



**MISSOURI STREAM TEAM
VOLUNTEER WATER QUALITY MONITORING PROGRAM
Standard Operating Procedure**

ORIGINAL EFFECTIVE DATE: January 29, 2018
RECERTIFICATION DATE:
SOP TITLE: MoST-VWQM-SOP: Chloride Measurement of Streams
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APPLICABILITY:	Applies to all Level 1, Level 2, Level 3 and CSI trained Missouri Stream Team, Volunteer Water Quality Monitoring Program Participants
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1.0 SCOPE AND APPLICABILITY

This Standard Operating Procedure (SOP) provides MoST, VWQM Program participants with guidance on the operation and maintenance of low range and high range Hach Quantab Chloride Titrator Strips and how to conduct field analysis of chloride in streams. Chloride is soluble and can enter surface and groundwater easily. Although non-toxic at low levels, elevated levels of chloride in waterbodies can have a detrimental effect on freshwater ecosystems. At high levels, chloride is toxic to freshwater organisms. Sources of chloride run-off are roads, parking lots, airports, drains, ditches, salt storage piles, garages, truck washing areas, sites where snow is piled, waste water treatment facilities, industrial and natural sources. The Missouri Water Quality Standards (MoDNR 2010) acute chloride toxicity criterion is 860 mg/L and chronic chloride toxicity criterion is 230 mg/L.

2.0 DEFINITIONS AND ABBREVIATIONS

CSI – Cooperative Stream Investigation
MDC – Missouri Department of Conservation
mg/L – milligrams per liter
MoDNR – Missouri Department of Natural Resources
MoST – Missouri Stream Team
SOP – Standard Operating Procedure
VWQM – Volunteer Water Quality Monitoring
QAPP – Quality Assurance Project Plan
QA/QC – Quality Assurance/Quality Control

3.0 SUMMARY OF METHOD

The chloride method described in this SOP is used by the MoST, VWQM Program participants that have received Level 1, Level 2, Level 3 or CSI Program training. Further background information can be found in the MoST, VWQM Level 1 Notebook and PowerPoint Presentation on water chemistry (see Section 10.0).

4.0 HEALTH AND SAFETY REQUIREMENTS

Appropriate protective gear, such as gloves and water proof boots, should be worn to protect against encountering potential water-borne illnesses during sampling. It is also advisable to frequently wash hands with soap and water, especially before eating or drinking.

Those participants that monitor near wastewater outfalls should be vaccinated for Hepatitis A. Please contact your county health department or your personal physician for this vaccination.

5.0 PERSONNEL QUALIFICATIONS

Participants will be knowledgeable of this SOP and will have, at a minimum, attended an Introductory and Level 1 VWQM workshop.

6.0 SUPPLIES AND EQUIPMENT

The following equipment is needed to measure chloride:

- Program-provided low range Hach Quantab Chloride Titrator Strips
- Program-provided high range Hach Quantab Chloride Titrator Strips

7.0 PROCEDURE

7.1 MEASUREMENT

1. Rinse a small container and fill with stream water to a depth of 1 inch.
2. Place low range Quantab Titrator strip vertically in water, ensuring the yellow band at the top is not submerged.
3. Allow sample water to saturate the wick of the titrator strip until the yellow band at the top turns black. This may take several minutes.
4. Remove titrator strip from the sample water and read the number where the white line peaks. This is your Quantab unit.
5. Refer to the table on the back of the Quantab bottle. Use your Quantab unit to convert to chloride.
6. Report chloride on your data sheet as mg/L.
7. If the low range Quantab Titrator strip reaches the maximum value, repeat steps 1-6 with high range Quantab Titrator Strips.

8.0 SPECIAL CONSIDERATIONS

The table on the back of the Quantab bottle may vary between bottles. Be sure to only reference the table on the bottle from which you obtained the titrator strip.

9.0 QUALITY ASSURANCE/QUALITY CONTROL

No specific quality control limits have been established for Hach Quantab titrator strips.

General quality assurance sampling techniques are covered during Volunteer Water Quality Monitoring Program workshops.

10.0 REFERENCES

Missouri Department of Natural Resources. 2010. Code of State Regulations, Rules of Department of Natural Resources, Division 20 – Clean Water Commission, Chapter 7 – Water Quality. Pg. 19.

Missouri Department of Natural Resources, Quality Assurance Project Plan for Level 2 and Level 3 Volunteer Water Quality Monitoring.

Missouri Stream Team – Volunteer Water Quality Monitoring Program; Level 1 Volunteer Water Quality Monitoring Training Notebook, Chapter 2, Water Chemistry
http://www.mostreamteam.org/Documents/VWQM/Level1_Notebook/04_Chapter2_Chemistry.pdf

Missouri Stream Team – Volunteer Water Quality Monitoring Program; Level 1 Volunteer Water Quality Monitoring Workshop PowerPoint Presentation, Water Chemistry
http://www.mostreamteam.org/Documents/VWQM/Level1_PPT/Chapter%20-%20Water%20Chemistry.pdf