TOWN OF GILL

MASSACHUSETTS

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SELECTBOARD MEETING MINUTES

August 26, 2013

Call to Order: The Selectboard meeting was called to order at 6:30 PM.

Present: John Ward, Ann Banash, and Randy Crochier, Selectboard members; Ray Purington, Admin. Assistant; Janet Masucci, Jess Gaines, David Detmold, Ronnie LaChance, Peter Valinski and Mike McManus.

Riverside Sewer I&I Study Phase 1: Peter Valinski and Mike McManus, both from Tighe & Bond, met with the Selectboard to discuss the recently completed Infiltration and Inflow Study – Phase 1 that they performed on the Riverside Sewer System. It was explained that this is an initial study, and is based upon pump station flow data that the Town provided, along with rainfall data (NOAA weather station in Orange) and groundwater data (regional monitoring well in Pelham).

There are three components to the wastewater that passes through the pump station: base flow (sanitary sewage), inflow (water entering the sewer system through catch basins, sump pumps, roof drains, etc.), and infiltration (water entering through leaks or cracks in the system). Rainfall induced infiltration is a particular type of infiltration that occurs due a temporarily high groundwater table right after a significant rainstorm. Inflow from a rain event is usually associated with the duration of the event plus 12 hours. The next 72 hours is the typical period for rainfall induced infiltration.

Tighe & Bond's analysis found that there is an average of 8,700 gallons per day of inflow and infiltration, although that amount varies widely due to weather events. The Massachusetts DEP suggests that 4,000 gallons per day per inch-mile is a typical threshold for cost effectiveness for locating discrete sources of infiltration. The Riverside system has roughly 12,000 feet of 8-inch diameter pipe. For the 3-year period of data that was used in the study, it calculated to an average 480 gallons per day per inch-mile, which would suggest it is not cost effective to study the matter further. (In other words, instead of spending money to find leaks, it is cheaper to just let the water enter the system and pay to pump it to Montague.) Even during the wettest period (March – May 2011), the average was only 830 gallons per day per inch-mile.

If the Town wants to find sources and points of infiltration, a TV camera inspection can be performed during a period of high groundwater. The camera shows water flowing in, problems with tree roots, mineral deposits, and structural problems with the sewer pipes and manholes. Camera operators can typically inspection 3,000-5,000 feet of pipe per day.

To correct leaks and cracks, there are three common methods: 1) robotic testing & sealing (approx $5/foot); 2) lining the pipe with a cured-in-place compound (approx $35/foot, used since the 1970s with a life span of about 50 years); and 3) dig up the system and install new pipe ($100-150/foot, plus extra disposal costs for asbestos cement pipe).

When asked about potential funding sources for further studies and/or repairs, Peter and Mike knew of none, offhand. A Community Development Block Grant might be an option. However, given the cost of further studies and repairs, it may be hard to find a justifiable reason to proceed further.

Asked if the Town was to take one next step in identifying sources of inflow, Tighe & Bond recommended conducting smoke testing using a blower and special, non-toxic smoke candles. As the smoke is being pushed through the sewer pipes, observers look for places where the smoke finds its way out from the system (storm drains and catch basins tied in to the sewer, basement sump pumps, roof drains and lawn drains). This type of test is best done this time of year, when the groundwater is low and the days are still long. Thanksgiving is a typical cutoff for smoke testing. If the Town elects to do this, Tighe & Bond could help with the public notification before the smoke testing, to alert residents and minimize alarm and concern.

The Selectboard thanked Peter and Mike for presenting their report. Peter and Mike left the meeting at 7:28pm.

Info on Emergency Borrowing: Treasurer Ronnie LaChance presented the Selectboard with handouts she received at a class on Emergency Borrowing. She noted that the Department of Revenue recommends towns use a financial advisor in emergency situations that will require high amounts of borrowing (hurricanes, floods, other large-scale disasters affecting a town and its infrastructure). Ronnie left the meeting at 7:30pm.

Minutes: Ann made a motion, seconded by Randy, to accept the minutes from 8/12 and 8/21. The vote was unanimous in the affirmative.

Energy Audit: The energy audit from Bart Bales has not been received. John indicated that we could expect something in two weeks.

Community Shared Solar: No developments to report.

Gill Elementary Paving: Ray reported that Lane Construction did the paving at Gill Elementary School on Saturday, August 24th, and finished removing their equipment today. He highlighted the excellent work by Mick LaClaire and Eddie Ambo of the Gill Highway Department getting the site ready for the project, and the cooperation from Doug Edson and Renaissance Excavating making equipment and operators available on short notice once the project was a "Go!"

NMH Annual Gift: The Town has received $25,000 from the NMH School as its annual gift in support of the Town's emergency services. The Board signed a letter to Peter Fayroian, Head of School, thanking the School for the gift.

Fire Department Fire Hose: No information has been received from the Fire Department about the inventory and condition of the Department's fire hoses. Once that information is provided, the Selectboard will consider making an allocation from the NMH Gift Account to purchase replacement fire hose.

Appointments: Acting on a request from the co-chairs of the Cultural Council, Ann made a motion, seconded by Randy, to appoint Joyana Damon and Kristina McComb to the Cultural Council for terms through 8/26/2016. The vote was unanimous in the affirmative.

Cooperative Public Health Services Update: Randy reported that the FRCOG and CPHS have been notified that they have been awarded a District Incentive Grant by the Massachusetts Department of Public Health. This was a highly competitive implementation grant that the CPHS applied for two years ago, but did not receive. However, another grant recipient experienced difficulties implementing their program and was defunded, so the award was made to our CPHS. It appears as though the award will include $88,000 for calendar year 2013, $75,000 in CY14, and $50,000 in CY15. Some of the grant will be used to allow the CPHS assessments to member towns to grow at a slower rate. Randy credited Phoebe Walker and CPHS and FRCOG staff for their hard work in making the CPHS a success.

Meeting with Supt. Sullivan: The Board discussed their upcoming meeting with GMRSD Superintendent Michael Sullivan, as part of his meeting with the Montague Finance Committee. The Board noted their continued support for the financial planning provided by the Compact for Funding Education and its accompanying Table B. Ray will send a reminder of the meeting to members of Gill's Finance Committee.

ConCom/Selectboard Letter on FirstLight License Renewal: The Board reviewed a joint letter from the Selectboard and Gill Conservation Commission to the Federal Energy Regulatory Commission offering further comments from the Town on FirstLight's "Revised Study Plan". Ann made a motion, seconded by Randy, to adopt the letter and to file it electronically with the FERC. The vote was unanimous in the affirmative. The Board noted thanks to Gill resident Michael Bathory and FRCOG's Kimberly Noake MacPhee for their hard work keeping pace with the relicensing process and all its deadlines. Because she is signing a similar letter for the FRCOG, Ann did not sign this letter.

The Board welcomed and thanked Jess Gaines, a new volunteer helping with video recording the meeting. Jess left the meeting at 8:05pm.

Sound System Quote: Janet Masucci reported that Tommy Byrnes of Sovereignty Music Services in Bernardston visited the Town Hall with Janet and Ray to develop a list of equipment to improve the sound system in the upstairs meeting room. His recommendations include a mixer, 15" public address speakers with stands, cables, and four wireless microphones, at a total cost of $2,167.92. The Board felt that the list was very reasonable, and suggested

getting four additional wireless microphones so that everyone on the stage during Town Meeting could be amplified. The equipment will be purchased using PEG Access funds; currently the Town has more than $57,000 in that account.

David Detmold left the meeting at 8:15pm.

Warrant: The Board reviewed and signed FY 2014 warrant #5.

The meeting adjourned at 8:35pm.

Minutes respectfully submitted by Ray Purington, Administrative Assistant.

Randy P. Crochier, Selectboard Clerk

Town of Gill, MA Infiltration and Inflow Study – Phase 1

TO: Ray Purington, Administrative Assistant

FROM: Peter Valinski, P.E.
Michael McManus, P.E.
Justin Skelly

COPY: Mick LaClaire, Highway Department

DATE: August 20, 2013

The Town of Gill owns and maintains approximately 12,000 linear feet of gravity sanitary sewer which consists of mainly 8 inch asbestos cement pipe. There is one pump station that collects flow from the entire system, and conveys it through a force main that crosses the Connecticut River. Wastewater is discharged to the Town of Montague's collection system and Gill is charged for the cost of transporting and treating the waste through an inter-municipal agreement.

The sanitary flows sent to Montague include three major components: baseflow, infiltration, and inflow. These components are defined below:

Baseflow: the wastewater component of sanitary flow; it is the portion that comes from active usage of water.

Infiltration: extraneous water entering the sewer system, particularly during high groundwater conditions, through offset or open joints, breaks and holes in sewer pipes, or service connections and leaking manhole walls.

Infiltration rates are reported in terms of gallons per day (gpd). Units of gallons per day per inch of pipe diameter per mile of pipe (gpd/in-mi) are used to normalize the data and compare infiltration rates between sewer segments. The Massachusetts Department of Environmental Protection (MassDEP) Guidelines for Performing Infiltration/Inflow Analyses and Sewer System Evaluation Survey recommends that sewers with infiltration rates higher than 4,000 gpd/in-mi receive further study to locate discrete sources of infiltration.

Inflow: extraneous water entering the sewer system directly through sources such as roof leaders, sump pumps, basement drains, yard drains, catch basins, manhole covers, and other catchments of runoff-associated water during storm events.

Another phenomenon of wastewater flow is rainfall induced infiltration (RII). This is infiltration that occurs as rainfall percolates through the soil matrix. It is temporary in nature and affects infiltration sources normally above the groundwater table. Rates of RII are affected by antecedent moisture conditions; wet soils promote higher percolation rates than dry soil due to the polar nature of water.

The Town of Gill is interested in minimizing I/I that enters the collection system to minimize costs paid to Montague. As part of this effort, the Town has requested that Tighe & Bond perform the first phase of a Sanitary Sewer Evaluation Survey (SSES). An SSES is often carried out to identify discrete sources of infiltration and inflow (I/I). It is unknown the last time a SSES was conducted in Gill. This initial evaluation will serve to guide the focus of the SSES and includes a review of pump station flow rates, local rainfall, and regional groundwater data.

1 Historical Flow Data

The total sanitary flows sent to Montague are comprised of various components. Estimating a breakdown of these components can serve as a tool to better understand the nature of these flows and to focus future investigations. By analyzing pump station flows concurrently with rainfall and groundwater data, we can estimate relative I/I rates during various groundwater conditions and precipitation events.

1.1 Pump Station Flow Data

Flows from Gill are measured by a flow meter installed on a force main directly downstream of the Town's Fairview Street Pump Station (FSPS), located at 51 Riverview Drive, and prior to discharge into Montague's collection system. Historical flow data from January 2010 through May 2013 show total daily flows ranging from 9,300 gpd during dry weather up to 85,000 gpd during high flow periods (typically in the spring when snow melt is occurring and groundwater levels and rainfall amounts are higher). The total average daily flow during this period was 27,100 gpd.

Members of Gill's Highway Department take readings from a totalizer at approximately 7 AM daily, and record this data. The values recorded by the Town are not instantaneous, and the actual maximum instantaneous flow rate is likely greater than the reported flow since flows include most of the previous day (from approximately 7 AM) and up to approximately 7 AM of the day listed. Mick LaClaire, Gill Highway Department Superintendent, indicated that he believes that high flow periods often coincide with significant wet weather and high groundwater periods, indicative of some level of RII entering the Town's collection system.

1.2 Rainfall Data

Since rainfall has a direct impact on I/I, rainfall data from the study period was gathered. This data was obtained from the NOAA weather station at Orange Municipal Airport in Orange, MA. Orange is located approximately 12 miles east of Gill, and is the closest location of a NOAA rain gauge. This gauge will provide an appropriate estimate of the intensity and amount of rainfall experienced in Gill.

1.3 Groundwater Data

Infiltration occurs when groundwater enters the sewer through infrastructure defects. As the groundwater level rises, the potential for infiltration increases. Groundwater levels usually vary from location to location, depending on soil conditions and local topography. The potential for infiltration is often evaluated by comparing sewer depths to groundwater levels.

Groundwater data was collected from the USGS database of regional monitoring wells. Data was tracked using the nearest monitoring well located approximately 22 miles away in Pelham, MA. This location is an air percussion observation water-table well, 740-feet deep, located about 50 feet east of U.S. Highway 20 and about 70 feet south of the dirt road to Gate 8, Quabbin Reservoir.

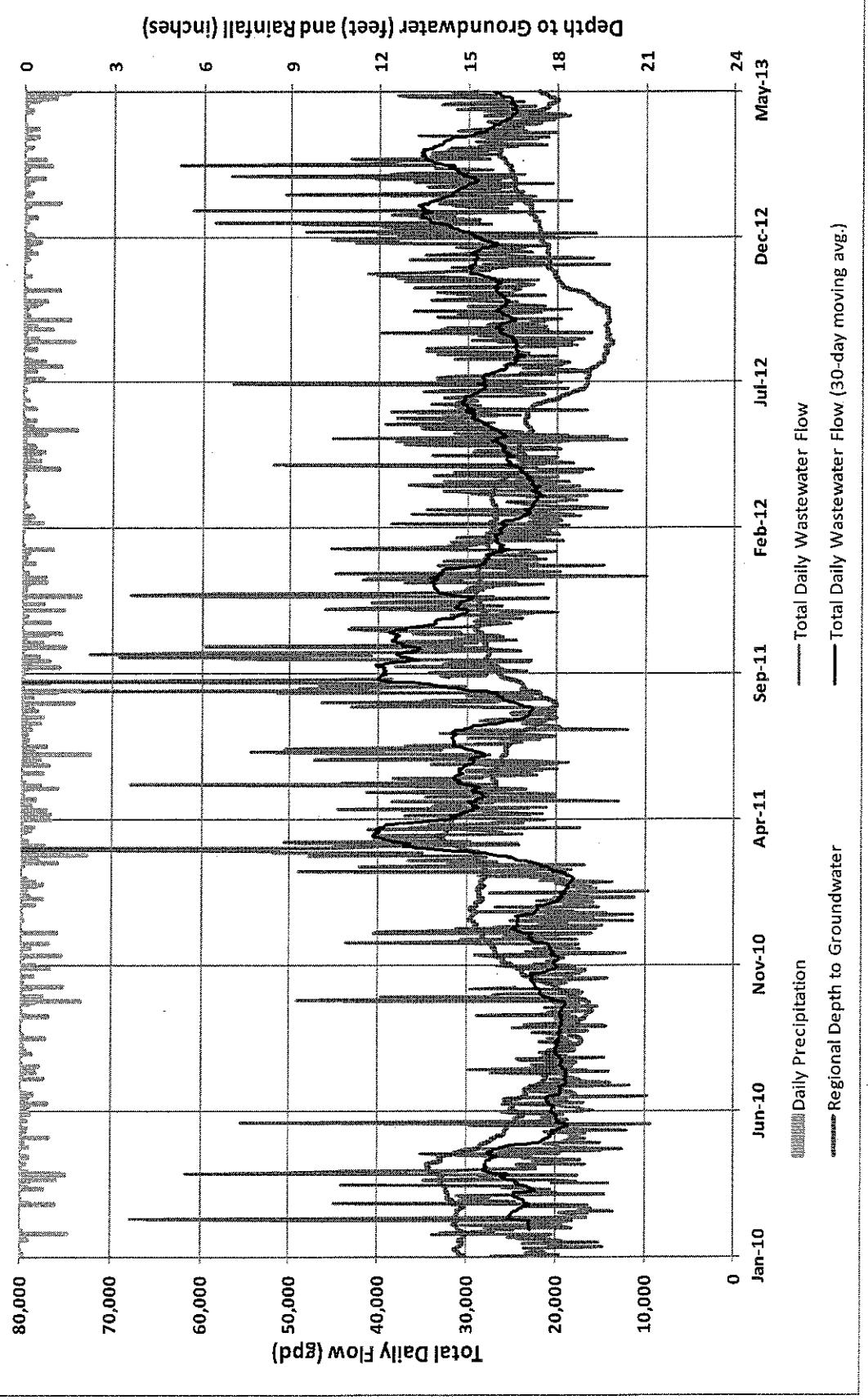
The depth to groundwater is measured on a daily basis, though there are some gaps in readings. Actual depths to groundwater in Gill likely vary from these readings in Pelham, but they serve as a good source of information regarding groundwater trends during the study period.

2 Composition of Flows

Per capita wastewater flow for the Town's sewer users was estimated to determine the sanitary portion of flows, or baseflow, that are measured at the FSPS. "TR-16: Guides for the Design of Wastewater Treatment Works" recommends using an average daily per capita flow of not less than 70 gpd for flow projections when actual water use data is not available. The United States Census Bureau provides an average number of persons per household in Franklin County of 2.3 and from the Town's sewer billing database, there are 114 equivalent dwelling units (EDUs) connected to the collection system. With the estimated value of 161 gpd/EDU for residential users in Gill, this results in an estimated baseflow of 18,400 gpd. Therefore the average I/I for the study period is approximately 8,700 gpd (average total daily flow of 27,100 gpd minus baseflow). Flow (presented as a total daily and monthly moving average), rainfall and groundwater data from January 2010 through May 2013 are plotted in Figure 1.

Based on Figure 1, the wastewater flows show a slight correlation to groundwater level. The general shape and trends of the data sets are similar. Seasonal groundwater levels followed similar trends in 2010-2013, yet average wastewater flows varied from year to year. This indicates that rainfall may play a more significant role than elevated groundwater levels in extraneous flows to the collection system, which is indicative of RII or inflow entering the system.

Figure 1
FSPS Flow, Rainfall, and Groundwater Data



To identify the effect wet weather has on the FSPS and the frequency of pump on/off cycles, circular flow charts were obtained for two days in May and June 2013 that showed significant differences. These flow charts are included as Attachment A. Precipitation data for the periods leading up to and on the days that were selected for analysis are presented in Table 1.

TABLE 1
Summary of conditions for the comparison of a wet and dry period

Date	Total Daily Flow (gal)	Precip. in Previous Week (in)	Precip. (in)	Precip. Duration (hours)	Max. Intensity (in/hr)	Depth to Groundwater (feet)
5/18/13	31,600	0.39	0.00	N/A	N/A	17.79
6/11/13	69,900	3.43	1.19	16	0.38	17.07

1. Precipitation amount and intensity data was obtained from the NOAA weather station at Orange Municipal Airport in Orange, MA.
2. Depth to groundwater data was obtained from the USGS regional monitoring well in Pelham, MA.

Based on this data, inflow and RII are likely the most significant sources of I/I in Gill's collection system. It should be noted however, that inflow, infiltration, and RII components are not mutually exclusive. For example, increased infiltration, through a rise in groundwater levels during a storm event, could be interpreted as inflow or RII, rather than infiltration. In the same manner, sump pumps connected to the sewer system often discharge to the system during dry weather while groundwater is still elevated. Flow from these sources could be interpreted as infiltration. The following sections will attempt to analyze and quantify each portion of I/I in more detail.

2.1 Infiltration

Typically the average minimum nighttime flow rate (when sanitary flows should be minimal) during a dry weather period can be utilized to approximate the level of infiltration within a collection system. The flow data available for the FSPS indicates pump on/off cycles throughout the day, but accurate flow rate data is difficult information to extract from the circular charts.

As an alternative approximation of infiltration, we can use the average I/I volume of 8,700 gpd for the study period as calculated above. With approximately 12,000 linear feet of pipe in the collection system, at an average diameter of 8 inches, the average infiltration rate is approximately 480 gpd/in-mi for the 3-year study period. This value can vary widely; for example the average infiltration rate was approximately 830 gpd/in-mi between March 2011 and May 2011.

MassDEP has established a threshold of 4,000 gpd/in-mi as a measure for being cost effective to perform follow-up work to locate discrete sources of infiltration. Since this value was not met for the sewershed, it does not appear to be cost effective to perform further investigation for infiltration sources.

As infiltration and RII enter the collection system from similar sources, formal recommendations for further investigations will be made with both components in mind. Section 2.3 presents findings related to RII.

2.2 Inflow

Using a similar approximation method for inflow as for infiltration, the baseflow volume of 18,400 gpd can be subtracted from the maximum total daily flow value observed during the study period of 85,000 gpd. Accounting for the estimated 8,700 gpd of infiltration, peak inflow rates experienced can reach approximately 58,000 gpd, or more than 300% of the baseflow portion of sanitary flows.

An additional way of confirming the presence of direct inflow is to observe the collection system's response to rain events. Regardless of groundwater levels, if inflow is present there would be an increase in flows during precipitation events, with flows returning to pre-storm levels shortly thereafter. Data for precipitation events that were analyzed for the presence of inflow is shown in Table 2.

TABLE 2
Impact of rainfall on total daily flow during a storm event in September/October 2010

Date	Total Daily Flow (gal)	Precip. (in)	Precip. Duration (hours)	Max. Intensity (in/hr)	Depth to Groundwater (feet)
9/25/10	15,200	0.00	N/A	N/A	19.10
9/26/10	18,400	0.00	N/A	N/A	19.09
9/27/10	18,400	0.26	9	0.10	19.11
9/28/10	20,200	0.46	9	0.20	19.10
9/29/10	17,300	0.00	N/A	N/A	19.11
9/30/10	17,700	1.52	12	0.36	19.13
10/1/10	36,100	2.02	9	0.60	19.04
10/2/10	49,100	0.00	N/A	N/A	18.92
10/3/10	18,200	0.00	N/A	N/A	18.84
10/4/10	18,700	0.11	3	0.08	18.75

1. Precipitation amount and intensity data was obtained from the NOAA weather station at Orange Municipal Airport in Orange, MA.
2. Depth to groundwater data was obtained from the USGS regional monitoring well in Pelham, MA.

Again it should be noted that the flows presented for each day include the majority of flow from the previous day. Keeping this in mind, in the days leading up to the precipitation event, average flows were approximately 15,000 to 18,000 gpd. On September 28th, 0.46 inches of precipitation fell and flows increased to 20,200 gpd; the following day flows returned to 17,300 gpd. On September 30th and October 1st, 1.52 and 2.02 inches of precipitation fell, respectively, and flows increased up to 49,100 gpd; the following day flows returned to 18,200 gpd. This increase in flow on days where precipitation was experienced is indicative of inflow or RII entering Gill's collection system. It is recommended that further investigations into sources of both inflow and RII be completed.

Since extraneous flows from inflow and RII are both related to precipitation events, it is unclear of the exact RII component of this inflow. Instantaneous flow data would be

required to analyze the timing of the precipitation in relation to the increased flows and the eventual return to dry-weather flows.

2.3 Rainfall Induced Infiltration

To identify the presence of RII within the collection system, a comparison of several storms and their associated flow responses was made. If there is a correlation between past precipitation events and high groundwater conditions, this is generally indicative of RII in the system. A comparison of two periods with storms of similar precipitation amounts and intensities, but different groundwater conditions is shown in Table 3.

TABLE 3
Response of daily flow during similar storm events under high and low groundwater conditions

Date	Total Daily Flow (gal)	Precip. (in)	Max. Intensity (in/hr)	Depth to Groundwater (feet)
Low Groundwater Period				
9/25/10	15,200	0.00	N/A	19.10
9/26/10	18,400	0.00	N/A	19.09
9/27/10	18,400	0.26	0.10	19.11
9/28/10	20,200	0.46	0.20	19.10
9/29/10	17,300	0	N/A	19.11
9/30/10	17,700	1.52	0.36	19.13
10/1/10	36,100	2.02	0.60	19.04
10/2/10	49,100	0	N/A	18.92
10/3/10	18,200	0	N/A	18.84
10/4/10	18,700	0.11	0.08	18.75
High Groundwater Period				
12/4/11	28,700	0	N/A	15.47
12/5/11	20,800	0	N/A	15.44
12/6/11	28,900	0.15	0.05	15.39
12/7/11	27,100	1.93	0.32	15.33
12/8/11	54,900	0.73	0.31	15.23
12/9/11	67,900	0	N/A	15.24
12/10/11	58,200	0	N/A	15.26
12/11/11	39,100	0	N/A	15.30
12/12/11	29,100	0	N/A	15.29

1. Precipitation amount and intensity data was obtained from the NOAA weather station at Orange Municipal Airport in Orange, MA.
2. Depth to groundwater data was obtained from the USGS regional monitoring well in Pelham, MA.

Several key trends can be observed from the data in Table 3. Groundwater in December 2011 was approximately 4 feet higher than it was in September-October 2010. As expected, a slightly higher base wastewater flow was observed during the period with higher groundwater.

In addition, despite greater total rainfall and intensity of the storm in 2011, the peak total daily flow was 49,100 gpd in 2010 compared to 67,900 gpd in 2011. Also, after the 2010 event, flows returned to pre-storm values within 2 days of the rainfall, whereas in 2011 (with a higher groundwater table), the return to a pre-storm flow took several more days. A differing response to similar storms under differing groundwater conditions is generally indicative of RII. Based on the data in Table 3, it appears that Gill's collection system is subject to some amount of RII.

One more significant wet weather period was analyzed to determine if RII is a significant component of flow in the collection system. A wet weather period in March 2011 was identified and information for this period is presented in Table 4.

TABLE 4
Impact of two storm events within a short timespan on collection system flows

Date	Total Daily Flow (gal)	Precip. (in)	Max. Intensity (in/hr)	Depth to Groundwater (feet)
3/5/11	29,100	0.02	0.01	15.32
3/6/11	47,900	2.20	0.34	15.42
3/7/11	38,600	1.36	0.25	15.48
3/8/11	35,000	0.00	N/A	15.47
3/9/11	52,000	0.00	N/A	15.40
3/10/11	51,150	0.05	0.03	15.24
3/11/11	51,150	0.60	0.21	15.07
3/12/11	82,750	0.01	0.01	14.90
3/13/11	82,750	0.00	N/A	14.80
3/14/11	45,200	0.00	N/A	14.74
3/15/11	40,000	0.00	N/A	14.71

1. Precipitation amount and intensity data was obtained from the NOAA weather station at Orange Municipal Airport in Orange, MA.
2. Depth to groundwater data was obtained from the USGS regional monitoring well in Pelham, MA.

For days where the same total daily flow value is presented, flows were collected for a two-day period and then divided between the two days to obtain a daily average value. This time period in March 2011 consisted of one major precipitation event over two days, followed by three days with minimal additional rainfall, and then another less intense event. Flows never quite returned to the previous dry weather levels before the second precipitation event occurred. This led to a further increase in total daily flow after the second event, even though less precipitation fell during that event. Another factor to consider is the snowpack that was likely present during these rain events, which could have led to localized flooding over manhole covers and increased use of basement sump pumps.

Based on the data in Table 4, RII is likely significant within Gill's collection system. It is recommended that investigations into RII be completed.

3 Recommendations for Additional Study

Typically sewersheds with high rates of infiltration or RII are further studied using the following programs:

- Closed-circuit television (CCTV) inspection – an interior inspection of the sewer by a mobile, robotic camera
- Manhole inspections – a surficial inspection of manholes for defective components that allow I/I to enter the collection system

Sewersheds with high rates of inflow are often investigated further using the following programs:

- Smoke testing – involves forcing a non-toxic, odorless smoke through the sewer system that can be seen venting out of inflow sources, such as catch basins
- Building inspections – involve inspections of a building's plumbing to determine if connections for storm or groundwater exist, such as a sump pump

Based on the data analyzed in this report, it appears that the main source of extraneous flow in the Gill collection system is RII. Inflow may also contribute a significant portion of extraneous flows. Because there appears to be both infiltration and inflow components, and because Gill's collection system is small, we recommend a full SSES program be executed. The program can be phased such that the next phase of the project (Phase 2) includes investigations into infiltration/RII sources during a high groundwater period, and a subsequent phase (Phase 3) includes inflow investigations and can be performed at any time.

3.1 Phase 2 Investigations

Phase 2 investigations would include CCTV and manhole inspections. It is recommended that CCTV inspections be performed on the entire system because of its overall benefit to the Town with respect to operations and maintenance of the system. CCTV inspections identify defects that may require immediate rehabilitation, but they also act as an asset management tool and bring to light the condition of the system as a whole so that planning for future improvements can be considered. Since it is not known when the last time the sewer system was inspected, it would be a valuable piece of information for the Town. This work should take place during a high groundwater period to provide maximum benefit, preferably after periods of significant rainfall. This work should be performed when the previous day's total daily flow exceeds 40,000 gpd.

While in the field on June 26, 2013, one manhole out of the four that were examined exhibited signs of infiltration staining around a joint. With a relatively low number of manholes in the collection system, it is recommended that a formal manhole inspection program be initiated concurrently with the CCTV inspections, and that all of the manholes in Gill's collection system be inspected.

3.2 Phase 3 Investigations

Phase 3 investigations would include smoke testing and building inspections. For the same reason that CCTV and manhole inspections would be valuable, smoke testing should be

performed throughout the entire system. In a small collection system it is a quick way to rule out possible inflow sources quickly and cost-effectively.

In discussions with Mick LaClaire, there are some concerns over the presence of sump pumps connected to Gill's collection system. A small set of building inspections (approximately 50 of the 114 total connections) should be performed to determine if sump pumps exist and are connected to the sewer. The locations for the building inspections will be based on Town personnel experience and the results of the CCTV inspections performed during Phase 2. While the initial phase of building inspections are typically performed voluntarily, the Town has the authority to demand these inspections under Article 7, Section 1 of the Sewer Use Regulations.

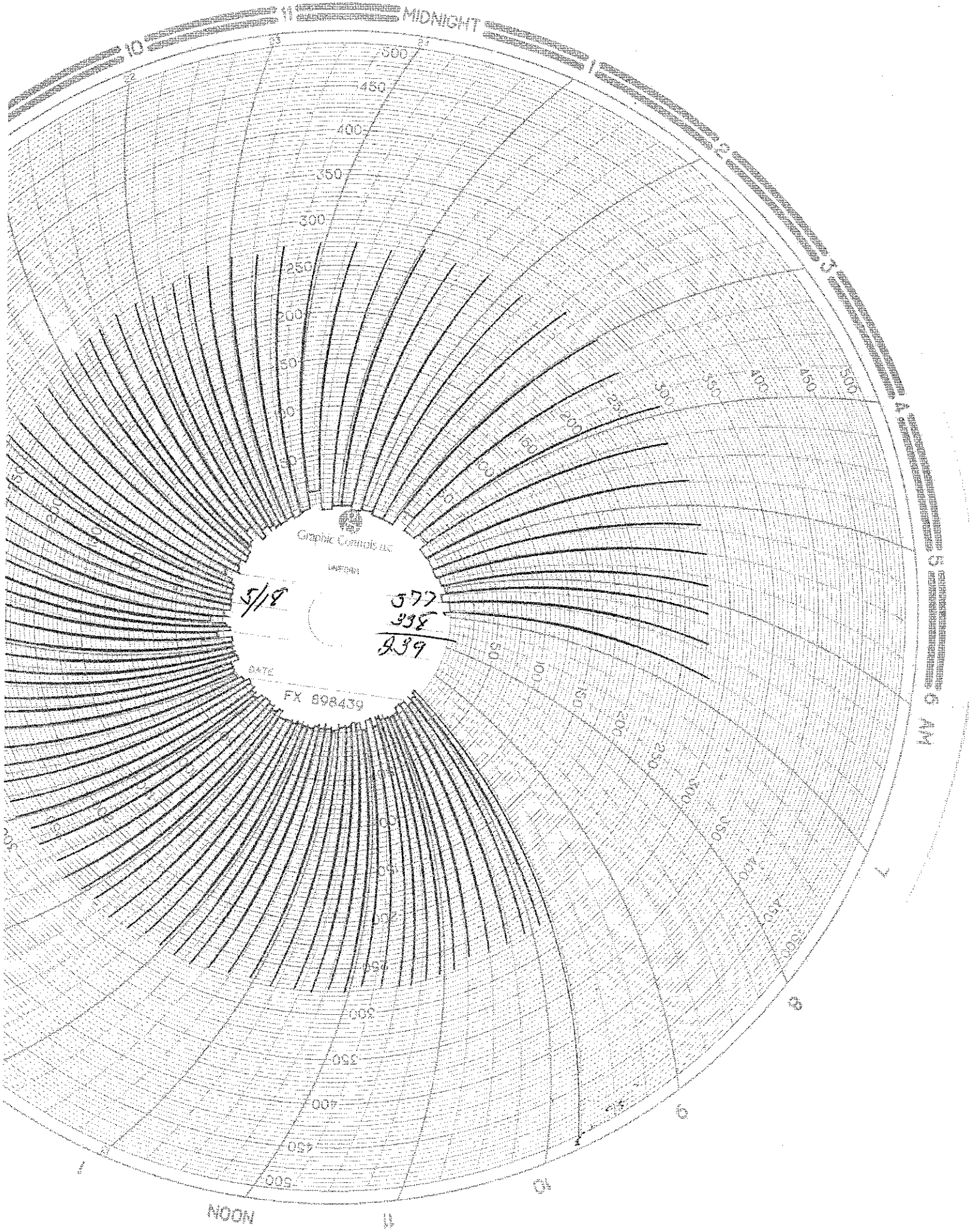
We recommend that the Town plan for conducting work on Phase 2 beginning in spring 2014, with additional work performed as funds are available. Phase 2 can be further broken down into sub-phases as necessary, depending on availability of funding. For the purposes of this report, we are presenting costs assuming that Phase 2 will need to be broken down further into two separate projects to spread costs over two years. Phase 3 costs can be refined upon completion of Phase 2.

TABLE 5
Opinions of probable cost for Phase 2 and 3 investigations

Phase 2A	
Light Cleaning and CCTV Inspections (6,000 LF)	$15,900
Manhole Inspection Program (65 manholes)	$4,300
Subtotal	$20,200
Engineering/Reporting	$5,000
Total	$25,200
Phase 2B	
Light Cleaning and CCTV Inspections (6,000 LF)	$15,900
Subtotal	$15,900
Engineering/Reporting	$4,000
Total	$19,900
Phase 3A	
Smoke Testing Program (12,000 LF)	$5,600
Engineering/Reporting	$5,000
Total	$10,600
Phase 3B	
Building Inspection Program (50 buildings)	$4,300
Engineering/Reporting	$5,000
Total	$9,300

Attachment A

Dry and Wet Weather Period Circular Flow Charts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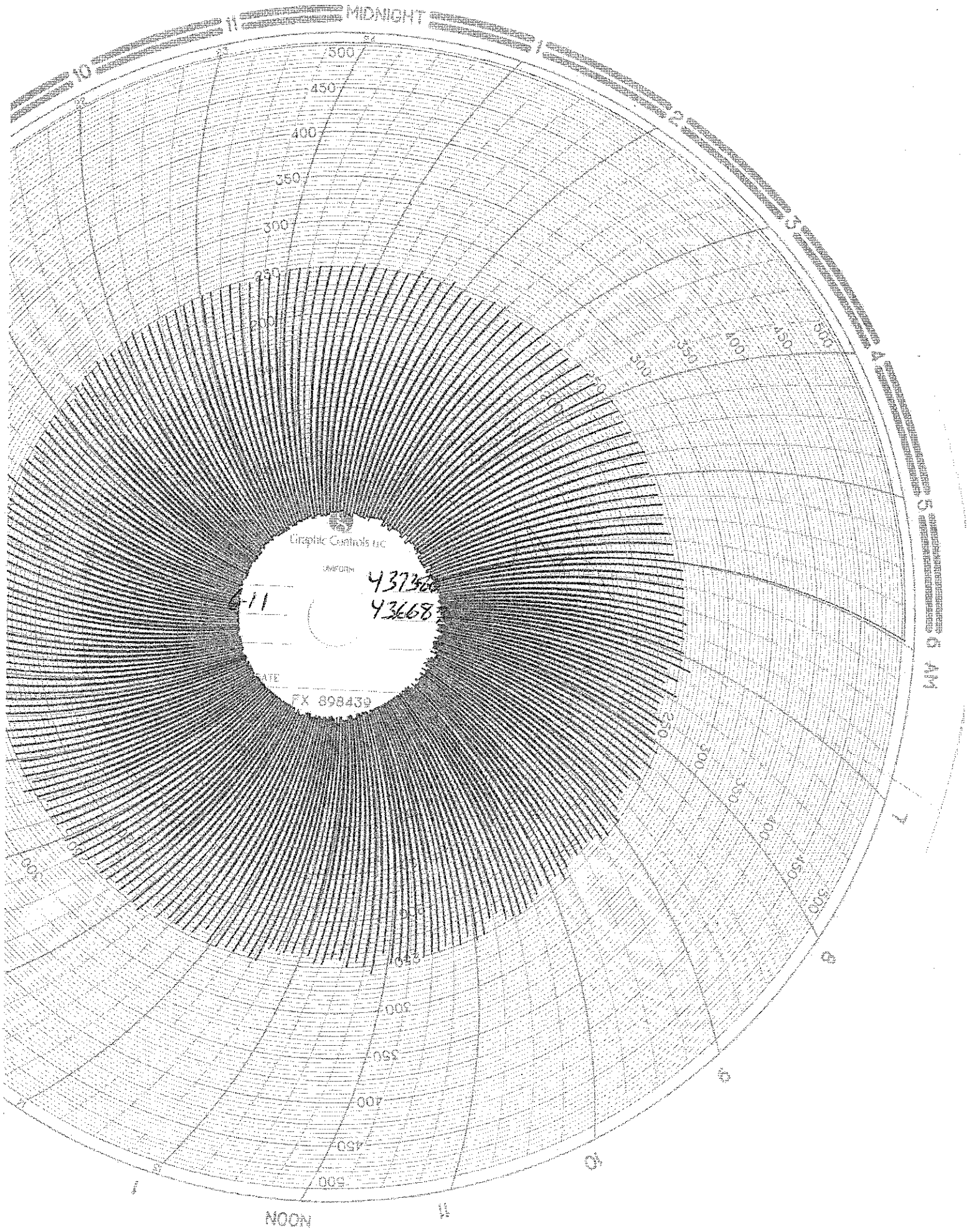
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TOWN OF GILL

MASSACHUSETTS

www.gillmass.org

August 26, 2013

Mr. Peter Fayroian, Head of School
Northfield Mount Hermon
One Lamplighter Way
Gill, MA 01354

Dear Mr. Fayroian:

On behalf of the Town of Gill and its residents and businesses, please accept our sincerest thank you to Northfield Mount Hermon School for the $25,000 gift to the Town in support of emergency services. The School's continued generosity is greatly appreciated.

With regards,

Gill Selectboard

John R. Ward

Randy P. Crochier

Ann H. Banash

Telephone 413-863-9347 325 Main Road, Gill MA 01354 Fax 413-863-7775

August 29, 2013

Honorable Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

Re: Northfield Mountain Pumped Storage Project, FERC No. 2485-063
And the Turners Falls Project, FERC No. 1889-081

Comments on the Revised Study Plan (RSP) submitted by FirstLight August 14, 2013

Section 3.1 Geology and Soils, 3.1.1 *2013 Full River Reconnaissance Study,* 3.1.2 *Northfield Mountain/Turners Falls Operations Impact on Existing Erosion and Potential Bank Instability, and Appendix D: 2013 Quality Assurance Plan (QAPP)*

Dear Secretary Bose:

The Town Of Gill, incorporated in September 28, 1793, is situated on the west bank of the Connecticut River, extending from just below the Route 10 Bridge to the Turners Falls Dam. The Connecticut River has been closely tied to and is an integral part of the Town's development and community history. The Town boundaries include over twelve miles of shoreline on the Connecticut River. Through its appointed Conservation Commission, the Town has an important regulatory role in accordance with the Massachusetts Wetlands and River Protection Acts.

The Town of Gill has active members on the Connecticut River Streambank Erosion Committee (CRSEC), a committee of the Franklin Regional Council of Governments' (FRCOG). The CRSEC, convened in 1994 and formalized by FERC in the 1999 Erosion Control Plan, brings together the Northfield Mountain Pumped Storage Project operator, state and municipal entities, landowners, and NGO's to select and prioritize bioengineering projects to stabilize and repair areas of bank erosion in the Turners Falls Pool.

We assert that bank erosion is the principal environmental problem in the Turners Falls Pool and impacts all the other resources listed in the Proposed Study Plan – Water Resources; Fish and Aquatic Resources; Terrestrial Resources; Wetlands, Riparian and Littoral Habitat; Recreation and Land Use; Cultural Resources; and Developmental Resources.

The Town of Gill's Conservation Commission as a member of the Connecticut River Streambank Erosion Committee (CRSEC) attempted to work with FirstLight and FERC on the 2013 FRR methodology and the Quality Assurance Project Plan (QAPP), but the QAPP has not been finalized since FirstLight stopped collaborating on the Plan.

The 2013 FRR has not been significantly improved from its 2008 predecessor. The 2013 FRR methodology and QAPP still need significant improvements. We still want to be involved in the process to refine the methodology and the tasks that would need to be added to the 2013 FRR to gather data to inform relicensing. With this in mind, the 2013 FRR should be confined to the compliance arena, and FirstLight should be directed to work with the CRSEC to develop an appropriate methodology and QAPP.

The Town of Gill supports the Franklin Regional Council of Governments' (FRCOG) Comment Letter on the Revised Study Plan (RSP) that states that although the RSP contains the fourth version of the study plans for Section 3.1 Geology and Soils, these study plans still do not meet the standard of technically defensible and rigorous scientific investigations with clearly stated goals, objectives and deliverables. We also have no confidence that the data collected as part of these studies can be used in a meaningful way to evaluate the potential impacts project operations have on the natural resources of Franklin County.

Thus, we are not providing additional comments on Appendix D – Quality Assurance Project Plan (QAPP) since this document accompanies Section 3.1.1 2013 Full River Reconnaissance (FRR) Study, which continues to be inadequate for relicensing and compliance purposes. The 2013 FRR should be removed from the relicensing process because, as written in the RSP, the data gathered from this study will not provide scientifically defensible information nor will it provide sound data for the other studies that rely upon it.

We regret that the short timeframe to provide comments on these studies precludes detailed comments. However, we would like to express our strong support of the detailed comments submitted to you by the Franklin Regional Council of Governments (FRCOG) as we emphasize the following points below on Section 3.1.2 raised by the FRCOG and the Connecticut River Watershed Council (CRWC).

Proposed Study 3.1.2 *Northfield Mountain/Turners Falls Operations Impact on Existing Erosion and Potential Bank Instability*

Resource Management Goals of Agencies

Task 2: Geomorphic Understanding of Connecticut River

The 2007 Field Report accomplished much of tasks 1 and 2. Data gaps were identified in that study, and study 3.1.2 should simply proceed with filling in data gaps and analysis.

At the top of page 3-30, the RSP indicates that historic geomorphology will be analyzed and discussed. As noted, stakeholders requested an historical analysis. The RSP does not give any details on what data will be used or how it will be analyzed and presented, other than referring to the list existing information. We request a specific description of what the historical analysis and discussion will entail. By comparison, TransCanada's RSP study 3 page 34 says, "Changes in the location of erosion through time will be achieved through comparisons of at least 3 map years of GIS data (1979, 2010, and to be completed in 2014) with pie charts and maps to be used to determine if river bank erosion has increased through time as suggested in some of the study requests." And, we recommend Field's 2007 recommendation #9 in Section 9.b Monitoring of Erosion was that, "An attempt should be made to overlay the 1961 aerial photographs with a current flight and to create a topographic map from the 1961 flight. The feasibility of this effort has been confirmed by Eastern Topographics, Inc. This effort will identify the previous extent of the low bench (Figure 7a-b) and identify areas of the most significant bank recession in the past 45 years." Recommendation #10 in the 2007 Field report was "Portions of the 1971 ground surveys by Ainsworth and Associates, Inc. of Greenfield MA should be resurveyed to identify changes in bank position since the opening of the Northfield Mountain Pumped Storage Project."

Task 4a: Install Proposed Water Level Monitors in Turners Falls Impoundment.

We request that a water level monitor be installed between the TF boat barrier line and the tailrace, upstream of the Narrows or French King Gorge. Figure 3.2.2-2 shows a dramatic grade change at and upstream of the gorge. The tailrace site has its own set of dynamics that might not be representative of upstream of the gorge.

We also request that the water level monitors be installed for a full calendar year or longer.

Task 4c: Identification and Examination of Fixed Riverbank Transects

We concur with the CRWC recommendation that fixed transects selected for detailed study be identified in conjunction with the Connecticut River Streambank Erosion Committee, the Massachusetts Department of Environmental Protection (MassDEP) and other interested stakeholders.

Task 5b: Evaluation of Hydrodynamic Forces Due to Boat Waves

The second paragraph on page 3-43 says that erosion associated with boat waves will be documented "through measurements of the amount of erosion." No further information is provided about what that entails, but a study plan should explain what will be measured and how

it will be done. The flow rate of the river and the high and low flow or gage height for that day should be recorded for the days of analysis as a backdrop to any erosion measurements.

Task 7: Report

Few details are provided as to what will be in the final report to this complicated study with multiple components. We recommend something akin to TransCanada's revised Study 2 (Riverbank Transect Study).

In closing, we request having a local representative from the FRCOG, the Connecticut River Watershed Council, the Franklin Conservation District, the Gill Conservation Commission, or the Landowners and Concerned Citizens for License Compliance accompany FirstLight when they conduct the FRR after the methodology and the QAPP have been revised.

The Town of Gill looks forward to continuing our active engagement in the relicensing of the Turners Falls Dam and Northfield Mountain Pumped Storage Projects and appreciates the opportunity to comment on the Revised Study Plan.

Sincerely,

Town of Gill Conservation Commission

Town of Gill Selectboard

cc: John Howard, First Light Hydro generating Company

Robert McCollum, MA Department of Environmental Protection

Robert Kubit, MA Department of Environmental Protection

Peggy Sloan, Franklin Regional Planning Board

Tom Miner, Connecticut River Streambank Erosion Committee

Ken Hogan, Federal Energy Regulatory Commission

Chris Chaney, Federal Energy Regulatory Commission

Congressman James McGovern

Jennifer Soper, MA Department of Conservation and Recreation

Paul Jahnige, MA Department of Conservation and Recreation

Senator Stan Rosenberg, Massachusetts State Senate

Senator Benjamin Downing, Massachusetts State Senate

Representative Denise Andrews, Massachusetts House of Representatives

Bethany A. Card, MA Department of Environmental Protection

Michael Gorski, MA Department of Environmental Protection

Brian Harrington, MA Department of Environmental Protection