## Level 3 Project Study Plan

### *2015 West Creek Environmental Monitoring*

(1) Objectives

During 2007 and 2008, the Northeast Ohio Regional Sewer District (NEORSD) completed baseline environmental assessments at five sites on West Creek which included river miles (RM) 7.90, 3.65, 2.40, 1.60, and 0.20. The baseline sampling in West Creek was completed to assess the conditions of the creek prior to restoration activities.

From July 13, 2012, through October 12, 2012, in-stream restoration activities were completed on West Creek at RM 3.65, RM 2.10 and RM 1.60. The goals of the restoration activities were to improve existing in-stream habitat, construct additional in-stream habitat, remove or alter existing fish migration barriers, and re-stabilize eroding stream banks by utilizing bioengineered technology and natural channel design techniques.

From spring 2013 through spring 2014, in-stream restoration activities took place at West Creek RM 0.20. The goal of the restoration activities was to construct a working, living floodplain. This was accomplished with the construction and improvement of in-stream habitat, demolition of a hardened channel that confined the creek, and re-stabilization and re-vegetation of the stream bank in the affected area. Also accomplished was the construction of a backwater channel within the floodplain to capture overbank flows from the channel and Cuyahoga River.

In 2014, post-restoration monitoring was conducted at RMs 3.65, 2.10, 1.60, and 0.20 on West Creek where in-stream habitat restoration work was completed. Results from the post monitoring were evaluated to determine any improvements in the fish or macroinvertebrate communities and the results were compared to data collected during the *2007* and *2008 West Creek Restoration Evaluation* studies to illustrate spatial and temporal trends.

In 2015, environmental assessment work will be completed at the same sites as in 2014 and will also include an evaluation at RM 5.30. An evaluation of RM 0.20 on an unnamed tributary to West Creek will be conducted as well. This unnamed tributary enters West Creek at RM 0.85. Assessments will include electrofishing, macroinvertebrate sampling, water chemistry sampling and a habitat evaluation. The results obtained from this assessment will be evaluated using Ohio EPA's Qualitative Habitat Evaluation Index (QHEI), Index of Biotic Integrity (IBI), and Invertebrate Community Index (ICI). An examination of the individual metrics that comprise these indices, along with water quality data and the Ohio EPA Macroinvertebrate Field Sheet, will also be used. Water chemistry data will also

be compared to the Ohio Water Quality Standards to determine the attainment status of the creek (Ohio EPA, 2011)[1]. Ohio EPA will be performing monitoring work on West Creek in 2015. They have requested all monitoring data from river miles 0.20, 1.60, and 2.10.

(2) Nonpoint/Point Sources

| Point Sources | Nonpoint Sources |
|---|---|
| Combined Sewer Overflows | Urban runoff |
| Sanitary Sewer Overflows | Landfills |
| Storm Sewer Outfalls | Spills |
| Home Septic Systems | |

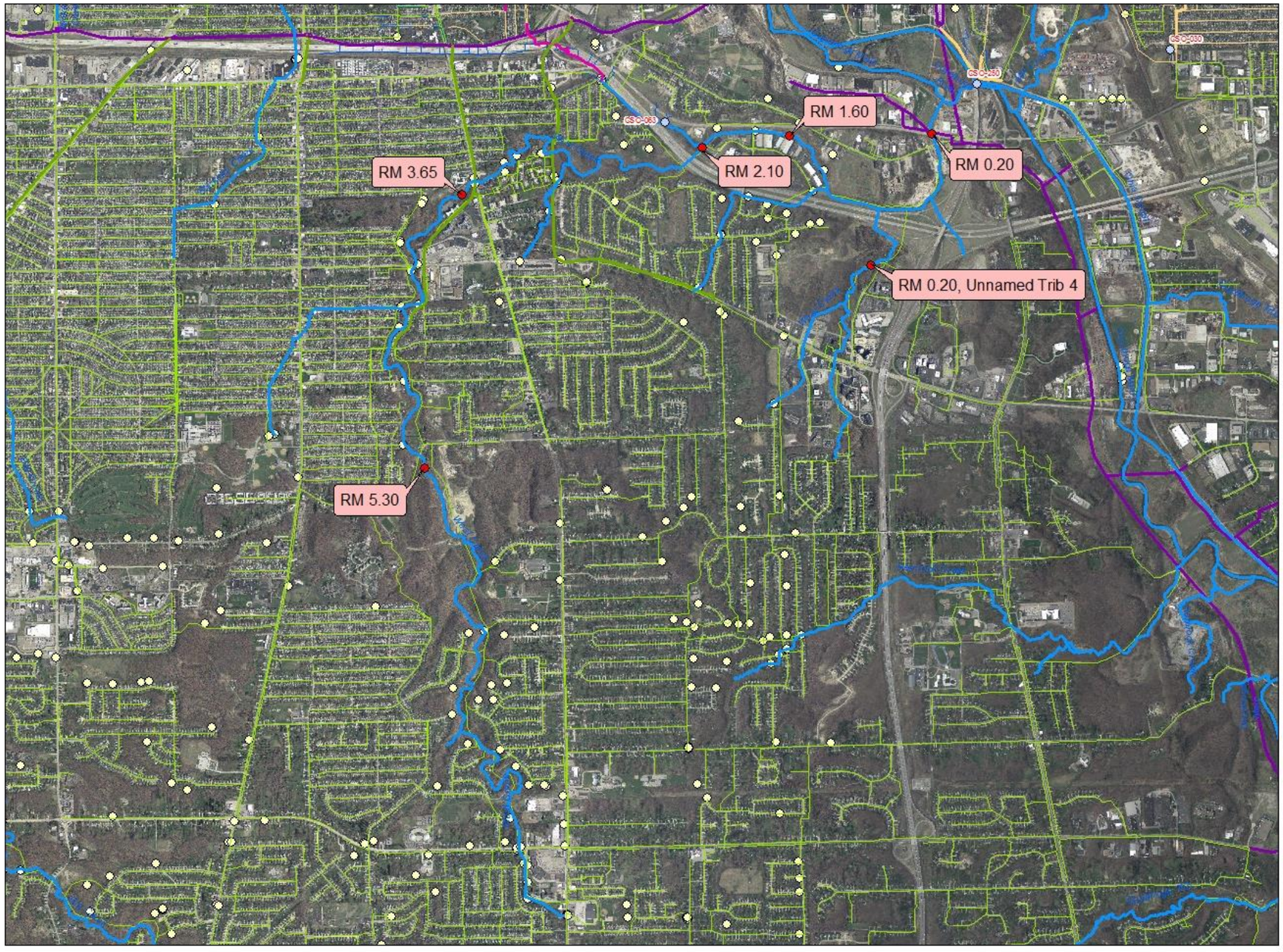
A map has been provided in section 6 to show point sources that may be influencing the water quality at each sample location. These sources, along with the ones listed in the table above, may be impacting the health of the fish and benthic macroinvertebrate communities in the West Creek watershed.

(6) Sampling Locations

The following electrofishing, macroinvertebrate and water chemistry sample locations, listed from upstream to downstream on West Creek, will be surveyed during the 2015 field season.

[1] See appendix H for a list of all references.

| Water Body | Latitude | Longitude | River Mile | Location | USGS HUC 8 Number Name | Purpose |
|---|---|---|---|---|---|---|
| West Creek | 41.3899 | -81.6982 | 5.30 | Upstream of Ridgewood Drive | 04110002 Cuyahoga | Evaluate water chemistry, habitat, fish, & macroinvertebrates downstream of former landfill |
| West Creek | 41.4103 | -81.6943 | 3.65 | Upstream of Broadview Road | 04110002 Cuyahoga | Evaluate water chemistry, habitat, fish, & macroinvertebrates after restoration and removal of two fish barriers |
| West Creek | 41.4136 | -81.6705 | 2.10 | Brooklyn Heights downstream from I-480 | 04110002 Cuyahoga | Evaluate water chemistry, habitat, fish, & macroinvertebrates after restoration and habitat enhancement |
| West Creek | 41.4144 | -81.6618 | 1.60 | Downstream from Lancaster Drive Bridge | 04110002 Cuyahoga | Evaluate water chemistry, habitat, fish, & macroinvertebrates after restoration and habitat enhancement |
| Unnamed Tributary to West Creek | 41.4047 | -81.6539 | 0.20 | West Creek Rd | 04110002 Cuyahoga | Evaluate water chemistry, habitat, fish, & macroinvertebrates |
| West Creek | 41.4145 | -81.6477 | 0.20 | Between Granger & Schaaf Roads | 04110002 Cuyahoga | Evaluate habitat, fish, & macroinvertebrates after restoration |




Northeast Ohio Regional Sewer District
Protecting Your Health and Environment

# West Creek Study Plan

Overview Map


**Legend**

- Monitoring Site
- Regional Drainage
- CSO Outfall
- District Facility
- Outfalls
- NEORSD CSO Combined Sewer
- NEORSD CSO Responsibility Sewer
- NEORSD Intercommunity Relief Sewer
- NEORSD INTERCEPTOR
- Local Combined Sewer
- Local Culverted Stream
- Local Sanitary Sewer
- Local Storm Sewer

N

0.45
Miles