Northeast Ohio Regional
Sewer District
Protecting Your Health and Environment

OHIO EPA - DSW
2006 DEC 12 AM 10: 00

December 7, 2006

Jeff Reynolds
Ohio EPA, Division of Surface Water
Standards & Technical Support Section
P.O. Box 1049
122 S. Front Street
Columbus, Ohio 43216-1049

Dear Mr. Reynolds:

Please find enclosed for your review and the Director's approval a Level 3 Project Study Plan titled "2006 Benthic Macroinvertebrate Sampling Upstream of NEORSD CSO Areas." The objective of this study is to conduct benthic macroinvertebrate and water quality sampling upstream from areas of Northeast Ohio Regional Sewer District-owned combined sewer overflows. If you have any questions regarding the content of this study plan, please do not hesitate to contact me. I can be reached by email at rhoadesj@neorsd.org or phone (216) 641-6000 ext. 2219.

Sincerely,

John W. Rhoades
Supervisor of Environmental Assessment
Northeast Ohio Regional Sewer District

Northeast Ohio Regional Sewer District
Protecting Your Health and Environment

Level 3 Project Study Plan

2006 Benthic Macroinvertebrate Sampling Upstream of NEORSD CSO Areas

(1) Objective

The objective of this study is to conduct benthic macroinvertebrate and water quality sampling upstream from areas of Northeast Ohio Regional Sewer District (NEORSD)-owned combined sewer overflows (CSOs). The resulting upstream data will be compared with the benthic macroinvertebrate data obtained from these streams, downstream of the NEORSD CSO areas in compliance with Ohio EPA NPDES Permit No. 3PA00002*FD, to determine the extent to which downstream macroinvertebrate communities may be impacted by CSOs or other environmental factors. This sampling will be conducted by the NEORSD's Water Quality and Industrial Surveillance department (WQIS) and will occur from June 15 through September 30, 2006, as required in the OEPA *Biological Criteria for the Protection of Aquatic Life Volume III* (1987, updated September 30, 1989).

Sample sites for this study are located on Big Creek, Doan Brook, Euclid Creek and Mill Creek, all of which are surface waters within the NEORSD service area (Appendix A). Quantitative and qualitative benthic macroinvertebrate sampling will be conducted at each sample site. The benthic macroinvertebrate results will be complied and used to calculate an Invertebrate Community Index (ICI) score for each site. Species assemblages and the evaluation of individual metrics will also be analyzed. Water quality sampling data will be evaluated to determine the presence and/or absence of excursions from water quality criteria.

(2) Nonpoint/Point Sources

Point Sources	Nonpoint Sources
CSO outside of NEORSD service area	Urban Runoff
Storm Sewer Outfalls	Landfill Leachate
Upstream tributaries	Possible Spills
Home Sewage Treatment Systems	Agriculture
	Golf Course Runoff

Other factors that may influence ecological conditions during the study include periods of drought and periods of heavy precipitation.

(3) Parameters Covered

Macroinvertebrate quantitative and qualitative samples will be collected and shipped to EA Engineering, Science and Technology for identification and enumeration. EA Engineering, Science and Technology will identify the specimens to the level of taxonomy recommended in Ohio EPA's *Biological Criteria for the Protection of Aquatic Life, Volume III* (1987, updated September 30, 1989).

Water quality sampling will be conducted at each sampling site weekly, from the time of HD installation to HD retrieval, unless surface water conditions are deemed unsafe. Field measurements of dissolved oxygen, pH, conductivity, water temperature and flow will also be obtained. Appendix B lists the parameters to be tested. It should be noted that parameters may need to be adjusted throughout the study as deemed appropriate.

Fish sampling will not be conducted during this study, due to time and personnel limitations. Additionally, these data would not result in pertinent information for the study, as fish sampling is not required in Ohio EPA Permit No. 3PA00002*FD.

(4) Field Collection and Data Assessment Techniques

Macroinvertebrate sampling will be conducted using quantitative and qualitative sampling techniques. Two rounds of quantitative sampling will include five Hester-Dendy multi-plate artificial substrate samplers (HD sampler) that are placed at the sample locations and allowed to be colonized for a six-week period. Five Surber square-foot samples may be used in place of a HD sampler deemed uncollectible due to the HD sampler having been vandalized, buried, etc. Surber samples, if supplemented for a HD sampler, will be used for informational purposes only. Qualitative sampling will be accomplished using a D-frame dip net when each HD sampler is retrieved. Field parameters of pH, water temperature, dissolved oxygen and conductivity will be measured weekly, from the time of HD sampler installation to HD sampler retrieval. Stream flow will be measured during HD sampler installation and retrieval.

Macroinvertebrate collection will be conducted following the OEPA *Biological Criteria for the Protection of Aquatic Life Volume III* (1987, updated September 30, 1989). Data assessment for the macroinvertebrates collected will follow the OEPA *Biological Criteria for the Protection of Aquatic Life Volume II* (1987, updated January 1, 1988).

Water quality sampling and chemical analyses will follow the *Manual of Ohio EPA Surveillance Methods and Quality Assurance Practices* (2006). Two 4L disposable polyethylene cubitainers with disposable polypropylene lids will be used to collect a surface grab sample at each location. One duplicate sample and one field blank will be collected at a randomly selected site for each round of sampling. Field analyses include the use of a Marsh-McBirney FloMate Model 2000 Portable Flow Meter, which measures flow in feet per second, and a YSI-556 MPS Multi-Parameter Water Quality Meter to measure dissolved oxygen, water temperature, conductivity and pH. Laboratory Analytical Methods and Detection Limits are located in Appendix B.

(5) Sampling Locations

Site Location	Latitude	Longitude	River Mile	General Location Info	USGS 7.5 Minute Quadrangle Map Name
Big Creek #26	N41.4460°	W81.7540°	~4.5	East Branch at Memphis MetroPark	Lakewood
Big Creek #28.1	N41.4230°	W81.8019°	~4.7	West Branch at West 150th	Lakewood
Doan Brook #18.1	N41.4838°	W81.5643°	~0.2	North Branch at Attleboro Road	Shaker Heights
Doan Brook #19.5	N41.4739°	W81.5590°	~7.6	South Branch at Lee Road	Shaker Heights
Euclid Creek #0.5A	N41.5825°	W81.5594°	~0.7	Downstream of Lakeshore Avenue	East Cleveland
Euclid Creek #1.5	N41.5658°	W81.5358°	~2.7	Upstream of Euclid Avenue	East Cleveland
Mill Creek #34.6	N41.4305°	W81.5442°	~8.3	Upstream of South Miles Road	Shaker Heights

The purpose of sampling at each location is to compare the macroinvertebrate communities and water quality data from the upstream sampling sites to those from the respective sampling sites located downstream from areas of NEORSD-owned CSOs. Data generated will be used to evaluate the extent to which NEORSD CSOs or other environmental factors may be impacting the downstream macroinvertebrate community.

(6) Schedule

A proposed agenda for two HD sampler installation dates, two HD sampler retrieval dates and the weekly water quality sampling between June 15 and September 30 is attached in Appendix C. These dates may be adjusted throughout the field season as a result of unsafe surface water conditions such as inclement weather and/or high water levels.

(7) QA/QC

The Quality Assurance/Quality Control (QA/QC) Plan incorporates field sampling and laboratory analyses. QA/QC for field sampling for macroinvertebrates includes placing HD sampler and kick samples into plastic jars, both of which have paper labels on the outside and the inside, which are then filled with ethanol and closed. The field truck remains locked when not occupied. Field activities are entered in a QDC log book including field identifications of macroinvertebrates found in the kick sample. These samples are sealed, bagged and shipped to EA Engineering, Science and Technology with an inventory sheet approximately one week after collection. The EA Engineering, Science and Technology QA/QC plan is attached in Appendix D. Water quality meters and the flow meter are calibrated according to the *Manual of Ohio EPA Surveillance Methods and Quality Assurance Practices* (2006).

Water quality samples obtained for chemical analyses are collected, labeled and then placed on ice inside the field truck. As with macroinvertebrate field sampling, the field truck remains locked when not occupied/visible. Sampling activities are entered in a QDC log book including sample time and condition of surface water sampled. The samples are then delivered immediately to the NEORSD Analytical Services cooler, after which the door to the cooler is locked and the samples are transferred to the custody of Analytical Services. The NEORSD Analytical Services Quality Manual is attached in Appendix E. Control copies of Analytical Service's Quality Manual or Standard Operating Procedures (SOPS) can be reviewed or audited on-site. Copies of the Quality Manual and SOPS can only be given to a third party as uncontrolled copies, due to the fact that all information is time sensitive and may be revised at any time. The Quality Assurance Officer at Analytical Service should be contacted for updates, revisions and any information on document control at 216-641-6000.

(8) Work Products

Anticipated work products include ICI scores along with associated biological index metrics and scores, biological data including a list of macroinvertebrate taxa, measured chemical data including field measurements and laboratory

analyses, and any noted excursions from water quality criteria. The ICI scores will be supplemented with chemical water quality data, which are compared to Ohio Water Quality Standards, and weather/precipitation data for information on extreme low-flow and/or high-flow conditions that may adversely affect the communities. Excursions from water quality criteria in combination with low ICI scores at any site will prompt investigative work by NEORSD intended to identify and make recommendations for the elimination of heretofore unidentified sources of pollution.

(9) Qualified Data Collectors

The following Level 3 Qualified Data Collectors will be involved with this study:

Name	Address	Email Address	Phone Number	QDC Specialty
[1] Kathryn Crestani	4747 East 49th Street Cuyahoga Heights, Ohio 44125	crestanik@neorsd.org	216-641-6000	CWQA-011
Seth Hothem	4747 East 49th Street Cuyahoga Heights, Ohio 44125	hothems@neorsd.org	216-641-6000	CWQA-010
[2] Tiffany Moore	4747 East 49th Street Cuyahoga Heights, Ohio 44125	mooret@neorsd.org	216-641-6000	CWQA-017 BMB (QDC-017)
[3] John W. Rhoades	4747 East 49th Street Cuyahoga Heights, Ohio 44125	rhoadesj@neorsd.org	216-641-6000	CWQA-008
Tom Zablotny	4747 East 49th Street Cuyahoga Heights, Ohio 44125	zablotnyt@neorsd.org	216-641-6000	CWQA-018
Cathy Zamborsky	4747 East 49th Street Cuyahoga Heights, Ohio 44125	zamborskyc@neorsd.org	216-641-6000	CWQA-009
[4]Marty Sneen	EA Engineering, Science and Technology 444 Lake Cook Road Suite #18 Deerfield, IL 60015	msneen@eaest.com	847-945-8010	QDC# 026

[1] Chemical Water Quality Assessment (CWQA) Project Manager
[2] Benthic Macroinvertebrate Biology (BMB) Project Manager
[3] Lead Project Manager
[4] Benthic Macroinvertebrate Identification

The following is a list of persons not qualified as level 3 data collectors who may be involved in the project. Prior to the start of sampling, the project managers will conduct training with each of these and any other individuals on the proper methods for macroinvertebrate and water quality sample collections. The lead project manager will be responsible for reviewing all reports and data analysis prepared by these individuals prior to completion.

Name	Address	Email Address	Phone Number
Joseph Broz	4747 East 49th Street Cuyahoga Hts., Ohio 44125	brozj@neorsd.org	216-641-6000
Tim Dobriansky	4747 East 49th Street Cuyahoga Hts., Ohio 44125	dobrianskyt@neorsd.org	216-641-6000
Rae Grant	4747 East 49th Street Cuyahoga Hts., Ohio 44125	grantr@neorsd.org	216-641-6000
Lateefah Hafeez	4747 East 49th Street Cuyahoga Hts., Ohio 44125	hafeezl@neorsd.org	216-641-6000
Eric Hinton	4747 East 49th Street Cuyahoga Hts., Ohio 44125	hintone@neorsd.org	216-641-6000
Mike Pavlik	4747 East 49th Street Cuyahoga Hts., Ohio 44125	pavlikm@neorsd.org	216-641-6000
Francisco Rivera	4747 East 49th Street Cuyahoga Hts., Ohio 44125	riveraf@neorsd.org	216-641-6000
Kevin Roff	4747 East 49th Street Cuyahoga Hts., Ohio 44125	roffk@neorsd.org	216-641-6000
Frank Schuschu	4747 East 49th Street Cuyahoga Hts., Ohio 44125	schuschuf@neorsd.org	216-641-6000
Elizabeth Toot-Levy	4747 East 49th Street Cuyahoga Hts., Ohio 44125	toot-levye@neorsd.org	216-641-6000
Wolfram vonKiparski	4747 East 49th Street Cuyahoga Hts., Ohio 44125	vonkiparskiw@neorsd.org	216-641-6000
Timothy Whipple	4747 East 49th Street Cuyahoga Hts., Ohio 44125	whipplet@neorsd.org	216-641-6000
Mohammad Zachariah	4747 East 49th Street Cuyahoga Hts., Ohio 44125	zachariahm@neorsd.org	216-641-6000

(10) Documentation of approval of project manager as level 3 qualified data collector

See attached (Appendix F).

(11) Contract laboratory contact information

Marty Sneen, Benthic Specialist (QDC# 026)
EA Engineering, Science and Technology
444 Lake Cook Road Suite #18
Deerfield, IL 60015
msneen@eaest.com
847-945-8010 ext. 108

(12) ODNR collectors' permit

See attached (Appendix G).

(13) Catalog Statement

A digital photo catalog of all sampling locations will be maintained for 10 years and will include photos of the specific sampling location(s), the riparian zone

adjacent to the sampling location(s) and the general land use in the immediate vicinity of the sampling location(s).

Signature: _____ Date: 12/07/06

(14) Voucher Specimen Statement

Based on Ohio EPA's Final Responsiveness Summary of the Credible Data Rules (3/24/06), NEORSD is requesting approval of an alternative vouchering protocol as follows:

NEORSD will maintain a single voucher collection which includes two specimens of each species or taxa collected in the course of biological sampling at each location. The lead project manager will provide specimens to the Director upon request. This collection will be stored at the NEORSD laboratory in the Environmental Maintenance and Services Center.

Signature: _____ Date: 12/07/06

(15) Trespassing Statement

I, Catherine M. Zmuda, have not been convicted or pleaded guilty to a Violation of section 2911.21 of the Revised Code (criminal trespass) or a substantially similar municipal ordinance within the previous five years.

Signature: _____ Date: 12/7/06

I, John W. Rhoades, have not been convicted or pleaded guilty to a Violation of section 2911.21 of the Revised Code (criminal trespass) or a substantially similar municipal ordinance within the previous five years.

Signature: _____ Date: 12/07/06

I, Seth Hathem, have not been convicted or pleaded guilty to a Violation of section 2911.21 of the Revised Code (criminal trespass) or a substantially similar municipal ordinance within the previous five years.

Signature: _____ Date: 12/7/06

I, Tiffany L. Moore, have not been convicted or pleaded guilty to a Violation of section 2911.21 of the Revised Code (criminal trespass) or a substantially similar municipal ordinance within the previous five years.

Signature: Tiffany L. Moore Date: 12/7/06

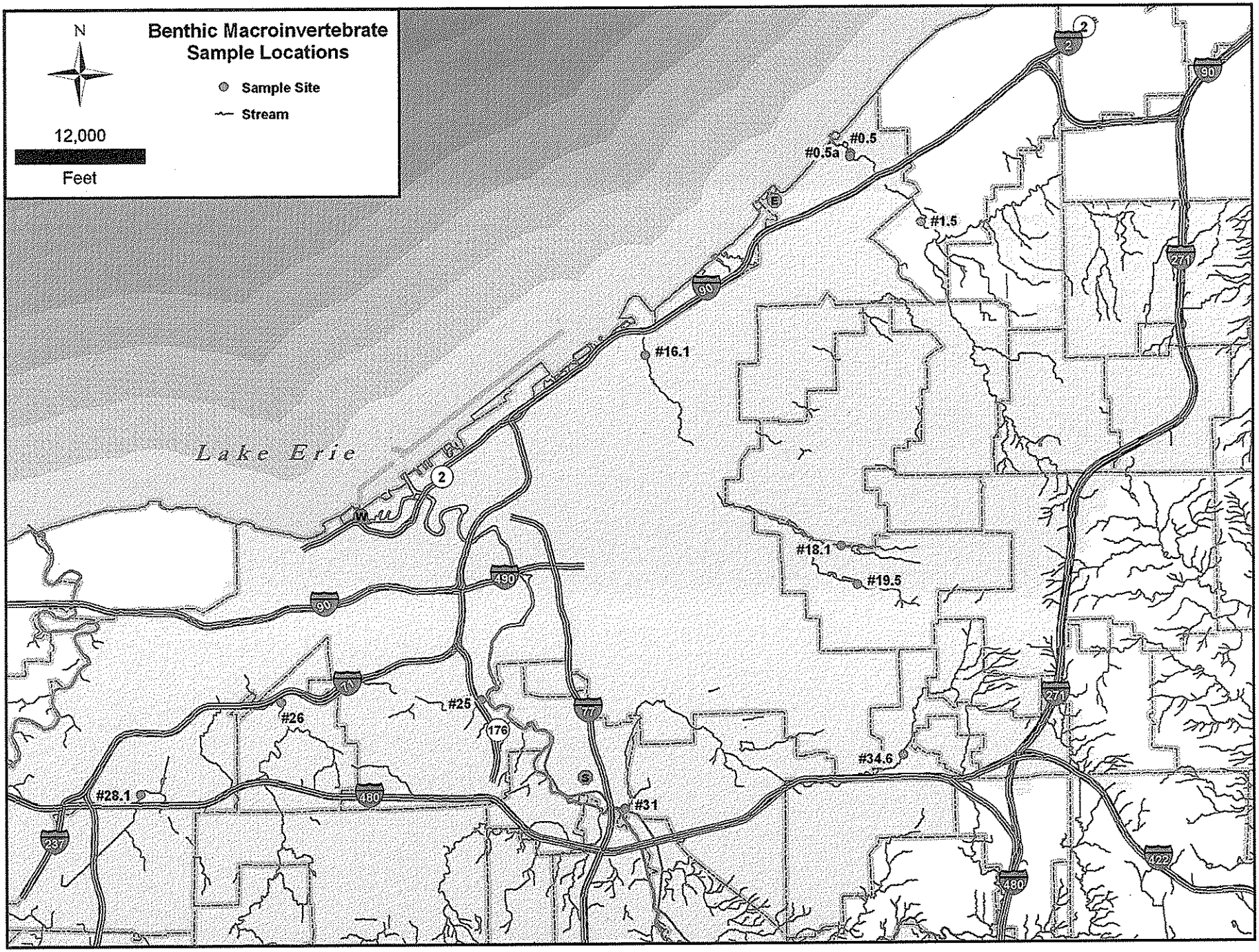
I, THOMAS ZABLOTNY, have not been convicted or pleaded guilty to a Violation of section 2911.21 of the Revised Code (criminal trespass) or a substantially similar municipal ordinance within the previous five years.

Signature: [signature] Date: 12-7-06

I, Kathryn Crestani, have not been convicted or pleaded guilty to a Violation of section 2911.21 of the Revised Code (criminal trespass) or a substantially similar municipal ordinance within the previous five years.

Signature: [signature] Date: 12/7/06

Appendix A



Benthic Macroinvertebrate
Sample Locations
N
Sample Site
Stream
12,000
Feet
Lake Erie
#0.5
#0.5a
#1.5
#16.1
#18.1
#19.5
#25
#26
#28.1
#31
#34.6
2
90
271
490
77
176
480
237
422

Appendix B

Parmeter	Test	Detection Limit
Alkalinity	EPA 310.2	5 mg/L
COD	EPA 410.4	1 mg/L
Hex Chrome	SM 3500	10 ug/L
Mercury	EPA 245.2	0.05 ug/L
NH3	EPA 350.1	0.01 mg/L
NO2	EPA 354.1	0.01 mg/L
NO3	EPA 353.2	0.01 mg/L
Soluble-P	SolPO4	0.01 mg/L
Total-P	EPA 365.2	0.01 mg/L
BOD	EPA 405.1 (5 Day)	2 mg/L
TDS	EPA 160.1	1 mg/L
Ag	EPA 200.7	1 µg/L
Al	EPA 200.7	5 µg/L
As	EPA 200.7	2 µg/L
Be	EPA 200.7	0.5 µg/L
Ca	EPA 200.7	50 µg/L
CaCO3	EPA 200.7	1 µg/L
Cd	EPA 200.7	1 µg/L
Co	EPA 200.7	1 µg/L
Cr	EPA 200.7	1 µg/L
Cu	EPA 200.7	1 µg/L
Fe	EPA 200.7	1 µg/L
K	EPA 200.7	50 µg/L
Mg	EPA 200.7	20 µg/L
Mn	EPA 200.7	1 µg/L
Mo	EPA 200.7	2 µg/L
Na	EPA 200.7	20 µg/L
Ni	EPA 200.7	1 µg/L
Pb	EPA 200.7	3 µg/L
Sb	EPA 200.7	5 µg/L
Se	EPA 200.7	5 µg/L
Sn	EPA 200.7	10 µg/L
TMET	EPA 200.7	(sum of Cr+Cu+Ni+Zn)
Ti	EPA 200.7	10 µg/L
Tl	EPA 200.7	10 µg/L
V	EPA 200.7	1 µg/L
Zn	EPA 200.7	1 µg/L
TS	EPA 160.3	1 mg/L
TSS	EPA 160.2	1 mg/L
Turbidity	SM 2130B	0.1 NTU
pH		(value reported in) s.u.
Field pH		(value reported in) s.u.
Field Conductance	SM 2510A	(value reported in) µs/cm

Parmeter	Test	Detection Limit
Field D.O.	SM 4500-0 G	(value reported in) mg/L
Field Temperature	EPA 170.1	(value reported in) °C
Flow		(value reported in) fps

Appendix C

2006 Benthic Macroinvertebrate Sampling Schedule for Location Upstream of NEORSD CSO Areas			
	Date	Parameters	Stream
First Round	06/15/06	HD Installation/Water Quality Samples	Big Creek, Doan Brook, Euclid Creek and Mill Creek
	06/22/06	Water Quality Samples	Big Creek, Doan Brook, Euclid Creek and Mill Creek
	06/29/06	Water Quality Samples	Big Creek, Doan Brook, Euclid Creek and Mill Creek
	07/06/06	Water Quality Samples	Big Creek, Doan Brook, Euclid Creek and Mill Creek
	07/13/06	Water Quality Samples	Big Creek, Doan Brook, Euclid Creek and Mill Creek
	07/20/06	Water Quality Samples	Big Creek, Doan Brook, Euclid Creek and Mill Creek
	07/27/06	HD Retrieval/Water Quality Samples	Big Creek, Doan Brook, Euclid Creek and Mill Creek
Second Round	08/03/06	HD Installation/Water Quality Samples	Big Creek, Doan Brook, Euclid Creek and Mill Creek
	08/10/06	Water Quality Samples	Big Creek, Doan Brook, Euclid Creek and Mill Creek
	08/17/06	Water Quality Samples	Big Creek, Doan Brook, Euclid Creek and Mill Creek
	08/24/06	Water Quality Samples	Big Creek, Doan Brook, Euclid Creek and Mill Creek
	08/31/06	Water Quality Samples	Big Creek, Doan Brook, Euclid Creek and Mill Creek
	09/07/06	Water Quality Samples	Big Creek, Doan Brook, Euclid Creek and Mill Creek
	09/14/06	HD Retrieval/Water Quality Samples	Big Creek, Doan Brook, Euclid Creek and Mill Creek

Appendix D

Standard Operating Procedures

Laboratory Processing of Benthic Samples

Upon arrival at the laboratory, the Hester-Dendy (H-D), Surber, and qualitative samples were logged in and accounted for. Prior to sorting and identification, each sample was rinsed on a No. 60 (0.250 mm openings) U.S. Standard Testing Sieve to remove the preservative and the H-D plates were scraped to remove the organisms. Sorting of each H-D and Surber sample was conducted in a white enamel pan first under a magnifier lamp and finally under a compound dissecting scope. If necessary, a Folsum sample splitter was used to subsample the H-Ds and Surbers until a more manageable number of organisms was achieved. Prior to splitting, the sample was pre-picked to remove any large and/or rare taxa. In all a minimum of 250 organisms in representative proportions were removed from the fractionated samples. Organisms were sorted to higher taxonomic levels (generally Class or Order level) and preserved separately in labeled vials containing 70% ethyl alcohol. To assure a consistent level of quality and sorting efficiency, senior EA personnel checked all samples. The qualitative samples contained very little detrital matter and therefore were simply rinsed prior to identification.

Macroinvertebrate identifications were made to the lowest practical taxonomic level using the most current literature available (see attached list of taxonomic literature). Whenever possible, the level of identifications followed those recommended by Mr. Jeffery DeShon of the Ohio EPA (pers. comm., 1998). Chironomidae larvae were cleared in warm 10% potassium hydroxide and mounted in CMC-10 prior to identification. Generally, 100 chironomids from any single sample were mounted for identification. For all sample types, specimens were enumerated, coded and recorded on a standard laboratory bench sheet for data processing.

Data Analyses

The Invertebrate Community Index (ICI) was used as the principal measure of overall macroinvertebrate community condition. Developed by the Ohio EPA, the ICI is a modification of the Index of Biotic Integrity for fish (Ohio EPA 1987). The ICI consists of ten individually scored structural community metrics:

1. Total number of taxa
2. Total number of mayfly taxa
3. Total number of caddisfly taxa
4. Total number of dipteran taxa
5. Percent mayflies
6. Percent caddisflies
7. Percent Tanytarsini midges
8. Percent other dipterans and non-insects
9. Percent tolerant organisms
10. Total number of qualitative EPT taxa.

Scoring criteria for all ten metrics is dependent upon drainage area. The scoring of an individual sample was based on the relevant attributes of that sample compared to equivalent data from 232 reference sites throughout Ohio. Metric scores range from six points for values comparable to exceptional community structure to zero points for values that deviate strongly from the expected range of values based on scoring criteria established by Ohio EPA (1989a). The sum of the individual metric scores resulted in the ICI score for that particular location.

Calculation of the ICI was conducted using a computer program written for the software SAS® by EA in 1994. This program is continuously tested and updated to ensure its accuracy. Although the ICI is most often used to analyze the combination of H-D and qualitative data from a particular location, for this study, the ICI was also calculated for the combination of Surber and qualitative data when H-D data were not available.

The only other statistical comparison used was the relative abundance (or percent composition) of individual taxa from each site and sample type. Relative abundance was calculated for both sample types as:

$$\text{Rel. Abund.}(\%) = 100 \times \frac{\text{\# Individuals of a Taxa}}{\text{Total \# of Individuals in Sample}}$$

All sample processing and data analysis were completed by permanent and full-time EA Engineering, Science, & Technology, Inc. staff working our Deerfield, Illinois office and laboratory. Specific staff members that worked on this project and relevant experience are listed below by task:

Task	EA Personnel	Years of Experience
Login	Sarah Olson	1.5
Sorting	Nick Wood	1
Chironimid Mounting	Paul Hauser	2
	Sarah Olsen	1.5
Identification	Marty Sneen	17
Data Analysis	Matt Poore	1
	Joe Vondruska	22
	Marty Sneen	17

Selected Ohio EPA Reporting Requirements

Item 12-Taxonomic literature

Although EA's taxonomic library contains substantially more references than are listed here, the following list only includes taxonomic literature used to identify the benthos in samples from Big Creek, Doan Brook, Euclid Creek, and Mill Creek.

Bednarik, A.F. and W.P. McCafferty. 1979. Biosystematic revision of the genus Stenonema (Ephemeroptera: Heptageniidae). Canadian Bulletins of Fisheries and Aquatic Sciences 201:1-73.

Bode, R.W. 1983. Larvae of North American Eukiefferiella and Tvetenia (Diptera: Chironomidae). New York State Museum Bulletin 452:1-40.

Bolton, M.J. 1998. Guide to the identification of larval Chironomidae (Diptera) in the temperate eastern Nearctic north of Florida. Ohio EPA, Division of Surface Water, Ecological Assessment Section, Columbus, Ohio.

Brown, H.P. 1976. Aquatic dryopoid beetles (Coleoptera) of the United States. Water Pollution Control Series 18050 ELDO4/72. 2nd edition. U.S. Environmental Protection Agency, Cincinnati, OH.

Burch, J.B. 1982. Freshwater snails (Mollusca: Gastropoda) of North America. EPA-600/3-82-026. U.S. Environmental Protection Agency, Environmental Monitoring and Support Laboratory, Cincinnati, OH.

Epler, J.H. 1987. Revision of the Nearctic Dicrotendipes Kieffer, 1913 (Diptera: Chironomidae). Evolutionary Monographs No. 9:1-102.

_____. 1995. Identification manual for the larval Chironomidae (Diptera) of Florida. Florida DEP, Division of Water Facilities, Tallahassee, FL.

_____. 2001. Identification manual for the larval Chironomidae (Diptera) of North and South Carolina. North Carolina DENR, Division of Water Quality, Raleigh, NC.

Grodhaus, G. 1987. Endochironomus Kieffer, Tribelos Townes, Synendotendipes new genus, and Endotribelos new genus (Diptera: Chironomidae) of the Nearctic region. Journal of the Kansas Entomological Society 60(2):167-247.

Jezerinac, R.F., G.W. Stocker, and D.C. Tarter. 1995. The crayfishes (Decapoda: Cambaridae) of West Virginia. Bulletin of the Ohio Biological Survey 10(1):1-193.

Klemm, D.J. 1985. Guide to the freshwater Annelida (Polychaeta, naidid, and tubificid Oligochaeta, and Hirudinea) of North America. Kendall/Hunt Publishing Co., Dubuque, IA.

Larson, D.J., Y. Alarie, and R.E. Roughley. 2000. Predaceous Diving Beetles (Coleoptera: Dytiscidae) of the Nearctic Region: with emphasis on the fauna of Canada and Alaska. NRC Research Press, Ottawa, Canada.

Maschwitz, D.E. 1976. Revision of the Nearctic species of the subgenus Polypedilum (Chironomidae: Diptera). Doctoral Dissertation, University of Minnesota.

McCafferty, W.P. and R.D. Waltz. 1990. Revisionary synopsis of the Baetidae (Ephemeroptera) of North and Middle America. Transactions of the American Entomological Society 116(4):769-799.

Merritt, R.W. and K.W. Cummins, eds. 1996. An introduction to the aquatic insects of North

America. 3rd edition. Kendall/Hunt Publishing Co., Dubuque, IA.

Morihara, D.K. and W.P. McCafferty. 1979. The Baetis larvae of North America (Ephemeroptera: Baetidae). Transactions of the American Entomological Society 105:139-221.

Needham, J.G. and M.J. Westfall, Jr. 1955. A manual of the dragonflies of North America (Anisoptera) including the Greater Antilles and the provinces of the Mexican border. University of California Press, Berkeley, California.

Pennak, R.W. 1989. Fresh-water invertebrates of the United States. 2nd edition. John Wiley & Sons, New York, NY.

Roback, S.S. 1985. The immature chironomids of the eastern United States VI. Pentaneurini-genus Ablabesmyia. Proceedings of The Academy of Natural Sciences of Philadelphia 137(2):153-212.

Saether, O.A. 1977. Taxonomic studies on Chironomidae: Nanocladius, Pseudochironomus, and the Harnischia complex. Bulletin of the Fisheries Research Board of Canada 196:1-143.

Simpson, K.W. and R.W. Bode. 1980. Common larvae of the Chironomidae (Diptera) from New York State streams and rivers with particular reference to the fauna of artificial substrates. New York State Museum Bulletin 439:1-105.

Wiederholm, T., ed. 1983. Chironomidae of the Holarctic region. Keys and diagnoses. Part 1. Larvae. Entomologica Scandinavica Supplement 19:1-457.

Wiggins, G.B. 1996. Larvae of the North American caddisfly genera (Trichoptera). 2nd edition. University of Toronto Press, Toronto, Canada.

Item 13-Reference Collection

A reference collection was not necessary for identification of these specimens. However, if a reference collection had been needed to verify any specimens, EA maintains a sizable macroinvertebrate voucher collection with over 1800 specimens representing over 700 taxa. If this taxonomic library proved to be insufficient, every reasonable attempt would be made to have the specimen(s) identified or verified by a noted authority.

Item 16-Chironomidae Identification

Chironomidae larvae were cleared in warm 10% potassium hydroxide and mounted in CMC-10 prior to identification. Generally, 100 chironomids from any single sample are mounted for identification. Species level identifications generally follow those suggested by Ohio EPA.

Item 17-Copies of Raw Data

Copies of the laboratory bench sheets are appended to the hard copy of this document.

Item 18-ICI Calculation

The Invertebrate Community Index (ICI) was used as the principal measure of overall macroinvertebrate community condition. Developed by the Ohio EPA, the ICI is a modification of the Index of Biotic Integrity for fish (Ohio EPA 1987). The ICI consists of ten individually scored structural community metrics:

1. Total number of taxa
2. Total number of mayfly taxa
5. Percent mayflies
6. Percent caddisflies
7. Percent Tanytarsini midges
3. Total number of caddisfly taxa
4. Total number of dipteran taxa
8. Percent other dipterans and non-insects
9. Percent tolerant organisms
10. Total number of qualitative EPT taxa.

Scoring criteria for all ten metrics is dependent upon drainage area. The scoring of an individual sample was based on the relevant attributes of that sample compared to equivalent data from at least 232 reference sites throughout Ohio. Metric scores range from six points for values comparable to exceptional community structure to zero points for values that deviate strongly from the expected range of values based on scoring criteria established by Ohio EPA (1989a). The sum of the individual metric scores resulted in the ICI score for that particular location.

Calculation of the ICI was conducted using a computer program written for the software SAS® by EA in 1994. This program is continuously tested and updated to ensure its accuracy.

Item 20-Statistical Analyses

The only other statistical comparison used was the relative abundance (or percent composition) of individual taxa per site and sample type. Relative abundance was calculated for both sample types as:

$$\text{Rel. Abund.} = \frac{\text{\# Individuals of a Taxa}}{\text{Total \# of Individuals in Sample}}$$

Item 21-Results

Complete results are appended to the hard copy of this document.

Item 25-Electronically Formatted Data

For convenience, the data and text are provided in electronic format as Word 2003® files via email and on the enclosed CD-RW.

Appendix E

Appendix F

Northeast Ohio Regional Sewer District
Protecting Your Health and Environment

Analytical Services
4747 East 49th Street
Cuyahoga Hts., OH 44125

SOP 5001-0 Quality Assurance Manual

Effective Date: April 10, 2006

This manual is applicable to the Quality Assurance System governing the Analytical Services Department of the Northeast Ohio Regional Sewer District Analytical Services Department.

Approvals:

Superintendent of
Environmental Services: Richard Connnelly Date: 4/11/06

Manager of Analytical Services: Mark Citriglia Date: 4/10/06

Quality Assurance Specialist: Carol Turner Date: 4/10/06

Supervising Chemist: Eva Hatvani Date: 4/10/06

Supervising Chemist: Oljeg Jamnicky Date: 4/10/06

Supervising Chemist: Cheryl Soltis-Muth Date: 4/10/06

Logistics Chemist: Cynthia Williams Date: 4/10/06

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Analytical Services
4747 East 49th Street
Cuyahoga Hts., OH 44125

Quality Assurance Manual
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1.0 Quality Assurance Policy

1.1 The Analytical Services Department provides performs analytical testing for the various departments within the Northeast Ohio Regional Sewer District (NEORSD). The Analytical Services Department also performs work for external sources on a limited basis. The analytical information generated is used for daily operation of the wastewater treatment facilities, and Provides compliance monitoring for the treatment facilities as required by the Ohio Environmental Protection Agency. Additionally the laboratory monitors materials introduced into the collection system and monitors water quality throughout the service area form samples submitted from the Water Quality and Industrial Surveillance Department.

1.2 The management staff of Analytical Services is committed to operating the laboratory in a safe, professional and proficient manner. To attain these goals, management is committed to and has adopted policies and procedures in accordance with the National Environmental Laboratory Accreditation Conference (NELAC).

1.3 The goal of management is to generate information of the highest quality that is legally defensible and presents the laboratory and its employees as ethical and competent. The management staff is responsible for ensuring that policies and objectives are communicated to, understood and implemented by all laboratory personnel.

1.4 The Quality System is documented and defined in the Quality Assurance Manual. The Quality Assurance Manual, Standard Operating Procedures and supplemental instructions for the performance of duties are available to the laboratory personnel. Every employee of the NEORSD Analytical Services department is responsible to read, understand and follow the policies defined in the Quality Assurance Manual.

2.0 Organization and Management Structure

2.1 The ***Superintendent of Environmental Services*** is the final authority for laboratory operations. The ***Superintendent*** has assigned daily management of the laboratory to the ***Manager of Analytical Services.***

2.2 The ***Manager of Analytical Services*** reports directly to the ***Superintendent of Environmental Services***. The manager is responsible for addressing the technical issues of the laboratory and assuring that the technical operations of the laboratory are conducted within the guidelines

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of the Quality Assurance System. ***Manager of Analytical Services*** is responsible for implementing actions necessary to bring operations into compliance with the Quality Assurance System.

2.3 The ***Quality Assurance Specialist*** reports directly to the ***Manager of Analytical Services***. The ***Quality Assurance Specialist*** is responsible for monitoring laboratory compliance with those requirements set forth in this Quality Assurance Manual. The ***Quality Assurance Specialist*** has the authority to issue requests for corrective action on items or activities found to be out of compliance with the Quality Assurance System. The ***Quality Assurance Specialist*** has the final authority on issues dealing with the quality of the data. The ***Quality Assurance Specialist*** has the authority to suspend analyses or require re-analyses.

2.4 The ***Supervising Chemist*** is considered the technical director of the areas under his/her direct supervision. Responsibilities include assisting and training of laboratory personnel with the various approved EPA methods utilized within the laboratory. Management of the day to day analytical activities of chemists, biologist and wastewater analysts. Evaluation, review and approval of data, and quality control statistics for the analyses performed in the laboratory. The Supervising Chemists report directly to the Manager of Analytical Services. A detailed job description for this position is on file with the Employee Resources Department.

2.5 The ***Logistic Chemists*** assists the Manager of Analytical Services and the QA/QC Specialist with coordination of administrative and operational functions including chemical inventory, disposition of laboratory equipment and supplies, data reporting, Chain of Custody procedures, project management, and scheduling. The Logistics Chemist reports directly to the QA/QC Specialist. A detailed job description for this position is on file with the Employee Resources Department.

2.6 The ***Advanced Instrumentation Chemist*** (AI Chemist) performs qualitative, and quantitative chemical analyses utilizing advanced instrumentation such as ICP, GFAA, Automated Analyzers, TOC and other instrumentation. The AI Chemist is responsible for troubleshooting and training on the advanced instrumentation. The AI Chemist reports directly to a Supervising Chemist. A detailed job description for this position is on file with the Employee Resources Department.

2.7 ***Chemists*** are responsible for the analysis of water samples such as municipal and industrial wastewater and sludge sample for various chemical analyses, including wet chemistry, physical properties and

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instrumental analyses. Chemist follow defined laboratory standard operating procedures and utilize good analytical techniques. They will also collect samples and transport samples utilizing chain of custody procedures defined by the laboratory. Chemists report directly to the Supervising Chemist. A detailed job description for this position is on file with the Employee Resources Department.

2.8 **Biologist** analyze water samples such as municipal and industrial wastewater and sludge sample for various bacteriological and microbiological components, bioassay, and physical and chemical, including wet chemistry, physical properties and instrumental analyses. Follow standard methods and good analytical techniques. Biologist follow defined laboratory standard operating procedures and utilize good analytical techniques. They will also collect samples and transport samples utilizing chain of custody procedures defined by the laboratory. The biologist report directly to the supervising chemist. A detailed job description for this position is on file with the Employee Resources Department

2.9 **Wastewater Analysts III** analyze water samples such as municipal and industrial wastewater and sludge sample for various chemical analyses, including wet chemistry, physical properties and instrumental analyses. Analysts follow defined laboratory standard operating procedures and utilize good analytical techniques. Wastewater Analyst will also collect samples and transport samples utilizing chain of custody procedures defined by the laboratory A detailed job description for this position is on file with the Employee Resources Department

2.10 ***Wastewater Analyst (I, II)*** analyzes water samples such as municipal and industrial wastewater and sludge sample for various chemical analyses, including wet chemistry, physical properties. Analysts follow defined laboratory standard operating procedures and utilize good analytical techniques. Wastewater Analyst will also collect samples and transport samples utilizing chain of custody procedures defined by the laboratory. A detailed job description for this position is on file with the Employee Resources Department.

2.11 The ***Sample Control Specialist***, administers, coordinates, documents, and participates in the chain of custody program controlling wastewater, sludge, industrial, and surface water samples submitted to Analytical Services. The Sample Control Specialist reports directly to the QA/QC Specialist. A detailed job description for this position is on file with the Employee Resources Department.

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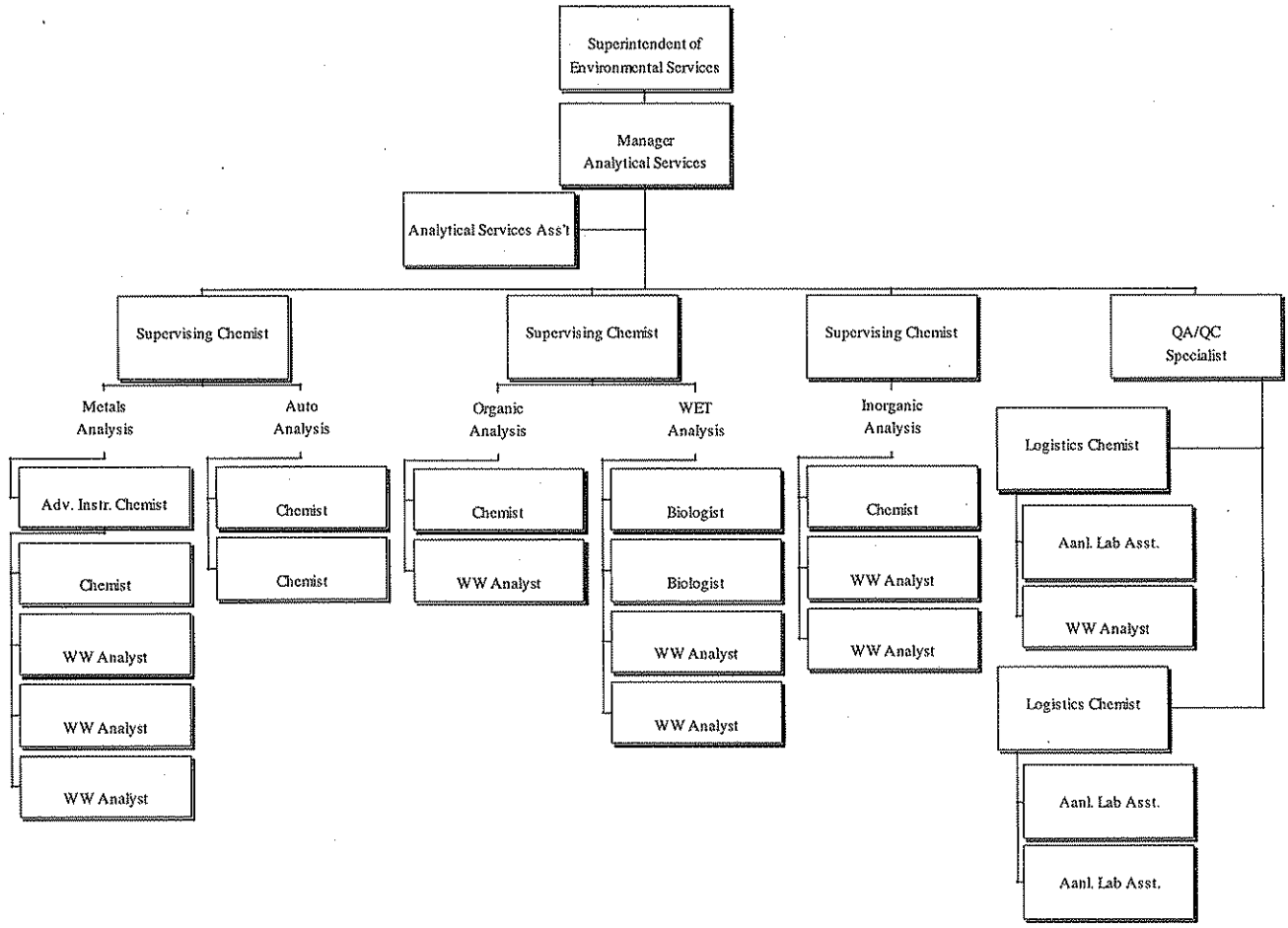
2.12 The ***Analytical Laboratory Assistant***, cleans, organizes and maintains laboratory glassware, sampling equipment, vehicles, refrigerator and general areas within the laboratory facilities. The lab assistant distributes and disposes of supplies and samples as directed. The Analytical Laboratory Assistant reports directly to the Logistic Chemist. A detailed job description for this position is on file with the Employee Resources Department

2.13 The ***Analytical Services Assistant*** assists the management staff of Analytical Services with the coordination of administrative tasks, operational functions, data reporting, document management and storage for compliance reports. A detailed job description for this position is on file with the Employee Resources Department

2.14 Table of Organization



3.0 Documents Control

3.1 Maintenance and management of the document control system is the responsibility of the Quality Assurance Specialist. Documents related to analysis, calibration, calculations and reports are maintained to allow for historical reconstruction of data.

3.2 The following documents are considered controlled documents and are to be maintained by the document control system

- 3.2.1 Quality Assurance Manual
- 3.2.2 Standard Operating Procedures
- 3.2.3 Analytical Data Sheets, Forms and Notebooks
- 3.2.4 Instrument Printouts and Run Logs
- 3.2.5 Batch records
- 3.2.6 Calibration curves and records
- 3.2.7 Method detection limits records
- 3.2.8 Training Records
- 3.2.9 Instrument Maintenance logs

3.3 Document Control System

3.3.1 Controlled documents are maintained by the document control system. Controlled documents exist as procedures or forms. Logs are maintained of both types of documents to prevent duplication, for reference and organization. Controlled documents must be issued and revised by use of the document control system.

3.3.2 Controlled documents must be approved by the Quality Assurance Specialist and must have a unique identifying number and reflect revision and or effective date.

3.3.3 The document control system is designed so only the current revision of each document is available for use. The document control system is a computerized system. The Quality Assurance Specialist maintains the control of documents on the computer network via password protection. Documents are available on the laboratory information management system as read only documents. Approved copies of controlled operating procedures are distributed throughout the laboratory. These documents are managed by the Quality Assurance Specialist. All analysts receive approved controlled copies of pertinent operating procedures that are stored in the Analytical Services Handbook. These operating procedures are managed by the Quality Assurance Specialist.

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3.3.4 When a new revision is issued the original signed hard copy is marked obsolete. The obsolete document is retained in the historic record to provide for reconstruction of laboratory activities. A new controlled copy of the analytical procedures will be placed in the area and the original copy will be destroyed. When a new revision of pertinent operating procedures has been issued, the Quality Assurance Specialist will collect any old version, and distribute the new controlled version of the operating procedure. The Quality Assurance Specialist will maintain the documentation needed for tracking of controlled copies of any operating procedures. Operating procedure that must be distributed to all Analytical Services Personnel will be performed during general meetings.

3.3.5 Support activities are documented on forms and maintained as controlled documents. Support activities include Quality Assurance assignments such as reagent standardization, equipment maintenance and thermometer and balance calibrations.

3.3.6 Records will reflect the dates, times, observations and identify the individual making the entries and observations. All controlled documents and records are retained for five years unless alternative arrangements are made.

4.0 Critical Staff Positions

4.1 The Manager of Analytical Services has authorized the establishment of the Quality Assurance System for the purpose of developing, monitoring and continually improving the quality control and documentation systems used within the laboratory. The Manager of Analytical Services will be informed of any non-compliance of the requirements of the Quality Assurance System. Enforcement of the requirements of the Quality Assurance System ultimately is the responsibility of the Manager of Analytical Services.

4.2 The Supervising Chemist of Analytical Services exercises actual day-to-day supervision of laboratory operations and reporting of results. These include:

4.2.1 Monitoring standards of performance in quality control and quality assurance.

4.2.2 Monitoring the validity of the analyses performed and data generated in the laboratory to assure reliable data.

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4.2.3 Provide support to laboratory in the review and response to corrective actions.

4.2.4 Provide technical support for development and improvement of methodologies.

4.2.5 Provide the focal point for technical training of employees.

4.3 Quality Assurance Specialist manages the Quality Assurance System as follows:

4.3.1 Reviewing Standard Operating Procedures for analytical and Quality Assurance procedures, assuring conformance with document control procedures.

4.3.2 Planning and conducting, if necessary, the training of analysts in good laboratory practices and test method requirements.

4.3.3 The analysis of trends in the laboratory precision and accuracy that are demonstrated by the results of analysis of quality control samples.

4.3.4 Serving as a focal point for the reporting and disposition of non-conformances.

4.3.4 Coordinating responses to Corrective Action Requests.

4.3.5 Suggesting actions to be taken in order to correct a problem with an analytical procedure.

4.3.6 Informing the Manger of Analytical Services of out-of-control situations: this includes the authority to require the laboratory to discontinue a procedure until corrective action brings the analysis back into control.

4.3.7 Maintaining the laboratory quality files and preparing routine Quality Control reports for review by the Manager and Superintendent.

4.4 Laboratory personnel are responsible to follow the Quality Assurance Manual and the related Standard Operating Procedures (SOP) as written. All laboratory personnel must adhere to issued quality control practices and procedures as stipulated by management and dictated by good laboratory practices. It is the responsibility of all laboratory personnel to

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advise management of observations that may result in the laboratory performance not attaining the objectives of the Quality Assurance System.

5.0 Traceability of Analytical Measurements

5.1 Analytical testing performed within the Analytical Services Department is performed on a batch basis. Each batch will be identified with a unique number for traceability. SOP-5010-1 Sample Batch Determination defines the procedures for creating preparation and analytical batches.

5.2 Samples are grouped based on matrix and time. Influent, effluent and pretreatment samples are all classified as a wastewater matrix. Sludge, grits and soils are classified as solid matrix. Each batch of samples is monitored by specified quality control activities.

5.3 Analytical measurements are recorded on controlled forms, or entered directly into the laboratory's Information Management System (LIMS) that collects all measurements and quality control activities associated with the batch. The date and time the analysis was performed, measurements obtained and calculations used to obtain the result are recorded.

4.4 Calibration curves are part of the document control system. Calibration dates are recorded thus analytical data can be traced to specific calibration curves.

4.5 Following data review the batch records become part of the record retention and filed for future retrieval. All records are stored on site for two years and then moved to off-site storage as defined in the District's record retention policy.

4.6 All recording and data corrections will be documented according to generally recognized good laboratory practices. These practices include recording in ink, dating, initialing entries and all correction will be made with a single-line through the old data and dated and initialed. The correction must not obscure the original entry.

6.0 Methods Performed

6.1 Analytical procedures are performed according to issued Standard Operating procedures derived from *Standard Method for the Examination of Water and Wastewater*, 20th ed and *Methods for Chemical Analysis of Water and Wastes* EPA 600/4-79-020

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TEST NAME	TEST METHODOLOGY
pH 150.1	EPA 150.1
Bisulfite-B601-93	AWWA-B601-93
Hypochlorite-B300-64	AWWA-B300-64
Alkalinity-310.2	EPA-310.2
TSS-160.2 + TVSS-160.4	EPA -160.4
TS 160.3	EPA 160.3
TDS - 160.1	EPA 160.1
Alkalinity-310.1	EPA 310.1
TDS-160.1 +TDVS - 160.4	EPA 160.4
Chloride-325.3	EPA 325.3
TS 160.3 + TVS - 160.4	EPA 160.3 & 160.4
Sulfate 375.4	EPA 375.4
%TVS-SM 2540E	Standard Methods 20th Ed.
Hexavalent Chrome-SM 3500	Standard Methods 20th Ed.
Setteable Solids-160.5	EPA 160.5
%TS-SM 2540B	Standard Methods 20th Ed.
Phenol EPA 420.4	EPA 420.4
Oil & Grease -1664	EPA 1664
Fecal Coliform -9222 D.	Std Methods 19th 9222 D.
COD-EPA 410.4	EPA 410.4
E. Coli-9213 D	Std Methods, 20 ed. 9213 D
Total Coliform - 9222 B.	Std Methods 20th, 9222 B.
Fecal Strep - 9230 C.	Std Methods 20th, 9230 C
Total Chlorine Residual - 4500-Cl G.	Std Method 20th, 4500-Cl G.
Total Chlorine Residual -4500-Cl F.	Std Methods 20th, 4500-Cl F.
BOD-Total - 5 Day - 405.1	EPA 405.1
Conductivity SM 2510B	SM 2510B
Turbidity SM 2130B	SM 2130B
Fluoride-9214	EPA 9214
Phosphorus Total-365.2	EPA 365.2
Phosphorus-Soluble EPA 365.2	EPA 365.2
Phosphorus Ortho-365.2	EPA 365.2
Acidity-305.1	EPA 305.1
Field Conductance SM 2510A	SM 2510A
Cyanide Total-335.2	EPA 335.2
BOD-Carbonaceous - 5 DAY - 405.1	EPA-405.1
BOD-Soluble - 5 Day - 405.1	EPA-405.1
Cyanide WAD-335.2	EPA - 335.2
Nitrogen NH3-350.1	EPA-350.1
Nitrogen-NO3 + NO2 353.2	EPA 353.2
Nitrogen Nitrite354.1	EPA 354.1
Field D.O. SM 4500-0 G	SM 4500-0 G
Field Temperature EPA 170.1	EPA 170.1
Field Turbidity EPA 180.1	EPA 180.1
Field TDS EPA 160.1	EPA 160.1
GFAA As EPA 206.2	EPA 206.2

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TEST NAME	TEST METHODOLOGY
GFAA Ag-EPA 272.2	EPA 272.2
Cyanide- Amenable SM 4500 CN G	SM 4500 CN G
ICP-Daily Metals-200.7	EPA-200.7
ICP-Total Metals-200.7	EPA-200.7
Cyanide 1677	EPA 1677
Mercury 245.2	EPA 245.2
Mercury 1631	EPA 1631
Nitrogen TKN-351.1	EPA-351.1
BOD-Winkler-Azide Modification Method	STM 20th edition 4500-O C.
TSS 160.2	EPA 160.2
Mercury 1631-Dissolved	EPA 1631
Oil & Grease -SGT HEM 1664	EPA 1664
GFAA Se EPA 270.2	EPA 270.2
Phosphorus-Soluble-Automated	EPA 365.2

7.0 Capabilities Review for Addition to Methods Performed

7.1 Tests may be added to methods performed after a review of resources and capabilities.

7.2 The Manager of Analytical Services is to review equipment, space and personnel resources to determine the capabilities of the laboratory to add methods.

7.3 The Quality Assurance Specialist is to review the method for proper quality control activities to be instituted for routine method performance evaluation.

7.4 The Quality Assurance Specialist and the Supervising Chemist are to review method validation requirements such as calibration requirements, method detection limit determination, training needed, accuracy and precision of the method for desired use of the data.

7.5 Following a determination that resources are satisfactory for successful performance, a test may be added. Standard Operating Procedures and method detection limit studies are to be added to the appropriate documentation.

8.0 Traceability of Calibration and Method Validation

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8.1 Method Linearity Studies

8.1.1 Linearity studies are performed were appropriate to define the working range of the method and demonstrate that the response is linearly proportional to the analyte concentration.

8.1.2 Standards traceable to the National Institute of Standards are used for linearity studies. Vendor certification is retained for reference.

8.1.3 The correlation coefficient of the calibration curve must be 0.995 or better unless specified in individual Standard Operating Procedure. The linearity studies will also define the working range of the method.

8.1.4 The reporting level of a method must be included in the calibration curve, or must be verified each day of use with a control sample at the reporting level with 70%-130% recovery.

8.2 Method Specificity

8.2.1 Methods used at Northeast Ohio Regional Sewer District Laboratory are approved for monitoring and reporting to the Ohio Environmental Protection Agency.

8.2.1. Specificity is not monitored directly. Method bias is monitored by performing duplicate and spike analysis. Individual Standard Operating Procedures define the frequency and limits for variability and recoveries.

8.3 Method Accuracy

8.3.1 Method accuracy is monitored by the analysis of standards with each batch of samples. Individual Standard Operating Procedures define the acceptable performance.

8.3.2 The laboratory participates in proficiency test programs where sample are analyzed without prior knowledge of certified concentrations. Results are evaluated after the completion of the studies and any problem identified are addressed with corrective actions.

8.4 Method Precision

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8.4.1 Method precision may be evaluated by the use of control samples of known concentration.

8.4.2 Sample matrix effects may create a positive bias or a negative bias. Method precision on specific samples is measured by the used of duplicates, spikes and spike duplicates. The accuracy is measured by the recovery and reproducibility of the recoveries.

8.5 Reagents and Standards

8.5.1 The type and purity of chemicals, reagents and solvents shall be dictated by the analytical method. Chemicals, reagents, and reference standards are purchased based upon the method specifications for each analysis regarding the purity of the material to be used in the analytical procedure. If a method does not specify the purity, then reagent grade (or better) chemicals, reagents and reference standards are purchased.

8.5.2 A reagent or chemical that does not meet the method specifications or is beyond the expiration date shall not be used.

8.5.3 The purity of reagents and solvents shall be monitored through reagent blanks that are analyzed with each set of samples.

8.5.4 Reference materials (standards) used to calibrate instruments or validate and monitor analytical methods must be National Institute of Standards Technology (NIST) traceable or equivalent.

8.5.5 When the laboratory receives a chemical the chemical is labeled with the following information:

8.5.5.1 Date of receipt,
8.5.5.2 Open date,
8.5.5.3 Expiration date,
8.5.5.4 Analyst initials.
8.5.5.5 Unique Trace ID

8.5.6 Reagents are prepared in a controlled room for most analytical procedures. All procedures are documented and reagents are labeled prior to use in the laboratory.

8.5.7 Buffers are discarded 6 months after being opened or after the manufacturer's expiration date. All other chemical reagents are maintained for six years after receipt, or according to manufacturer's expiration date, which ever comes first.

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9.0 Sample Receipt and Handling

9.1 Samples analyzed at the within the Analytical Services Departments are not limited to pretreatment samples, plant influent, plant effluent, plant process control samples and receiving water from the treatment facility. Other sample types include sludge, soils, sediments and industrial wastes.

9.2 Samples are collected in designated containers, labeled with the date and delivered to the laboratory.

9.3 Chain of Custody procedures are defined in **SOP-5005-X Chain of Custody**.

9.3 Laboratory personnel track samples by the sampling location and the sampling date. A unique sample identifier is assigned by the LIMS.

9.4 If analysis is delayed samples are preserved and/or stored in refrigeration units until processed. Individual Standard Operating Procedures specify preservation and holding times. The hold time for grab samples starts from the time of sampling. The hold time for composite samples is measured from the time the sampling was completed.

9.5 Samples transferred to contract laboratories will be collected in bottles provided by the contract laboratory, and chain of custody forms. Sample storage will be performed at the instruction of the contracting laboratory.

10.0 Facility and Equipment

10.1 The laboratory facility is heated and cooled to maintain stable conditions throughout the year. Thermostats are programmable and provide control for laboratory and office spaces.

10.2 Hot and cold water are provided throughout the laboratory. Sinks are located throughout the laboratory to accommodate need. Laboratory water consists of a main Reverse Osmosis/Deionization (RO/DI) system.

10.3 Laboratory areas are limited access areas. Safety design was given top priority in the facility. Emergency showers, eye wash stations, and fire extinguishers are located throughout the laboratory.

10.4 Exhaust hoods are located in the laboratory for use when fume or odors are of concern. General fume hoods and local dedicated venting systems are located throughout the laboratory to provide adequate space for safe handing of materials and prevent exposure.

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11.0 Equipment Calibration and Maintenance

11.1 Preventive maintenance is a scheduled program of actions taken to maintain analytical instruments and equipment and is performed whether or not the performance of the equipment indicates a need for. This maintenance is designed to eliminate the downtime that might occur from instrument failure.

11.2 The Management Staff of Analytical Services is responsible for ensuring all preventive maintenance is performed according to laboratory procedures. Instrument specific-standard operating procedures detail the maintenance program that is in place at the Northeast Ohio Regional Sewer District Laboratory.

11.2 Analytical balances are serviced under contact with the manufacturer. The calibration records are maintained as specified in the document control system.

11.3 Thermometers are calibrated annually and traceable to the National Institute of Standard. The maintenance and calibration of thermometers is addressed in specific Standard Operating procedure(s).

11.4 Ovens, refrigerators and incubators are monitored daily for acceptable performance. Adjustments are made as needed to meet specifications. Equipment needing continual adjustment is scheduled for servicing. The Quality Assurance Officer is responsible for reviewing records for performance compliance.

12.0 Data Verification and Internal Quality Control Activities

12.1 Each analyst is responsible for verifying the correctness of the data produced by any method. This verification includes reviewing the acceptability of produced data with respect to:

- 12.1.1 Correctness of numerical input
- 12.1.2 Numerical correctness of calculations
- 12.1.3 Acceptability of quality assurance/quality control data
- 12.1.4 Instrument operation according to method specifications (calibrations, performance checks, etc.)
- 12.1.5 Documentation of dilutions, standard concentrations, etc.

12.2 The analyst is further required to perform data review for each batch of samples. This review includes the prescribed QC activities, calculations and supporting documentation as specified by internal procedures. If changes are made to data or reports the changes will be clearly marked to show that they are to replace previously submitted data.

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12.3 Data will be archived to allow the easy retrieval for submittal when requested. Raw data shall be kept with batch records. All files will be archived for five years, unless previous arrangements have been made with the customer.

12.4 Method Blanks (MB) are processed and analyzed with each analytical batch. Method blanks are used in the evaluation of contamination control practices. Method blanks with values ± the method reporting level are considered in control and related data can be reported without qualifiers. Data associated with methods blanks that do not meet acceptance criteria can only be reported as specified in specific procedures.

12.5 Initial Calibration Verification (ICV) standards are analyzed with each batch in order to evaluate stability of the calibration curve. This standard must be from an independent source.

12.6 Continuing Calibration Verification Standards (CCV) are analyzed with each batch in order to evaluate stability of the calibration curve. The acceptance criteria for each analytical method are specified in individual SOPs.

12.7 Laboratory Control Standard (LCS) is analyzed with each batch as required by standard operating procedures. An LCS is used to evaluate the methodology. If an LCS is in control it is considered evidence that the procedure was in control when performed. The limits for the control standard are specified in individual method SOPs. An LCS may not be available for some methods such as dissolved oxygen. Individual SOPs will specify activities to be performed.

12.8 Matrix Spikes and Matrix Spike Duplicates (MS/MSD) are analyzed in order to determine matrix effect and to evaluate precision. Alternatively, a duplicate and a spike, if appropriate, are performed per batch. The limits for spike recovery and precision are dependent on the analyte and method. Individual SOPs specify limits and actions to be taken. Methods such as pH and suspended solids cannot be spiked. Individual SOPs will specify activities to be performed.

12.9 Raw analytical data are recorded, dated, initialed, or signed on analytical data sheets. Data from instrument output is dated and initialed. Analytical data sheets include provisions for the QC data, including calibration data, method blank data, duplicate data, spike data, and laboratory control standard data, as appropriate for each analytical procedure.

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12.10 On-going quality control data generated is tracked per standard operating procedures. Generation of control charts is the responsibility of the analysts. Review of the control charts is the responsibility of the Supervising Chemist. When anomalies or out of control conditions arise, the Quality Control Specialist is contacted to initiate required corrective action as prescribed in individual standard operating procedures.

12.11 Reagents and chemicals used are of the purity specified in the procedure. Method blanks are carried through analysis procedures as an evaluation of contamination and stability of reagents.

13.0 Corrective Actions

13.1 The Quality Assurance Specialist is responsible for the administration of the corrective action system. The system is to be used to assign responsibility, document action taken and to track activities in order to ensure completion of assignments and meeting of deadlines.

13.2 Method specific corrective action is specified in individual procedural SOPs. Method specific corrective actions mainly address quality control activities that do not meet acceptance criteria specified in the individual standard operating procedures. If these actions fail to correct the observed non-compliance then the corrective action system is to be followed.

13.3 The corrective action system can be used to respond to findings of internal, customer or regulatory audits. The corrective action system can be used to respond to adverse events in the processing of materials. Corrective action may be used to respond to customer complaints. The corrective action system is used whenever departures from documented policies or procedures occur. Changes in the Quality System are documented using the Corrective Action System.

13.4 Completed corrective action are documented and maintained by the Quality Assurance Specialist. Records are maintained with the other controlled documents for 5 years.

14.0 Control of Data Generated from non-Conforming Activities

14.1 The Quality Assurance Specialist is responsible for responding to activities (i.e. calibration, analysis) that are non-conforming to policy and specifications. The Quality Assurance Specialist is to be responsible for the gathering of information needed to assess the impact of the non-conformance on data and laboratory performance.

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14.2 The Manager of Analytical Services, the Quality Assurance Specialist and addition individuals at the discretion of the Superintendent are to evaluate the significance of the non-conformance and the corrective action.

14.3 The review must include if client notification is necessary, if work must be recalled and when work can resume.

14.4 The response to the non-conformance is to be documented and handled through the corrective action system.

15.0 Complaints

15.1 Complaints are to be directed to the Manager of Analytical Services or the Quality Assurance Specialist. The Manager of Analytical Services or the Quality Assurance Specialist will determine if the complaint merits a response.

15.2 When a complaint raises doubt concerning the laboratory's compliance with the laboratory's policies or procedures or with the quality of the laboratory's results, those areas involved will be audited.

15.3 When the complaint meets the criteria above the corrective action system will be used to initiate, track and respond to the complaint and its findings.

16.0 Confidentiality and Public Access

16.1 Northeast Ohio Regional Sewer District Laboratory is part of a public entity and as such the information generation by the laboratory may be public information.

16.2 All external requests for laboratory data from agencies not currently working with the District must be directed to the Districts Legal Department. All other request can be directed to the Manager of Analytical Services for resolution.

17.0 Data Review and Audits

17.1 The Quality Assurance Specialist will be responsible for audits. Northeast Ohio Regional Sewer District Laboratory personnel may perform audits or an outside auditor may be contracted to perform audits.

17.2 The audits are to verify if the laboratory is in compliance with the requirements of the laboratory's quality system as defined in the Quality Manual and standard operating procedures. The results of the audits are

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considered internal information and not released during audits or inspections.

17.3 Response to findings during an audit is handled through the Corrective Action System.

18.0 Training and Demonstration of Capability

18.1 The Quality Assurance Specialist is responsible for an annual review of the performance records of the laboratory personnel.

18.2 A review of the performance on required quality control activities on each analytical procedure will be used to evaluate an analyst's capability. If the last four laboratory control samples are in control this will be considered sufficient evidence that the analyst is capable of performing the procedure.

18.3 If one the last four laboratory control samples do not meet the method acceptance criteria then training may be required by the Quality Assurance Specialist. Required training is to be documented as corrective action.

18.4 Demonstration of capability to add a new method will be accomplished by analyzing a laboratory control sample four times. The average recovery and standard deviation will be calculated and if the laboratory values are within the published limits the procedure can be performed in the laboratory. Corrective action must be performed and the analysis repeated until it can be demonstrated that the laboratory can generate the expected performance data.

19.0 Ethical Conduct

19.1 It is the policy of Northeast Ohio Regional Sewer District Laboratory to perform our duties in a manner that will reflex our commitment to highest possible ethical standard. We will perform and report our work in a manner that accurately reflects the results obtained in the laboratory.

19.2 Management will provide and document training on the ethical conduct expected in the performance of laboratory duties. Ethics training includes examples of unacceptable conduct, how to report observed misconduct and possible penalties.

19.3 It is the responsibility of every employee to report only his or her own data and to report it accurately. Every employee has the responsibility to notify management when they become aware of unethical conduct by another employee.

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20.0 Reporting of Data

20.1 Northeast Ohio Regional Sewer District Laboratory provides service to the Director of Operations and Maintenance for regulatory reporting, and facility operation. Report services for the pretreatment and stream monitoring programs are provided to the Manager of Water Quality and Industrial Surveillance. Reports will be in a format that will allow the Superintendent to meet these goals. Release of information to a third party is at the instruction of the Director of Operations and Maintenance and the District's Legal Department.

20.2 Reports will clearly reflect the sample identification; date sampled, results obtained and reporting units.

Property of NEORSD. This is a date sensitive document and may not be current after 4/11/06.
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Appendix F

OhioEPA
State of Ohio Environmental Protection Agency

STREET ADDRESS:
Lazarus Government Center
122 S. Front Street
Columbus, Ohio 43215

TELE: (614) 644-3020 FAX: (614) 644-3184
www.epa.state.oh.us

MAILING ADDRESS:
P.O. Box 1049
Columbus, OH 43216-1049

Effective Date: June 30, 2006
Expiration Date: June 29, 2008

CERTIFIED MAIL

ENTERED DIRECTOR'S JOURNAL
JUN 30 2006
OHIO E.P.A.

Kathryn Crestani
Northeast Ohio Regional Sewer District
4075 West 215 Street
Fairview Park, Ohio 44126

Re: Qualified Data Collector Approval, Surface Water Volunteer Monitoring Program

Dear Ms. Crestani:

The Division of Surface Water Volunteer Monitoring (Credible Data) Program has reviewed your Qualified Data Collector (QDC) application. Pursuant to Ohio Revised Code (ORC) 6111.53 and Ohio Administrative Code (OAC) 3745-4-03, you are approved as a QDC for the following level and specialty:

QDC Level: 3
QDC Specialty: Chemical Water Quality Assessment
QDC number: 011

Please use this QDC number on all correspondence, study plans, etc. submitted to Ohio EPA.

As noted at the top of this letter, this status is effective as of the date of this letter and expires two years from that date. You may now submit study plans to the Volunteer Monitoring Program.

A renewal application must be submitted in accordance with OAC 3745-4-03(C). As provided in this rule, renewal of status is contingent upon active participation in the Volunteer Monitoring Program at the designated level and specialty. Lack of such participation will prevent you from renewing your status, but you may re-apply for initial QDC status.

As a reminder, your status is contingent upon the absence of any trespassing violation (within the previous five years) by you or any person sampling under your supervision. Always obtain land owner permission prior to sampling.

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.
6/30/06

Bob Taft, Governor
Bruce Johnson, Lieutenant Governor
Joseph P. Koncelik, Director

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Additionally, collection (and retention) of aquatic biological samples (this includes fish, macroinvertebrates, mollusks, and shells) requires a collector's permit from the Ohio Department of Natural Resources/Division of Wildlife. Obtain this permit prior to collection of any biological samples.

The approval of this certification is a final action of the director of Ohio EPA and may be appealed to the Environmental Review Appeals Commission pursuant to ORC 3745.04. The appeal must be in writing and set forth the action complained of and the grounds upon which the appeal is based. It must be filed with the Commission within thirty days after notice of the director's action. Notice of the filing of the appeal must be filed with the director within three days after the appeal is filed with the commission. An appeal may be filed with the Commission at the following address: 309 South Fourth Street, Room 222, Columbus, Ohio 43215.

Sincerely,

Joseph P. Koncelik
Director

OhioEPA
State of Ohio Environmental Protection Agency

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Lazarus Government Center
122 S. Front Street
Columbus, Ohio 43215

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Effective Date: June 30, 2006
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ENTERED DIRECTOR'S JOURNAL
JUN 30 2006
OHIO E.P.A.

Seth Hothem
Northeast Ohio Regional Sewer District
7815 Dartworth Drive
Parma, Ohio 44129

Re: Qualified Data Collector Approval, Surface Water Volunteer Monitoring Program

Dear Mr. Hothem:

The Division of Surface Water Volunteer Monitoring (Credible Data) Program has reviewed your Qualified Data Collector (QDC) application. Pursuant to Ohio Revised Code (ORC) 6111.53 and Ohio Administrative Code (OAC) 3745-4-03, you are approved as a QDC for the following level and specialty:

QDC Level: 3
QDC Specialty: Chemical Water Quality Assessment
QDC number: 010

Please use this QDC number on all correspondence, study plans, etc. submitted to Ohio EPA.

As noted at the top of this letter, this status is effective as of the date of this letter and expires two years from that date. You may now submit study plans to the Volunteer Monitoring Program.

A renewal application must be submitted in accordance with OAC 3745-4-03(C). As provided in this rule, renewal of status is contingent upon active participation in the Volunteer Monitoring Program at the designated level and specialty. Lack of such participation will prevent you from renewing your status, but you may re-apply for initial QDC status.

As a reminder, your status is contingent upon the absence of any trespassing violation (within the previous five years) by you or any person sampling under your supervision. Always obtain land owner permission prior to sampling.

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Bob Taft, Governor
Bruce Johnson, Lieutenant Governor
Joseph P. Koncelik, Director

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6/30/06

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The approval of this certification is a final action of the director of Ohio EPA and may be appealed to the Environmental Review Appeals Commission pursuant to ORC 3745.04. The appeal must be in writing and set forth the action complained of and the grounds upon which the appeal is based. It must be filed with the Commission within thirty days after notice of the director's action. Notice of the filing of the appeal must be filed with the director within three days after the appeal is filed with the commission. An appeal may be filed with the Commission at the following address: 309 South Fourth Street, Room 222, Columbus, Ohio 43215.

Sincerely,

Joseph P. Koncelik
Director

Ohio EPA
State of Ohio Environmental Protection Agency

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122 S. Front Street
Columbus, Ohio 43215

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P.O. Box 1049
Columbus, OH 43216-1049

OHIO E.P.A.
JUL 24 2006
ENTERED DIRECTOR'S JOURNAL

CERTIFIED MAIL

Effective Date: July 24, 2006
Expiration Date: July 23, 2008

Tiffany Lynn Moore
Northeast Ohio Regional Sewer District
8927 Weaver Road
Ravenna, Ohio 44266-8057

Re: Qualified Data Collector Approval, Surface Water Volunteer Monitoring Program

Dear Ms. Moore:

The Division of Surface Water Volunteer Monitoring (Credible Data) Program has reviewed your Qualified Data Collector (QDC) application. Pursuant to Ohio Revised Code (ORC) 6111.53 and Ohio Administrative Code (OAC) 3745-4-03, you are approved as a QDC for the following level and specialty:

QDC Level: 3
QDC Specialty: Chemical Water Quality Assessment
QDC number: 017

Please use this QDC number on all correspondence, study plans, etc. submitted to Ohio EPA.

As noted at the top of this letter, this status is effective as of the date of this letter and expires two years from that date. You may now submit study plans to the Volunteer Monitoring Program.

A renewal application must be submitted in accordance with OAC 3745-4-03(C). As provided in this rule, renewal of status is contingent upon active participation in the Volunteer Monitoring Program at the designated level and specialty. Lack of such participation will prevent you from renewing your status, but you may re-apply for initial QDC status.

As a reminder, your status is contingent upon the absence of any trespassing violation (within the previous five years) by you or any person sampling under your supervision. Always obtain land owner permission prior to sampling.

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency
7-24-06

Additionally, collection (and retention) of aquatic biological samples (this includes fish, macroinvertebrates, mollusks, and shells) requires a collector's permit from the Ohio Department of Natural Resources/Division of Wildlife. Obtain this permit prior to collection of any biological samples.

The approval of this certification is a final action of the director of Ohio EPA and may be appealed to the Environmental Review Appeals Commission pursuant to ORC 3745.04. The appeal must be in writing and set forth the action complained of and the grounds upon which the appeal is based. It must be filed with the Commission within thirty days after notice of the director's action. Notice of the filing of the appeal must be filed with the director within three days after the appeal is filed with the commission. An appeal may be filed with the Commission at the following address: 309 South Fourth Street, Room 222, Columbus, Ohio 43215.

Sincerely,

Joseph P. Koncelik
Director

State of Ohio Environmental Protection Agency

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Lazarus Government Center
122 S. Front Street
Columbus, Ohio 43215

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P.O. Box 1049
Columbus, OH 43216-1049

Effective Date: June 30, 2006
Expiration Date: June 29, 2008

CERTIFIED MAIL

ENTERED DIRECTOR'S JOURNAL
JUN 30 2006
OHIO E.P.A.

John W. Rhodes
Northeast Ohio Regional Sewer District
22370 Blossom Drive
Rocky River, Ohio 44116

Re: Qualified Data Collector Approval, Surface Water Volunteer Monitoring Program

Dear Mr. Rhodes:

The Division of Surface Water Volunteer Monitoring (Credible Data) Program has reviewed your Qualified Data Collector (QDC) application. Pursuant to Ohio Revised Code (ORC) 6111.53 and Ohio Administrative Code (OAC) 3745-4-03, you are approved as a QDC for the following level and specialty:

QDC Level: 3
QDC Specialty: Chemical Water Quality Assessment
QDC number: 008

Please use this QDC number on all correspondence, study plans, etc. submitted to Ohio EPA.

As noted at the top of this letter, this status is effective as of the date of this letter and expires two years from that date. You may now submit study plans to the Volunteer Monitoring Program.

A renewal application must be submitted in accordance with OAC 3745-4-03(C). As provided in this rule, renewal of status is contingent upon active participation in the Volunteer Monitoring Program at the designated level and specialty. Lack of such participation will prevent you from renewing your status, but you may re-apply for initial QDC status.

As a reminder, your status is contingent upon the absence of any trespassing violation (within the previous five years) by you or any person sampling under your supervision. Always obtain land owner permission prior to sampling.

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.
By: [signature] Date: 6/30/06

Bob Taft, Governor
Bruce Johnson, Lieutenant Governor
Joseph P. Koncelik, Director

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Additionally, collection (and retention) of aquatic biological samples (this includes fish, macroinvertebrates, mollusks, and shells) requires a collector's permit from the Ohio Department of Natural Resources/Division of Wildlife. Obtain this permit prior to collection of any biological samples.

The approval of this certification is a final action of the director of Ohio EPA and may be appealed to the Environmental Review Appeals Commission pursuant to ORC 3745.04. The appeal must be in writing and set forth the action complained of and the grounds upon which the appeal is based. It must be filed with the Commission within thirty days after notice of the director's action. Notice of the filing of the appeal must be filed with the director within three days after the appeal is filed with the commission. An appeal may be filed with the Commission at the following address: 309 South Fourth Street, Room 222, Columbus, Ohio 43215.

Sincerely,

Joseph P. Koncelik
Director

Ohio EPA
State of Ohio Environmental Protection Agency

OHIO E.P.A.

JUL 24 2006

ENTERED DIRECTOR'S JOURNAL

STREET ADDRESS:
Lazarus Government Center
122 S. Front Street
Columbus, Ohio 43215

TELE: (614) 644-3020 FAX: (614) 644-3184
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MAILING ADDRESS:
P.O. Box 1049
Columbus, OH 43216-1049

Effective Date: July 24, 2006
Expiration Date: July 23, 2008

CERTIFIED MAIL

Tom Zablotny
Northeast Ohio Regional Sewer District
1660 Melody Lane
Medina, Ohio 44356

Re: Qualified Data Collector Approval, Surface Water Volunteer Monitoring Program

Dear Mr. Zablotny:

The Division of Surface Water Volunteer Monitoring (Credible Data) Program has reviewed your Qualified Data Collector (QDC) application. Pursuant to Ohio Revised Code (ORC) 6111.53 and Ohio Administrative Code (OAC) 3745-4-03, you are approved as a QDC for the following level and specialty:

QDC Level: 3
QDC Specialty: Chemical Water Quality Assessment
QDC number: 018

Please use this QDC number on all correspondence, study plans, etc. submitted to Ohio EPA.

As noted at the top of this letter, this status is effective as of the date of this letter and expires two years from that date. You may now submit study plans to the Volunteer Monitoring Program.

A renewal application must be submitted in accordance with OAC 3745-4-03(C). As provided in this rule, renewal of status is contingent upon active participation in the Volunteer Monitoring Program at the designated level and specialty. Lack of such participation will prevent you from renewing your status, but you may re-apply for initial QDC status.

As a reminder, your status is contingent upon the absence of any trespassing violation (within the previous five years) by you or any person sampling under your supervision. Always obtain land owner permission prior to sampling.

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency

By [signature] 7-24-06

Bob Taft, Governor
Bruce Johnson, Lieutenant Governor
Joseph P. Koncelik, Director

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Sincerely,

Joseph P. Koncelik
Director

Ohio EPA
State of Ohio Environmental Protection Agency

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122 S. Front Street
Columbus, Ohio 43215

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Columbus, OH 43216-1049

Effective Date: June 30, 2006
Expiration Date: June 29, 2008

CERTIFIED MAIL

OHIO E.P.A.
JUN 30 2006
ENTERED DIRECTOR'S JOURNAL

Catherine M. Zamborsky
Northeast Ohio Regional Sewer District
1749 Royalwood Road
Broadview Heights, Ohio 44147

Re: Qualified Data Collector Approval, Surface Water Volunteer Monitoring Program

Dear Ms. Zamborsky:

The Division of Surface Water Volunteer Monitoring (Credible Data) Program has reviewed your Qualified Data Collector (QDC) application. Pursuant to Ohio Revised Code (ORC) 6111.53 and Ohio Administrative Code (OAC) 3745-4-03, you are approved as a QDC for the following level and specialty:

QDC Level: 3
QDC Specialty: Chemical Water Quality Assessment
QDC number: 009

Please use this QDC number on all correspondence, study plans, etc. submitted to Ohio EPA.

As noted at the top of this letter, this status is effective as of the date of this letter and expires two years from that date. You may now submit study plans to the Volunteer Monitoring Program.

A renewal application must be submitted in accordance with OAC 3745-4-03(C). As provided in this rule, renewal of status is contingent upon active participation in the Volunteer Monitoring Program at the designated level and specialty. Lack of such participation will prevent you from renewing your status, but you may re-apply for initial QDC status.

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I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.
By: [signature] Date: 6/30/06

Bob Taft, Governor
Bruce Johnson, Lieutenant Governor
Joseph P. Koncelik, Director

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Additionally, collection (and retention) of aquatic biological samples (this includes fish, macroinvertebrates, mollusks, and shells) requires a collector's permit from the Ohio Department of Natural Resources/Division of Wildlife. Obtain this permit prior to collection of any biological samples.

The approval of this certification is a final action of the director of Ohio EPA and may be appealed to the Environmental Review Appeals Commission pursuant to ORC 3745.04. The appeal must be in writing and set forth the action complained of and the grounds upon which the appeal is based. It must be filed with the Commission within thirty days after notice of the director's action. Notice of the filing of the appeal must be filed with the director within three days after the appeal is filed with the commission. An appeal may be filed with the Commission at the following address: 309 South Fourth Street, Room 222, Columbus, Ohio 43215.

Sincerely,

Joseph P. Koncelik
Director

Appendix G

DIVISION OF WILDLIFE

Ohio Department of Natural Resources

Division of Wildlife Headquarters
2045 Morse Road, Bldg. G
Columbus, Ohio 43229-6693
1-800-WILDLIFE

WILD ANIMAL PERMIT: 108

SCIENTIFIC COLLECTION

STEVEN A GRAY
Chief, Division of Wildlife

DATE ISSUED
10/19/2006

Others authorized on permit
YES (SEE ATTACHMENT)

JOHN W. RHOADES
4747 EAST 49TH ST.
CUYAHOGA HTS., OH 44125-1011

SOCIAL SECURITY NUMBER:

is hereby granted permission to take, possess, and transport at any time and in any manner specimens of wild animals, subject to the conditions and restrictions listed below or any documents accompanying this permit.

This permit, unless revoked earlier by the Chief, Division of Wildlife, is effective from: 3/28/2006 to: 3/15/2007

This permit must be carried while collecting wild animals and be exhibited to any person on demand.

THIS PERMIT IS RESTRICTED TO THE FOLLOWING:

A. Specific Restrictions:

1. Permittee may collect fish and aquatic macro-invertabrates for survey and inventory purposes. All endangered species are to be release a site of capture.
2. Permittee must consult with Wildlife's Stream Conservation and Environmental Assessment Unit (SCEA) prior to conducting any wild animal work associated with compliance requirements of the Clean Water Act (CWA) Section 401 and/or 404. Contact the unit at 614/265-6308 (Bob Fletcher) or 614/265-6631 (Becky Jenkins).
3. 24 hours prior to setting trap nets or gillnets, contact must be made with the local wildlife officer or nearest district office to advise location and duration of sampling. All vouchers are to be deposited at NEORSD.
4. Collection is prohibited in Big Darby, Little Darby, Chagrin river and Fish Creek (Williams County) without explicit written permission from the Division of Wildlife.
5. Permittee must provide an annual report of collecting activities to the Division of Wildlife. Report shall provide species, quanity and locations of collection.

B. Locations of Collecting

STATEWIDE

C. Equipment and method used in collection:

SEINES, TRAP NETS AND ELECTROSHOCKER.

D. Name and number of each species to be collected:

FISH AND MACROINVERTEBRATES AS REQUIRED. ALL FISH (EXCEPT VOUCHER SPECIES) MUST BE RELEASED AT THE COLLECTION SITE.

G. An annual report detailing the date(s), location(s), quanitities and species collected must be submitted to the Division of Wildife by the following February 1st from issued date above.

This permit is not valid for collecting migratory birds, their nests, or eggs unless a current permit from the U.S. Fish and Wildlife Service has been obtained.

F. Additional restrictive documents accompanying this permit?

G. NO ENDANGERED SPECIES MAY BE TAKEN WITHOUT WRITTEN PERMISSION FROM THE CHIEF

OHIO
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF WILDLIFE

ATTACHMENT

This attachment to Scientific Collecting Permit # 108 authorizes the following persons to conduct the activities listed on the permit, within the conditions and restrictions set forth. Each person must carry and exhibit upon request, a copy of the permit and this attachment when conducting any of the listed activities. The person named on the permit assumes full responsibility for the actions of the persons on this list and for completing and submitting all required reports.

Name	Social Security No.
SETH HOTHEM	
THOMAS ZABLOTNY	
CATHERINE ZAMBORSKY	
TIFFANY MOORE	
ELIZABETH TOOT-LEVY	
KATHRYN CRESTANI	
RON MAICHLE	