

# MANAGEMENT REVIEW

SAINT PAUL REGIONAL WATER SERVICES  
LABORATORY

A review of the objectives and performance of the laboratory, including current conditions and recommendations for improvements.

# MANAGEMENT REVIEW

## SAINT PAUL REGIONAL WATER SERVICES LABORATORY

### GENERAL

Saint Paul Regional Water Services Laboratory (herein referred to as Laboratory) operates within the Saint Paul Regional Water Services (SPRWS) organization. The Laboratory's quality management system has been and continues to be developed by Water Quality staff assigned to the Laboratory. Upper management at SPRWS supports the quality system but does not intervene or interfere with it. The Laboratory's quality management is described in its Quality Manual and in its standard operating procedures.

The Laboratory is currently certified by the Minnesota Department of Health (MDH) as compliant with the National Environment Laboratory Accreditation Program (NELAP). The MDH is the certifying agency in the state of Minnesota. MDH has adopted NELAP standards as a requirement for laboratories seeking accreditation with the state.

The objective of the Laboratory is to produce data of known and documented quality, which assists the organization in meeting its goals of complying with EPA drinking water standards and providing excellent customer service.

### EXTERNAL AND INTERNAL AUDITS

The MDH requires accredited laboratories to undergo an assessment every two years. The assessment needs to be performed by an MDH approved assessor. The most recent assessment of the Laboratory was done in May of 2014.

The external onsite assessment was by Fred Ordway. This was our second assessment since the MDH adopted the National Environmental Laboratory Accreditation Program. A new requirement of MDH is to have laboratories hire an outside assessor. The cost of the assessment was

### NATIONAL ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM (NELAP)

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One of the ways that TNI fosters the generation of data of known and documented quality is through the National Environmental Laboratory Accreditation Program, or NELAP. The purpose of this program is to establish and implement a program for the accreditation of environmental laboratories.

NELAP relies on consensus standards representing the best professional practices in the industry to establish the requirements for this program, which is then implemented by state agencies recognized by TNI as Accreditation Bodies.

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*The NELAC Institute*

\$3,957.46, plus the annual fee to MDH of \$2400.

Mr. Ordway had 16 "findings", which is NELAP parlance for not meeting the standard, in areas related to environmental testing. They covered a range from document control to chemical testing to methods and equipment. All the findings are correctable, given proper focus and application by staff. Overall the audit was a positive experience for water quality staff. Mr. Ordway was fair in his assessment and helpful in explaining the standard. Staff learned, *"If it's not documented, it didn't happen."* He could tell we were making an effort to improve.

The 16 findings resulted in 28 corrective actions. Six citations were from the Management Requirements of the Standard and 10 were from the Technical Requirements of the Standard. A corrective action is a remedy for a departure from policies and procedures in the management system or technical operations. Some were quite minor, for instance, adding the sample collection time to the report for samples with holding times of less than 72 hours. Some were more serious, for example, not performing a documented internal audit. Of the 28 corrective actions, 22 are complete and 6 are still in process.

Since the external assessment, we have conducted 6 internal audits. An internal audit is a tool to determine if our operations are complying with requirements of the management system and the Standard. We have found the internal audits to be a helpful tool in the overall operation of the laboratory. It provides an opportunity for staff to discuss concerns, successes and ideas.

## PROFICIENCY TESTING

The Laboratory is currently certified for 17 analytes in the EPA Clean Water Program and 16 analytes in the EPA Safe Drinking Water Program. Nine of the analytes overlap in the two programs, i.e. copper is a certified analyte in both the Clean Water Program and the Safe Drinking Water Program.

The Laboratory must perform proficiency (PT) testing on these analytes twice a year. Proficiency testing consists of analyzing an unknown sample containing the target analyte and reporting the result back to the supplier. The reported result must be within an acceptable range as determined by the supplier. If the result is outside the acceptable range, a follow up sample must be analyzed. An unacceptable reported value also triggers a corrective action for the Laboratory and the analyst. These steps are repeated until an acceptable value is reported. To maintain accreditation, the Laboratory must maintain a history of at least two successful performances out of the most recent three attempts. Multiple sequential failures are indicative of poor laboratory practices or techniques.

For the year 2014, the 17 analytes had PT evaluations performed in each semester. There were two unacceptable results returned in each semester. The first semester unacceptable results were for Nitrate/Nitrite Nitrogen and Nitrate Nitrogen. These analytes were retested and passed on a subsequent sample. The corrective action for this failed PT stated that a component on the analyzer was replaced before running the second sample. The second semester unacceptable results were for lead and aluminum. These analytes were retested on a subsequent sample, on which the aluminum passed and the lead failed again. A third lead sample was analyzed and passed. The corrective action for this PT failure states that the high rate of dilution required on the sample may have been



a factor. PT samples often need to be diluted by a factor of 100 to put them in a range we normally work in. All reagents and standards were also re-made on the third sample.

In summary the PT testing requirements are being met and did not indicate systematic failures in laboratory practices or techniques. There were several unacceptable results, but this is not unheard of in Laboratory PT testing. The Laboratory was able to correctly analyze these results on subsequent samples.

## CORRECTIVE ACTIONS

The majority of corrective actions in 2014 were associated with the external audit as mentioned above. There were also some associated with PT testing as noted above. There were two additional corrective actions, one associated with total coliform/e. coli testing sample incubation and one with control checks on autoclave and drying oven in April. Neither was significant and did not adversely affect sample results.

## CHANGES IN WORK AND WORK VOLUME

The workload for the laboratory, in terms of samples processed, has been stable for several years and does not present any problems. The amount of work per sample has changed somewhat due to the requirements of NELAP. This additional work is mainly due to increased documentation and quality assurance requirements. For example, a batch of five samples analyzed for copper on the AA will require an additional seven QC samples, for a total of thirteen. These QC samples are prepped in house and tied to a standard inventory in LIMS. Upon completion of the run the recoveries of the QC samples need to be verified to ensure the quality of the run. If acceptable, all batch data is then entered in LIMS and reviewed by the technical manager for that area. The data from the instrument is also scanned and attached to the batch within LIMS. These steps help ensure data quality but do take time.

The requirements of NELAP are reshaping how work is carried out within the Laboratory. It will also shape future hiring in the Laboratory, at least to some degree. Future hires will need to have relevant laboratory skills and the ability to operate in the modern quality management environment.

## CONCLUSION AND RECOMMENDATIONS

The Laboratory has maintained compliance with NELAP standards and thus has maintained certification by MDH for environmental testing. There are no systematic problems with how the Laboratory carries out its work, but there is room for improvement. The findings from the auditor will be used as a guide to ensure work is done in compliance with the standard.

Laboratory personnel are the key component for future success and for maintaining MDH certification, and maintaining a high level of professional interest and pride-of-work will be beneficial to the Laboratory's mission. The Laboratory staff should meet weekly to review and discuss issues related to quality management. Group discussions and involvement by all personnel in maintaining quality work are beneficial to the analysts and their

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supervisor. Personnel should also be encouraged to seek relevant training opportunities for themselves and the group.

Management should continue to support the laboratory by continuing to fund it adequately, as has been the practice. This includes occasional capital expenditures to upgrade aging equipment, such as replacement of the Atomic Adsorption Spectrophotometer in the next five years.

When hiring new personnel, attempts should be made at finding employees with relevant laboratory experience and a basic understanding of quality control and/or quality management principles.

