



WATER POLLUTION CONTROL

MEMORANDUM

To: Gregg Mandsager, City Administrator

CC: Nancy Lueck, Finance Director
Fran Donelson, Secretary

From: Jon Koch, WPCP Director

Date: October 9, 2014

Re: Distillation Unit for the Lab Annex Project

INTRODUCTION: In order to increase efficiency and eliminate harmful fumes in the new lab, the WPCP is requesting the purchase of the SCP DigiPrep 300 distillation unit from SCP Science for \$8,017.00. \$7,500.00 was budgeted for this unit. Now that the casework is arriving and is being scheduled for construction, this unit needs to be purchased for installation at the same time to ensure no retro fitting is required later.

BACKGROUND: Advanced distillation using concentrated acids and bases is required for the analysis of multiple parameters including ammonia and volatile acids. These parameters are required to be reported by the DNR and EPA. The current method requires multiple manual distillation units that release harmful acidic and alkaline fumes into the lab. The single unit will contain these fumes and reduce sampling time from 1 hour to 10 minutes.

Three bids were received for this purchase. The high bid came from Buchi Labortechnik for \$8,547.00. A bid from Velp Scientifica for \$7,430.00 is not being used so that equipment from SCP Science currently used by the lab can be used in the new distillation unit, saving the purchase of costly new glassware. The SCP unit also has an enclosed compartment to capture more of the noxious fumes produced while use of the same unit by a local industry will allow for more accurate analytical comparisons to be made.

RECOMMENDATION/RATIONALE: Staff recommends the purchase of the SCP DigiPrep 300 distillation unit for \$8,017.00 from SCP Science.

INTEROFFICE MEMORANDUM

TO: JON KOCH
FROM: PATTI FULLER-BLOECHIL
SUBJECT: DISTILLATION SYSTEM
DATE: OCTOBER 9, 2014

DISTILLATION SYSTEM FOR LABORATORY ANALYSIS

BACKGROUND:

Muscatine WPCP Laboratory performs distillation using concentrated acid and bases for the analysis of ammonia/TKN, phenols, and volatile organic acids. Distillation should be performed in a hood or using a process that removes fumes. The lab currently uses a macro distillation system in the lab with the burners that heat up to over 400 °C with an open coil burner. The burners are becoming more difficult to purchase since the technology is older and primarily only used in only the oil and gas industry. The laboratory has performed analysis seven distillations set ups to keep up with analysis needs. At this time, the lab has four burners working and to purchase one burner, the cost would be \$ 800 per burner. The current setup is clumsy and can be somewhat dangerous with the hot glassware that tends to crack during analysis and hot burners.

I propose to purchase newer technology that uses steam distillation in a contained system that super heats purified water and distills the analytes of interest into a receiving flask. The strong fumes will be better contained since the hot glassware will not be opened to the lab when switching samples out since there is no open burner. The new system will remove the old sample from the flask reducing exposure to fumes in the lab. The time to distill one sample (with rinse) will be approximately 10 – 14 minutes, verses 40-60 minutes. The system can only perform one sample at a time, but performing the tests in approximately the same amount of time. The new technology will be able to do the testing for the same number of samples and same sample analysis of ammonia/TKN, phenols, and volatile organic acids (VOAs).

The new plant NPDES Permit will require increase testing for TKN and VOAs. Currently the plant is not required to test TKN on a weekly basis and VOA analysis for each digester daily, but these will be requirements of the permit. That would mean an increase in the use of distillation equipment and fumes in the laboratory.

QUOTE REQUESTS

Below is the summary of the quotes. I recommend that the laboratory purchase the SCP Science DigiPrep 300 Distillation System for the following reasons:

- The Laboratory currently owns an SCP High Temperature DigiPrep Digester Block so the same glassware will be used for the instrumentation.

- This system is used by other local industries for analysis. To allow for collaboration with other labs in the area we would like to purchase the same unit.
- The SCP Science 300 has an enclosed sample compartment.

Supplier	Model Number	Price
SCP Science	DigiPrep 300	\$8,017
Velp Scientifica	Model UDK 139	\$7,430
Büche	K-355	\$8,547