evaluation, inventory, and geographical location of all public and private sanitary sewer manholes, public and private sewer mains, service line cleanouts, and lift stations in the wastewater collection system and water meters in the water distribution system. With respect to the sewage lift stations, the project team is responsible for performing an inventory, survey, and drawdown testing at all lift stations in DeKalb County.

The inventory includes obtaining the number of pumps, capacity, type, motor size, and other name plate data such as serial numbers and year of installation. The project team also determines the wetwell dimensions, street address, subdivision (if applicable), basin, and subbasin. The project team is responsible for surveying the coordinates of the center of the wetwell, in addition to an updated boundary survey and a 2-foot topographic survey that locates any buildings, fences, and driveways and determines first floor elevations. Drawdown testing involves the installation of an electronic data logger at each lift station, which is used to determine the inflow into the lift station and outflow for each pump and combinations of pumps.

This Technical Memorandum, No. LS-45, has been prepared to present the results of the inventory, survey, and drawdown testing of Hearn Road Lift Station (DeKalb County Lift Station No. 45). In Attachment A, a compact disc has been included which contains electronic copies of all deliverables required by DeKalb County, including the updated Access database, MicroStation survey files, and digital photos.

Hearn Road Lift Station is located in the Corn Creek sewage drainage basin in the southern part of the County, as shown on the locality map in Attachment B. The nearest physical address of the lift station is **4317 Hearn Road, Ellenwood, GA 30294**. Wastewater collected at Hearn Road Lift Station is pumped to the Snapfinger Creek Advanced Wastewater Treatment (AWT) facility. Hearn Road Lift Station is one of DeKalb County's numerous small sewage lift stations.

2. METHODOLOGY

The inventory and survey of Hearn Road Lift Station was performed by teams from Brown and Caldwell (BC) and Long Engineering on March 14, 2008 and May 1, 2008, respectively. The inventory of pumps, motors, standby generator, and other lift station information including wetwell dimensions was recorded on a Lift Station Inspection Form, a copy of which is presented in Attachment C. The teams took digital photos of the lift station, which are presented in the form of a photo log in Attachment D.

A boundary survey of the lift station was performed, in addition to a 2-foot topographic survey of the lift station, standby generator, and access road. The locations of incoming sewers and manholes were recorded and also surveyed. The survey drawings of the lift station are presented in Attachment E.

The drawdown testing of this lift station was carried out over an 11-day period from March 14 to March 25, 2008 and accomplished with an Isco 4501 Pump Station Flow Monitor (flow monitor). The lift station has two pumps and current clamps were used to connect the flow monitor to the

pump motor starters. The clamps were attached by Department of Watershed Management (DWM) personnel. This device was used to log the start and stop times of the pumps as the wetwell fills and empties. In order to analyze the filling and pumping of the lift station using the flow monitor, at least seven cycles of filling and pumping were required. This criterion was met as the BC team let the flow monitor continuously monitor for 11 days, generating more than a week of inflow and outflow data. The BC team also obtained corresponding 24-hour rainfall data for the nearest weather station, at Stockbridge/McDonough, Georgia, via the web site www.wunderground.com to determine if there were apparent impacts of rainfall on the lift station inflow.

The team determined the dimensions and elevation at the top of the concrete slab. They also measured the depth from the top of the slab to the bottom of the wetwell and the elevations of all the floats and/or pressure transducer levels: low-low (LL), low/lead on (L), high/lag on (H), and high-high (HH). The activation and termination of pumps at Hearn Road Lift Station is controlled by pressure transducer readings, in which the transducer is mounted and suspended inside the wetwell. HH is governed by a float. Additionally, BC personnel used a laser measurement device to verify Long's measurements and the measurements the County has written on the pump controls since these dimensions are extremely important in the pump station analysis.

Survey measurements were used to calculate the various volumes between the pump start/stop levels. The volumetric data was required for calculation of the average inflow into the wetwell and flow capacity of the lift station pumps. Every pump start and stop over the monitoring period was recorded on the flow monitor and the data were analyzed using the Isco Pumplink® software provided with the device. In cases where the pump station did not have sufficient inflow over the monitoring period to trigger both pumps to run concurrently for an appreciable amount of time, BC personnel manually operated both pumps in the ON position and simultaneously measured the wetwell water level over timed intervals. This manual two-pump pumpdown test was the best way to assess the performance of both pumps running together.

The results of the drawdown testing and calculations are presented in Attachment F.

3. SUMMARY OF LIFT STATION INVENTORY AND SURVEY

In this section, summary tables of the inventory of the pumps and motors at Hearn Road Lift Station are presented, including the general information in Table 3-1.

Table 3-1. General Lift Station Summary		
Name of Lift Station	#45 Hearn Road	
Nearest Physical Address	4317 Hearn Road, Ellenwood, GA 30294	
State Plane Coordinate of Wetwell Center	Easting: 2,282,621.6923	Northing: 1,328,484.0965
Drainage Basin / Sub-Drainage Basin	Snapfinger Creek	Corn Creek
Lift Station Description	This is one of DeKalb's numerous small lift stations. The lift station has two vertical centrifugal 40-hp pumps mounted below ground in a packaged lift station assembly.	

Tables 3-2 and 3-3 detail the name plate information obtained during the inventory of pumps and motors.

Table 3-2. Pump No. 1 Name Plate Summary	
Pump Number	1
Pump Manufacturer / Model Number	Smith & Loveless/4D3
Name Plate Capacity, gpm	350
Total Dynamic Head, ft	117.5
Motor Horsepower	40
Motor RPM	1776
Observations, if any	Pump operational
Data Gaps	Date of pump installation; pump impeller diameter; pump impeller model number; date of motor installation

Table 3-3. Pump No. 2 Name Plate Summary	
Pump Number	2
Pump Manufacturer / Model Number	Smith & Loveless/4D3
Name Plate Capacity, gpm	350
Total Dynamic Head, ft	117.5
Motor Horsepower	40
Motor RPM	1776
Observations, if any	Pump operational
Data Gaps	Date of pump installation; pump impeller diameter; pump impeller model number; date of motor installation

Table 3-4 details the wetwell operating levels and volumes between levels. The pressure transducer monitors up to four levels in the wetwell and is used to activate or terminate the operation of pumps. A float signals a high-level (HH) alarm elevation. The table notes how the lift station operates as the level goes up or down in the wetwell.

Table 3-4. Wetwell Operating Levels and Volumes			
Elevation (ft) or Volume (gal)		Action When Level Goes Up	Action When Level Goes Down
High-level alarm (HH) elevation, ft	715.93	Alarm sent to DWM	DWM personnel must respond to cancel alarm
Level 3 (H/lag on) elevation, ft	713.40	Level at which lag pump starts	None
Level 2 (L/lead on) elevation, ft	711.40	Level at which lead pump starts	None
Level 1 (LL/low-low) elevation, ft	707.20	None	All pumps stop
Bottom of wetwell elevation, ft	703.29		
Volume between levels 3 and HH, gal	876 ¹		
Volume between levels 2 and 3, gal	798 ²		
Volume between levels 1 and 2, gal	1358 ³		
Total Wetwell Storage Volume, gal	3033		

¹ Includes 148 gallons of storage in the sewer between manhole 15-002-s029 and the wet well.

² Includes 222 gallons of storage in the sewer between manhole 15-002-s029 and the wet well.

³ Includes 149 gallons of storage in the sewer between manhole 15-002-s029 and the wet well.

4. RESULTS OF LIFT STATION DRAWDOWN TESTS

Inflows and outflows were determined for the two pumps using the Isco Pumplink software provided with the flow monitor. Table 4.1 shows an average inflow of 93.4 gpm over the period March 14 through March 25, 2008.

Table 4-1. Drawdown Test General Summary	
Monitoring Period	Start on March 14, 2008 at 12:48 p.m. End on March 25, 2008 at 9:16 a.m.
Total Inflow, gal	1,459,478 gal
Average Inflow, gpm	93.4 gpm
Comments	Lift station does not have a flow meter to check and calibrate inflow and outflow.

Table 4-2 shows the daily inflow and rainfall data for the same period.

Table 4-2. Drawdown Test and Rainfall Daily Summary						
Day:	3/14/08	3/15/08	3/16/08	3/17/08	3/18/08	3/19/08
Inflow, gal	56,973 ¹	140,224	145,098	117,374	115,697	136,717
Average Inflow, gpm	84.8	97.4	100.8	81.5	80.4	94.9
Rainfall ² , in	0.42	0.64	0.00	0.00	0.00	0.78
Day:	3/20/08	3/21/08	3/22/08	3/23/08	3/24/08	3/25/08
Inflow, gal	132,525	130,461	157,434	151,388	137,717	37,869 ¹
Average Inflow, gpm	92.0	90.6	109.3	105.1	95.6	68.1
Rainfall ² , in	0.00	0.00	0.00	0.00	0.00	0.00

¹ Datum does not include entire day.

² Rainfall data were obtained from the web site www.wunderground.com at a Stockbridge/McDonough, GA weather station.

Table 4-3 contains a summary of the average pumping rates and comparison with the name plate capacities.

Table 4-3. Drawdown Test Pumps Summary			
Pump No.	Number of Starts	Name Plate Capacity, gpm	Average Pumping Rate, gpm
1	393	350	419
2	393	350	353

The average pumping rate has been calculated using the Isco PumpLink software, which takes inflow into account. It is notable that the condition of two pumps running concurrently never occurred during the monitoring period, but it is assumed to occur when levels in the wetwell are high enough (reaching level 3/lag on, as shown in Table 3-4). The lack of data with two pumps on precluded a PumpLink calculation of pumping rate with two pumps on. Thus, a manual test was performed with both pumps manually turned on. Using the laser measurement device, BC concurrently recorded wetwell water levels over timed intervals. However, high inflow into the wetwell precluded this measurement and thus a two-pump pumping rate was not determined.

5. LIFT STATION PROBLEMS

The drawdown testing and field observations at Hearn Road Lift Station indicated no problems. However, County personnel did state that the wetwell has been observed to receive a high load of sediment. Additionally, County personnel said that a second influent pipe, of 4-inch diameter, is located directly underneath the 24-inch line and thus cannot be observed. The runtime shown on the stand-by generator, only 1.9 hours, appeared to be in error. The operation of the runtime meter should be checked.

Due to high inflow entering the wetwell from the 24-inch line, a manual pumpdown test could not be performed. The inflow rate was too significant for meaningful drawdown measurements to be collected, i.e. the water level did not change appreciably. Additionally, it should be noted that the 24-inch influent was recorded by the surveyor to enter the wetwell at a negative slope, i.e. it is not sloped to flow into the wetwell. Due to this, the pipe storage calculations included in Appendix F utilize additional pipe storage in the subsequent upstream pipe segment, which has a typical slope.

Several rain events occurred during the monitoring period, but the events did not correspond to the dates of greatest inflow. Thus, it is unlikely that rainfall-induced inflow and infiltration had an impact on the lift station.

6. ELECTRONIC DELIVERABLES

Attachment A includes a CD containing the following electronic deliverables:

1. Updated Access database containing inventory of all lift stations surveyed by the BC and Long Engineering team to date.
2. MicroStation and Adobe files of the survey drawings.
3. An electronic copy of Technical Memorandum No. LS-45 and attachments.

7. ACKNOWLEDGEMENTS

The assistance of the DeKalb County Department of Watershed Management personnel during the inventory, survey, and drawdown testing at Hearn Road Lift Station is gratefully acknowledged, especially Steve Johnson and Jose Santiago.

**Attachment A: CD containing the following
electronic deliverables:**

1. Updated Access database containing inventory of all lift stations surveyed by the BC and Long Engineering team to date
2. MicroStation and Adobe files of survey drawings of lift station
3. An electronic copy of Technical Memorandum No. LS-45 and attachments.

Attachment B: Locality and Site Map of Hearn Road Lift Station



River Point Place

4317 Hearn Rd, Ellenwood, GA 30294
Hearn Road Lift Station

Knights Lane

Elkwood Circle

Stillwater Point

Black Water Cove

Sweet Meadow Lane

River Road

Timberwood Estates Drive

South River Bend

May Office

© 2008 Tele Atlas
elev 231 m

Attachment C: Copy of Lift Station Inspection Form

- LEGEND:
- N/F NOW OR FORMERLY
- SS— SANITARY SEWER GRAVITY LINE
- FM— SANITARY SEWER FORCE MAIN
- ℙ PROPERTY LINE
- ℄ CENTERLINE
- R/W RIGHT OF WAY
- ⊙ SANITARY SEWER MANHOLE
- DB, /PG. DEED BOOK AND PAGE
- COMPUTED PROPERTY CORNER
- FOUND PROPERTY CORNER
- P.O.B. POINT OF BEGINNING
- P.O.C. POINT OF COMMENCEMENT
- LLL LAND LOT LINE

DEED REFERENCES:				
DEED BOOK	PAGE	DATE	NAME	
1)	1937	460	13 NOV 1964	W.J. MARSH, JR.
2)	10488	586	25 JUN 1999	HENRY COUNTY WATER & SEWERAGE AUTHORITY

WET-WELL CENTER
COORDINATES:
TOP EL.- 732.54'
N- 1,328,484.0965
E- 2,282,621.6923

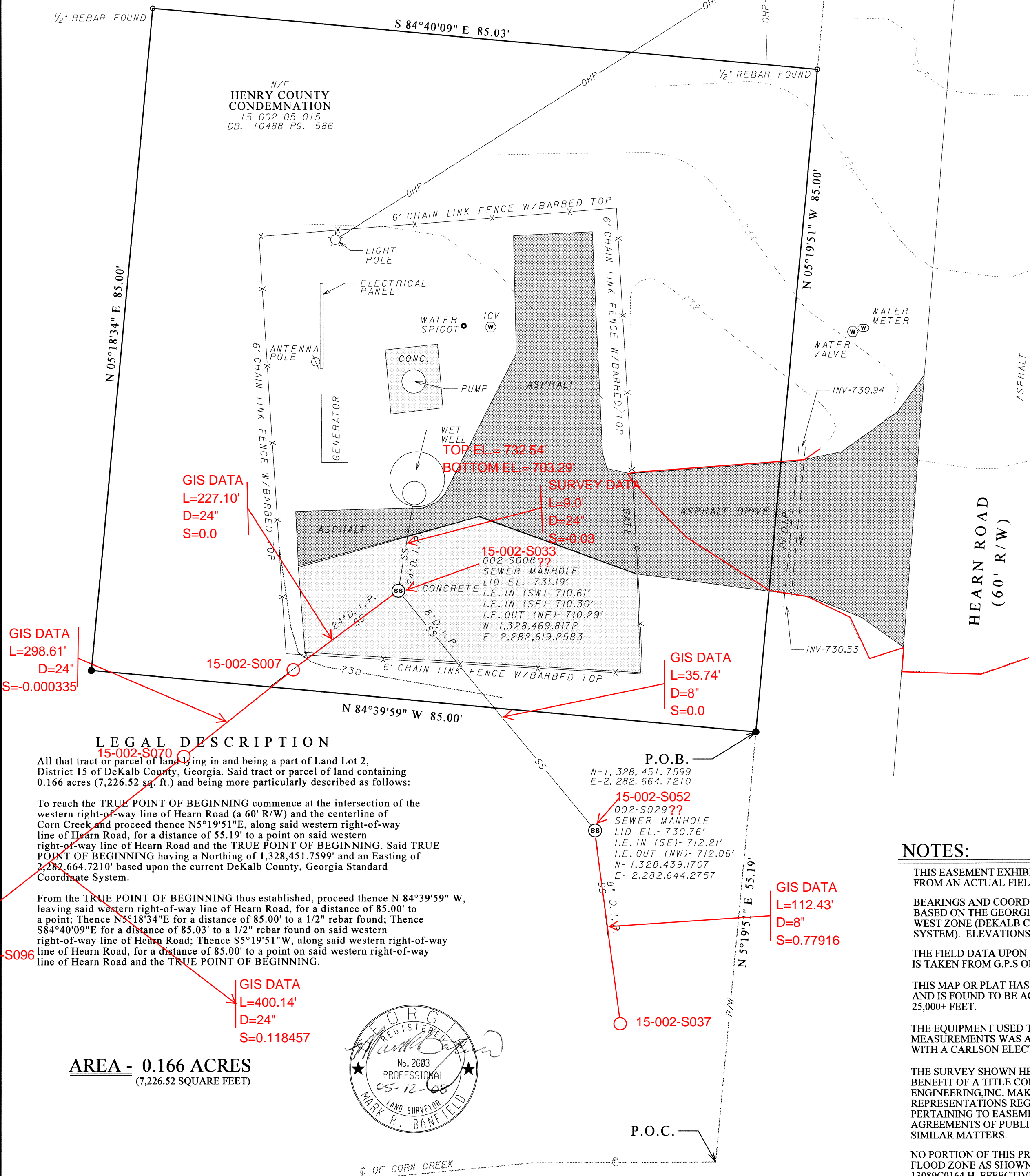
24° D.I.P.
I.E. IN = 710.56'

24° D.I.P.
9.0' L.F.
3.0' R.S.
REVERSE
SLOPE

002-S008
SEWER MANHOLE
LID EL.- 731.19'
I.E. IN (SW)- 710.61'
I.E. IN (SE)- 710.30'
I.E. OUT (NE)- 710.29'
N- 1,328,469.8172
E- 2,282,619.2583

NO SCALE

N/F
W.J. MARSH, JR.
15 002 05 015
DB. 1937 PG. 460



LEGAL DESCRIPTION

All that tract or parcel of land lying in and being a part of Land Lot 2, District 15 of DeKalb County, Georgia. Said tract or parcel of land containing 0.166 acres (7,226.52 sq. ft.) and being more particularly described as follows:

To reach the TRUE POINT OF BEGINNING commence at the intersection of the western right-of-way line of Hearn Road (a 60' R/W) and the centerline of Corn Creek and proceed thence N5°19'51\"E, along said western right-of-way line of Hearn Road, for a distance of 55.19' to a point on said western right-of-way line of Hearn Road and the TRUE POINT OF BEGINNING. Said TRUE POINT OF BEGINNING having a Northing of 1,328,451.7599' and an Easting of 2,282,664.7210' based upon the current DeKalb County, Georgia Standard Coordinate System.

From the TRUE POINT OF BEGINNING thus established, proceed thence N 84°39'59\" W, leaving said western right-of-way line of Hearn Road, for a distance of 85.00' to a point; Thence N5°18'34\"E for a distance of 85.00' to a 1/2\" rebar found; Thence S84°40'09\"E for a distance of 85.03' to a 1/2\" rebar found on said western right-of-way line of Hearn Road; Thence S5°19'51\"W, along said western right-of-way line of Hearn Road, for a distance of 85.00' to a point on said western right-of-way line of Hearn Road and the TRUE POINT OF BEGINNING.

GIS DATA
L=400.14'
D=24\"
S=0.118457

AREA - 0.166 ACRES
(7,226.52 SQUARE FEET)



NOTES:

THIS EASEMENT EXHIBIT AND TOPOGRAPHIC SURVEY IS PRODUCED FROM AN ACTUAL FIELD SURVEY PERFORMED 1 MAY 2008.

BEARINGS AND COORDINATES SHOWN ON THIS PLAT ARE BASED ON THE GEORGIA STATE PLANE COORDINATE SYSTEM, WEST ZONE (DEKALB COUNTY STANDARD COORDINATE SYSTEM). ELEVATIONS SHOWN ARE BASE ON NAVD88.

THE FIELD DATA UPON WHICH THIS MAP OR PLAT IS BASED IS TAKEN FROM G.P.S OBSERVATIONS.

THIS MAP OR PLAT HAS BEEN CALCULATED FOR CLOSURE AND IS FOUND TO BE ACCURATE TO WITHIN ONE FOOT IN 25,000+ FEET.

THE EQUIPMENT USED TO PERFORM LINEAR AND ANGULAR MEASUREMENTS WAS A TOPCON GPT 3000 IN CONJUNCTION WITH A CARLSON ELECTRONIC DATA COLLECTOR.

THE SURVEY SHOWN HEREON WAS PREPARED WITHOUT THE BENEFIT OF A TITLE COMMITMENT; THEREFORE, LONG ENGINEERING, INC. MAKES NO GUARANTEES OR REPRESENTATIONS REGARDING INFORMATION SHOWN HEREON PERTAINING TO EASEMENTS, RIGHT-OF-WAY, SETBACKS LINES, AGREEMENTS OF PUBLIC RECORD, RESERVATIONS AND OTHER SIMILAR MATTERS.

NO PORTION OF THIS PROPERTY LIES WITHIN THE 100-YEAR FLOOD ZONE AS SHOWN ON THE F.I.R.M. PANEL NUMBER 13089C0164 H, EFFECTIVE MAY 7, 2001, AVAILABLE FROM F.E.M.A.

SCALE IN FEET		VERTICAL DATUM		LONG JOB NO.		REVISION DATES		BOUNDARY - AND - TOPOGRAPHIC SURVEY FOR:	
0 5 10 20		NAD83		0009-7550				DEKALB COUNTY PUBLIC WORKS WATER & SEWER	
LONG ENGINEERING, INC.		DRAWN BY SMS		DATE 12 MAY 2008				45 - HEARN ROAD LIFT STATION	
1780 Corporate Drive Suite 400 Norcross, Georgia 30093 Tel 770.931.8005 Fax 770.931.8555 www.longeng.com		CHECKED BY JGL		SCALE 1\" = 10'				LOCATED IN:	
								LAND LOT 2 15 th LAND DISTRICT	
								DEKALB COUNTY GEORGIA	

PUMP STATION INSPECTION FORM – DEKALB MAPPING PROJECT

SURVEY INSPECTION BY LONG ENGINEERING:

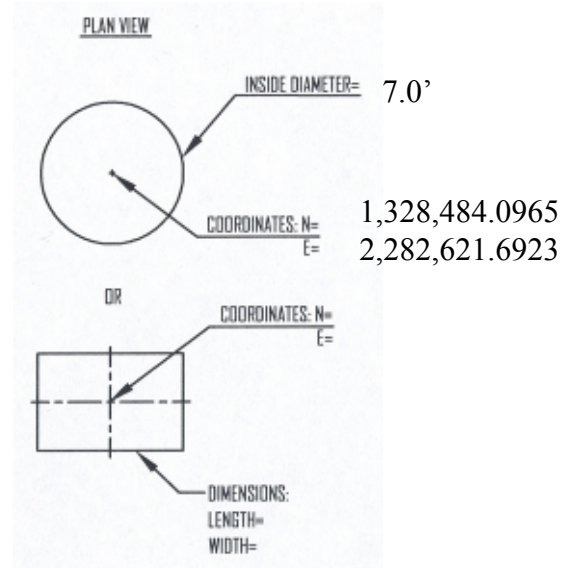
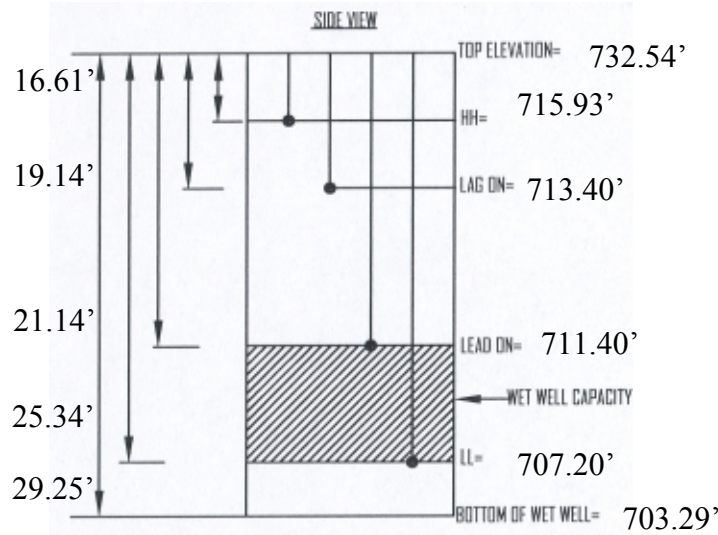
1. CREW: JJ/JM	2. DATE: 5/01/08	TIME: 1400	3. PUMP STATION ID/NAME: 45 / HEARN ROAD
4. GENERAL LOCATION: WEST SIDE OF HEARN RD., ~500' NORTH OF THURGOOD ESTATES DR.	5. LAND LOT: 02		
6. NEAREST STREET ADDRESS: 4317 HEARN RD., ATLANTA, GA 30294	7. DRAINAGE BASIN: SNAPPINGER CREEK		
8. SUB-DRAINAGE BASIN: CORN CREEK	9. OWNER (1. COUNTY, 2. PRIVATE): 1		
10. COUNTY: DEKALB	11. MUNICIPALITY: UNINCORPORATED		
12. SUBDIVISION: N/A	13. LAND DISTRICT: 15 TH		
14. TYPE OF FENCING - CODES (1. CHAIN LINK 2. WOOD 3. BRICK 4. NONE): 1	15. FENCE PERIMETER/LENGTH (FEET): 204.2		

PUMP STATION

16. PUMP STATION TYPE – CODES (1. ABOVE GROUND 2. BELOW GROUND 3. RECESSED 4. NONE): 2	17. PUMP STATION FIRM CAPACITY (GPM): 353
18. PUMP STATION NAME TAG VERIFICATION - SAME NAME TAG ON PUMPS, MOTORS, AND OTHER EQUIPMENT-CODES (1. YES 2. NO & WHY): 1	
19. CENTER OF WETWELL COORDINATES: EASTING: 2,282,621.6923	NORTHING: 1,328,484.0965

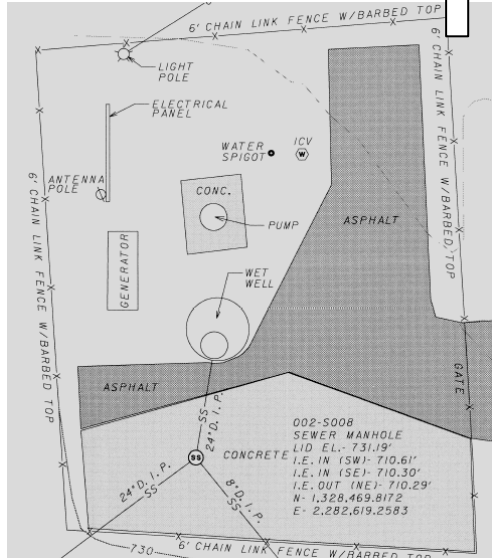
WETWELL INFORMATION

RECORD ALL 5 MEASURE DOWNS



20. TOP ELEVATION: 732.54'	21. HH ELEVATION: 715.93
22. LAG DN ELEVATION: 712.37	23. LEAD DN ELEVATION: 711.40
24. LL ELEVATION: 707.20	25. WETWELL (BOTTOM) ELEVATION: 703.29
26. WETWELL SIZE (DIAMETER/DIMENSIONS IN FEET): 7.0'	27. WETWELL CAPACITY, (GALLONS): 1358
28. ELEVATIONS OF OTHER STRUCTURES: REFER TO SURVEY DRAWING IN ATTACHMENT E	

29. PUMP STATION AREA SKETCH:



30. SCHEMATIC OF PUMPS, MOTORS, VALVES, AND PIPEWORK:

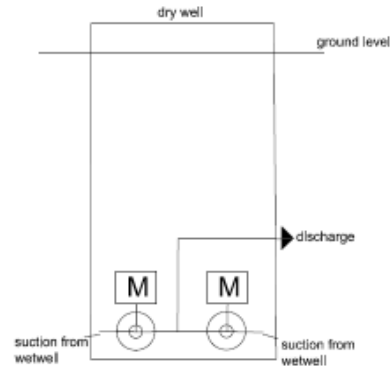


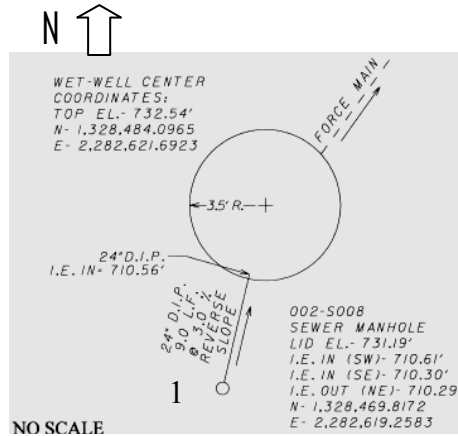
PHOTO NUMBERS	PICTURE DESCRIPTION
	SITE PICTURE: Refer to Photos on pages D-1 to D-2 in Attachment D.
	WETWELL:
	PUMPS, MOTOR:

31. PUMP STATION COMMENTS:

THE HEARN ROAD LIFT STATION (LS #45) IS A BELOWGROUND LIFT STATION. THE LIFT STATION HAS TWO VERTICALLY-MOUNTED CENTRIFUGAL PUMPS. THESE PUMPS ARE FLOODED-SUCTION-PRIMED. BOTH PUMPS WERE OPERATIONAL DURING THE VISIT.

WETWELL MEASUREMENTS (BC WILL COMPLETE PIPE ID NO.S)

(NUMBER PIPES IN CLOCKWISE DIRECTION FROM PIPE OUT)



32. PIPE OUT ID:	35. PIPE 1 ID: 15-002-s008-15-002-w401	38. PIPE 2 ID: NA	41. PIPE 3 ID:	44. PIPE 4 ID:
33. PIPE OUT SIZE (IN): ID	36. PIPE 1 SIZE (IN): 24	39. PIPE 2 SIZE (IN): 4	42. PIPE 3 SIZE (IN):	45. PIPE 4 SIZE (IN):
34. PIPE OUT ELEVATION: 718	37. PIPE 1 ELEVATION: 710.56	40. PIPE 2 ELEVATION: NA	43. PIPE 3 ELEVATION:	46. PIPE 4 ELEVATION:

46B. ADDITIONAL COMMENTS:
COUNTY PERSONNEL SAY THERE IS AN ADDITIONAL 4" INFLUENT UNDERNEATH THE 24" INFLUENT. THE 4" LINE CANNOT BE SEEN. HIGH INFLOW.

INVENTORY BY BC:

47. INVENTORY DATE: 3/14/08

48. INVENTORY TEAM: BS/FO

PUMP NO. 1 INFORMATION

49. PUMP NUMBER:	1	50. PUMP TYPE:	VERTICAL CENTRIFUGAL
51. PUMP MANUFACTURER:	SMITH AND LOVELESS	52. PUMP SIZE:	4"
53. PUMP MODEL NUMBER:	403	54. PUMP SERIAL NUMBER:	990654
55. PUMP CAPACITY (GPM):	350	56. PUMP TOTAL DYNAMIC HEAD (FT):	117.5
57. PUMP LOCATION:	BELOW GROUND	58. PUMP CLASSIFICATION:	BELOW GROUND
59. DATE PUMP INSTALLED:	INFORMATION NOT FOUND	60. PUMP IMPELLER DIAMETER:	INFORMATION NOT FOUND
61. PUMP IMPELLER MODEL NUMBER:	INFORMATION NOT FOUND	62. NO. OF STAGES:	1
63. PUMP PRIMING TYPE:	FLOODED SUCTION	64. SUCTION SIDE END TYPE:	FLANGED
65. SUCTION SIDE END DIAMETER:	8"	66. SUCTION SIDE CENTERLINE ELEVATION:	705
67. DISCHARGE SIDE END TYPE:	FLANGED	68. DISCHARGE SIDE END DIAMETER:	4"
69. DISCHARGE SIDE CENTERLINE ELEVATION:	705	70. MOTOR MANUFACTURER:	SMITH AND LOVELESS
71. DATE OF MOTOR INSTALLATION:	INFORMATION NOT FOUND	72. MOTOR MODEL NO.:	6VA324TDR8632TD4
73. MOTOR ORIENTATION:	VERTICAL	74. MOTOR TYPE:	AC INDUCTION/TDR
75. MOTOR VOLTAGE:	460	76. MOTOR HP:	40
77. MOTOR RPM:	1776	78. MOTOR FULL LOAD AMPS:	49
79. MOTOR RUN TIME (HOURS):	7712.31		

PUMP NO. 2 INFORMATION

80. PUMP NUMBER:	2	81. PUMP TYPE:	VERTICAL CENTRIFUGAL
82. PUMP MANUFACTURER:	SMITH AND LOVELESS	83. PUMP SIZE:	4"
84. PUMP MODEL NUMBER:	403	85. PUMP SERIAL NUMBER:	990655
86. PUMP CAPACITY (GPM):	350	87. PUMP TOTAL DYNAMIC HEAD (FT):	117.5
88. PUMP LOCATION:	BELOW GROUND	89. PUMP CLASSIFICATION:	BELOW GROUND
90. DATE PUMP INSTALLED:	INFORMATION NOT FOUND	91. PUMP IMPELLER DIAMETER:	INFORMATION NOT FOUND
92. PUMP IMPELLER MODEL NUMBER:	INFORMATION NOT FOUND	93. NO. OF STAGES:	1
94. PUMP PRIMING TYPE:	FLOODED SUCTION	95. SUCTION SIDE END TYPE:	FLANGED
96. SUCTION SIDE END DIAMETER:	8"	97. SUCTION SIDE CENTERLINE ELEVATION:	705
98. DISCHARGE SIDE END TYPE:	FLANGED	99. DISCHARGE SIDE END DIAMETER:	4"
100. DISCHARGE SIDE CENTERLINE ELEVATION:	705	101. MOTOR MANUFACTURER:	SMITH AND LOVELESS
102. DATE OF MOTOR INSTALLATION:	INFORMATION NOT FOUND	103. MOTOR MODEL NO.:	6VA324TDR8632TD4
104. MOTOR ORIENTATION:	VERTICAL	105. MOTOR TYPE:	AC INDUCTION/TDR
106. MOTOR VOLTAGE:	460	107. MOTOR HP:	40
108. MOTOR RPM:	1776	109. MOTOR FULL LOAD AMPS:	49
110. MOTOR RUN TIME (HOURS):	7070.59		

PUMP NO. 3 INFORMATION N/A			
111. PUMP NUMBER:		112. PUMP TYPE:	
113. PUMP MANUFACTURER:		114. PUMP SIZE:	
115. PUMP MODEL NUMBER:		116. PUMP SERIAL NUMBER:	
117. PUMP CAPACITY (GPM):		118. PUMP TOTAL DYNAMIC HEAD (FT):	
119. PUMP LOCATION:		120. PUMP CLASSIFICATION:	
121. DATE PUMP INSTALLED:		122. PUMP IMPELLER DIAMETER:	
123. PUMP IMPELLER MODEL NUMBER:		124. NO. OF STAGES:	
125. PUMP PRIMING TYPE:		126. SUCTION SIDE END TYPE:	
127. SUCTION SIDE END DIAMETER:		128. SUCTION SIDE CENTERLINE ELEVATION:	
129. DISCHARGE SIDE END TYPE:		130. DISCHARGE SIDE END DIAMETER:	
131. DISCHARGE SIDE CENTERLINE ELEVATION:		132. MOTOR MANUFACTURER:	
133. DATE OF MOTOR INSTALLATION:		134. MOTOR MODEL NO.:	
135. MOTOR ORIENTATION:		136. MOTOR TYPE:	
137. MOTOR VOLTAGE:		138. MOTOR HP:	
139. MOTOR RPM:		140. MOTOR FULL LOAD AMPS:	
141. MOTOR RUN TIME (HOURS):			
PUMP NO. 4 INFORMATION N/A			
142. PUMP NUMBER:		143. PUMP TYPE:	
144. PUMP MANUFACTURER:		145. PUMP SIZE:	
146. PUMP MODEL NUMBER:		147. PUMP SERIAL NUMBER:	
148. PUMP CAPACITY (GPM):		149. PUMP TOTAL DYNAMIC HEAD (FT):	
150. PUMP LOCATION:		151. PUMP CLASSIFICATION:	
152. DATE PUMP INSTALLED:		153. PUMP IMPELLER DIAMETER:	
154. PUMP IMPELLER MODEL NUMBER:		155. NO. OF STAGES:	
156. PUMP PRIMING TYPE:		157. SUCTION SIDE END TYPE:	
158. SUCTION SIDE END DIAMETER:		159. SUCTION SIDE CENTERLINE ELEVATION:	
160. DISCHARGE SIDE END TYPE:		161. DISCHARGE SIDE END DIAMETER:	
162. DISCHARGE SIDE CENTERLINE ELEVATION:		163. MOTOR MANUFACTURER:	
164. DATE OF MOTOR INSTALLATION:		165. MOTOR MODEL NO.:	
166. MOTOR ORIENTATION:		167. MOTOR TYPE:	
168. MOTOR VOLTAGE:		169. MOTOR HP:	
170. MOTOR RPM:		171. MOTOR FULL LOAD AMPS:	
172. MOTOR RUN TIME (HOURS):			
VACUUM PRIMING PUMPS			
PUMP NO. 1 INFORMATION			
173. PUMP NUMBER:		174. PUMP TYPE:	
175. PUMP MANUFACTURER:		176. PUMP SIZE:	
177. PUMP MODEL NUMBER:		178. PUMP SERIAL NUMBER:	
179. DATE PUMP INSTALLED:		180. MOTOR MANUFACTURER:	
181. MOTOR MODEL NO.:		182. DATE OF MOTOR INSTALLATION:	
183. MOTOR TYPE:		184. MOTOR HP:	
185. MOTOR VOLTAGE:		186. MOTOR RPM:	
187. MOTOR SERIAL NUMBER:			
PUMP NO. 2 INFORMATION			
188. PUMP NUMBER:		189. PUMP TYPE:	
190. PUMP MANUFACTURER:		191. PUMP SIZE:	
192. PUMP MODEL NUMBER:		193. PUMP SERIAL NUMBER:	
194. DATE PUMP INSTALLED:		195. MOTOR MANUFACTURER:	
196. MOTOR MODEL NO.:		197. DATE OF MOTOR INSTALLATION:	
198. MOTOR TYPE:		199. MOTOR HP:	
200. MOTOR VOLTAGE:		201. MOTOR RPM:	
202. MOTOR SERIAL NUMBER:			

STANDBY GENERATOR	
203. MANUFACTURER:	CUMMINS
204. MODEL:	DGDB-3372846
205. YEAR OF MANUFACTURE:	2000
206. SERIAL NUMBER:	E990916805
207. ENGINE (KW):	100
208. ENGINE CYLINDERS:	6
209. ENGINE RPM:	1800
210. ENGINE FUEL:	DIESEL
211. ENGINE PISTON VOLUME:	5.9 L
212. ENGINE RUN TIME (H):	1.9

**Lift Station
Site Map
45 - HEARN ROAD**

002-w401




002-s008

002-s029

002-s007

002-s006

 **Lift Stations**

 **Sewer Manholes**

 **Sewer Lines**



0 125 250
FT

BROWN AND
CALDWELL

Attachment D: Photos of Hearn Road Lift Station



Belowground Lift Station Station and 100-kW Standby Generator



Belowground Smith and Loveless (model: 4D3) 40-hp centrifugal pump (one of two)

BROWN AND CALDWELL



Wetwell (background to left) and Dry Well (foreground)

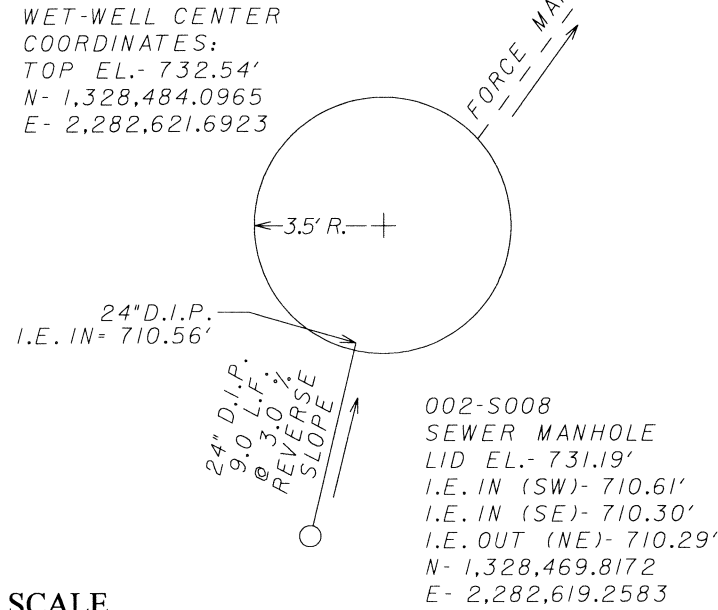


Wetwell

Attachment E: Boundary and Topographic Survey of Hearn Road Lift Station

- LEGEND:
- N/F NOW OR FORMERLY
- SS— SANITARY SEWER GRAVITY LINE
- FM— SANITARY SEWER FORCE MAIN
- ℙ PROPERTY LINE
- ℄ CENTERLINE
- R/W RIGHT OF WAY
- ⊙ SANITARY SEWER MANHOLE
- DB, /PG. DEED BOOK AND PAGE
- COMPUTED PROPERTY CORNER
- FOUND PROPERTY CORNER
- P.O.B. POINT OF BEGINNING
- P.O.C. POINT OF COMMENCEMENT
- LLL LAND LOT LINE

DEED REFERENCES:				
DEED BOOK	PAGE	DATE	NAME	
1)	1937	460	13 NOV 1964	W.J. MARSH, JR.
2)	10488	586	25 JUN 1999	HENRY COUNTY WATER & SEWERAGE AUTHORITY



N/F
W.J. MARSH, JR.
15 002 05 015
DB. 1937 PG. 460

1/2" REBAR FOUND

N/F
HENRY COUNTY
CONDEMNATION
15 002 05 015
DB. 10488 PG. 586

N 05°18'34" E 85.00'

S 84°40'09" E 85.03'

1/2" REBAR FOUND

N 05°19'51" W 85.00'

HEARN ROAD
(60' R/W)

LEGAL DESCRIPTION

All that tract or parcel of land lying in and being a part of Land Lot 2, District 15 of DeKalb County, Georgia. Said tract or parcel of land containing 0.166 acres (7,226.52 sq. ft.) and being more particularly described as follows:

To reach the TRUE POINT OF BEGINNING commence at the intersection of the western right-of-way line of Hearn Road (a 60' R/W) and the centerline of Corn Creek and proceed thence N5°19'51"E, along said western right-of-way line of Hearn Road, for a distance of 55.19' to a point on said western right-of-way line of Hearn Road and the TRUE POINT OF BEGINNING. Said TRUE POINT OF BEGINNING having a Northing of 1,328,451.7599' and an Easting of 2,282,664.7210' based upon the current DeKalb County, Georgia Standard Coordinate System.

From the TRUE POINT OF BEGINNING thus established, proceed thence N 84°39'59" W, leaving said western right-of-way line of Hearn Road, for a distance of 85.00' to a point; Thence N5°18'34"E for a distance of 85.00' to a 1/2" rebar found; Thence S84°40'09"E for a distance of 85.03' to a 1/2" rebar found on said western right-of-way line of Hearn Road; Thence S5°19'51"W, along said western right-of-way line of Hearn Road, for a distance of 85.00' to a point on said western right-of-way line of Hearn Road and the TRUE POINT OF BEGINNING.

AREA - 0.166 ACRES
(7,226.52 SQUARE FEET)



P.O.B.

N- 1,328,451.7599
E- 2,282,664.7210

002-S029
SEWER MANHOLE
LID EL.- 730.76'
I.E. IN (SE)- 712.21'
I.E. OUT (NW)- 712.06'
N- 1,328,439.1707
E- 2,282,644.2757

P.O.C.

NOTES:

THIS EASEMENT EXHIBIT AND TOPOGRAPHIC SURVEY IS PRODUCED FROM AN ACTUAL FIELD SURVEY PERFORMED 1 MAY 2008.

BEARINGS AND COORDINATES SHOWN ON THIS PLAT ARE BASED ON THE GEORGIA STATE PLANE COORDINATE SYSTEM, WEST ZONE (DEKALB COUNTY STANDARD COORDINATE SYSTEM). ELEVATIONS SHOWN ARE BASE ON NAVD88.

THE FIELD DATA UPON WHICH THIS MAP OR PLAT IS BASED IS TAKEN FROM G.P.S OBSERVATIONS.

THIS MAP OR PLAT HAS BEEN CALCULATED FOR CLOSURE AND IS FOUND TO BE ACCURATE TO WITHIN ONE FOOT IN 25,000+ FEET.

THE EQUIPMENT USED TO PERFORM LINEAR AND ANGULAR MEASUREMENTS WAS A TOPCON GPT 3000 IN CONJUNCTION WITH A CARLSON ELECTRONIC DATA COLLECTOR.

THE SURVEY SHOWN HEREON WAS PREPARED WITHOUT THE BENEFIT OF A TITLE COMMITMENT; THEREFORE, LONG ENGINEERING, INC. MAKES NO GUARANTEES OR REPRESENTATIONS REGARDING INFORMATION SHOWN HEREON PERTAINING TO EASEMENTS, RIGHT-OF-WAY, SETBACKS LINES, AGREEMENTS OF PUBLIC RECORD, RESERVATIONS AND OTHER SIMILAR MATTERS.

NO PORTION OF THIS PROPERTY LIES WITHIN THE 100-YEAR FLOOD ZONE AS SHOWN ON THE F.I.R.M. PANEL NUMBER 13089C0164 H, EFFECTIVE MAY 7, 2001, AVAILABLE FROM F.E.M.A.

SCALE IN FEET		VERTICAL DATUM	LONG JOB NO.	REVISION DATES		BOUNDARY -AND- TOPOGRAPHIC SURVEY FOR:	
0 5 10 20		NAD83	0009-7550			DEKALB COUNTY PUBLIC WORKS WATER & SEWER	
LONG ENGINEERING, INC. 1780 Corporate Drive Suite 400 Norcross, Georgia 30093 Tel 770.931.8005 Fax 770.931.8555 www.longeng.com		DRAWN BY	DATE			45 - HEARN ROAD LIFT STATION	
		SMS	12 MAY 2008				
		CHECKED BY	SCALE				
		JGL	1" = 10'				
						LAND LOT 2 15 th LAND DISTRICT	
						DEKALB COUNTY GEORGIA	

Attachment F: Drawdown Test Results from Isco 4501 Pump Station Flow Monitor

Station name: 45 - Hearn Road

From: March 14, 2008

Flow units: Gallons/Min

To: March 25, 2008

Volume units: Gallons

PUMP OPERATION			
Combination	Average Outflow	Operation Time	Number of Uses
1	419.0	28:03:54	393
2	352.9	35:33:24	393
3	0	00:00:00	0
1 & 2	0	00:00:00	0
1 & 3	0	00:00:00	0
2 & 3	0	00:00:00	0
1, 2 & 3	0	00:00:00	0
Total volume that went through the station: 1459478			

OVERALL OPERATION			
Inputs	Total Time	Occurrences	
Input #1	28:03:54	393	
Input #2	35:33:24	393	
Input #3	00:00:00	0	
Input #4	00:00:00	0	
Input #5	00:00:00	0	
Input #6	00:00:00	0	
Input #7	00:00:00	0	
Power failure	00:16:05	1	

Station Settings Beginning: 03 / 14 / 08			
Phone number:	Influent is Between levels 1 & 2		
Short event filter in use	0 Gallons		
Volume Between levels 5 & 6:	0 Gallons		
Volume Between levels 4 & 5:	876.3 Gallons		
Volume Between levels 3 & 4:	798.3 Gallons		
Volume Between levels 2 & 3:	1358 Gallons		
Volume Between levels 1 & 2:	Capacity		
Pump 1 alone	444.0	Calculated	Yes
Pump 2 alone	333.9	Yes	Yes
Pump 3 alone	0	Yes	Yes
Pumps 1 and 2	0	Yes	Yes
Pumps 1 and 3	0	Yes	Yes
Pumps 2 and 3	0	Yes	Yes
Pumps 1, 2, and 3	0	Yes	Yes

Station Layout			
	When level goes up	When level goes down	
Action at level 6	Nothing	Nothing	
Action at level 5	Nothing	Nothing	
Action at level 4	Nothing	Nothing	
Action at level 3	Any pump starts	Nothing	
Action at level 2	Any pump starts	Nothing	
Action at level 1	Nothing	All 3 pumps stop	

Flow units: Gallons/Min

Volume units: Gallons

Date	Day	Volume	INFLOW			Pump #1			Pump #2			Pump #3		
			Avg	Min	Time	Max	Time	Avg	Starts	Timer	Avg	Starts	Timer	Avg
01	Sat	No Data												
02	Sun	No Data												
03	Mon	No Data												
04	Tue	No Data												
05	Wed	No Data												
06	Thu	No Data												
07	Fri	No Data												
08	Sat	No Data												
09	Sun	No Data												
10	Mon	No Data												
11	Tue	No Data												
12	Wed	No Data												
13	Thu	No Data												
14	Fri	56973	39.56	69.82	19:57	107.3	19:25	358.6	16	01:29	321.5	16	01:32	0
15	Sat	140224	97.38	35.76	04:22	181.7	15:28	393.9	35	02:52	330.4	35	03:35	0
16	Sun	145098	100.8	40.87	04:55	175.2	21:46	415.1	38	02:45	338.9	38	03:47	0
17	Mon	117374	81.51	37.37	04:25	192.1	21:42	410.7	32	02:18	326.7	32	03:04	0
18	Tue	115697	80.35	35.65	03:53	184.2	23:08	417.0	33	02:12	332.2	33	03:03	0
19	Wed	136717	94.94	40.32	04:59	191.2	16:36	437.8	36	02:35	359.0	36	03:12	0
20	Thu	132525	92.03	44.25	03:59	151.1	22:41	420.3	37	02:33	369.1	37	03:06	0
21	Fri	130461	90.60	44.51	04:10	180.3	20:38	457.9	36	02:33	363.9	36	03:04	0
22	Sat	187434	109.3	37.45	05:29	218.0	13:43	446.1	40	02:34	380.3	40	03:31	0
23	Sun	151388	105.1	42.92	06:00	216.6	22:27	448.5	40	02:43	379.2	40	03:25	0
24	Mon	137717	95.64	43.08	04:03	257.0	08:42	436.6	38	02:33	365.8	38	03:11	0
25	Tue	37869	25.30	40.49	03:39	130.5	06:57	432.6	12	00:42	345.9	12	00:57	0
26	Wed	No Data												
27	Thu	No Data												
28	Fri	No Data												
29	Sat	No Data												
30	Sun	No Data												
31	Mon	No Data												
Month		Total	Avg	Min	Date	Max	Date	Avg	Starts	Timer	Avg	Starts	Timer	
3		1459477	89.63	35.65	18	257.0	24	421.2	393	28:03	351.2	393	35:33	0

Month	Total	Avg	Min	Date	Max	Date	Avg	Starts	Timer	Avg	Starts	Timer
3	1459477	89.63	35.65	18	257.0	24	421.2	393	28:03	351.2	393	35:33
Description	SPECIAL EVENTS						SPECIAL EVENTS					
	Day	Qty	Duration	Other	Description	Day	Qty	Duration	Other			
Power Failure	25	1	00:16:05									



COMBINATIONS OF PUMPS			Occurrences	Timer
Pumps	Average	Qty		
1	421.2	393	0	35:33
2	351.2	0	0	00:00
1 & 2	0	0	0	00:00
1 & 3	0	0	0	00:00
2 & 3	0	0	0	00:00
1 & 2 & 3	0	0	0	00:00

OTHER INFORMATION			Qty	Timer
Power failure	Qty	Timer		
Input #4	0	00:00:00	0	00:00:00
Input #5	0	00:00:00	0	00:00:00
Input #6	0	00:00:00	0	00:00:00
Input #7	0	00:00:00	0	00:00:00

Inflow scale: 0%=10 GalPm, 100%=200 GalPm

00:00	0	0
00:30	0	0
01:00	0	0
01:30	0	0
02:00	0	0

02:30	03:00	0	0
03:00	03:30	0	0
03:30	04:00	0	0
04:00	04:30	0	0
04:30	05:00	0	0
05:00	05:30	0	0
05:30	06:00	0	0
06:00	06:30	0	0
06:30	07:00	0	0
07:00	07:30	0	0
07:30	08:00	0	0

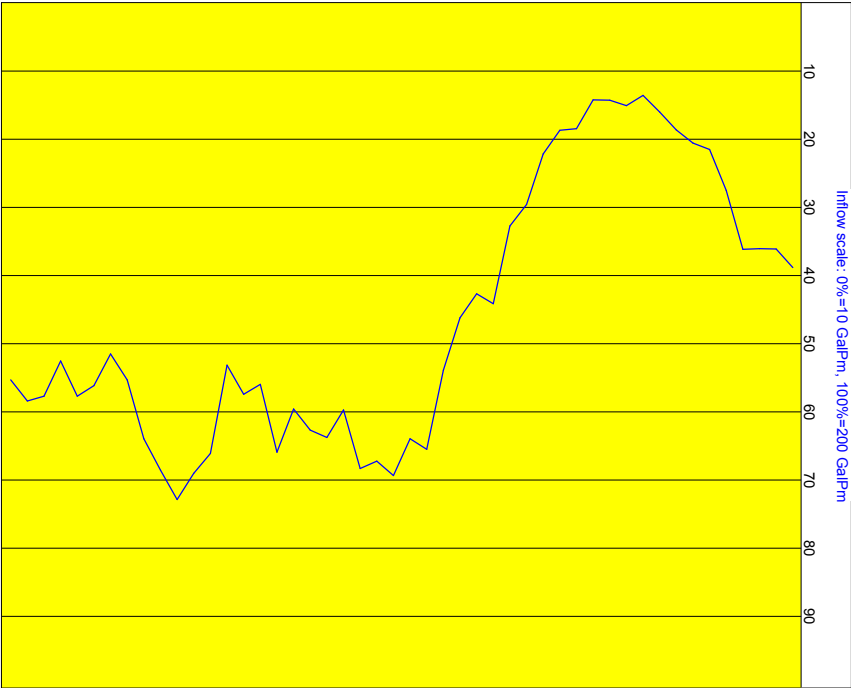
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16.30	16.00	22.05	73.51
16.30	16.00	22.59	75.31
16.30	17.00	24.46	81.52
17.30	17.00	24.77	82.57
17.30	18.00	22.54	75.14
18.00	18.00	22.90	76.32
18.30	19.00	25.32	84.40
19.00	19.00	28.03	93.99
19.30	20.00	28.97	96.56
20.00	20.30	29.60	98.66
20.30	21.00	28.85	96.15
21.00	21.30	27.66	92.21
21.30	22.00	28.30	94.33
22.00	22.30	28.89	89.63
22.30	23.00	30.75	102.5
23.00	23.30	30.06	100.2
23.30	24.00	30.06	99.22



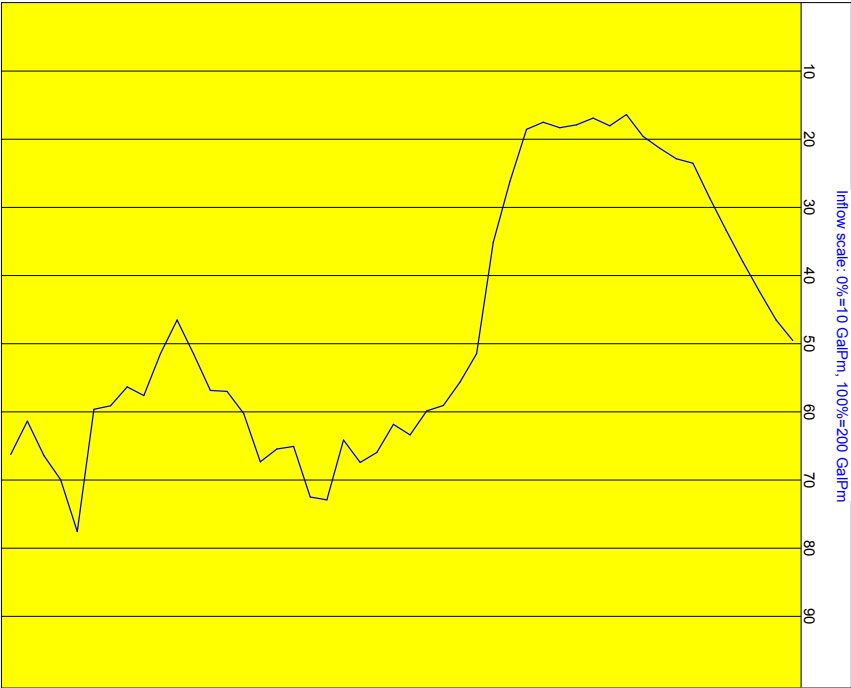
DAILY REPORT				
Saturday, March 15, 2008				
Station Name:	45 - Hearn Road	Flow Units:	Gallons/Min	
Volume Units:	Gallons	Time:	04:22	
Minimum Inflow:	35.76	Maximum Inflow:	15.28	
Maximum Inflow:	181.7	Avg Inflow:	97.38	
Total Volume:	140224			
COMBINATION OF PUMPS				
Pumps	Average Outflow	Time	Volume	Occurrences
1	383.9	02:52:14	67840	36
2	330.4	03:35:55	71331	35
3	0	00:00:00	0	0
1 & 2	0	00:00:00	0	0
1 & 3	0	00:00:00	0	0
2 & 3	0	00:00:00	0	0
1 & 2 & 3	0	00:00:00	0	0
OTHER INFORMATION				
Inputs	Occurrences	Total Time		
Power failure	0	00:00:00		
Input #1	36	02:52:14		
Input #2	35	03:35:55		
Input #3	0	00:00:00		
Input #4	0	00:00:00		
Input #5	0	00:00:00		
Input #6	0	00:00:00		
Input #7	0	00:00:00		
SPECIAL EVENTS				
Description	From	To	Duration	Other

From	To	Volume	Inflow
00:00	00:30	2505	83.50
00:30	01:00	2352	78.40
01:00	01:30	2349	78.29
01:30	02:00	2355	78.51
02:00	02:30	1862	62.08
02:30	03:00	1522	50.74
03:00	03:30	1469	48.96
03:30	04:00	1359	45.30
04:00	04:30	1211	40.37
04:30	05:00	1073	35.76
05:00	05:30	1158	38.60
05:30	06:00	1111	37.04
06:00	06:30	1109	36.95
06:30	07:00	1349	44.98
07:00	07:30	1362	45.39
07:30	08:00	1560	52.01
08:00	08:30	1981	66.02
08:30	09:00	2160	71.99
09:00	09:30	2807	93.55
09:30	10:00	2724	90.79
10:00	10:30	2925	97.50
10:30	11:00	3361	112.0
11:00	11:30	4021	134.0
11:30	12:00	3933	131.1
12:00	12:30	4240	141.3
12:30	13:00	4118	137.3
13:00	13:30	4181	139.4
13:30	14:00	3694	123.1
14:00	14:30	3923	130.8
14:30	15:00	3860	128.7
15:00	15:30	3885	122.8
15:30	16:00	4045	134.6
16:00	16:30	3479	116.0
16:30	17:00	3562	118.7
17:00	17:30	3320	110.7
17:30	18:00	4055	135.2
18:00	18:30	4221	140.7
18:30	19:00	4439	148.0
19:00	19:30	4193	139.8
19:30	20:00	3933	131.1
20:00	20:30	3442	114.7
20:30	21:00	3226	107.5
21:00	21:30	3491	116.4
21:30	22:00	3577	119.2
22:00	22:30	3286	109.5
22:30	23:00	3579	119.3
23:00	23:30	3618	120.6
23:30	00:00	3441	114.7



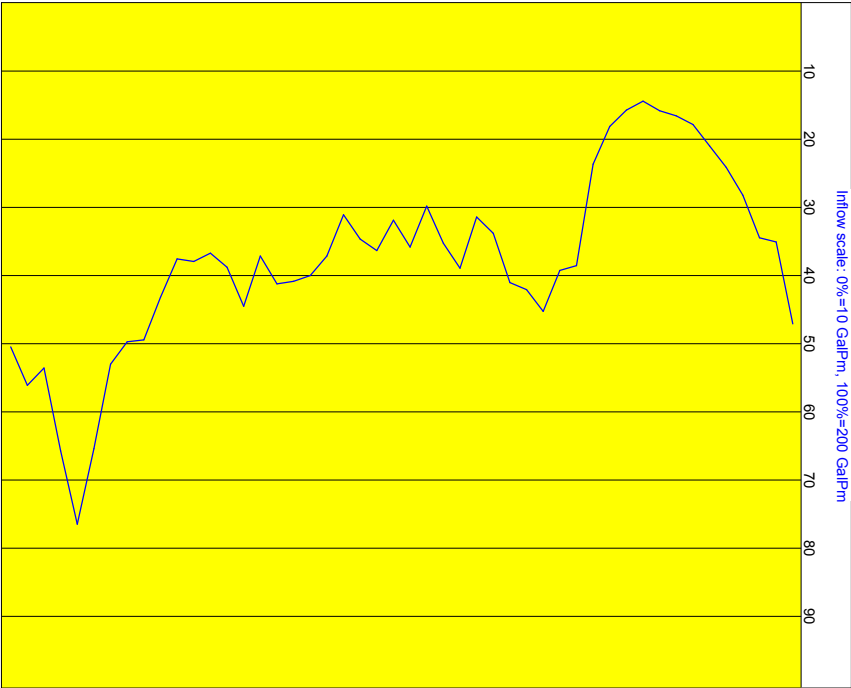
DAILY REPORT				
Sunday, March 16, 2008				
Station Name:	45 - Hearn Road		Flow Units:	Gallons/Min
Volume Units:	Gallons	Time:	04:55	
Minimum Inflow:	40.87	Time:	21:46	
Maximum Inflow:	175.2	Avg Inflow:	100.8	
Total Volume:	145098			
COMBINATION OF PUMPS				
Pumps	Average Outflow	Time	Volume	Occurrences
1	415.1	02:45:30	68693	37
2	338.9	03:47:53	77219	38
3	0	00:00:00	0	0
1 & 2	0	00:00:00	0	0
1 & 3	0	00:00:00	0	0
2 & 3	0	00:00:00	0	0
1 & 2 & 3	0	00:00:00	0	0
OTHER INFORMATION				
Inputs	Occurrences	Total Time		
Power failure	0	00:00:00		
Input #1	37	02:45:30		
Input #2	38	03:47:53		
Input #3	0	00:00:00		
Input #4	0	00:00:00		
Input #5	0	00:00:00		
Input #6	0	00:00:00		
Input #7	0	00:00:00		
SPECIAL EVENTS				
Description	From	To	Duration	Other

From	To	Volume	Inflow
00:00	00:30	3115	103.8
00:30	01:00	2945	98.15
01:00	01:30	2706	90.19
01:30	02:00	2458	81.92
02:00	02:30	2198	73.27
02:30	03:00	1925	64.18
03:00	03:30	1638	54.61
03:30	04:00	1600	53.34
04:00	04:30	1511	50.37
04:30	05:00	1412	47.08
05:00	05:30	1232	41.05
05:30	06:00	1324	44.14
06:00	06:30	1262	42.06
06:30	07:00	1318	43.95
07:00	07:30	1341	44.71
07:30	08:00	1296	43.20
08:00	08:30	1355	45.17
08:30	09:00	1788	59.61
09:00	09:30	2297	76.55
09:30	10:00	3224	107.5
10:00	10:30	3460	115.3
10:30	11:00	3655	121.8
11:00	11:30	3702	123.4
11:30	12:00	3902	130.1
12:00	12:30	3812	127.1
12:30	13:00	4048	134.9
13:00	13:30	4130	137.7
13:30	14:00	3942	131.4
14:00	14:30	4443	148.1
14:30	15:00	4419	147.3
15:00	15:30	3986	133.2
15:30	16:00	4016	133.9
16:00	16:30	4123	137.4
16:30	17:00	3721	124.0
17:00	17:30	3537	117.9
17:30	18:00	3530	117.7
18:00	18:30	3230	107.7
18:30	19:00	2944	98.15
19:00	19:30	3224	107.5
19:30	20:00	3573	119.1
20:00	20:30	3500	116.7
20:30	21:00	3658	121.9
21:00	21:30	3687	122.9
21:30	22:00	4706	156.9
22:00	22:30	4274	142.5
22:30	23:00	4074	135.8
23:00	23:30	3785	126.2
23:30	00:00	4063	135.4



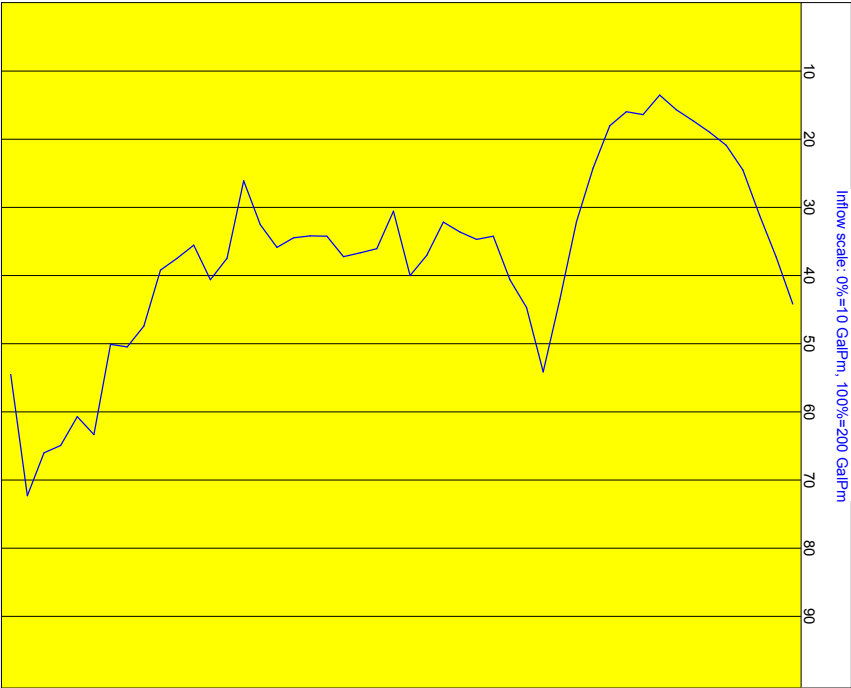
DAILY REPORT				
Monday, March 17, 2008				
Station Name:	45 - Hearn Road		Flow Units:	Gallons/Min
Volume Units:	Gallons	Time:	04:25	
Minimum Inflow:	37.37	Time:	21:42	
Maximum Inflow:	192.1	Avg Inflow:	81.51	
Total Volume:	117374			
COMBINATION OF PUMPS				
Pumps	Average Outflow	Time	Volume	Occurrences
1	410.7	02:18:20	56816	33
2	326.7	03:04:01	60126	32
3	0	00:00:00	0	0
1 & 2	0	00:00:00	0	0
1 & 3	0	00:00:00	0	0
2 & 3	0	00:00:00	0	0
1 & 2 & 3	0	00:00:00	0	0
OTHER INFORMATION				
Inputs	Occurrences	Total Time		
Power failure	0	00:00:00		
Input #1	33	02:18:20		
Input #2	32	03:04:01		
Input #3	0	00:00:00		
Input #4	0	00:00:00		
Input #5	0	00:00:00		
Input #6	0	00:00:00		
Input #7	0	00:00:00		
SPECIAL EVENTS				
Description	From	To	Duration	Other

From	To	Volume	Inflow
00:00	00:30	2976	99.20
00:30	01:00	2292	76.41
01:00	01:30	2259	75.29
01:30	02:00	1903	63.43
02:00	02:30	1672	55.72
02:30	03:00	1492	49.74
03:00	03:30	1314	43.81
03:30	04:00	1241	41.38
04:00	04:30	1200	40.00
04:30	05:00	1121	37.37
05:00	05:30	1194	39.80
05:30	06:00	1330	44.34
06:00	06:30	1645	54.84
06:30	07:00	2489	82.97
07:00	07:30	2529	84.30
07:30	08:00	2871	95.68
08:00	08:30	2690	89.65
08:30	09:00	2632	87.74
09:00	09:30	2222	74.05
09:30	10:00	2085	69.50
10:00	10:30	2512	83.75
10:30	11:00	2302	76.75
11:00	11:30	1995	66.49
11:30	12:00	2336	77.86
12:00	12:30	2111	70.36
12:30	13:00	2366	78.86
13:00	13:30	2268	75.60
13:30	14:00	2068	68.92
14:00	14:30	2410	80.32
14:30	15:00	2573	85.77
15:00	15:30	2622	87.39
15:30	16:00	2643	88.11
16:00	16:30	2410	80.35
16:30	17:00	2830	94.32
17:00	17:30	2504	83.46
17:30	18:00	2386	79.55
18:00	18:30	2465	81.82
18:30	19:00	2434	81.14
19:00	19:30	2754	91.81
19:30	20:00	3110	103.7
20:00	20:30	3125	104.2
20:30	21:00	3312	110.4
21:00	21:30	4015	133.8
21:30	22:00	4644	154.8
22:00	22:30	4034	134.5
22:30	23:00	3344	111.5
23:00	23:30	3488	116.3
23:30	00:00	3166	105.5



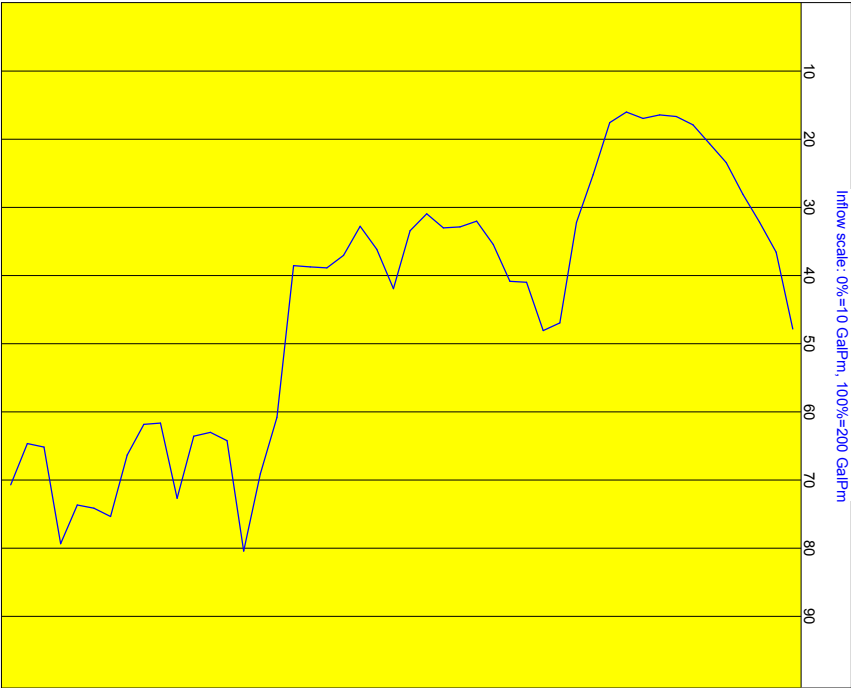
DAILY REPORT				
Tuesday, March 18, 2008				
Station Name:	45 - Hearn Road		Flow Units:	Gallons/Min
Volume Units:	Gallons	Time:	03:53	
Minimum Inflow:	35.65	Avg Inflow:	23.08	
Maximum Inflow:	164.2		80.35	
Total Volume:	115697			
COMBINATION OF PUMPS				
Pumps	Average Outflow	Time	Volume	Occurrences
1	417.0	02:12:00	55038	32
2	332.2	03:03:41	61016	0
3	0	00:00:00	0	0
1 & 2	0	00:00:00	0	0
1 & 3	0	00:00:00	0	0
2 & 3	0	00:00:00	0	0
1 & 2 & 3	0	00:00:00	0	0
OTHER INFORMATION				
Inputs	Occurrences	Total Time		
Power failure	0	00:00:00		
Input #1	32	02:12:00		
Input #2	33	03:03:41		
Input #3	0	00:00:00		
Input #4	0	00:00:00		
Input #5	0	00:00:00		
Input #6	0	00:00:00		
Input #7	0	00:00:00		
SPECIAL EVENTS				
Description	From	To	Duration	Other

From	To	Volume	Inflow
00:00	00:30	281.1	93.68
00:30	01:00	241.9	80.62
01:00	01:30	206.8	68.94
01:30	02:00	169.3	56.44
02:00	02:30	148.7	49.57
02:30	03:00	137.8	45.93
03:00	03:30	128.1	42.71
03:30	04:00	119.2	39.74
04:00	04:30	106.9	35.65
04:30	05:00	123.1	41.04
05:00	05:30	120.9	40.30
05:30	06:00	132.4	44.14
06:00	06:30	167.6	55.87
06:30	07:00	212.5	70.85
07:00	07:30	277.2	92.40
07:30	08:00	337.6	112.5
08:00	08:30	283.9	94.63
08:30	09:00	260.7	86.91
09:00	09:30	224.4	74.78
09:30	10:00	227.1	75.70
10:00	10:30	221.0	73.66
10:30	11:00	212.6	70.88
11:00	11:30	240.6	80.19
11:30	12:00	257.2	85.74
12:00	12:30	203.8	67.94
12:30	13:00	235.0	78.33
13:00	13:30	238.4	79.46
13:30	14:00	241.5	80.52
14:00	14:30	224.5	74.82
14:30	15:00	224.1	74.71
15:00	15:30	225.8	75.26
15:30	16:00	233.8	77.94
16:00	16:30	214.9	71.63
16:30	17:00	178.4	59.46
17:00	17:30	242.9	80.96
17:30	18:00	260.8	86.92
18:00	18:30	231.9	77.29
18:30	19:00	243.0	80.99
19:00	19:30	252.7	84.24
19:30	20:00	299.3	99.8
20:00	20:30	316.7	105.6
20:30	21:00	314.7	104.9
21:00	21:30	389.7	129.9
21:30	22:00	374.8	124.9
22:00	22:30	398.9	133.0
22:30	23:00	405.0	135.0
23:00	23:30	440.8	146.9
23:30	00:00	339.6	113.2



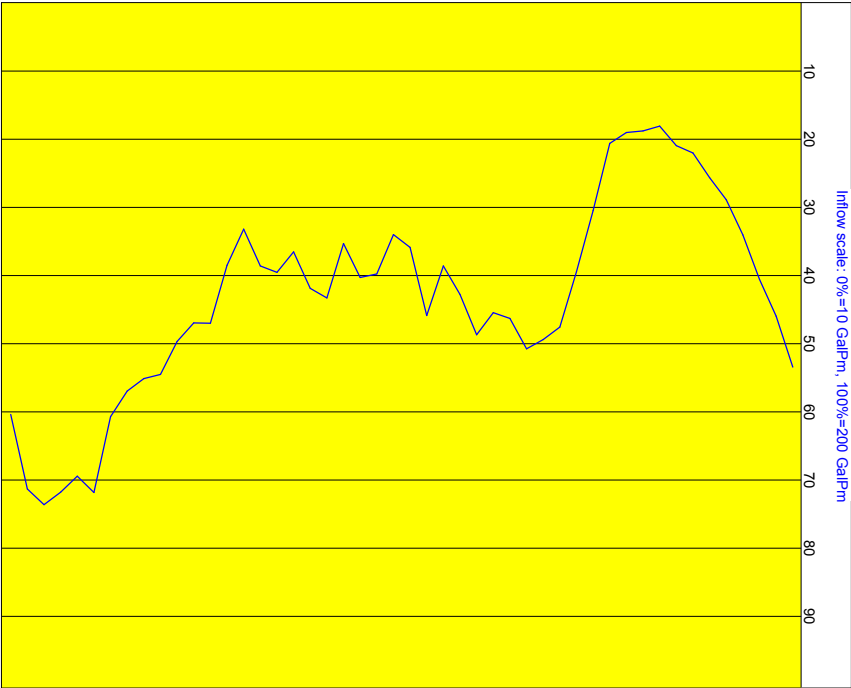
DAILY REPORT				
Wednesday, March 19, 2008				
Station Name:	45 - Hearn Road		Flow Units:	Gallons/Min
Volume Units:	Gallons	Time:	04:59	
Minimum Inflow:	40.32	Time:	16:36	
Maximum Inflow:	191.2	Avg Inflow:	94.94	
Total Volume:	136717			
COMBINATION OF PUMPS				
Pumps	Average Outflow	Time	Volume	Occurrences
1	437.8	02:35:50	68224	37
2	359.0	03:12:37	69151	0
3	0	00:00:00	0	0
1 & 2	0	00:00:00	0	0
1 & 3	0	00:00:00	0	0
2 & 3	0	00:00:00	0	0
1 & 2 & 3	0	00:00:00	0	0
OTHER INFORMATION				
Inputs	Occurrences	Total Time		
Power failure	0	00:00:00		
Input #1	37	02:35:50		
Input #2	36	03:12:37		
Input #3	0	00:00:00		
Input #4	0	00:00:00		
Input #5	0	00:00:00		
Input #6	0	00:00:00		
Input #7	0	00:00:00		
SPECIAL EVENTS				
Description	From	To	Duration	Other

From	To	Volume	Inflow
00:00	00:30	3019	100.6
00:30	01:00	2379	79.30
01:00	01:30	2127	70.80
01:30	02:00	1895	63.17
02:00	02:30	1631	54.37
02:30	03:00	1474	49.13
03:00	03:30	1317	43.91
03:30	04:00	1247	41.58
04:00	04:30	1234	41.15
04:30	05:00	1264	42.12
05:00	05:30	1210	40.32
05:30	06:00	1299	43.29
06:00	06:30	1734	57.80
06:30	07:00	2131	71.03
07:00	07:30	2968	98.93
07:30	08:00	3032	101.1
08:00	08:30	2629	87.64
08:30	09:00	2621	87.38
09:00	09:30	2313	77.10
09:30	10:00	2119	70.64
10:00	10:30	2167	72.24
10:30	11:00	2176	72.54
11:00	11:30	2058	68.59
11:30	12:00	2199	73.31
12:00	12:30	2882	89.40
12:30	13:00	2353	78.43
13:00	13:30	2161	72.05
13:30	14:00	2404	80.15
14:00	14:30	2508	83.60
14:30	15:00	2500	83.34
15:00	15:30	2489	82.98
15:30	16:00	3754	125.1
16:00	16:30	4225	140.6
16:30	17:00	4869	162.3
17:00	17:30	3948	131.6
17:30	18:00	3880	129.3
18:00	18:30	3911	130.4
18:30	19:00	4429	147.6
19:00	19:30	3802	126.7
19:30	20:00	3813	127.1
20:00	20:30	4069	135.6
20:30	21:00	4582	152.7
21:00	21:30	4512	150.4
21:30	22:00	4486	149.5
22:00	22:30	4806	160.2
22:30	23:00	4002	133.4
23:00	23:30	3972	132.4
23:30	00:00	4317	143.9



DAILY REPORT				
Thursday, March 20, 2008				
Station Name:	45 - Hearn Road	Flow Units:	Gallons/Min	
Volume Units:	Gallons	Time:	03:59	
Minimum Inflow:	44.25	Avg Inflow:	22:41	
Maximum Inflow:	151.1		92.03	
Total Volume:	132525			
COMBINATION OF PUMPS				
Pumps	Average Outflow	Time	Volume	Occurrences
1	420.3	02:33:27	64501	36
2	369.1	03:06:40	68895	37
3	0	00:00:00	0	0
1 & 2	0	00:00:00	0	0
1 & 3	0	00:00:00	0	0
2 & 3	0	00:00:00	0	0
1 & 2 & 3	0	00:00:00	0	0
OTHER INFORMATION				
Inputs	Occurrences	Total Time		
Power failure	0	00:00:00		
Input #1	36	02:33:27		
Input #2	37	03:06:40		
Input #3	0	00:00:00		
Input #4	0	00:00:00		
Input #5	0	00:00:00		
Input #6	0	00:00:00		
Input #7	0	00:00:00		
SPECIAL EVENTS				
Description	From	To	Duration	Other

From	To	Volume	Inflow
00:00	00:30	3335	111.2
00:30	01:00	2911	97.03
01:00	01:30	2805	86.83
01:30	02:00	2233	74.43
02:00	02:30	1940	64.66
02:30	03:00	1756	58.53
03:00	03:30	1552	51.75
03:30	04:00	1490	49.68
04:00	04:30	1327	44.25
04:30	05:00	1367	45.85
05:00	05:30	1380	45.99
05:30	06:00	1471	49.04
06:00	06:30	2031	67.71
06:30	07:00	2542	84.72
07:00	07:30	3002	100.1
07:30	08:00	3107	103.6
08:00	08:30	3183	106.1
08:30	09:00	2830	97.65
09:00	09:30	2881	96.04
09:30	10:00	3067	102.2
10:00	10:30	2729	90.96
10:30	11:00	2493	83.10
11:00	11:30	2907	96.89
11:30	12:00	2339	77.98
12:00	12:30	2232	74.39
12:30	13:00	2559	85.29
13:00	13:30	2588	86.27
13:30	14:00	2307	76.90
14:00	14:30	2759	91.97
14:30	15:00	2680	89.32
15:00	15:30	2375	79.15
15:30	16:00	2545	84.84
16:00	16:30	2493	83.11
16:30	17:00	2187	72.89
17:00	17:30	2487	82.90
17:30	18:00	2869	88.97
18:00	18:30	2967	98.91
18:30	19:00	3121	104.0
19:00	19:30	3398	113.3
19:30	20:00	3432	114.4
20:00	20:30	3536	117.9
20:30	21:00	3749	125.0
21:00	21:30	4380	146.0
21:30	22:00	4244	141.5
22:00	22:30	4378	145.9
22:30	23:00	4481	149.4
23:00	23:30	4350	145.0
23:30	00:00	3731	124.4



DAILY REPORT
Friday, March 21, 2008

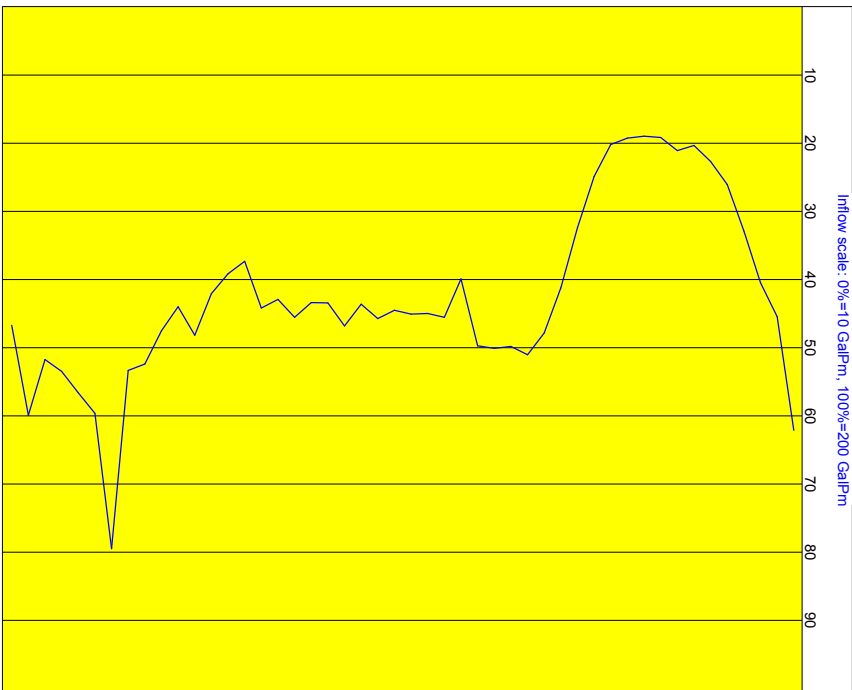
Station Name:	45 - Hearn Road
Volume Units:	Gallons
Minimum Inflow:	44.51
Maximum Inflow:	190.3
Total Volume:	130461
Flow Units:	Gallons/Min
Time:	04:10
Time:	20:38
Avg Inflow:	90.80

COMBINATION OF PUMPS				
Pumps	Average Outflow	Time	Volume	Occurrences
1	437.9	02:23:58	63041	36
2	363.9	03:04:15	67057	36
3	0	00:00:00	0	0
1 & 2	0	00:00:00	0	0
1 & 3	0	00:00:00	0	0
2 & 3	0	00:00:00	0	0
1 & 2 & 3	0	00:00:00	0	0

OTHER INFORMATION		
Inputs	Occurrences	Total Time
Power failure	0	00:00:00
Input #1	36	02:23:58
Input #2	36	03:04:15
Input #3	0	00:00:00
Input #4	0	00:00:00
Input #5	0	00:00:00
Input #6	0	00:00:00
Input #7	0	00:00:00

SPECIAL EVENTS					
Description	From	To	Duration	Other	

From	To	Volume	Inflow
00:00	00:30	3828	127.6
00:00	01:00	2883	96.11
01:00	01:30	2600	86.67
01:30	02:00	2167	72.25
02:30	02:30	1781	59.38
02:30	03:00	1560	53.01
03:00	03:30	1455	48.49
03:30	04:00	1487	49.90
04:00	04:30	1388	46.28
04:30	05:00	1377	45.91
05:00	05:30	1395	46.98
05:30	06:00	1448	48.28
06:00	06:30	1713	57.11
06:30	07:00	2141	71.37
07:00	07:30	2642	88.06
07:30	08:00	3019	100.6
08:00	08:30	3198	106.6
08:30	09:00	3131	104.4
09:00	09:30	3047	104.9
09:30	10:00	3124	104.1
10:00	10:30	2567	85.57
10:30	11:00	2889	96.29
11:00	11:30	2857	95.22
11:30	12:00	2861	95.37
12:00	12:30	2828	94.28
12:30	13:00	2898	96.59
13:00	13:30	2778	92.59
13:30	14:00	2959	98.62
14:00	14:30	2766	92.20
14:30	15:00	15.30	92.20
15:00	15:30	2766	96.28
15:30	16:00	2888	98.28
16:00	16:30	2737	91.25
16:30	17:00	2811	93.70
17:00	17:30	2420	80.66
17:30	18:00	2526	84.20
18:00	18:30	2889	89.64
18:30	19:00	3038	101.3
19:00	19:30	2890	101.3
19:30	20:00	3278	93.34
20:00	20:30	3278	100.0
20:30	21:00	3325	109.3
21:00	21:30	4615	111.0
21:30	22:00	3686	160.5
22:00	22:30	3616	122.9
22:30	23:00	3338	117.2
23:00	23:30	3240	111.3
23:30	00:00	3704	123.5
23:30	00:00	2854	98.45



DAILY REPORT
Saturday, March 22, 2008

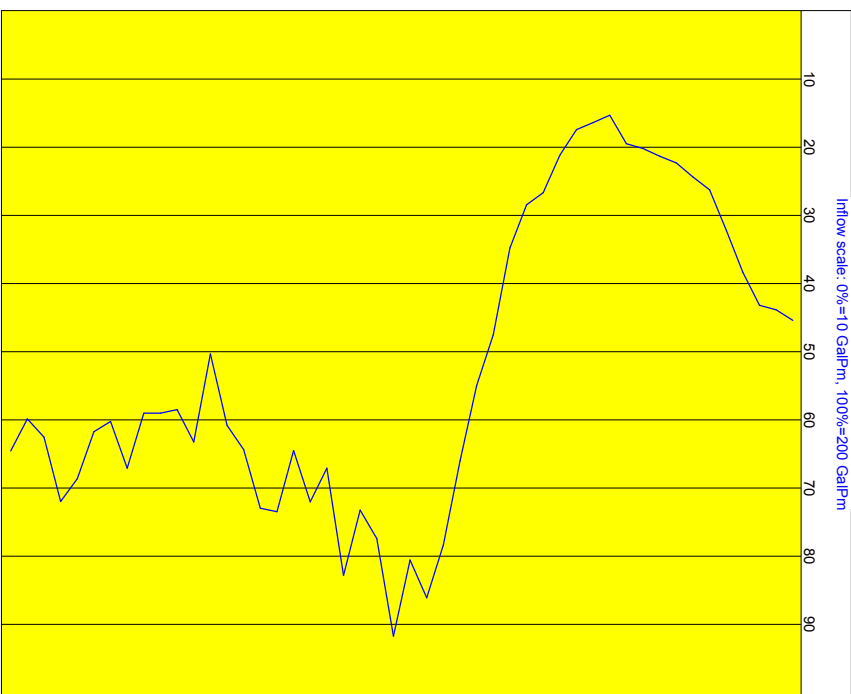
Station Name:	45 - Hearn Road
Volume Units:	Gallons
Minimum Inflow:	37.45
Maximum Inflow:	215.0
Total Volume:	1574.34
	Avg Inflow:
	Flow Units:
	Gallons/Min
	Time:
	05:29
	13:43
	109.3

COMBINATION OF PUMPS				
Pumps	Average Outflow	Time	Volume	Occurrences
1	446.1	02:54:27	77817	41
2	380.3	03:31:21	80381	40
3	0	00:00:00	0	0
1 & 2	0	00:00:00	0	0
1 & 3	0	00:00:00	0	0
2 & 3	0	00:00:00	0	0
1 & 2 & 3	0	00:00:00	0	0

OTHER INFORMATION		
Inputs	Occurrences	Total Time
Power failure	0	00:00:00
Input #1	41	02:54:27
Input #2	40	03:31:24
Input #3	0	00:00:00
Input #4	0	00:00:00
Input #5	0	00:00:00
Input #6	0	00:00:00
Input #7	0	00:00:00

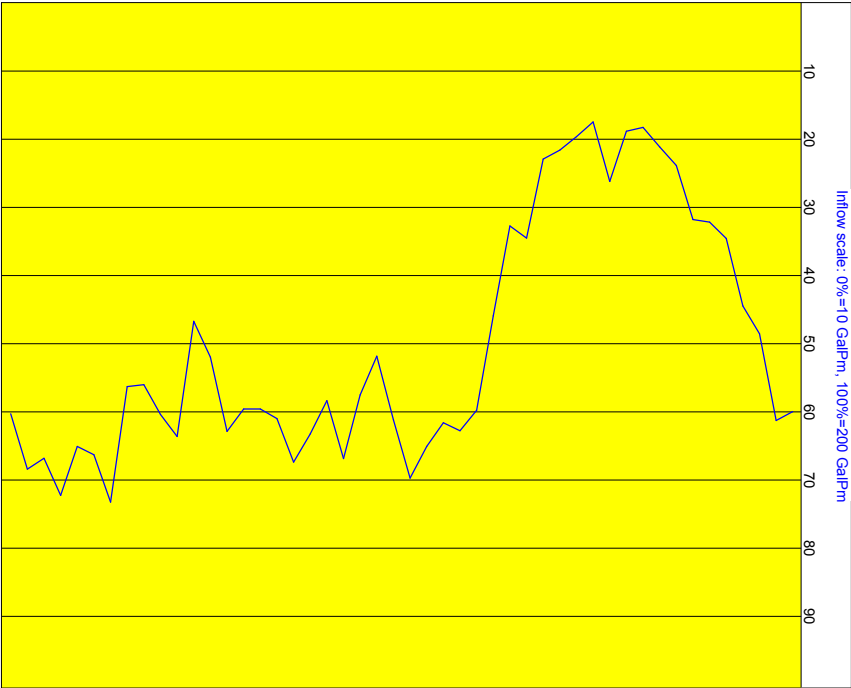
[illegible]

From	To	Volume	Inflow
00:00	00:30	2880	96.00
00:30	01:00	2791	93.05
01:00	01:30	2754	91.79
01:30	02:00	2478	82.61
02:00	02:30	2126	70.88
02:30	03:00	1791	59.71
03:00	03:30	1685	56.18
03:30	04:00	1567	52.24
04:00	04:30	1513	50.43
04:30	05:00	1448	48.27
05:00	05:30	1407	46.89
05:30	06:00	1170	38.01
06:00	06:30	1232	41.08
06:30	07:00	1289	42.97
07:00	07:30	1502	50.08
07:30	08:00	1502	50.08
08:00	08:30	63.94	63.94
08:30	09:00	1918	75.89
09:00	09:30	2277	100.00
09:30	09:00	2999	100.00
09:00	10:00	3423	114.1
10:00	10:30	4051	135.0
10:30	11:00	4751	158.4
11:00	11:30	5191	173.0
11:30	12:00	4876	162.5
12:00	12:30	5509	183.6
12:30	13:00	4699	156.6
13:00	13:30	4460	148.7
13:30	14:00	5004	166.8
14:00	14:30	4112	137.1
14:30	15:00	4390	146.3
15:00	15:30	3966	132.2
15:30	16:00	4474	149.1
16:00	16:30	4446	148.2
16:30	17:00	3957	131.9
17:00	17:30	3754	125.1
17:30	18:00	3180	105.3
18:00	18:30	3894	129.8
18:30	19:00	3622	120.7
19:00	19:30	3652	121.7
19:30	20:00	3651	121.7
20:00	20:30	4110	137.0
20:30	21:00	3721	124.0
21:00	21:30	3808	126.9
21:30	22:00	4199	140.0
22:00	22:30	4388	146.3
22:30	23:00	3853	128.4
23:00	23:30	3700	123.3
23:30	00:00	3967	132.2



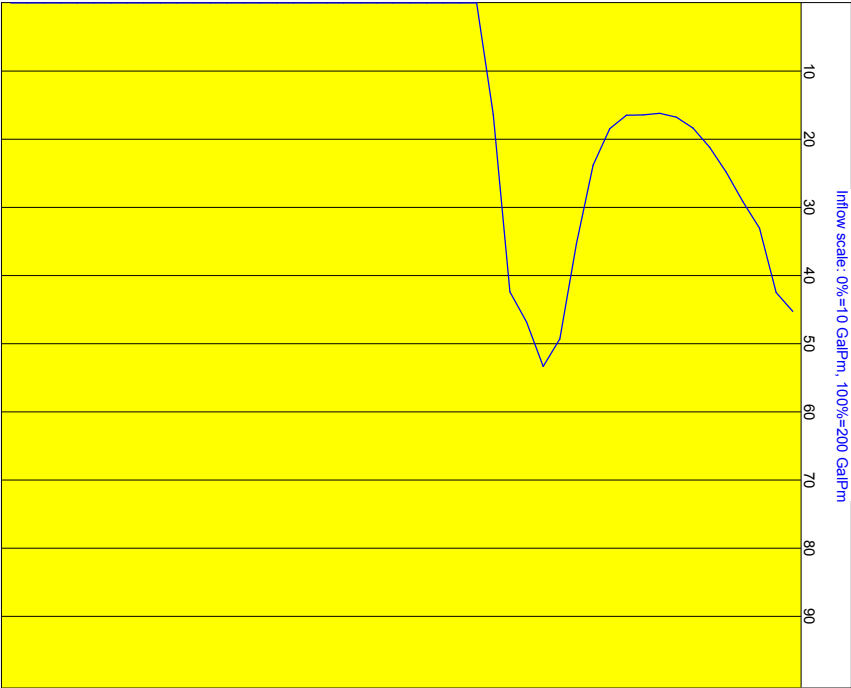
DAILY REPORT				
Sunday, March 23, 2008				
Station Name:	45 - Hearn Road	Flow Units:	Gallons/Min	
Volume Units:	Gallons	Time:	06:00	
Minimum Inflow:	42.92	Time:	22:27	
Maximum Inflow:	216.6	Avg Inflow:	105.1	
Total Volume:	151388			
COMBINATION OF PUMPS				
Pumps	Average Outflow	Time	Volume	Occurrences
1	445.5	02:43:03	72646	40
2	379.2	03:25:36	77969	0
3	0	00:00:00	0	0
1 & 2	0	00:00:00	0	0
1 & 3	0	00:00:00	0	0
2 & 3	0	00:00:00	0	0
1 & 2 & 3	0	00:00:00	0	0
OTHER INFORMATION				
Inputs	Occurrences	Total Time		
Power failure	0	00:00:00		
Input #1	40	02:43:03		
Input #2	40	03:25:36		
Input #3	0	00:00:00		
Input #4	0	00:00:00		
Input #5	0	00:00:00		
Input #6	0	00:00:00		
Input #7	0	00:00:00		
SPECIAL EVENTS				
Description	From	To	Duration	Other

From	To	Volume	Inflow
00:00	00:30	3706	123.5
00:30	01:00	3782	126.1
01:00	01:30	3059	102.0
01:30	02:00	2826	94.19
02:00	02:30	2263	75.43
02:30	03:00	2127	70.89
03:00	03:30	2107	70.22
03:30	04:00	1656	55.21
04:00	04:30	1500	49.99
04:30	05:00	1339	44.63
05:00	05:30	1372	45.72
05:30	06:00	1790	59.66
06:00	06:30	1293	43.09
06:30	07:00	1415	47.16
07:00	07:30	1529	50.97
07:30	08:00	1603	53.42
08:00	08:30	2260	75.33
08:30	09:00	2160	71.99
09:00	09:30	2908	96.95
09:30	10:00	3694	123.1
10:00	10:30	3865	128.8
10:30	11:00	3799	126.6
11:00	11:30	3997	133.2
11:30	12:00	4262	142.1
12:00	12:30	3774	125.8
12:30	13:00	3245	108.2
13:00	13:30	3568	118.9
13:30	14:00	4098	136.6
14:00	14:30	3616	120.5
14:30	15:00	3891	129.7
15:00	15:30	4127	137.6
15:30	16:00	3764	125.5
16:00	16:30	3684	122.6
16:30	17:00	3864	122.8
17:00	17:30	3870	129.0
17:30	18:00	3282	108.4
18:00	18:30	2953	98.43
18:30	19:00	3913	130.4
19:00	19:30	3729	124.3
19:30	20:00	3481	116.0
20:00	20:30	3497	116.6
20:30	21:00	4461	148.7
21:00	21:30	4067	135.6
21:30	22:00	3996	133.2
22:00	22:30	4404	146.8
22:30	23:00	4094	136.5
23:00	23:30	4186	139.5
23:30	00:00	3726	124.2



DAILY REPORT				
Tuesday, March 25, 2008				
Station Name:	45 - Hearn Road		Flow Units:	Gallons/Min
Volume Units:	Gallons	Time:	03:39	
Minimum Inflow:	40.49	Time:	06:57	
Maximum Inflow:	130.5	Avg Inflow:	28.30	
Total Volume:	37869			
COMBINATION OF PUMPS				
Pumps	Average Outflow	Time	Volume	Occurrences
1	432.6	00:42:12	18254	11
2	345.9	00:57:21	19840	12
3	0	00:00:00	0	0
1 & 2	0	00:00:00	0	0
1 & 3	0	00:00:00	0	0
2 & 3	0	00:00:00	0	0
1 & 2 & 3	0	00:00:00	0	0
OTHER INFORMATION				
Inputs	Occurrences	Total Time		
Power failure	1	00:16:05		
Input #1	11	00:42:12		
Input #2	12	00:57:21		
Input #3	0	00:00:00		
Input #4	0	00:00:00		
Input #5	0	00:00:00		
Input #6	0	00:00:00		
Input #7	0	00:00:00		
SPECIAL EVENTS				
Description	From	To	Duration	Other
Power Failure	10:22	10:38	00:16:05	

From	To	Volume	Inflow
00:00	00:30	2872	95.75
00:30	01:00	2714	90.48
01:00	01:30	2179	72.65
01:30	02:00	1958	65.27
02:00	02:30	1712	57.07
02:30	03:00	1503	50.08
03:00	03:30	1344	44.80
03:30	04:00	1233	41.76
04:00	04:30	1221	40.69
04:30	05:00	1235	41.18
05:00	05:30	1237	41.22
05:30	06:00	1349	44.95
06:00	06:30	1654	55.13
06:30	07:00	2307	76.90
07:00	07:30	3101	103.4
07:30	08:00	3330	111.0
08:00	08:30	2960	98.65
08:30	09:00	2708	90.26
09:00	09:30	1232	41.06
09:30	10:00	0	0
10:00	10:30	0	0
10:30	11:00	0	0
11:00	11:30	0	0
11:30	12:00	0	0
12:00	12:30	0	0
12:30	13:00	0	0
13:00	13:30	0	0
13:30	14:00	0	0
14:00	14:30	0	0
14:30	15:00	0	0
15:00	15:30	0	0
15:30	16:00	0	0
16:00	16:30	0	0
16:30	17:00	0	0
17:00	17:30	0	0
17:30	18:00	0	0
18:00	18:30	0	0
18:30	19:00	0	0
19:00	19:30	0	0
19:30	20:00	0	0
20:00	20:30	0	0
20:30	21:00	0	0
21:00	21:30	0	0
21:30	22:00	0	0
22:00	22:30	0	0
22:30	23:00	0	0
23:00	23:30	0	0
23:30	00:00	0	0



Calculation of Storage in Sewer Pipes at Hearn Road Lift Station

Level Control	Elevation (ft)
HH	715.93
Lag On	713.40
Lead On	711.40
LL	707.20

1) Storage Between LL and Lead On

Pipe Name	Wetwell Invert Elevation (ft)	Pipe Size (in)	Crown Elevation (ft)	d/D at Wetwell	Submerged Area of Pipe at Wetwell (ft ²)	Slope	Submerged Condition at Wetwell	Storage (gallons)
15-002-s029__15-002-s008	710.30	8.55	711.01	1.00	0.3987	5.10%	Full	43

2) Storage Between Lead On and Lag On

Pipe Name	Wetwell Invert Elevation (ft)	Pipe Size (in)	Crown Elevation (ft)	d/D at Wetwell	Submerged Area of Pipe at Wetwell (ft ²)	Slope	Submerged Condition at Wetwell	Storage (gallons)
15-002-s029__15-002-s008	710.30	8.55	711.01	1.00	0.3987	5.10%	Full	117

3) Storage Between Lag On and HH

Pipe Name	Wetwell Invert Elevation (ft)	Pipe Size (in)	Crown Elevation (ft)	d/D at Wetwell	Submerged Area of Pipe at Wetwell (ft ²)	Slope	Submerged Condition at Wetwell	Storage (gallons)
15-002-s029__15-002-s008	710.30	8.55	711.01	1.00	0.3987	5.10%	Full	148

Due to the negative slope of the influent 24" line coming into wetwell 15-002-w401, the above calculations instead use the next upstream sewer pipe segment as the 1. The segment is an 8" line. Additionally, it is arbitrarily assumed that a volume equal to half the storage of the 24" line contributes to Volume 1 (storage between LL : the other half contributes to Volume 2. The 24" line stores 211 gallons.

Cylindrical Wetwell Volume Calculation - Hearn Road Lift Station

User Inputs:

$D_{ww} := 7 \cdot \text{ft}$	Wetwell diameter
$x := 0 \cdot \text{in}$	Approximate offset distance
$d_{HH} := 16.61 \cdot \text{ft}$	Laser measurement to <u>HH Float</u>
$d_H := 19.14 \cdot \text{ft}$	Laser measurement to <u>H</u>
$d_L := 21.14 \cdot \text{ft}$	Laser measurement to <u>L</u>
$d_{LL} := 25.34 \cdot \text{ft}$	Laser measurement to <u>LL</u>

Vertical Distances:

$D_{HH} := \sqrt{d_{HH}^2 - x^2}$	$D_{HH} = 16.61 \text{ ft}$	Vertical distance to top of <u>HH Float</u>
$D_H := \sqrt{d_H^2 - x^2}$	$D_H = 19.14 \text{ ft}$	Vertical distance to <u>H</u>
$D_L := \sqrt{d_L^2 - x^2}$	$D_L = 21.14 \text{ ft}$	Vertical distance to <u>L</u>
$D_{LL} := \sqrt{d_{LL}^2 - x^2}$	$D_{LL} = 25.34 \text{ ft}$	Vertical distance to <u>LL</u>

Height Differentials:

$\Delta h_1 := D_{LL} - D_L$	$\Delta h_1 = 4.2 \text{ ft}$	Height differential between <u>LL</u> and <u>L</u>
$\Delta h_2 := D_L - D_H$	$\Delta h_2 = 2 \text{ ft}$	Height differential between <u>L</u> and <u>H</u>
$\Delta h_3 := D_H - D_{HH}$	$\Delta h_3 = 2.53 \text{ ft}$	Height differential between <u>H</u> and <u>HH</u>

Volumes (Excludes Pipe Storage, if any):

$V_1 := \Delta h_1 \cdot \frac{\pi \cdot D_{ww}^2}{4}$	$V_1 = 1209.1 \text{ gal}$	Volume between <u>LL</u> and <u>L</u>
$V_2 := \Delta h_2 \cdot \frac{\pi \cdot D_{ww}^2}{4}$	$V_2 = 575.8 \text{ gal}$	Volume between <u>L</u> and <u>H</u>
$V_3 := \Delta h_3 \cdot \frac{\pi \cdot D_{ww}^2}{4}$	$V_3 = 728.3 \text{ gal}$	Volume between <u>H</u> and <u>HH</u>
$V_T := V_1 + V_2 + V_3$	$V_T = 2513.2 \text{ gal}$	Total Wetwell Volume