FINAL AUDIT REPORT

City of Lakeland Wastewater Treatment - Glendale Laboratory OGC 16-0031

Laboratory Records Audit August 5-7, 2014

Aquatic Ecology and Quality Assurance Section
Water Quality Standards Program
Division of Environmental Assessment and Restoration
Florida Department of Environmental Protection
March 8, 2016

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Introduction

This laboratory records audit was performed at the request of the Watershed Assessment Section (WAS) of the Florida Department of Environmental Protection (department) in follow-up to specific concerns about the quality of analytical data generated from samples collected by the City of Lakeland (City) and analyzed at the City's Glendale Wastewater Treatment Plant Laboratory (letter, dated March 12, 2009, from Douglas Gleckler, Manager of Lakes and Stormwater, City of Lakeland, to Julie Espy, former Administrator, department WAS). A second letter from the City stated that corrective actions had been implemented to address those concerns (letter, dated June 30, 2009, from Douglas Gleckler to Julie Espy). This audit focused on records from the Glendale Lab and the associated field records from the City. The records were reviewed for completeness and adherence to the department's quality assurance rule, Chapter 62-160, Florida Administrative Code (F.A.C). The results of the audit have been evaluated to provide the recommendations in this report for the usability of data generated from the samples collected by the City and analyzed by the Glendale Lab for the listing of impaired waters under the Impaired Surface Waters Rule (Chapter 62-303, F.A.C.). The auditors assessed the potential usability of the data according to applicable criteria as outlined in rules 62-160.650 and 62-160.670, F.A.C. (Chapter 62-160, Quality Assurance), including specific Data Quality Objectives (DQOs) identified by the department for data used to assess impairment of surface waters (Table 1).

Description of Audit

Auditors Michael Blizzard, Nia Wellendorf, Jennifer Claypool, Meghann Niesen, and Ray Leary, from the department's Aquatic Ecology and Quality Assurance Section (AEQAS), met with Curtis Porterfield, Sandra George, and Laurie Smith of the City of Lakeland, Lakes and Stormwater Division (COLLS), on August 5, 2014. Construction occurring in the Glendale Lab prevented the auditors from performing the audit on site. Instead, copies of the original records were brought to the city offices for the auditors to review. City staff were available to answer questions and retrieve records as needed. The records audited were chosen from a data set covering the dates between March 1, 2009 and March 1, 2013 and included the following analytes: fecal coliforms, alkalinity, nitrate + nitrite (NOx), total Kjeldahl nitrogen (TKN), calcium, copper, lead, magnesium, and zinc (see appendix). This date range was chosen because corrective actions were implemented in March, 2009, per the City's second letter.

Preliminary Audit Report and Implementation of Corrective Actions

A preliminary audit report of findings and deficiencies was sent to Dan Mahon, laboratory manager of the Glendale Lab, on March 24, 2015. Mr. Mahon replied on July 22, 2015, with proposed corrective actions for the noted deficiencies, and provided additional clarifications on February 24, 2016 (Table 2). The auditors reviewed the corrective actions and determined that the corrective actions for the laboratory meet the department's minimum quality standards, with the exception of a few minor documentation errors. The inadequate corrective actions are noted in Table 2, along with the reasons why specific corrective actions are inadequate and any applicable standards or method

requirements comprising the associated audit criteria. In the response column of Table 2, the department noted which corrective actions were acceptable. Those corrective actions implemented by the Glendale laboratory according to the statements in Table 2 and deemed acceptable by the department are approved as of February 24, 2016.

A preliminary report was also sent to Curtis Porterfield, manager of the COLLS, on March 21, 2015, and this report contained the findings in Table 3. These findings were related to data entry, which is the responsibility of the COLLS staff. Mr. Porterfield responded with corrective actions on July 16, 2015. The corrective actions proposed by COLLS are acceptable, with an additional recommendation for finding 6, with the condition that errors in STORET identified by this audit will be corrected, as noted in Table 3. Those corrective actions implemented by the city are approved as of February 24, 2016.

Usability Statement

Based on the results of this audit, the samples analyzed by the Glendale Lab from March 1, 2009 to March 1, 2013 for fecal coliforms, total Kjeldahl nitrogen (TKN), calcium, copper, lead, magnesium, and zinc, do NOT meet the data quality objectives for impaired waters determinations conducted according to Chapter 62-303, F.A.C. Therefore, AEQAS recommends that data produced by the Glendale Laboratory for these analytes should NOT be used by the department when assessing the impairment status of waters (Table 1). A lack of appropriate quality control (QC) measures and/or documentation were observed for all of the above analytes. The majority of the fecal coliform samples were not run at appropriate dilutions, and duplicates and verifications were not analyzed according to the reported method and NELAC standards. The TKN standards noted in the run logs did not have the appropriate linkage to stock solutions, and the majority of the samples were digested without the appropriate QC samples. All audited metals data (calcium, copper, lead, magnesium and zinc) showed problems similar to the TKN samples regarding a lack of linkage and insufficient QC. There were also 17 documentation errors out of the 38 metals samples reviewed. All of the above deficiencies were determined by the auditors to be critical QC failures.

Based on the results of this audit, the data produced from samples analyzed by the Glendale Lab for alkalinity and nitrate + nitrite (NOx) meet the data quality objectives for impaired waters determinations conducted according to Chapter 62-303, F.A.C. AEQAS recommends that the alkalinity and NOx data produced from March 1, 2009 to March 1, 2013, may be used for planning and verified listing purposes. The auditors note that the audited alkalinity records indicated a high frequency of blank results above the detection limit, but all samples reviewed for this audit were more than 10 times the concentration found in the blank, and the small amounts detected in the blanks are insignificant and do not affect the usability of the sample data. The NOx samples had few errors, although the auditors note one clarification concerning corrective actions (finding 24, Table 2).

This audit evaluated the indicated data for the use(s) described in this report. The usability of the audited data for other purposes or the usability of data for other analytes or other date ranges must be determined separately according to applicable requirements in rule 62-160.670, F.A.C.

Table 1. Data usability recommendations for data generated by the Glendale Lab for impaired waters determinations under Chapter 62-303, F.A.C. "Do Not Use" means the data collected in this time period are of insufficient quality for the indicated use. "Planning and Verified List" means the data generated in the given time period were of acceptable quality for use in determining impairment status.

Analyte	Do Not Use	Planning and Verified List
Fecal coliforms	All data between 3/1/09 and 3/1/13	
TKN	All data between 3/1/09 and 3/1/13	
NOx		All data between 3/1/09 and 3/1/13
Ca, Cu, Pb, Mg, Zn	All data between 3/1/09 and 3/1/13	
Alkalinity		All data between 3/1/09 and 3/1/13

Table 2. Findings of Deficiency, Lab Response and Final department comments.

Finding #	Analyte	Finding	Sample(s) affected (sample ID, date, lab ID)	Required Response/Required or Suggested Corrective Action (CA)	Laboratory Response	Implementation Schedule	AEQAS response	NELAC standard/Method Requirement/Rule
1	ALL	Instances of lab blank contamination and other QC failures, including failure to have accompanying non-conformance reports or indications of corrective actions.	As noted below for individual analytes.	**Required CA**: Ensure non-conformance events are investigated, corrected and documented according to NELAC standards	A non-conformance log is now being instigated. The log will document non-conformance events, identify problems and suggest a correction.	4/2/2015	Acceptable	NELAC, section 5.4.10.6, NELAC Appendix D, sec. D.1.1.1 (d) (3)
2	ALL	Non-detects are reported as < followed by the MDL rather than the MDL followed by the qualifier U, as required by the QA Rule (Chapter 62-160, F.A.C.).	ALL	**Required CA:** Adjust lab report format. Add the correct protocol for reporting non-detect results to the Lab Quality Manual.	Lab report format has been changed to reflect the MDL followed by the qualifier code. The correct protocol is now reflected in the Quality Manual.	4/2/2015	Acceptable	Rule 62-160.700 Table 1, F.A.C.
3	ALL	Lab ID numbers are not unique. The numbering scheme seems to be using the month the sample was received for the first part of the ID followed by a sequential number that starts over at 001 each month. This means that from year to year it is possible to have more than one sample with the exact same ID. While this isn't a problem for analysis, it could be a problem when manipulating the data. For this audit, all samples were also verified by date.	ALL	**Required CA:** In compliance with NELAC standards, develop a system for assigning unique lab sample identification numbers that does not repeat IDs.	The lab has initiated a new lab numbering system. The year of the sample (e.g., 15) is placed in the beginning of the lab number. This change is reflected in the Quality Manual.	3/30/2015	Acceptable	NELAC 5.5.8.2, 5.5.8.3.1.d
4	Fecal Coliforms	Although the audit covered the dates April 2009 through January 2013, the majority of the records provided to department ended in July of 2011. The QC after this date was not evaluated because that information was not part of the available records.	Samples analyzed after July 2011.	**Suggested response:** Please let us know if these records are available.	All records after July 2011 are available for review.	4/2/2015	No further action is necessary.	Rule 62-160.340, F.A.C.

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5	Fecal Coliforms	The dates and times recorded for sample incubations are not clear. For samples there is one time listed for the entire batch. There is no indication what stage of processing the time is for. The QC samples only have a single date for each batch, with no times listed.	ALL	**Required CA**: Record the beginning and end time of each filtration batch and the time that the samples were placed in and removed from the incubator. Update the Lab Quality Manual and relevant Standard Operating Procedures (SOP) to ensure analysts are following NELAC requirements. For past samples, provide an explanation for the time and date notations in the log books.	The lab is now recording the beginning and end time of each filtration batch and the time that the samples were placed in and removed from the incubator. The quality manual has been updated to reflect this change.	3/30/2015	Acceptable	NELAC 5.4.12.2.1 – .3, and 5.4.12.2.5.3; SM 9020, 9.d; SM 9222 B 5.b. & c., D 2.d.; Table FS 1000-4, footnote 22, DEP SOPs; Rules 62-160.340(1) (a) & (b), (2) (b) 4. & 5., F.A.C.
6	Fecal Coliforms	The incubator temperatures are not recorded when samples are incubated. There is a monthly temperature verification log.	ALL	**Required CA:** Record the calibration-corrected temperature twice daily as specified in SM 9020 A.4. Update the Lab Quality Manual and relevant SOP to ensure analysts are following NELAC requirements.	The lab has always checked and recorded all incubators, ovens, and refrigerators twice daily. These records are available for review.	N/A	Additional records reviewed and acceptable.	NELAC Appendix D, sec. D.3.8 (6) (1)
7	Fecal Coliforms	Amount filtered and time of filtration are not given for QC blanks (assumes the "pre" and "post" designation of run log entries are referring to blanks).	ALL	**Required CA**: Record volume filtered and actual time filtered for every blank, or the beginning and end times of filtration for the batch. Blanks should be run at the beginning and end of every batch and every 30 minutes or 10 samples, whichever comes first. Update the Lab Quality Manual and relevant SOP to ensure analysts are following NELAC requirements.	The lab is now recording the volume filtered for every blank and the beginning and end times of filtration for each batch. Blanks are run at the beginning and the end of each batch, and filtration times of each batch will not exceed 30 minutes. 100 mL of buffer water are always used for sample size. The relevant SOP has been updated to reflect this change.	3/30/2015	Acceptable	NELAC 5.4.12.2.1 – .3, 5.4.12.2.5.3, and Appendix D, section D.3.1a)2); SM 9020, 9.d; SM 9222 B 5.b. & c.; Rules 62-160.340(1)(a) & (b), (2)(b)4., F.A.C.

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8	Fecal Coliforms	No lab duplicates are run with these samples. There is a log of cumulative duplicate results of samples with detections, mostly effluent samples incubated at 44.5 degrees (temperature recorded for some log entries only). No evaluation statistics are noted. No other records for lab duplicates or precision criterion calculations were provided. No apparent lab duplicates of lake samples were found, and it was assumed that lake samples are not routinely duplicated. It is not known whether 10% of other sample types duplicated. For this audit, the presumed wastewater duplicates were examined in lieu of any other, more relevant results.	ALL	**Required CA**: Analyze duplicates according to instructions in SM 9020 B 9e. Update the Lab Quality Manual and relevant SOP to ensure analysts are following NELAC requirements.	Lab duplicates have been run only on effluent plant samples. After September 23 2008, field personnel brought in field duplicates, but actual individual samples were not analyzed in duplicate. The lab will now analyze one duplicate every 10 samples per batch as outlined in SM 9020B9E.	3/30/2015	Acceptable	SM 9020 B 9e, NELAC Appendix D, sec. D.3.2
9	Fecal Coliforms	Verifications were found in two locations. Within the bench run log the verifications were always done with effluent samples. The majority of the verifications were done with less than 10 colonies. In a separate QC notebook a monthly verification was done using one colony from a lake sample per month.	ALL	**Required CA:** Verify positives monthly by picking 10 colonies and adjust counts of verified samples based on percent verification. Update the Lab Quality Manual and relevant SOP to ensure analysts are following NELAC requirements.	The lab will verify positives monthly and will adjust counts of the verified Colonies. The relevant SOP has been updated to reflect this change.	3/30/2015	Acceptable	NELAC appendix D, section D.3.4.b, SM 9222D 2f

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10	Fecal Coliforms	The samples were not qualified with a B for being outside the ideal colony count range.	Morton 6/2/09 6043, Gibson 6/2/10 6051, Wire 3/15/11 3264, Crago 5/2/12 5039, Beulah 1/8/13 1113, Gibson 2/6/13 2091, Bonnet 1/8/13 1114	**Required:** Select sample dilutions as described in SM 9222. Use the B-qualifier code according to instructions in Table 1 of rule 62-160.700, F.A.C., when samples are not within the ideal colony count range. Verify this procedure is documented in the method SOP and/or lab quality manual.	The volume filtered for the referenced samples were not 100 mL. Historically, these samples have either a high TSS or 100 ml will not pass through the membrane, and a volume less than 100 mL has to be used. If the recorded dilution factor is 10, then 10 mL sample volume was used. If the recorded dilution factor is 100, then 1 mL volume was used. As per the finding number seven, filtering volumes will be documented. A B qualifier code will be used when counts are not in the ideal colony count range. The lab will now use a series of 3 dilutions for samples if 100 mL is not used as the sample size. The relevant SOP has been updated to reflect this change.	2-22-2016	This is acceptable, with the condition that the analyst records in the bench log the reason for not running 100 mL each time this occurs, and that every attempt is made to run multiple dilutions for all samples of unknown concentration.	SM 9222 D, 2.a.; Rule 62-160.700 Table 1, F.A.C.

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11	Fecal Coliforms	Only one dilution was run (1/10), and the samples did not meet the ideal colony count range. Without other dilutions, it could not be determined if the sample would have been within range with another dilution.	LH 29 4/6/09 4093, Bonny 6/3/09 6065, LH29 5/4/10 5037, LH31 7/5/10 7206, John 6/7/11 6129, Bonny 9/7/11 9103, Crago 8/8/12 8136, Crago 11/5/12 11050, Morton 11/7/12 1112 Morton 6/2/09 6043, Gibson 6/2/10 6051, Wire 3/15/11 3264, Crago 5/2/12 5039, Beulah 1/8/13 1113, Gibson 2/6/13 2091, Bonnet 1/8/13 1114	**Required CA:** Select sample dilutions as described in SM 9222 for samples of unknown concentration. Update the Lab Quality Manual and relevant SOP to ensure analysts are following NELAC requirements.	The lab will now use a series of 3 dilutions for samples if 100 mL is not used as the sample size. The relevant SOP has been updated to reflect this change	2-22-2016	This is acceptable, with the condition that the analyst records in the bench log the reason for not running 100 mL each time this occurs, and that every attempt is made to run multiple dilutions for all samples of unknown concentration.	SM 9222 D, 2.a.; Rule 62-160.700 Table 1, F.A.C.
12	Fecal Coliforms	The date for the media QC check is illegible due to photocopying. Unable to determine if media was checked prior to running samples.	LH29 4/6/09 4093	**Suggested CA**: Provide a legible copy of this page in the log book.	Record for this sample is not readily available because it is past the 5 years of record keeping. Record is archived.	N/A	**This response is not adequate. Further corrective actions are needed.** This sample was checked in for Fecal Coliform but appears to not have been analyzed. The field sheet and COC were not available. There is a result in STORET for this sample ID, which appears to be a data entry error originating from the City of Lakeland. Ensure that tests checked off in sample receiving match the tests requested by the client and the tests run in the lab	NELAC, section 5.5.8.3.1d)2)

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13	Fecal Coliforms	The box for temperature verification on the lab receiving log was blank. Unknown if sample was received on ice.	Bonny 6/3/09 6065, Bonny 9/7/11 9103	**Required CA**: Ensure that the temperature (or receipt on ice) is recorded for every sample.	Sample #9013 bonnie has the box for receipt on ice checked. Sample # 6065 bonnie results are archived, and unavailable for review.	3/30/2015	No further action is necessary.	NELAC, section 5.4.12.1.5 (a)
14	TKN	According to the lab the designation S-0 is used for the method blank. These blanks are not processed with every preparation batch.	ALL	**Required response and CA:** Explain how method blanks are prepared and analyzed. Update the Lab Quality Manual and relevant SOP to ensure analysts are following NELAC requirements.	Method Blanks had been typically prepared monthly or twice monthly, depending on the monthly samples load. They are prepared by placing 25 ML deionized water into a digestion tube that has digestion reagent and boiling chips added. Blanks are handled and analyzed exactly as a sample. On a sample run, the blank is labeled as S-0. In the initial calibration curve, it is included in the regression equation. Between each batch, it is a CCB, but not used to recalculate a standard curve. The digestion log sheet has been modified. Method blanks are now being run every 20 samples in a batch. For example, if a batch has 40 samples to digest, 2 method blanks are digested in that batch. Method blanks will be noted on the analysis run as to the date they were digested and can be cross referenced with the digestion log.	2-22-2016	**Acceptable**	NELAC Appendix D, sec. D.1.1.1

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15	TKN	There is no clear linkage between QC samples (Matrix Spike/Matrix Spike duplicate, Laboratory Control Spike, Method Blank) on the run logs and the samples listed on the digestion logs.	ALL	**Required response and CA:** Explain how and when QC samples are prepared and analyzed, including batching requirements. Develop a system to uniquely identify discrete QC samples.	QA duplicate and spikes are digested and analyzed so that a duplicate and spike will appear in each analytical batch (no more than 10 samples). The sample aliquot is placed in a digestion tube which has digestion reagent and boiling chips added. The spike and its duplicate are prepared as follows: 100 mL of a sample is placed in a cup. 2mls of a 100ppm TKN standard concentration is also placed in the sample cup. 25 mls of the spiked sample is placed in the digestion tube for digestion. This is repeated a 2nd time and used as the duplicate. The digestion log sheet has been modified. Matrix spikes can now be verified on the digestion logs and run sheets. Blanks and LCS samples can now be linked between the digestion record and the analytical run.	2-23-2016	Acceptable, with the condition that NELAC and method batching requirements are met.	Rule 62-160.340(1) (a) and Rule 62-160.340(2) (a), (b), (d), (f). F.A.C.; NELAC 5.4.12, Appendix D sec. D.1.1.1, and sec. D.1.1.2.1
16	TKN	The linkage between the sample identified by the lab as the secondary standard and the source of the standard is not clear. The auditors could not confirm expiration dates.	ALL	**Required response and CA:** Provide the expiration dates for the relevant standards. Ensure the secondary standards are listed in a standards receipt or preparation log.	Standards expiration dates are now found in the standards dilution log and on the standard reagent bottle. The standards dilution log will now contain information on the date that secondary sample is prepared. Starting and final concentrations are also found in this log. The standards are now linked to digestion logs and run logs. Each standard has a unique ID that is used in all records to maintain linkage.	4/3/2015	Acceptable	NELAC 5.4.12.2.5.3(i)

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17	TKN	There was no positive verification of acid preservation (pH<2) on the lab sample check in log.	LH31 7/709 7085, Wire 1/8/13 1117	**Required CA:** Ensure that samples are checked for pH upon receipt and the verification is recorded.	Sample LH31 from 7/7/09 has been archived, and unavailable for review. The sample batch for Wire on 1/8/13 was accidently not checked off as having a pH<2. Technicians have been advised to make sure that all relevant boxes and forms are checked.	4/3/2015	Acceptable	NELAC 5.4.12.2.5.1
18	TKN	The method blanks on this run were all above the MDL. The sample was improperly qualified with a J. The proper qualifier is V. A non-conformance report was not included with the lab report.	LH31 7/7/09 7085	**Required CA:** Ensure the "V" data qualifier code is used for method blank contamination according to instructions in Table 1 of Chapter 62-160, F.A.C. Issue a correction for this sample. Develop a system for using and filing non-conformance reports.	Sample LH31 from 7/7/09 has been archived, and unavailable for review.	4/3/2015	Nonconformance response noted above (see Finding #1). Ensure that the appropriate qualifier is used in the future.	Rule 62-160.700 Table 1, F.A.C.
19	TKN	All of the method blanks (s=0) in this run are above the MDL. There are no qualifiers noted on the run log or the lab report. There is no non-conformance report.	LH31 8/2/11 8028	**Required CA:** Ensure the appropriate qualifiers are used in the future. Issue a correction for this sample.	The correct qualifier code for this sample should be "V". See response #1.	4/3/2015	We agree that “V” is the appropriate qualifier, but it was not reported with the result. Please ensure that the “V” qualifier is added to this result.	Rule 62-160.700 Table 1, F.A.C.
20	TKN	RPD for MS/MSD was calculated incorrectly. The RPD calculated by the auditor was different than that noted on the run log.	Mirror 9/2/09 9037 LH8 3/1/10 3008	**Suggested CA:** Ensure that calculations are checked by a reviewer on a regular basis.	Sample Mirror from 9/2/09 has been archived, and unavailable for review. The calculation for this bench sheet value (3-1-10) was rechecked and found to be correct as stated.	3/30/2015	The MS/MSD pair reviewed for 9037 was sample ID 9064. The results were 1.34 and 1.21, with a calculated RPD of 10.5%. The reported RPD was 7. The pair reviewed for 3008 was sample ID 3014. The results were 1.81 and 2.15, with a calculated RPD of 17.3. RPD reported was 13. Even accounting for different significant figures, the auditors could not find a reason for the difference. In the future use diligence in performing calculations.	NELAC, appendix D, section 1.1.3.1 (d), SM 4020 B, 3.c

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21	NOx	The method name is not consistent in the records. On the lab sample log in sheet and the analytical runs it is NO3, on the lab reports it is Nitrate + Nitrite (NOX)	ALL	**Required CA:** Explain what was analyzed for this record set and ensure that all records are consistent.	The record set was analyzed for NOx and the lab log-in sheets have been modified.	3/30/2015	Acceptable	NELAC, section 5.4.12.1.4
22	NOx	The linkage between the sample identified by the lab as the secondary standard and the source of the standard is not clear. The auditors could not confirm expiration dates.	ALL	**Required response and CA:** Provide the expiration dates for the relevant standards. Ensure the secondary standards are listed in a standards receipt or preparation log.	All standards and standard dilutions are logged into a standards receipt log and a standards dilution log. Standards used for QC and calibration can now linked back to a lot number and expiration date and is located on the run cover sheet. Each standard has a unique ID that is used in all records to maintain linkage.	3/30/2015	Acceptable	NELAC 5.4.12.2.5.3(i)
23	NOx	It is not clear if a Laboratory Control Spike or Lab Fortified Blank was run with each sample batch. There is not a sample labeled as such.	ALL	**Required response:** Explain what QC is analyzed for this method. Update the SOP to include the required QC according to the method and/or NELAC standards, if applicable.	On the data runs, the lab fortified blank is labeled as s-3 or s-4. It is a mid-range standard to verify the regression curve. Also could be called a CCV.	4/3/2015	Acceptable	NELAC, appendix D, section 1.1.2.1
24	NOx	The stated % recovery on spikes for all runs do not match what the auditors calculated using the raw results. The auditors were unable to determine how recoveries were calculated by the lab. This includes the recoveries for the column efficiency check.	ALL	**Required response:** Explain how the recoveries were calculated.	Recoveries are calculated as such: %recovery = (Ave. of spiked values - true sample value)/spike concentration x 100. Also, you must calculate for the change in volume. For example if 2 mL of standard is used in a sample volume of 100, final volume is 102 mL. This adds 2% to the calculated recovery.	4/3/2015	The method provides the relevant spike recovery calculation. The correct calculation for column efficiency checks should also be investigated.	EPA 353.2, section 9.4.2

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25	NOx	The calibration standard was expired when these samples were run.	LH29 3/2/09 3020, Bonny 3/3/09 3049, LH29 4/6/09 4093	**Required CA:** Ensure that expired standards are disposed of properly and not used for analysis after the expiration date.	These samples have been archived, and unavailable for review. Expired standards are not used past the expiration date. This event was probably a technician error. Expired standards are disposed of properly per SOP.	4/3/2015	Acceptable	NELAC, section 5.5.6.4 (a)
26	NOx	The sample log in sheet, field sheet, and chain-of-custody were not provided for this sample. Preservation could not be verified.	Horney 6/7/11 6128	**Suggested CA:** Provide these records if possible.	Records have been provided	4/3/2015	Acceptable	NELAC, section 5.5.8.3.1
27	NOx	The lab sample check in log was changed in May 2012 to indicate that NO_3 samples were preserved with H_2SO_4. Prior to that date, the samples were received unacidified and run within 48 hours. An email from May 31, 2011 between the lab and department indicated the lab could not run acidified samples because of interference. These samples should have been pH adjusted prior to analysis. A log for the pH adjustments was not provided.	All samples from 2012-2013	**Required response:** Explain the change in sample check in logs that occurred in 2012. If samples were pH adjusted provide the relevant logs.	Samples that were analyzed prior to 2012 were unpreserved, were not adjusted for any pH, but were run directly out of the field container. The carrier used for the automated analysis was water. After discussions with the field technicians for the City Lakes Division, they preferred that we analyze the preserved samples, instead. We complied, and changed our carrier to mimic the preserved sample. The individual samples were run a few hours after the start time documented on the lab report.	2012	The method SOP was reviewed by the department and found to be correctly implemented.	EPA Method 353.2 sec. 11.1
28	Alkalinity	The sample run time was prior to the sample receipt time.	Meadowview 6/9/09 6159, HW31 8/4/09 8040	**Suggested CA**: Ensure that lab reports are checked by a reviewer on a regular basis.	For these samples, the analysis was run automatically on an auto-sampler. The run for the day started in the morning (noted as the start time), and the samples were added at the end of the run. So those samples were run a few hours after the start time documented on the lab report.	7-17-2015	Acceptable.	NA

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29	Alkalinity	Both method blanks and field blanks had concentrations greater than the MDL. A non-conformance report was not found.	John 3/10/09 3149, Meadowview 6/9/11 6159, Crago 3/8/11 3137, Beulah 3/15/11 3261, HW29 10/4/11 10037, Wire 1/4/12 1047, Mirror 5/1/12 5019, Bonnet 7/10/12 7150	**Required response:** Issue a correction report for these samples with the appropriate qualifiers, if applicable. Provide any relevant non-conformance reports.	John, 3/10/09 record > 5 years, archived and not available. Meadowview, 6/9/11 - method blanks at beginning and end of run < MDL. Crago, 3/8/11 - sample result > 10 field and method blanks. Qualification not necessary. Beulah, 3/15/11 - sample result > 10 times method blank. Qualification not necessary. HW29 10/4/11 - sample result > 10 times field and method blanks. Qualification not necessary. Wire 1/4/12 - sample result > 10 times method blank. Qualification not necessary. Mirror 5/1/12 - sample result > 10 times method blank. Qualification not necessary. Bonnet 7/10/12 - sample result > 10 times method blank. Qualification not necessary. A non-conformance log is now in place. The log will document non-conformance events, identify problems and suggest a correction.	4-2-2015	Acceptable.	NELAC, section 5.4.10.6 and Appendix D sec. D.1.1.1 (d) (3),
30	Alkalinity	Positive verification of receipt temperature could not be verified (record not found).	HW31 11/3/13 11067	**Suggested response:** Provide the relevant record if possible.	The sample in question is actually HW31 on 11/3/10. The receiving technician did not check off on the lab log-in form that the samples were on ice. The COC for this sample (supplied to you now) documents that the sample was preserved on ice.	7-17-2015	Acceptable	NELAC, section 5.4.12.2.5.1

Finding #	Analyte	Finding	Sample(s) affected (sample ID, date, lab ID)	Required Response/Required or Suggested Corrective Action (CA)	Laboratory Response	Implementation Schedule	AEQAS response	NELAC standard/Method Requirement/Rule
31	Calcium, Copper, Lead, Magnesium, Zinc	The digestion of QC samples could not be verified based on the records provided. There is no clear linkage between QC samples on analytical run logs and the associated digestion logs. According to Dan Mahon (laboratory manager), the sample labeled PBK is the method blank. This sample ID was not always found with every analytical batch both on digestion logs and analytical runs. An LCS was not digested with every prep batch. It is not clear if MS/MSD samples were digested.	ALL	**Required response and CA:** Explain how QC samples are prepared and analyzed, including batching requirements. Develop a system for assigning a unique identifier to discreet QC samples.	When the samples in question were digested, we did not run a LCS and LCB with each analytical batch, but just one per month. We now digest and run a LCS and LCB with each batch of 20 or less, and they are uniquely identified by the date they were digested both on the digestion log and on the analytical run report.	2-23-2016	Acceptable	NELAC, Appendix D, section D.1.1.
32	Calcium	The lowest calibration standard is 1.00 mg/L; the lab's stated PQL for Ca is 0.25 mg/L	ALL	**Required CA:** Use a standard that is ≤ the PQL for the lowest calibration standard.	The lab will use a standard that is ≤ the PQL for the lowest calibration stand in future analysis.	6-30-2015	Acceptable	NELAC 5.5.5.2.2.1f)
33	Zinc	Digestion log was requested but not provided; could not verify digestion	Morton 9/14/2010 9237	**Required response:** Please provide the relevant document.	The digestion log sheet for Morton 9/14/10 is included	6-30-2015	Acceptable	NA
34	Zinc	No calibration blank or method blank found on run. The only quality control samples identified were an ICV and a field blank.	Morton 3/9/2009 3150	**Required response:** Issue a correction with the appropriate qualifiers for improper QC.	The analytical run for this sample has been archived, and is no longer available. We now digest and run a LCS and LCB with each batch of 20 or less, and they are uniquely identified by the date they were digested both on the digestion log and on the analytical run report	2-23-2016	Acceptable	Appendix D, section D.1.1.1
35	Zinc	The digestion log for this sample was dated incorrectly. The sample ID and sample date was used to confirm digestion.	Bentley 8/7/12 8105	**Required response:** Correct the date, and initial and date the correction.	The date has been corrected, and the correction has been initialed and dated.	6-30-2015	Acceptable	NA

Finding #	Analyte	Finding	Sample(s) affected (sample ID, date, lab ID)	Required Response/Required or Suggested Corrective Action (CA)	Laboratory Response	Implementation Schedule	AEQAS response	NELAC standard/Method Requirement/Rule
36	Magnesium	The lowest calibration standard is 0.1 mg/L; the lab's stated PQL for Mg is 0.07 mg/L.	ALL	**Required CA:** Use a standard that is ≤ the PQL for the lowest calibration standard.	The lab will use a standard that is < the PQL for the lowest calibration standard in future analysis.	6-30-2015	Acceptable	NELAC 5.5.5.2.2.1f)
37	Magnesium	No method blank (PBK) on this run, only CCB and field blank.	LH 29 9/1/09 9012	**Required response:** Issue a correction with the appropriate qualifiers for improper QC.	The analytical run for this sample has been archived, and is no longer available. We now digest and run a LCS and LCB with each batch of 20 or less, and they are uniquely identified by the date they were digested both on the digestion log and on the analytical run report	2-23-2016	Acceptable	NELAC Appendix D, sec. D1.1.1
38	Magnesium	No CCB or PBK are associated with this run.	Wire 6/8/09 6139	**Required response:** Issue a correction with the appropriate qualifiers for improper QC.	The analytical run for this sample has been archived, and is no longer available. We now digest and run a LCS and LCB with each batch of 20 or less, and they are uniquely identified by the date they were digested both on the digestion log and on the analytical run report	2-23-2016	Acceptable	NELAC Appendix D, sec. D1.1.1
39	Lead	ICV was greater than +/- 5% different from the expected value (7.4 vs. 8.5), but lab documented it was within limits.	LH31 2/1/2011 2015, Meadowview 6/8/2011 6158	**Required CA:** Follow the requirements of SM3020 for acceptance criteria of ICV samples.	An ICV acceptance criteria of between 95% and 105% of the expected value is now being used. We have adjusted our acceptance limits in our in-house SOPs.	2-9-2016	Acceptable	SM3020B

Finding #	Analyte	Finding	Sample(s) affected (sample ID, date, lab ID)	Required Response/Required or Suggested Corrective Action (CA)	Laboratory Response	Implementation Schedule	AEQAS response	NELAC standard/Method Requirement/Rule
40	Copper	Sample pH check not indicated on lab log in sheet but checked on field sheet.	LH8 9/7/2010 9089, Hunter 9/8/2010 9126	**Required CA:** Ensure that the temperature (or receipt on ice) is recorded for every sample.	The receiving technician did not check off on the Lab Log-in form that the samples were on ice, or preserved with the appropriate acid. All technicians have been instructed to completely fill out the sample log in form.	6-30-2015	Acceptable	NELAC, section 5.4.12.2.5.1
41	Copper	ICV was greater than +/- 5% different from the expected value but lab documented it was within limits.	Gibson 3/12/09 3219	**Required CA:** Follow the requirements of SM3020 for acceptance criteria of ICV samples.	An ICV acceptance criteria of between 95% and 105% of the expected value is now being used. We have adjusted our acceptance limits in our in-house SOPs.	2-9-2016	Acceptable	SM3020B

Table 3. Findings of deficiency, COLLS response, and final department comments.

Finding #	Analyte	Finding	Sample(s) affected (sample ID, date, lab ID)	Required Response/Required or suggested corrective action (CA)	Sampling Unit Response	Implementation Schedule	AEQAS response	NELAC standard/Method Requirement/Rule
1	ALL	The sampling entity was inconsistent in its use of sample field IDs for the Lake Hollingsworth samples. On field sheets and at sample check in the ID started with HW. In STORET the IDs start with LH.	ALL	**Required response and CA:** Explain the discrepancy between sample field IDs and STORET records. Develop guidance to make the assignment of sample field IDs consistent. Use the same ID for an individual sample on all records associated with that sample.	*Previous reply received from City* Due to prior years of staff changes, it is difficult to determine where the inconsistency originated. However, these stations are no longer used or sampled. Should any be used in the future, efforts will be made to assure that STORET identifiers and City of Lakeland field records are consistent.	N/A	Acceptable	NA
2	Fecal Coliform	The results and sample IDs for these samples do not match between the field records, lab records, and STORET. It appears the results reported in STORET are from other samples taken at the same time and given separate lab IDs. No results for these lab IDs were found.	LH 29 4/6/09 4093, LH11 1/12/10 1165, LH29 5/4/10 5037	**Required CA:** Ensure that each separate sample container has a unique ID and that the unique ID is used when reporting data. Do not report results under a different lab ID than what was on the lab report without an explanation and non-conformance report.	Due to prior years of staff changes, it is difficult to determine where the inconsistency originated. Several staff changes have taken place and current staff members adhere to Lakes and Stormwater SOP which provides for correct identification of samples and entry of lab results. In addition, after lab data is initially entered, a quality control check will be performed and signed off by a second staff member. This will help to identify and correct any data entry errors.	6/10/2015	Acceptable, with the understanding that any outstanding errors noted in this audit will be corrected with the assistance of the department's STORET coordinator.	NA
3	Fecal Coliform	The field sampler added R qualifier to copy of lab report for all analytes, per rain event on 3/1/11. This qualifier did not appear in STORET records.	LH31 3/2/11 3052	**Required CA:** Ensure that qualifiers are always associated with the affected sample.	A new system is in place to prevent data entry errors. After lab data is entered, a quality control check of the entered data will be performed and signed off by a second staff member. This will help to identify and correct any data entry errors.	6/11/2015	Acceptable, with the understanding that any outstanding errors noted in this audit will be corrected with the assistance of the DEP STORET coordinator.	Rule 62-160.240(4), F.A.C.

Finding #	Analyte	Finding	Sample(s) affected (sample ID, date, lab ID)	Required Response/Required or suggested corrective action (CA)	Sampling Unit Response	Implementation Schedule	AEQAS response	NELAC standard/Method Requirement/Rule
4	Fecal Coliform	The chain of custody has a sample ID of HW, without the number. This is not a unique ID for the project. The lab report did not specify the site number.	LH20 2/6/13 2093	**Required CA:** Ensure that the chain of custody is accurately and completely filled out (sampler). Note errors and discrepancies when samples are checked in (lab).	Chain of Custody (COC) will be reviewed for accuracy by the Environmental Specialist in the field and reviewed a second time by the Environmental Technician when the samples are checked in at the lab. This double check will help prevent errors on the COC.	6/12/2015	Acceptable, with the understanding that any outstanding errors noted in this audit will be corrected with the assistance of the DEP STORET coordinator. The correct site ID for this sample result should be verified in STORET.	DEP SOP, FD 1000 (Part FD 5000, section 3.)
5	Fecal Coliform	Fecal coliform was not indicated on the chain of custody, the lab check in log was checked off for Fecal coliform and the samples were analyzed.	Morton 6/2/09 6043, Bonny 6/3/09 6065, Bonnet 1/8/13 1114, Beulah 1/8/13 1113	**Required CA:** Ensure that the chain of custody is accurately filled out (sampler). Note errors and discrepancies when samples are checked in (lab).	The COC is correct. No fecal analysis was requested and this was a lab error. No response from Lakes & Stormwater required.	6/13/2015	Please verify whether the fecal data found in STORET for these sampling events are correct, and if in error, make appropriate corrections to the affected records with the assistance of the department's STORET coordinator.	NA

Finding #	Analyte	Finding	Sample(s) affected (sample ID, date, lab ID)	Required Response/Required or suggested corrective action (CA)	Sampling Unit Response	Implementation Schedule	AEQAS response	NELAC standard/Method Requirement/Rule
6	TKN	The field blank result was greater than the MDL. The blank value was greater than 10% of the sample value.	LH29 5/4/10 5037, LH8 3/1/10 3008, LH20 2/1/11 2012	**Required response:** Explain the procedure for batching and qualifying associated samples in the event of a field QC failure.	All Lakes and Stormwater samples are analyzed by the Polk County Natural Resources Lab. Considering that this lab is NELAP certified, we rely on their procedure for batching and qualifying. After entering sample results received from the lab, including all qualifiers, a quality control check of the entered data will be performed and signed off by a second staff member. This will help to identify and correct any data entry errors.		Typically it is up to the sampling entity to determine which samples to qualify when a field blank is contaminated. We recommend developing a system for determining what samples should be qualified in the event of a field blank QC failure. In addition, any outstanding errors noted in this audit should be corrected with the assistance of the department's STORET coordinator. A "J" data qualifier code should be added to the affected sample results in the STORET records.	Rule 62-160.700, Table 1, F.A.C. (2008)
7	TKN	The raw result on the run and the result on the lab report are 1.264. The result in STORET is non-detect.	John 6/8/10 6152	**Required response:** Explain the system in place to prevent data entry errors.	A new system is in place to prevent data entry errors. After lab data is entered, a quality control check of the entered data will be performed and signed off by a second staff member. This will help to identify and correct any data entry errors.	6/10/2015	Acceptable, with the understanding that any outstanding errors noted in this audit will be corrected with the assistance of the department's STORET coordinator.	Rule 62-160.670 F.A.C.
8	NO_x	The stated MDLs on the lab reports do not match the MDLs in STORET. The lab uses 0.01 mg/L, STORET has just 0.	ALL	**Required CA:** When entering data, ensure that all reporting limits are entered accurately as reported by the lab.	In the Lakes and Stormwater database, the reporting limit for NOx is 0.01mg/L. Upon accessing the STORET files from the Lakes and Stormwater office. The reporting limit of 0.01 mg/L is also reflected. Please review and provide additional detailed comment.	NA	Disregard. This finding was the result of data transcription error prior to the audit.	NA

Finding #	Analyte	Finding	Sample(s) affected (sample ID, date, lab ID)	Required Response/Required or suggested corrective action (CA)	Sampling Unit Response	Implementation Schedule	AEQAS response	NELAC standard/Method Requirement/Rule
9	Calcium	Lab reporting limit for this analyte was 0.05 mg/L for all others but reported as 1.05 mg/L for this sample.	Crago 8/8/12 8136	**Required CA:** Correct apparent data entry error.	In the Lakes and Stormwater database, the reporting limit for Calcium is 0.05 mg/L. Upon accessing the STORET files from the Lakes and Stormwater office, the reporting limit of 0.05 mg/L is also reflected. Please review and provide additional detailed comment.	NA	Disregard. This finding was the result of data transcription error prior to the audit.	NA
10	Zinc	The reporting limit on the lab reports does not match the limit entered into department's STORET.	Hunter 1/8/13 1115, Morton 3/9/09 3150, LH11 5/5/09 5050, Bentley 8/7/12 8105, Crago 11/5/12 11050	**Required CA:** Correct apparent data entry error.	Data entry errors have been corrected. A new system is in place to prevent data entry errors. After lab data is entered, a quality control check of the entered data will be performed and signed off by a second staff member. This will help to identify and correct any data entry errors.	6/10/15	Acceptable	Rule 62-160.670 F.A.C.
11	Magnesium	Reporting limit is 0.013 mg/L in STORET, but 0.03 mg/L on Lab Report.	Meadowvie w 3/10/10 3167	**Required CA:** Correct apparent data entry error.	Data entry error has been corrected. A new system is in place to prevent data entry errors. After lab data Is entered. A quality control check of the entered data will be performed and signed off by a second staff member. This will help to identify and correct any data entry errors.	6/10/2015	Acceptable	Rule 62-160.670 F.A.C.
12	Magnesium	The result for Mg on the lab report is 3.2 mg/L, which corresponds with the analytical run. The result in STORET is 14.9 mg/L.	LH 29 9/1/09 9012	**Required CA:** Correct apparent data entry error.	Data entry error has been corrected. A new system is in place to prevent data entry errors. Alter lab data is entered, a quality control check of the entered data will be performed and signed off by a second staff member. This will help to identify and correct any data entry errors.	6/10/2015	Acceptable	Rule 62-160.670 F.A.C.

Finding #	Analyte	Finding	Sample(s) affected (sample ID, date, lab ID)	Required Response/Required or suggested corrective action (CA)	Sampling Unit Response	Implementation Schedule	AEQAS response	NELAC standard/Method Requirement/Rule
13	Lead	Reporting limit was 0 in STORET but 0.4 µg/L on lab report.	All	**Required CA:** Correct apparent data entry error.	In the Lakes and Stormwater database, the reporting limit for Lead is 0.4 µg/L. Upon accessing the STORET files from the Lakes and Stormwater office. The reporting limit of 0.4 µg/L is also reflected. Please review and provide additional detailed comment.	NA	Disregard. This finding was the result of data transcription error prior to the audit.	NA
14	Lead	Analysis date is different between lab records and STORET.	Meadowview 6/8/11 6158	**Required CA:** Correct apparent data entry error.	On the water quality data sheet received from the lab, the analysis date is 6/16/2011. Upon accessing the STORET files. The analysis date of 6/16/2011 is also reflected. Please review and or provide additional detailed comment.	NA	Disregard. This finding was the result of data transcription error during the audit.	NA
15	Copper	Sample pH check indicated on lab log but obliterated on field sheet.	Beulah 1/8/13 1113	**Required CA:** Ensure that mistakes are not obliterated and the proper preservation is clearly marked.	The original field sheet had a hole from being wet, however, was still very readable, and the pH check indication was not obliterated. Because of the hole, a copy of the field sheet may not have provided a clear indication of the pH check. As part of a new procedure. The field sheet will be reviewed by the Environmental Specialist in the field and reviewed a second time by the Environmental Technician when the samples are checked in at the lab. This double check will help prevent problems with the field sheet in the future.	6/10/2015	Acceptable	Rule 62-160.240(1) & (3)(c), F.A.C.; DEP SOP FD 1000 (Parts FD 1100 & FD 5100)

Finding #	Analyte	Finding	Sample(s) affected (sample ID, date, lab ID)	Required Response/Required or suggested corrective action (CA)	Sampling Unit Response	Implementation Schedule	AEQAS response	NELAC standard/Method Requirement/Rule
16	Copper	Qualifier code "U" included on lab report but not in STORET.	Parker 5/2/12 5042	**Required CA:** Correct apparent data entry error.	Data entry error has been corrected. A new system is in place to prevent data entry errors. After lab data is entered, a quality control check of the entered data will be performed and signed off by a second staff member. This will help to identify and correct any data entry errors.	6/10/2015	Acceptable	Rule 62-160.670 F.A.C.

Appendix. Audited Samples.

Lab ID	Field ID	Collection Date	Parameter
3020	Lh29	3/2/09	NOx
3049	Bonny(center)	3/3/09	NOx
3150	Morton(center)	3/9/09	zinc
3149	John(center)	3/9/09	alkalinity
3168	Crago(center)	3/10/09	TKN
3167	Meadowview(center)	3/10/09	magnesium
3219	Gibson(center)	3/12/09	copper
4093	Lh29	4/6/09	fecal coliform
4093	Lh29	4/6/09	NOx
4090	Lh11	4/6/09	calcium
5050	Lh11	5/5/09	zinc
6043	Morton(center)	6/2/09	fecal coliform
6065	Bonny(center)	6/3/09	fecal coliform
6139	Wire(center)	6/8/09	magnesium
6159	Meadowview	6/9/09	alkalinity
7085	Lh 31	7/7/09	TKN
8040	Lh 31	8/4/09	alkalinity
9013	Lh31	9/1/09	calcium
9012	Lh29	9/1/09	magnesium
9037	Mirror(center)	9/2/09	TKN
10117	Lh20	10/8/09	copper
11062	Lh31	11/4/09	copper
12076	Bonnet(center)	12/3/09	fecal coliform
12077	Bonny(center)	12/3/09	copper
1165	Lh11	1/12/10	fecal coliform
3008	Lh 8	3/1/10	TKN
3145	Bonny(center)	3/9/10	TKN
3147	Mirror(center)	3/9/10	calcium
5037	Lh29	5/4/10	fecal coliform
5037	Lh 29	5/4/10	TKN
5038	Lh 31	5/4/10	alkalinity
6051	Gibson(center)	6/2/10	fecal coliform
6053	Hunter(center)	6/2/10	magnesium
6075	Wire(center)	6/3/10	zinc
6152	John(center)	6/8/10	TKN
6153	Meadowview(center)	6/8/10	copper
6154	Somerset	6/8/10	alkalinity
7206	Lh31	7/15/10	fecal coliform
8037	Lh29	8/3/10	copper
9089	Lh8	9/7/10	NOx

Lab ID	Field ID	Collection Date	Parameter
9089	Lh8	9/7/10	copper
9126	Hunter(center)	9/8/10	copper
9237	Morton(center)	9/14/10	zinc
11067	Lh31	11/3/10	lead
11067	Lh 31	11/3/10	alkalinity
12040	Morton(center)	12/2/10	NOx
12041	Somerset	12/2/10	NOx
12119	Beulah(center)	12/7/10	NOx
12120	Holloway(center)	12/7/10	calcium
1047	Lh31	1/4/11	zinc
2012	Lh20	2/1/11	TKN
2015	Lh31	2/1/11	lead
3052	Lh31	3/2/11	fecal coliform
3044	Lh31	3/2/11	NOx
3044	Lh31	3/2/11	copper
3043	Lh29	3/2/11	zinc
3138	Gibson(center)	3/8/11	copper
3137	Crago(center)	3/8/11	alkalinity
3264	Wire(center)	3/15/11	fecal coliform
3261	Beulah(center)	3/15/11	alkalinity
5155	Lh31	5/10/11	NOx
6129	John(center)	6/7/11	fecal coliform
6128	Horney(center)	6/7/11	NOx
6158	Meadowview(center)	6/8/11	lead
7128	Lh8	7/13/11	lead
8028	Lh 31	8/2/11	TKN
9009	Lh 29	9/1/11	TKN
9103	Bonny(center)	9/7/11	fecal coliform
9107	Meadowview(center)	9/7/11	NOx
9105	Hunter(center)	9/7/11	copper
9103	Bonny(center)	9/7/11	magnesium
9133	Parker(center)	9/8/11	copper
9134	Wire(center)	9/8/11	magnesium
10037	Lh 29	10/4/11	alkalinity
12067	Parker(center)	12/5/11	calcium
12080	Bentley(center)	12/6/11	calcium
1045	Bonnet(center)	1/4/12	lead
1047	Wire(center)	1/4/12	alkalinity
1113	Beulah(center)	1/8/12	calcium
5019	Mirror(center)	5/1/12	NOx
5017	Bentley(center)	5/1/12	lead
5017	Bentley(center)	5/1/12	zinc

Lab ID	Field ID	Collection Date	Parameter
5019	Mirror(center)	5/1/12	alkalinity
5039	Crago(center)	5/2/12	fecal coliform
5040	Gibson(center)	5/2/12	NOx
5042	Parker(center)	5/2/12	copper
5042	Parker(center)	5/2/12	magnesium
7153	Wire(center)	7/10/12	magnesium
7150	Bonnet(center)	7/10/12	alkalinity
8106	Bonny(center)	8/7/12	calcium
8105	Bentley(center)	8/7/12	zinc
8136	Crago(center)	8/8/12	fecal coliform
8136	Crago(center)	8/8/12	TKN
8139	Parker	8/8/12	TKN
8136	Crago(center)	8/8/12	calcium
8137	Gibson(center)	8/8/12	copper
11050	Crago(center)	11/5/12	fecal coliform
11050	Crago(center)	11/5/12	zinc
11112	Morton(center)	11/7/12	fecal coliform
11109	Bonny(center)	11/7/12	lead
1113	Beulah(center)	1/8/13	fecal coliform
1114	Bonnet(center)	1/8/13	fecal coliform
1117	Wire(center)	1/8/13	TKN
1113	Beulah(center)	1/8/13	copper
1115	Hunter(center)	1/8/13	magnesium
1115	Hunter(center)	1/8/13	zinc
1114	Bonnet(center)	1/8/13	alkalinity
1117	Wire(center)	1/8/13	alkalinity
2031	Mirror(center)	2/4/13	TKN
2032	Morton(center)	2/4/13	calcium
2031	Mirror(center)	2/4/13	copper
2032	Morton(center)	2/4/13	alkalinity
2091	Gibson(center)	2/6/13	fecal coliform
2093	Lh20	2/6/13	fecal coliform
2090	Crago(center)	2/6/13	TKN
2093	Lh20	2/6/13	NOx
2094	Parker(center)	2/6/13	lead
2090	Crago(center)	2/6/13	lead
2090	Crago(center)	2/6/13	magnesium