

**WOLFEBORO BOARD OF SELECTMEN  
SPECIAL MEETING  
April 19, 2010  
MINUTES**

**Members Present:** Linda Murray, Chairman, Sarah Silk, Vice-Chairman, Dave Senecal, Chuck Storm, Members.

**Member Absent:** Marge Webster, Member.

**Staff Present:** Dave Owen, Town Manager, Lee Ann Keathley, Secretary.

**Tuftonboro Board of Selectmen Present:** Carolyn Sundquist, Chairman, Bill Stockman, Dan Duffy, Members.

**Tuftonboro Conservation Commission Present:** Mike Phelps, Chairman, Gary Chehames, Nancy Piper, Jerry Light, Members, Steve Wingate, Alternate, Steve Truchon, Consultant, Mark Hutchins, Normandeau Associates.

*Chairman Murray opened the meeting at 9:00 AM at the Community Center*

**Public Works Information Meeting – Operation of the Rapid Infiltration Basins**

Dave Ford reviewed the background information relative to the permitting and construction phases of the site and timeline relative to such, see attached. He reviewed the site plan and site features, see attached plan. He reviewed the location of the groundwater monitoring wells and data summary of such, see attached; noting all reports related to such are filed with the State and the State has not required the Town to change the wells. He reviewed the ESP (Effluent Storage Pond) data and location of sampling sites for such, see attached. He stated the effluent comes from the treatment plant, goes to the pond, and is then discharged into the RIB's (Rapid Infiltration Basins) which is then released into the water table and heads downstream. He reviewed the data logging of the monitoring wells and the location of said wells, see attached; noting that since June 2009 data points are taken every hour. He stated the data also shows the flows of the RIB's; noting that due to high levels last year, the Town received permission from the State to spray; noting only half the area of the 100 acres was sprayed (staying out of the Mirror Lake watershed). He stated that regardless of the impact being much less in 2009 than previous years, the Town was still in violation due to runoff. He stated the system is now stabilized in the range of 350,000 gallons per day. He reviewed the stream gauging for Nineteen Mile Brook, see attached; noting the brook is the ultimate receiving body, therefore, knowing the stream is very important. He located the four gauging stations on the plan, see attached. He stated the stations will continued to be monitored to determine the base flow and have a better understanding of impact. He reviewed the estimated flow from the RIB's based on the Wright-Pierce Phase 3 Hydro Report March 2007, see attached. He stated over the past year, we have averaged about 400,000 gallons per day (0.62 CFS (cubic feet per second)). He noted a significant portion during low flow which is a concern, noting acknowledgement of such. He stated Tuftonboro had conducted a gauging review and such should be looked at. He stated weirs were set up to measure the flow at the central and western wetland areas and reviewed the weir flows for such, see attached. He noted the flows are in line with what had been predicted. He reviewed the updated RIB flow vs. ESP volume, see attached; noting such is subject to change based on daily conditions.

Gary Chehames asked where is the Town presently on being able to bypass the storage pond.

Dave Ford stated the Town has piping ability; however, it does not have pumping ability.

Member of the public questioned runoff from what is left from the old spraying fields and whether there is an ability to distinguish that from other runoff from what was sprayed in previous years, including saturation.

Dave Ford stated there is no longer any additional spray occurring; therefore, there is no runoff. He stated the monitoring wells located in the area have always met groundwater conditions. He stated in thirty years the Town never violated the groundwater flow rather, the Town's most recent violation was due to water runoff when the Town sprayed. He stated the Mirror Lake Association has a grant to do a study of the watershed and he believes one of their questions speaks to residuals coming out of the site.

Gary Chehames stated the Tuftonboro Conservation Commission (TCC) has done documentation of the area and written a letter, dated 1/27/10, requesting Mr. Ford to have an opportunity to further discuss the issues in that letter. He stated in July 2009 the TCC issued a letter to the Wolfeboro Public Works Department reporting information that had been reported to them by their engineer, Normandeau Associates, information that there was evidence of seeps and algae along the eastern side of the infiltration basin area. He stated a second letter was sent in August 2009 based on an action plan prepared by the Town of Wolfeboro. He stated there were a couple of statements in the action plan that they wanted to take exception to. **Statement #1:** *"Environmental impacts are being avoided through the process of re-infiltration from the seeps."* He stated it was their observation that it was very difficult to gauge how much treated effluent is coming through the seeps and re-entering into the ground; noting they observed channels of water that were flowing and flowing rather constantly and those waters that were flowing through the seeps were more correctly to be classified as a direct injection into the brook as opposed to a re-filtering into the ground.

**Statement #2:** *"Environmental impacts are being avoided."* He stated based on their information of seeing algae in the seeps and noticing a rather significant flow from the seeps directly into Nineteen Mile Brook caused concern. He noted the observations were in the unnamed portion of Nineteen Mile Brook, slightly above the brook. He stated as a result of the second letter and observations during the summer, the TCC commenced an algae monitoring program and established five stations along the brook; measuring the build up and presence of algae in the stream. He stated at the same time Wolfeboro commenced some water quality tests and he believes the data from the two towns reflected the same elevated levels of nutrients in the seeps in the surface waters and the presence of algae in the brook. He stated they performed a water flow stream gauging study; noting the expectation was to see an elevation in watershed and stream flow as was predicted by Wright-Pierce and wanted to know what it would look like from their point of view.

Referencing re-infiltration, Dave Ford stated he is in agreement that in the western wetland area, once the flow comes out of the ground it does not go back into the ground. He stated the statement he made was not relative to the central or western wetlands; noting the eastern wetland area is more saturated and predicts there will be an increase in wetland area. He stated the statement regarding re-infiltration was relative to the breakout area above the snowmobile trail. He stated there is a difference between impacts and significant impacts; noting it was clear there were going to be impacts. He stated when the model was done the State was interested in nitrogen levels; noting the State set a limit at the Town's boundary of 10 milligrams/liter. He stated the model assumed 9 milligrams would be going up to the facility and 7 milligrams would be coming out in the receiving bodies (identified in the report). He stated improvements were done at the treatment plant so the nitrogen levels are less going in; noting highest levels registered at 2 milligrams in the upper regions and 1 milligram in the lower regions. He stated the Town acknowledges the system is having an effect. He reviewed the areas where algae growth has been observed and noted that such will continued to be monitored.

Gary Chehames stated in conjunction with the documentation just reviewed and as a result of other reports that were distributed stating issues such as algae, storage pond, slope failure bordering the basins, wetland impacts from sand wash and possibly the closing of the snowmobile trail, the NH DES required an action plan. He stated the plan was submitted by Wolfeboro on 8/12/09. He stated the letter introducing the plan stated *"After careful and detailed*

*analysis of what happened and data collected the Town (of Wolfeboro) is confident that we are compliant with its Groundwater Discharge Permit and in many cases is having less of an environmental impact that predicted by the studies used to permit the site."* He stated the fact that the NH DES requested such a plan and within the text of the plan it is stated there are issues with the performance of the RWIDS (Rapid Wastewater Infiltration Disposal System basins, the TCC is very much alarmed. He stated the action plan also states "At this time we would like to continue to monitor the site and hold off any significant additional work. After obtaining a year's worth of data, the Town, its consultants and the NH DES can discuss the need for additional work or corrective action." He stated that statement was rapidly overtaken by NH DES and the construction of the additional RIB's that is currently underway. He stated it is their opinion that the infiltration disposal system is failing to properly accommodate treatment of the effluent as was intended by the NH DES approved design. He stated there is a difference of opinion in regard to such and their point of view is along the zero tolerance line and the Town of Wolfeboro's point of view is the use of the word significant or not using the word significant. He stated it is a paradox to say that the RWIDS is meeting the criteria of the Groundwater Discharge Permit in light of seeps and algae; noting seeps short circuit the aquifer and algae reflect a negative change in chemistry. He stated the need for corrective action to remedy the design of the RWIDS underscores these failures and the failures cannot be softened and simply dismissed as "unexpected issues". He stated consequently, we have and will continue to see a strong need to be critical of the following, the relationship between the statements that confirm permit compliance and the actual operational failures and the process of planning out corrective actions such as additional retention basins that are now under construction. He stated it seems that a lot of these decisions are economically based; noting the original design was in fact the lowest cost design and perhaps that had something to do with the fact that not all the basins were constructed in the beginning. He stated the TCC wonders how much hydro geological analysis was completed. He stated they are appreciative of the fact that the Town of Wolfeboro is not aggressively using the RIB's at this time. He stated they are critical of the lack of a value engineering component to planning the corrective actions and they feel there is a lack of operational criteria that can be used for proper lifecycle monitoring of the RWIDS. He stated the Wolfeboro Public Works Department and the Town of Wolfeboro should know when they should begin thinking of alternative arrangements for wastewater treatment. He stated the current system is a hugely complex operation and questioned how successful the system will be in 5-10 years and at some point monitoring and doing patches are going to be more problematic. He stated developing a system of operational criteria is necessary so that when the system shows signs of not being able to function any further the Town can channel its efforts in finding an alternative. He stated there is currently a lot of effort being devoted to just keeping the system on its feet and exploring ways to make it operate and it is going to be a difficult to maintain over the next 5-10 years.

Dave Ford stated Mitch Locker, NH DES, was invited to the meeting; however, he was unable to attend due to an emergency. He stated Mr. Locker wrote the permit and will be conducting a site inspection in the next two weeks. He stated the permit expires in five years and will be reviewed every five years for renewal; noting the Town is taking a proactive approach in reviewing the data prior to the expiration of the permit. He stated we don't live with zero tolerance and considers Tuftonboro a partner and appreciates their efforts; however, the Town of Wolfeboro answers to NH DES and follow what they say. He stated the system is a 20 – 50 year solution in reality and every five years the Town is required to get a renewal permit. He stated the site would be retired if a significant environmental impact was being seen with regards to how the State reviews it. He stated the Town has no notice of violations and is meeting permit requirements. He stated additional testing and data collection due to the unexpected issues have been conducted however, such is not evidence that the system is failing. He stated the Town is dealing with the problems responsibly; noting the critical issues are algae, soil migration and impact on wetland areas.

Gary Chehames verified the one year period for the meeting with NH DES commenced on 8/12/09.

Dave Ford stated the action plan notes a meeting with NH DES in one year; noting such would be the end of summer or early fall and would consist of developing a long term plan in terms of whether corrective action should be taken in the wetland areas to address the issues.

Gary Chehames stated what is central to their concern is the Groundwater Discharge Permit and requested Steve Truchon to speak to such.

Steve Truchon stated the following as a proposed course of action to address the concerns: non-relevance between permit compliance and actual operational issues, need for corrective actions that address existing operational issues and adding more infiltration basins and siting for such. Referencing non-relevance between permit compliance and actual operational issues, he stated the TCC is disappointed in the problematical performance of the RWIDS within a year of operation and felt there was some disconnect possibly due to the lack of relevant regulatory constraints currently in the existing Groundwater Discharge Permit. He stated ground waters to surface waters are known to contain little nitrate nitrogen naturally and the appearance of any increase is probably an indication of impact of pollution from wastewater treatment. Nitrate nitrogen concentrations in Nineteen Mile Brook prior to operations of the basins were about 0.08 milligrams per liter and were 0.25 post operation of the RWIDS; noting such is three times higher than the concentration at baseline. He stated existing groundwater discharge areas or seeps are not entirely in the groundwater discharge zone. He stated the seeps themselves contribute an average of .68 milligrams per liter of nitrogen directly into the brook. Irrespective of the nutrients status of surface waters in the groundwater discharge areas and seeps, he stated the chloride and conductivity data indicates the waters are 50% or more wastewater; noting such could change from rainfall and watershed and flowage from other areas. He stated the Town of Wolfeboro at some level is compliant with some elements of the existing Groundwater Permit; noting the Groundwater Permit level for effluent pump to the infiltration systems and the monitoring wells in the groundwater discharge zone is less than or equal to 10 milligrams per liter; noting one would expect the levels to be lower at the monitoring wells and questioned why it is 10 at the point at which the effluent is put into the RIB's and 10 at the monitoring wells.

Peter Atherton stated that other than phosphorus removal at the surface soils, the site is intended for disposal only. He stated they knew there would be some residual nutrient removal.

Dave Ford stated the standard level in Groundwater Discharge Permits is 10 milligrams per liter.

Steve Truchon stated the Groundwater Permit may not be protective of surface water quality in Nineteen Mile Brook because the permit level of less than or equal to 10 milligrams per liter corresponds to a human health based concentration for drinking water. He stated the State embraces that number as a number to put into a permit for total nitrogen; noting there are no human health receptors at the site and drinking wells are downstream therefore, such gives question to the validity of the number. He reviewed nutrient criteria / protective surface criteria by the US EPA that had been developed about one decade ago. He stated it is one thing to understand criteria and another thing to understand dilution and loading; noting that a lot of nitrogen could be loaded into the brook below permit level. However, issues could still develop, like algae.

Mark Hutchins stated considerably elevated concentrations of nitrate in the brook has not been seen however, we have had high flow years, noting that in low flow years probably 2/3rds of the flow in the brook would be effluent.

Dave Ford stated 50% was estimated; noting such is significant and the Town acknowledges such.

Nancy Byrd, Mirror Lake Protection Association, stated she does the monitoring on the lake and noticed this past year an improvement in the numbers coming in via the culvert under Lang Pond Road. However, the opposite seemed to occur in the undeveloped part that shares wetland with Nineteen Mile Brook, noting it is unclear where the watershed ends in that area. She questioned whether monitoring is being done to ensure it doesn't get back into Mirror Lake from Nineteen Mile Brook.

Steve Truchon stated the Mirror Lake Protection Association has applied for and received a grant from the EPA to study the nonpoint sources of nutrients entering the watershed and as part of such the area is going to be looked at as a hydro-geological connection between Nineteen Mile Brook and Mirror Lake.

Nancy Byrd stated perhaps it is time for Wolfeboro to think out of the box and in cleaning up the water perhaps, biological ways. She stated what she is hearing is that these are patches that are being done in Wolfeboro that ultimately, if they haven't failed already are going to fail.

Dave Ford stated there was a lot of effort by the Wolfeboro BOS to study all the alternatives and it was determined based on the consultants and the State that the current system was the best long term solution available.

Steve Truchon stated surface water samples taken in the brook and seep locations are corresponding to flow at the western and central wetlands and indicate that concentrations are approaching the criteria and sometimes maybe above the criteria. He stated filamentous algae is being seen and is indicative of the excess nutrient loading and present in the seep waters. He stated effluent concentrations of nitrates approach the permit level of 10 milligrams per liter at seeps or shallow monitoring wells.

Dave Ford stated the data distributed today is collected from monitoring wells that are down to bedrock and located in the higher elevations. He stated he does not have the data from the shallow monitoring wells.

Steve Truchon stated the State says the following in regard to algae: *"In accordance with anti-degradation laws, Surface Water Quality Regulations for the State of NH clearly state that effluent discharge to tributaries shall not contain nutrients that promote the growth of algae (NH Code of Administrative Definitions).* He stated the Nineteen Mile Brook Baseline Environmental Assessment that was performed by Normandeau Associates indicates that Nineteen Mile Brook is a high quality stream, typical of NH streams, unaffected by cultural development. He stated existing permit limits may increase the threat to this resource and contradict the efforts of NH DES' Watershed Management Bureau which has been formed to address nonpoint pollution issues throughout the State. He stated the Commission has suggestions to make revisions to the Groundwater Permit that as organic loading continues to the RIB's they believe the dissolved oxygen levels in the groundwater may becoming increasingly reduced; therefore, long term monitoring of the parameters is going to be important in recognizing how the system and the site is going to change in its capacity to handle wastewater in the ground. He stated the permit is going to need to change. He stated the permit level should be much more conservative to protect the brook. He further stated the permit requires two surface water samples be collected bi-annually; however, there is no permit limits present presented in the permit and it's not clear as to how the data is used to comply with the permit. He stated the permit should include criteria that is protective of surface waters; recognizing said criteria may not exist. However, benchmarks and guidelines exist that could be used in place of the criteria. He questioned whether the seep areas are effluent recharge from the groundwater to the surface.

Dave Ford reviewed the seep area at the site.

Steve Truchon stated the water that is flowing from the wetlands is no longer groundwater. Therefore, although the concentrations may be below the Groundwater Permit levels, it isn't groundwater and the TCC thinks there are methods or ways of permitting if these flows were to keep up, such as NPDES (National Pollution Discharge Elimination) Permit.

Dave Ford stated their efforts would be best served through better treatment at the plant and the pond. He stated the TCC's issue is how the State regulates groundwater. He stated the Town views the effluent as fully treated as evidenced by the phosphorus levels and nitrogen levels being less than predicted. He stated the Town of Wolfeboro has to go by what the permit states; noting the permit was issued in 2007 and is up for renewal in 2012.

Steve Truchon stated the existing permit specifies that the permittee shall not violate groundwater quality standards adopted by the Department and the groundwater at the boundary of the Groundwater Discharge Zone. He questioned the boundaries of said zone.

Peter Atherton replied 75' from the property line.

Dave Ford replied between the property line and the RIB site.

Steve Truchon stated the western wetland area is contributing flow to the brook and outside the Groundwater Discharge Zone; noting there could be changes in groundwater flow outside the zone and there is no management that takes place for such.

Dave Ford located the permit wells on the site; noting the intent of the State was to catch it before it gets out. He stated the levels are being monitored.

Mark Hutchins questioned how it can be guaranteed that piping is not occurring between the two wells.

Dave Ford stated the wells are measured to show volume; noting the flows are within the range of what was anticipated.

Nancy Piper asked if there is a way to correct the tunnel if piping is going on.

Dave Ford stated the prudent course of action is to slow down and monitor and study such; noting the value is in the treatment.

Mark Hutchins stated the proof is in the quality of the water coming out, if it is receiving the level of treatment that was anticipated and if so, then nothing needs to be done; noting the question is whether or not such is occurring.

Dave Ford stated the data indicates yes.

Mark Hutchins stated that not everything is being tested, only nutrients, compared to a fairly extensive testing protocol for the wells.

Dave Ford stated the Town is doing everything the State has asked them to do; noting he has provided a summary of the data.

Steve Truchon stated the TCC recommends the State take more of an adaptive management approach by looking at what the permit limit is then at concentrations of 80% and 60% of that limit in the monitoring wells, tie specific management activities to them earlier than the limits coming up to the permit level. He stated it is their opinion that corrective actions will be necessary for wetland areas and the seeps, and would like to see NH DES include a public commenting period when it comes time for corrective measures studies or remedial action.

Dave Ford stated the letter states the additional basins will be used for additional flow increase; however, they are not looking for such, noting the site is allowed for 600,000 gallons per day and the average is 400,000 gallons per day. Referencing the long term plan, he stated while some growth is anticipated, they anticipate a reduction due to the Inflow and Infiltration Program. He stated they will maintain their permit of 600,000 gallons per day, noting the new basins will be monitored.

Steve Truchon questioned the numbers of the new monitoring wells.

Dave Ford replied MWB4, GP8W, B3W and GP1W however, the wells will be renumbered.

Referencing the expansion of the site, Steve Truchon questioned whether the State has discussed with the Town further increasing water quality downstream from the site.

Dave Ford stated when the Town received the Groundwater Discharge Permit and construction approval, the State instructed the Town that all the basins had to be constructed. He stated the Town received a waiver for the construction of basins 4 & 5; however, following the unexpected issues the State required the Town to construct the basins. He stated basins 4 & 5 were covered in the original permit.

Steve Truchon verified the construction of basins 4 & 5 were part of the original design. In regard to the design of the additional RIB's, he questioned whether there have been any changes in the Peer Review process.

Dave Ford replied no.

Referencing Peter Atherton's memo, dated 2/11/10, Gary Chehames stated Mr. Atherton refers to a meeting in August 2009 in which DES stated that their preference on the next steps if the reserve area RIB's couldn't be built or wouldn't be sufficient, would be to explore additional RIB areas near the existing site. He questioned whether there are additional areas and are the areas under design.

Peter Atherton stated there is no design detail associated with the areas. He stated on the other side of the brook on the Hersey property there was another nugget of sand and gravel; however, it was too small for what was needed.

Gary Chehames questioned whether the Town has an option on the Hersey property.

Dave Ford replied no.

Mike Phelps stated there is an area available further up closer to the Town of Wolfeboro's drinking water source; noting it would feed the Upper Beach Pond watershed.

Referencing the comment that the BOS rushed into a solution, Linda Murray stated she came on in 2005 and the Administrative Order came right in. She stated the BOS ended up looking at all the different solutions with engineers; noting snowmaking, connecting to Franklin and re-use were reviewed. She stated the Town was getting a directive from DES that the spray fields were not an option. She stated in that timeframe the Town hired David Ford. She stated the Board is present with David Ford because they are concerned; noting that Mr. Ford keeps the BOS very informed and the BOS are meeting with Tuftonboro, as a neighbor, to try to solve and find out the best way to run this plant. She stated the DES supported the Town in moving in this direction and the Town will work at finding a solution.

Referencing Dave Ford's letter, dated 2/12/10, relative to false charges, Gary Chehames stated the intention of the Conservation Commission's letter is apparent, but they were alarmed at what they read in the press and did not think they were ascribing anything they read in the press as based on a direct statement by Mr. Ford. He stated there is still a difference of opinion regarding the 3 facts noted in the letters and would caution that on a few occasions they have read things in the press that cannot be ascribed to anyone saying anything. He stated it is extremely important that the press be very careful about ascribing statements to anyone that is involved in the review of this project and does not want to see facts misconstrued or incompletely stated appearing in the press and believes that is what is going on.

Dave Ford stated that if such is an apology then he will accept it; noting that he was charged with saying erroneous and false statements.

Gary Chehames stated he did not charge Mr. Ford with anything. He stated the statements in the Commission's letter were obtained from the press. He stated the Commission requests the following; the Commission receive information that Mr. Ford comes up with in further regard to the action plan, think about the value engineering approach and respond to the Commission regarding such and reaffirm what the Commission considers to be a genuine need for performance criteria.

Mike Phelps questioned the percentage of the water being injected into the RIB's and coming out as surface water at the piping and seep / breakout areas.

Referencing the memo from Weston & Sampson, dated 1/20/10, Gary Chehames stated a field review was done on the breakouts on the western side noting the following statement, "*Cursory field measurements of total flow were made at several points in the channelized flow. Based on field measurements, estimates of total flow were approximately 50 gallons per minute. It is unclear if all of this water is seepage or some of it is surface drainage due to snowmelt in the wet areas. Therefore, I estimate the range of seepage volumes of 25 - 50 gallons per minute on the day of the visit.*" He stated that puts it up to 72,000 gallons per day; noting such is not insignificant.

Dave Ford stated the weir flows are significant, but within what was predicted.

Peter Atherton stated it was always intended that groundwater would resurface at natural springs and seeps in addition to groundwater in the brook.

Dave Ford stated the hydrogeo report states that a certain percentage would go into Nineteen Mile Brook through groundwater, the same in the unnamed brook through groundwater but in the central, eastern and western wetland areas, it would come out on top of the wetlands and flow over the wetlands.

Nancy Byrd stated all this is taking place with the background of rapidly advancing scientific knowledge as to the short term and long term effects of cyanobacteria; noting Mirror Lake has had issues with such. She stated such has to be taken into consideration.

**It was moved by Sarah Silk and seconded by Dave Senecal to adjourn the April 19, 2010 Wolfeboro Board of Selectmen meeting. All members voted in favor.**

*There being no further business before the Board, the meeting adjourned at 11:00 AM.*

Respectfully Submitted,

*Lee Ann Keathley*  
Lee Ann Keathley



**AGENDA**  
**BOARD OF SELECTMEN**  
**Community Center, 32 Lehner Street**  
**April 19, 2010**

**9:00 AM - SPECIAL MEETING**

**I. Public Works Informational Meeting -- Operation of the Rapid Infiltration Basins**

- A. Introduction
- B. Background: study, permits, construction, operation
- C. Time line of unexpected issues
- D. Data
- E. Discussion / Questions

**II. Adjournment**

**If there is anyone with a disability needing any modifications and/or auxiliary aid to access this meeting, please notify the Planning & Development Department at 569-8161 at least 24 hours prior to the meeting date.**

# Wolfeboro Effluent Disposal Timeline

<u>DATE</u>	<u>EVENT</u>
March 2006	Wolfeboro Town Meeting Approves \$1.77 Mil
March 2007	Wright-Pierce Phase 3 Hydro Report (basis for Permit
July 11, 2007	NHDES issues Ground Water Discharge Permit for Whitten Site
March, 2008	Begin Construction of RIB, Pump Station and Pipeline
March 3, 2009	Begin Operation of Rapid Infiltration Basins
April 23, 2009	Observed Slope Failure above Central Wetland Area
Apr-June, 2009	Town modifies operation, collects additional data
June 8, 2009	Observed sink hole and sand piping
August 12, 2009	Town submits Response and Action Plan to NHDES
August 26, 2009	Meeting with Town, Consultants and NHDES to review Action Plan
	NHDES requires construction of additional basins
Fall 2009	Additional Geotech work, design of new RIBs
Jan 2010	Begin Construction of RIBs 4 & 5
April 2010	RIBs 4 & 5 Substantially Complete

# **Wolfeboro Public Works Informational Meeting**

Monday, April 19, 2010

## **Operation of Rapid Infiltration Basin (RIB)**

### **#    Data Handouts**

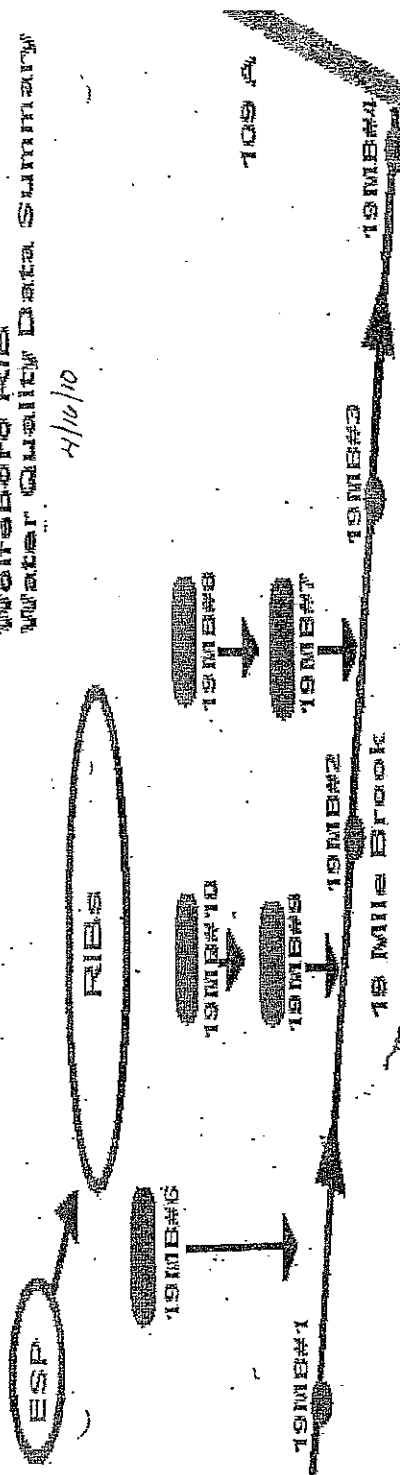
- 1    Site Plan**
- 2    RIB Permit Groundwater Monitoring Well Data Summary**
- 3    RIB Site Surface Water Quality Data Summary**
- 4    Monitoring Well (MW) Water Level vs. Discharge**
- 5    Nineteen Mile Brook - Stream Gauging and Watershed Map**
- 6    Estimated Flow from RIB**
- 7    Measured flow from RIB**
- 8    Operations Plan- RIB Flow vs. ESP Volume**



Wolfeboro Effluent Disposal System																				
RIB Permit Monitoring Well Data																				
	Nitrate/Nitrite (mg/l)					Total Phosphorus (mg/l)					Chloride (mg/l)					Sp. Conductance (uS/cm)				
Sampling Date	05/14/08	11/05/08	05/13/09	11/18/09	02/10/10	05/14/08	11/06/08	05/13/09	11/18/09	02/10/10	05/14/08	11/05/08	05/13/09	11/18/08	02/10/10	05/14/08	11/05/08	05/13/09	11/18/08	02/10/10
Monitoring Well																				
MW-1	<.5	0.12	<.08	0.13	<.05	0.09	0.02	0.14	<.002	0.1	1	1	1	2	<1	NT	34	26	34	23
MW-2	<.5	<.06	<.5	0.71	1	0.03	0.02	0.13	<.002	0.083	1	1	2	86	84	NT	26	39	360	380
MW-5	<.5	NT	1.2	1.6	1.8	0.04	NT	0.05	0.012	0.06	2	NT	100	84	70	NT		530	430	380
MW-8	<.5	0.19	1.4	1	2	0.04	0.04	0.03	0.008	0.032	2	1	98	80	84	NT	41	480	390	380
MW-15	<.5	0.18	<.5	1.5	1.2	0.04	0.04	0.32	0.01	0.045	1	1	2	86	86	NT	44	49	400	380
MW-19	NT	NT	1.6	NT	2.2	NT	NT	<.05	NT	0.03	NT	NT	NT	NT	89	NT	NT	NT	NT	470
Effluent to RIB	NT	NT	NT	3.8	2.9	NT	NT	NT	0.76	0.6	NT	NT	NT	87	83	NT	NT	NT	480	450
Note: NT=Not Tested																				

# WOLF CREEK RIVER WATER QUALITY DATA SUMMARY

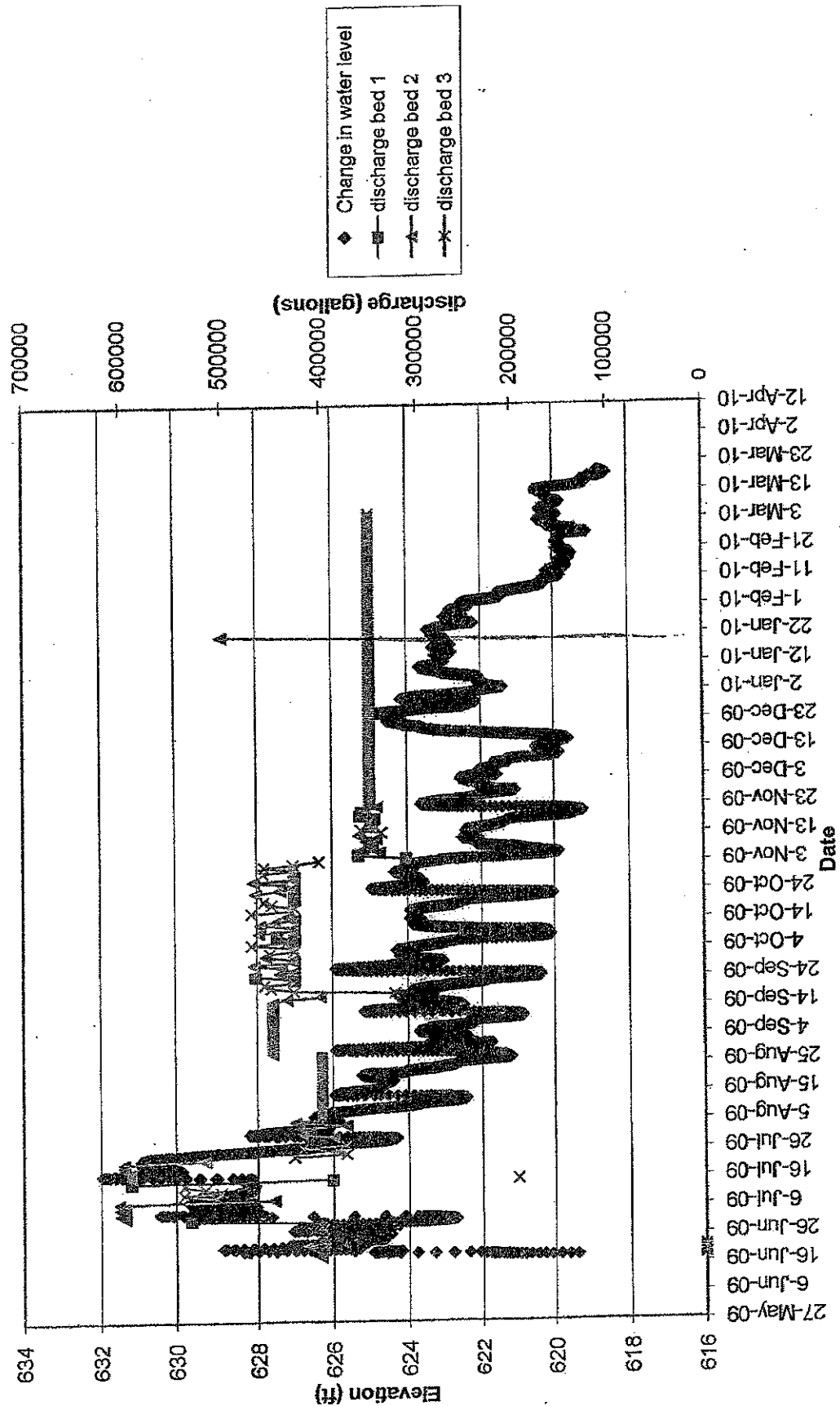
4/10/10



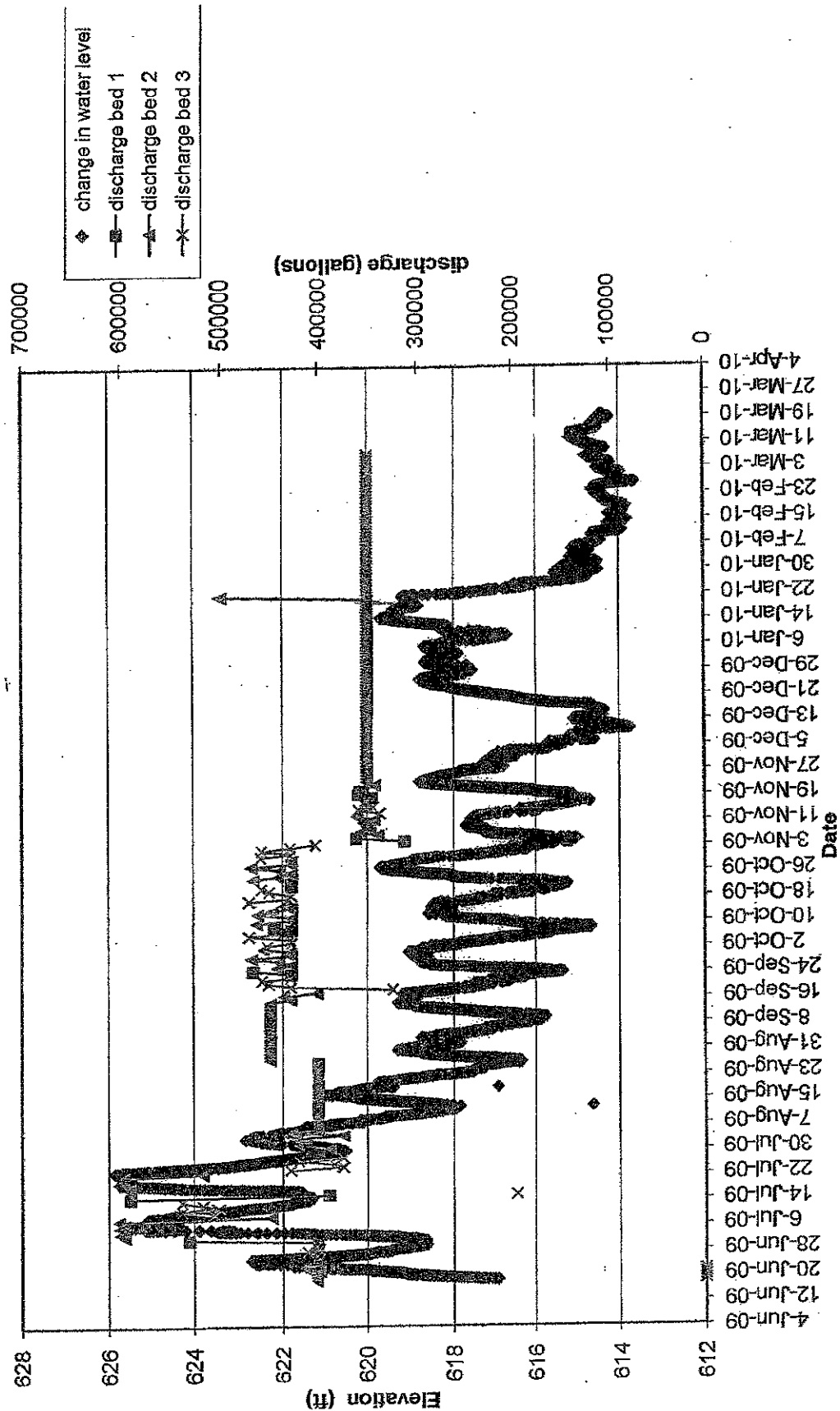
	Nitrate-Nitrite (mg/L)		Total Phosphorus (mg/L)		Chloride (mg/L)		SO <sub>4</sub> Conductance (uS/cm)	
	09/18/09	02/09/09	09/10/09	03/11/09	06/18/09	02/09/09	03/11/09	03/11/09
ESP	4.8	3.1	1.48	3.8	1.78	0.8	1.7	0.8
RIBS	NT	NT	1.7	3.8	3.1	NT	NT	NT
19MB#1	4.8	3.1	1.48	3.8	1.78	0.8	1.7	0.8
19MB#2	4.8	3.1	1.48	3.8	1.78	0.8	1.7	0.8
19MB#3	4.8	3.1	1.48	3.8	1.78	0.8	1.7	0.8
19MB#4	4.8	3.1	1.48	3.8	1.78	0.8	1.7	0.8
19MB#5	4.8	3.1	1.48	3.8	1.78	0.8	1.7	0.8
19MB#6	4.8	3.1	1.48	3.8	1.78	0.8	1.7	0.8
19MB#7	4.8	3.1	1.48	3.8	1.78	0.8	1.7	0.8
19MB#8	4.8	3.1	1.48	3.8	1.78	0.8	1.7	0.8
19MB#9	4.8	3.1	1.48	3.8	1.78	0.8	1.7	0.8
19MB#10	4.8	3.1	1.48	3.8	1.78	0.8	1.7	0.8
Soil Mass	4.8	3.1	1.48	3.8	1.78	0.8	1.7	0.8
Surface Water Sample Points	4.8	3.1	1.48	3.8	1.78	0.8	1.7	0.8
1	4.8	3.1	1.48	3.8	1.78	0.8	1.7	0.8
2	4.8	3.1	1.48	3.8	1.78	0.8	1.7	0.8
3	4.8	3.1	1.48	3.8	1.78	0.8	1.7	0.8
4	4.8	3.1	1.48	3.8	1.78	0.8	1.7	0.8
5	4.8	3.1	1.48	3.8	1.78	0.8	1.7	0.8
6	4.8	3.1	1.48	3.8	1.78	0.8	1.7	0.8
7	4.8	3.1	1.48	3.8	1.78	0.8	1.7	0.8
8	4.8	3.1	1.48	3.8	1.78	0.8	1.7	0.8
9	4.8	3.1	1.48	3.8	1.78	0.8	1.7	0.8
10	4.8	3.1	1.48	3.8	1.78	0.8	1.7	0.8
11	4.8	3.1	1.48	3.8	1.78	0.8	1.7	0.8
12	4.8	3.1	1.48	3.8	1.78	0.8	1.7	0.8
13	4.8	3.1	1.48	3.8	1.78	0.8	1.7	0.8
14	4.8	3.1	1.48	3.8	1.78	0.8	1.7	0.8
15	4.8	3.1	1.48	3.8	1.78	0.8	1.7	0.8
16	4.8	3.1	1.48	3.8	1.78	0.8	1.7	0.8
17	4.8	3.1	1.48	3.8	1.78	0.8	1.7	0.8
18	4.8	3.1	1.48	3.8	1.78	0.8	1.7	0.8
19	4.8	3.1	1.48	3.8	1.78	0.8	1.7	0.8
20	4.8	3.1	1.48	3.8	1.78	0.8	1.7	0.8
21	4.8	3.1	1.48	3.8	1.78	0.8	1.7	0.8
22	4.8	3.1	1.48	3.8	1.78	0.8	1.7	0.8
23	4.8	3.1	1.48	3.8	1.78	0.8	1.7	0.8
24	4.8	3.1	1.48	3.8	1.78	0.8	1.7	0.8
25	4.8	3.1	1.48	3.8	1.78	0.8	1.7	0.8
26	4.8	3.1	1.48	3.8	1.78	0.8	1.7	0.8
27	4.8	3.1	1.48	3.8	1.78	0.8	1.7	0.8
28	4.8	3.1	1.48	3.8	1.78	0.8	1.7	0.8
29	4.8	3.1	1.48	3.8	1.78	0.8	1.7	0.8
30	4.8	3.1	1.48	3.8	1.78	0.8	1.7	0.8
31	4.8	3.1	1.48	3.8	1.78	0.8	1.7	0.8
32	4.8	3.1	1.48	3.8	1.78	0.8	1.7	0.8
33	4.8	3.1	1.48	3.8	1.78	0.8	1.7	0.8
34	4.8	3.1	1.48	3.8	1.78	0.8	1.7	0.8
35	4.8	3.1	1.48	3.8	1.78	0.8	1.7	0.8
36	4.8	3.1	1.48	3.8	1.78	0.8	1.7	0.8
37	4.8	3.1	1.48	3.8	1.78	0.8	1.7	0.8
38	4.8	3.1	1.48	3.8	1.78	0.8	1.7	0.8
39	4.8	3.1	1.48	3.8	1.78	0.8	1.7	0.8
40	4.8	3.1	1.48	3.8	1.78	0.8	1.7	0.8
41	4.8	3.1	1.48	3.8	1.78	0.8	1.7	0.8
42	4.8	3.1	1.48	3.8	1.78	0.8	1.7	0.8
43	4.8	3.1	1.48	3.8	1.78	0.8	1.7	0.8
44	4.8	3.1	1.48	3.8	1.78	0.8	1.7	0.8
45	4.8	3.1	1.48	3.8	1.78	0.8	1.7	0.8
46	4.8	3.1	1.48	3.8	1.78	0.8	1.7	0.8
47	4.8	3.1	1.48	3.8	1.78	0.8	1.7	0.8
48	4.8	3.1	1.48	3.8	1.78	0.8	1.7	0.8
49	4.8	3.1	1.48	3.8	1.78	0.8	1.7	0.8
50	4.8	3.1	1.48	3.8	1.78	0.8	1.7	0.8

Note: NT=Not Tested

MW-19A Water Level vs Discharge



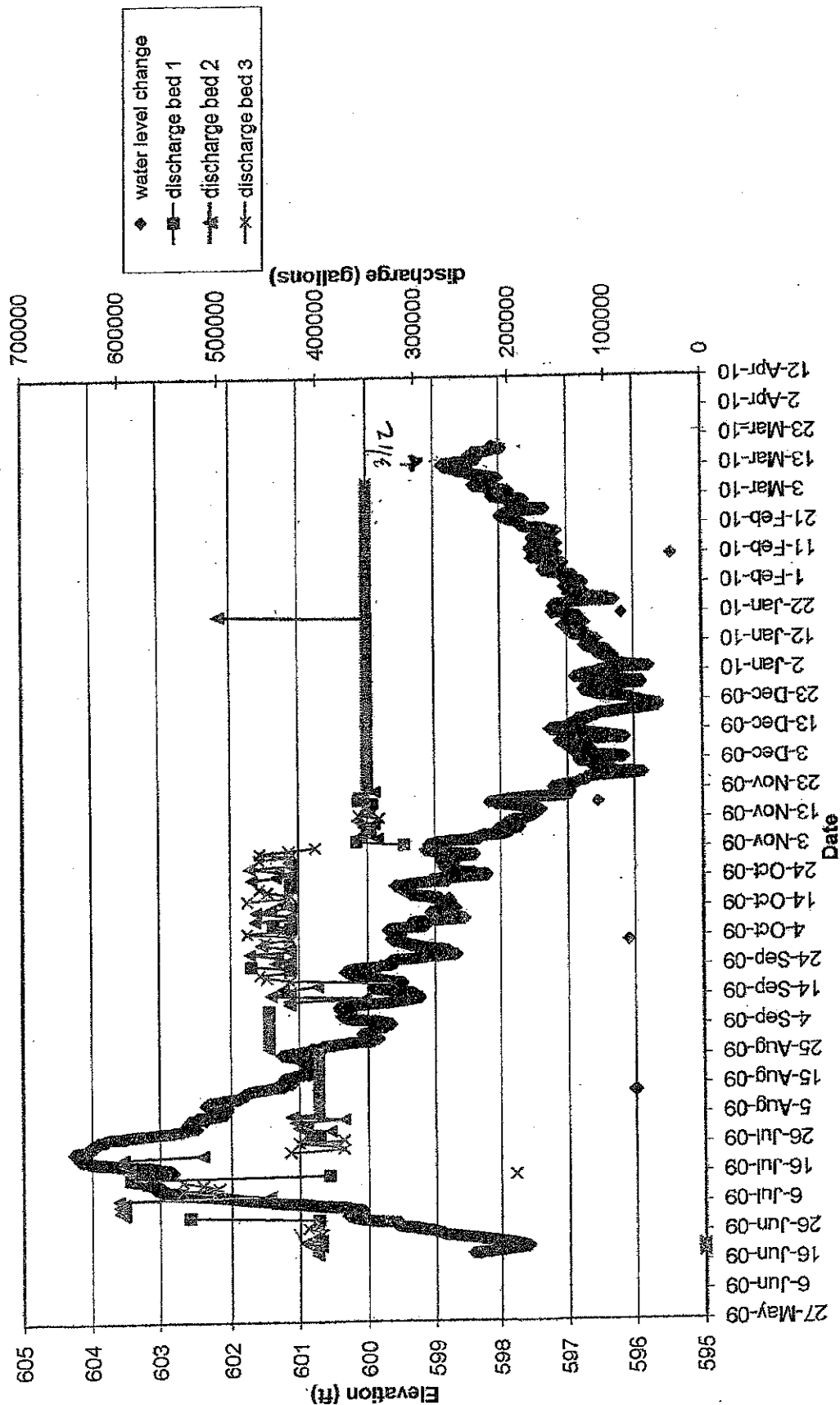
MW-16B Water level vs Discharge



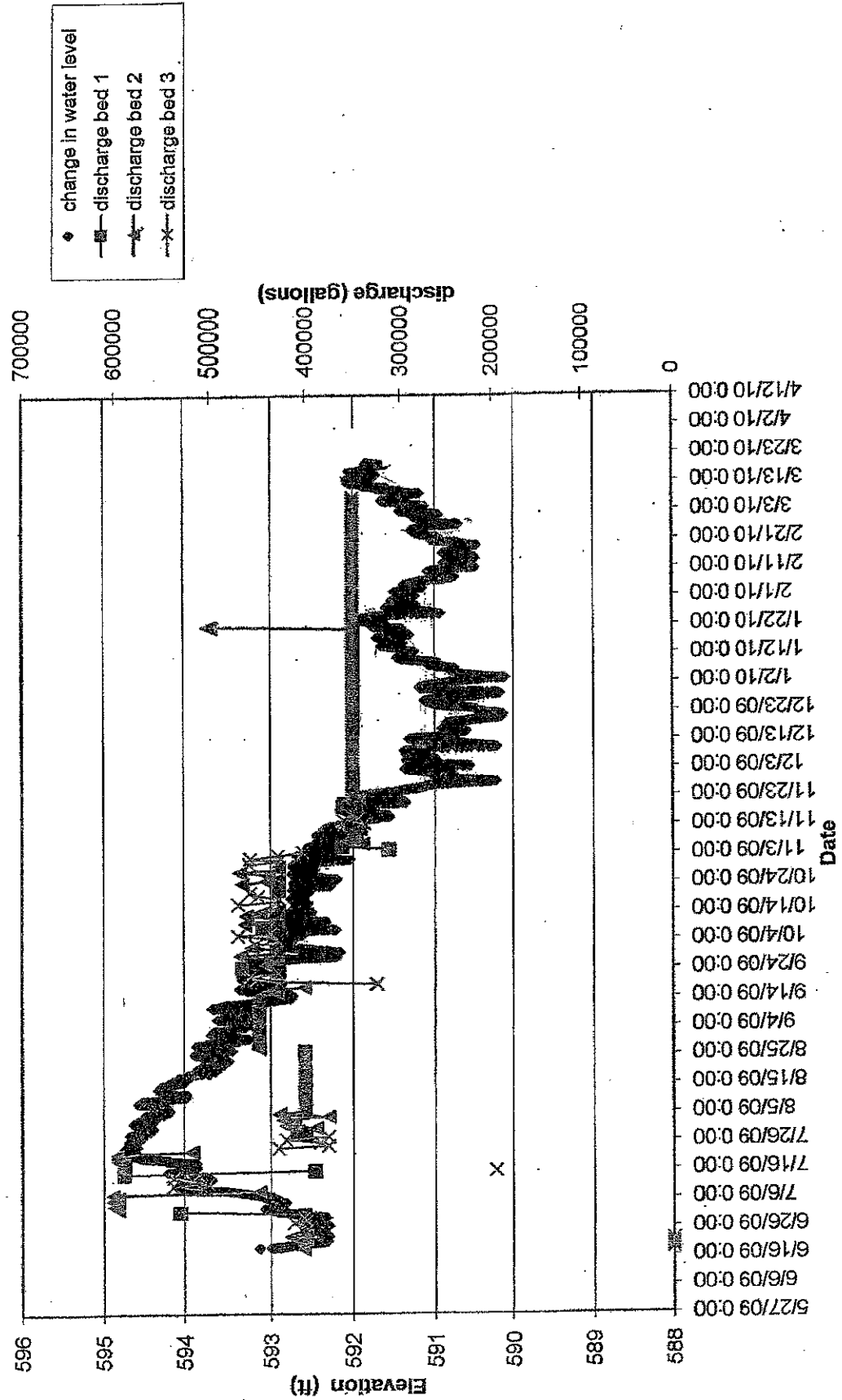


3/23/10

MW-8 Water Level vs Discharge



MW-13 Water level vs Discharge



Nineteen Mile Brook - Stream Gauging									
Date	RT 109A Bridge (SG-10)		NMB Downstream (SG-11)		NMB Upstream (SG-12)		NMB Unnamed Tributary (SG-13)		
	Staff Gauge Reading	Flow (cfs)	Staff Gauge Reading	Flow (cfs)	Staff Gauge Reading	Flow (cfs)	Staff Gauge Reading	Flow (cfs)	
6/4/2009	0.98	3.24	0.98	2.68	1.24	1.74	NMS	0.15	
6/25/2009	1.12	5.71	1.2	4.83	1.53	3.31	1.18	0.39	
7/21/2009	0.98	2.88	1.01	2.59	1.35	1.55	1.07	0.11	
9/11/2009	0.91	2.15	0.99	1.77	1.23	0.99	1	0.12	
11/18/2009	1.04	3.66	1.15	3.35	1.57	2.21	1.14	0.3	
12/18/2009	1.02	3.76	1.1	3.32					
2/26/2010	2.98	53.26	3.14	49.88	3.4	35.36	2.44	5.83	

(CFS) Flow  
 SG-10 53.26 2.15  
 SG-11 49.88 1.77  
 SG-12 24.98 .99  
 SG-13 - 5.83 .12

19 MILE BROOK  
 WATERSHED @  
 Route 109a



WEST ALTON QUADRANGLE  
 NEW HAMPSHIRE  
 MINUTE SERIES (TOPOGRAPHIC)

# Estimated Flow from RIB based on W-P Phase 3 Hydro Report March 2007

Model	Surface Water Body	Ambient Conditions	Based on 600,000GPD	% of Total	Assume 350,000	GPM	CFS	Assume 250,000	GPM	CFS
19 mile brook		89,000	166,000	24%	105,768	73	0.16	81,675	57	0.13
Unnamed Brook		3,000	181,000	26%	115,325	80	0.18	89,055	62	0.14
Western Wet			208,000	30%	132,528	92	0.21	102,340	71	0.16
Central Wet			60,000	9%	38,229	27	0.06	29,521	21	0.05
Eastern Wet		3,000	74,000	11%	47,149	33	0.07	36,409	25	0.06
		95,000	689,000		439,000	305		339,000	235	
RIB Flow										
GPD										
600,000		417								
500,000		347								
450,000		313								
350,000		243								
250,000		174								

<b>Wolfeboro RIB Site</b>									
<b>Flow Measurements in Central and Western Wetland Areas</b>									
<b>Date</b>	<b>Weir 1 Flow (GPM)</b>	<b>Weir 2 Flow (GPM)</b>	<b>Weir 3 Flow (GPM)</b>	<b>Weir 4 Flow (GPM)</b>	<b>Weir 5 Flow (GPM)</b>	<b>Weir 6 Flow (GPM)</b>	<b>Weir 7 Flow (GPM)</b>	<b>4/16/2010</b>	
3/4/2010	36	5	4						
3/5/2010	36	5	5						
3/9/2010	34	5	5	24	41				
3/11/2010	36	5	5	24	41	84	80		
3/12/2010	37	5	5	25	41	70	80		
3/15/2010	54	6	8	31	45	121	149		
3/16/2010	41	5	6	29	46	74	86		
3/17/2010	41	5	6	29	46	66	86		
3/19/2010	38	5	5	30	43	74	86		
3/22/2010	41	4	5	28	43	59	84		
3/23/2010	47	6	7	30	48	100	121		
3/24/2010	36	5	5	27	43	NT	86		
3/29/2010						100 +/- ?	121		
3/30/2010	41	4	5	27	46	NT	121		
3/31/2010	32	4	5	26	38	NT	91		
4/5/2010	26	4	4	26	41	32	78		
4/7/2010	27	4	4	26	41	32	78		
4/9/2010	26	4	4	28	46	66	91		
4/13/2010	27	4	5	28	44	62	82		
4/16/2010	34	6	6	30	51	96	115		

