

Responses to:

Duck Otter Creek Comments on Cardno Entrix Duck and Otter Creeks Great Lakes Legacy Act Data GAP Investigation Report

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Please consider the following
General Comments:

1. The area that is known to have noticeable oil in the sediments is the outfall or confluence of Otter Creek at the outfall to Maumee Bay. Although not part of this report, this is the most ecologically sensitive area for the waters and fish and needs remediation as soon as possible.

Response: The confluence area and remedial decisions are beyond the scope of the DGI so no changes to the report have been made.

2. The two sediment studies have conflicting data that needs to be resolved. The differences in the data are significant and require further investigation/responses.

Response: We are not sure which two studies are being referenced in this comment, but comparisons of DGI data with other investigations is beyond the scope of the report and has been identified as a topic for the next phase of this project. No changes to the report have been made.

3. It is baffling that the Otter Creek sediments between I280 and Star Avenue are not showing elevated PAH levels. I personally saw oil sheens created during debris removal in cleanup some years ago.

Response: The area between these two landmarks generally corresponds to the upstream portion of segment C of Otter Creek. Based on appendix D of the DGI report, 11 storm water outfalls enter Otter Creek between I-280 and Star Avenue, which indicates the potential for many sources to contribute materials to the stream. The DGI collected one sample (OC-16/17) from that reach, and the sediments were described as sand/gravel, and those coarse sediments do not usually hold contaminants. It is possible that the DGI sample was collected from a different area than where debris and sheen were observed some years ago, or, that stream conditions have changed since the earlier time. No changes to the report have been made.

4. It is also baffling that there is now a debate on the reference streams and the use of the data. In late summer/fall of 2010, there were conference calls that specifically discussed the issue of reference streams and which streams were most suitable for comparisons. If the use of reference streams was inappropriate and Duck and Otter data analysis should have stood on its own, then that should have been discussed and worked out then. I do not recall a discussion of a Marathon spill or other issues now being brought up. Why weren't they brought up then? I do recall that I did not think Amolosch Ditch or Grassy Creek seemed appropriate comparisons, but none of us could come up with something better. I do not recall that there were comments that it is inappropriate to use reference streams. I am not familiar with the protocol for these projects so I deferred to the 'experts'. I find it troubling that the reference streams were agreed

to then and now coming up again for debate. This is what frustrates many of us about government. There is a time for these issues to be debated. The data collection for the reference streams cost money. If the reference streams should not have been used, then it should have been stated at the time of the calls. Otherwise what is the purpose of having the calls?

Response: We concur that it is appropriate to include the urban comparison stream data in the report. Additional discussion is provided in the response to comments from Partners for Clean Streams.

In closing, all who review this please be aware that Duck and Otter Creeks are small. The levels of contaminants are not three alarm fires for water and habitat. The industrial partners stepped to the table voluntarily and were then placed in the mandatory assessment etc. system.

My best guess is that if the industrial partners had not stepped forward, getting some cleanup in the creeks would have been low on the E.P.A. priority list and decades away. We have an opportunity to get some cleanup at the most critical places that will help the creeks habitat and water quality. I hope that U.S.E.P.A. will allow the process to go forward with some needed data gap and conflict resolution to get the creeks cleaned up in the next several years.

Response: These comments are appreciated. Cleanup decisions are beyond the scope of the DGI and no changes to the report have been made.

Response to:

Partners for Clean Streams comments on DGI Report (prepared by Cardno Entrix, dated March 1, 2012)

Comments on the Draft Duck and Otter Creeks Great Lakes Legacy Act Data Gap Investigation Report, dated March 1, 2012 and prepared by Cardno Entrix on behalf of the Duck and Otter Creek Industrial Partners; Prepared by Kris Patterson on behalf of Partners For Clean Streams; March 30, 2012

After having briefly reviewed the draft report, I have the following comments, on behalf of Partners For Clean Streams. I request that careful consideration be given to these comments by the Partners and that a written response document be prepared detailing the changes that will be incorporated (or won't be incorporated, and an explanation) into a final report. In addition, please provide Partners for Clean Streams with copies of any other written comments submitted by other reviewers and include a compiled comment response document with future distributions of this draft report and the final report.

Response: PCS' commentary under "General Comments" and much of what is included under "Comments on specific Chapters and sections" requests incorporation of additional and /or changes to data presentation and evaluation which are beyond the scope of work previously determined for the project. While the Industry Partners and Cardno ENTRIX respect alternative views and approaches, where the commentary differs from the agreed scope of work or is in addition to it will be noted as such without changes to the report. Where specific questions and comments are provided, or specific clarifications to the comments can be made, these are identified and a specific response is provided.

PCS General Comments:

Urban Comparison Streams:

I strongly disagree with the use of urban comparison streams. The GLLA project is to evaluate Duck and Otter Creek.

Response: Sampling and analysis at comparison stream locations was pointed out as a data gap in the industry comments on the most recent 2007-2008 sediment sampling and risk assessments and is a major reason for the Industry Partners participation in the Data Gap Investigation (DGI) project. As a result the project Technical Approach determined two Triad reference/comparison locations along with 12 Duck and Otter Creek Triad locations were appropriate. Subsequently a site selection process was undertaken which is documented in Appendix A of the Report. During the process selection of the two urban comparison locations underwent extensive discussion with GLNPO, Ohio EPA, and several stakeholders including PCS and Duck & Otter Creek Partnership. Subsequently sampling and analysis at the two comparison locations was included in the GLNPO-approved project Quality Assurance Project Plan (QAPP) prepared by Weston Solutions. The findings of this investigation do not depend on the

urban comparison stream location data. The urban comparison data has no material impact on the conclusions and recommendations. Although there are no findings in the report which are tied to the two urban comparison stream location data, the data collected are an appropriate and necessary part of the DGI report. Changes to the document are described below.

The data for the urban comparison streams is also extremely limited, taken from only 2 locations (one per stream), which makes it only a limited snapshot; however, the repeated discussion in the report and in the Appendix A is over-stated, overly broad, and generalizes all conditions of urban streams are represented by these two limited sample location. It cannot be considered a representative sample and is very misleading to include discussion comparing the Duck and Otter data to the comparison stream data.

Response: As explained above the two urban comparison stream (UCS) locations were agreed and incorporated into the QAPP. The executive summary simply includes the data from the two comparison stream locations along with the data from Duck and Otter Creeks; it does not include generalizations regarding the urban comparison stream data. We have reviewed the report to identify statements that might be interpreted as “over-stated” or “overly broad.” The following revisions have been made in response to this comment:

- *Page E-2, first full paragraph. The first sentence was revised as follows: “Samples were collected from selected locations in Duck Creek, Otter Creek, and two nearby streams in urbanized but non-industrialized areas.” The second sentence was deleted.*
- *Section 1.3.5, second bullet, second sentence, revised as follows: “These comparisons provide supplemental information for evaluating impacts of urban conditions in the area.”*
- *Appendix A, first sentence, revised as follows: “The purpose for sampling local urban comparison streams in the Duck and Otter Creeks data gap investigation Great Lakes Legacy Act (GLLA) project was to provide supplemental information relevant to evaluating what the biological communities in Duck and Otter Creeks would be in the absence of inputs from surrounding industrial land use, as well as to provide points of comparison for sediment chemistry and toxicity test results.”*

First, the data for Duck and Otter Creeks should be evaluated independently of any other streams. The Duck and Otter sediment data should be evaluated against standard sediment references & benchmarks (such as McClarren et al, McDonald et al, and/or US EPA Region 5 guidance for sediment, even CERCLA or VAP guidance in the state of Ohio or other US EPA standards), not against other streams. All past sediment reports for Duck and Otter Creeks have used risk-based evaluations and discussed potential drivers. This report should do the same, eliminating the discussion of urban comparison streams. In addition, the remaining “Triad” data (QHEI, benthic collection, fish data, etc) should be compared against State of Ohio water quality standards, not against the urban comparison streams. The State of Ohio has clear, established indices and goals for streams and it is this comparable data that should be included.

Response: Comparisons of DGI data to screening criteria used on other GLLA and OEPA projects and calculated bioavailability/toxicity threshold values were performed the same way for all locations. This evaluation for the Duck and Otter Creek locations was not affected by including the urban comparison data in the same evaluation, and no changes have been made to the report.

PCS comments regarding use of risk-based evaluations and drivers are outside of the scope of work for the DGI. Comparisons of DGI data to the available Ohio Water Quality Standards were included in the evaluation of sediment pore water data; however, comparison of the other triad data were made to applicable guidelines and standards which may not be covered in the Ohio WQS. No changes have been made to the report.

Secondly, there is little to no detailed discussion for how the urban comparison streams were selected in the body of the report (rather than appendix). Page E-2 states “Grassy Creek in Perrysburg, OH and Amlosch Ditch in Oregon, OH were identified as urban streams most similar to Duck and Otter Creeks.” Was there rigorous scientific analysis of past sample data, multiple habitat evaluations, sediment analysis, percent pervious analysis, land cover analysis, evaluation of sources and impacts (including past ones), past Ohio EPA 303d list comparisons, etc? Other than proximity and visual assessments, what qualifies these streams as more or less similar to Duck and Otter? In addition, there are many other factors that may or may not impact the urban comparison streams, making it difficult, if not impossible, to isolate specific attributes or locations that would allow equal comparison between streams, especially given the limited data presented here for the comparison streams. If comparison streams were of interest for how an urban stream could achieve and meet Ohio Water Quality standards, there are examples within the AOC and within the HELP Eco region of stream segment meeting their designated uses in urban landscapes (such as Grassy Creek diversion, segments of Swan Creek, etc). Perhaps it would have been more illustrative (although still an un-necessary comparison in my opinion) to study those urban (and even historically impacted) stream segments that are meeting standards to understand how to best improve, within their existing watersheds, Duck and Otter Creek.

Response: The information on selection of the urban comparison stream locations is included in Appendix A. The alternative approach and criteria described for selection by PCS are outside of the scope of work for the DGI, and no changes have been made to the report.

Page E-2 also states “Samples were collected from selected locations in Duck Creek, Otter Creek and two streams in urbanized, but non-industrialized areas of Greater Toledo.” A quick search of publically available records shows that Amlosch Ditch, while in an urban area, is in fact regularly impacted by industrial inputs. Marathon Petroleum LLC, Oregon Terminal has a current industrial discharge permit (for their pond) that releases to Amlosch Ditch. Also, in 1993 BP Oil Co had a release or spill of 1890 gallons of #2 Diesel Fuel impacting Amlosch Ditch, as reported in the *Western Lake Erie Contingency Plan, Sept 2005*. Ohio EPA’s 303d report (1996, when detailed data was last published) evaluated Amlosch Ditch and determined it was “not supporting” for 4.4 miles for use attainment (per Ohio’s criteria) and that it’s restorability factor was “essentially” none. A comparison stream that is so highly degraded is not useful or an appropriate “bar” to use to strive for in restoring Duck and Otter Creeks to their designated use. Per the 2010 TMDL report from Ohio EPA, Grassy Creek is also only in partial attainment, but is

meeting for QHEI and macros; however, it has a different use designation than Otter Creek (to which it was generally compared).

Response: The location sampled on Amlosch Ditch for the Data Gap Investigation is several miles upstream of the discharge and release cited. Historic releases were researched as part of the urban comparison stream selection process and none were identified upstream of the sampling location. No changes have been made to the report.

More applicable though is the fact that Duck and Otter have comparison bars set already – that being the Ohio EPA Delisting Targets for Ohio’s Areas of Concern (2008 and soon to be updated), which uses State of Ohio criteria and more specific AOC BUI criteria to evaluate if a stream in an AOC is “restored.” In addition to identifying risk drivers, Duck and Otter “triad” data should be evaluated against the delisting criteria to determine where remedial measures (sediment remediation, habitat and storm water best management measures) would be effective in meeting or partially meeting BUI delisting criteria. Great Lakes Legacy Act funds are specifically in place to support AOC restoration and delisting and as such, the report and the supporting data should be clearly tied to comparisons of BUI delisting criteria for these streams. More useful summaries of the data and preparation of the data set would be necessary to compare the sample data to standard Ohio indices (such as the ICI for the macroinvertebrate data) and a much more detailed narrative (or summary tables, such as those included in a TMDL report or the Stage 2 document for this AOC) about the delisting standards and Ohio. In addition, I would also remind the authors that “free froms” are also included in State of Ohio standards and BUI delisting criteria, such as free from sheens (particularly petroleum-based ones), which were repeatedly noted for sample locations within Otter Creek.

Response: Evaluation of remedial measures is beyond the scope of the DGI report. Consideration of remedial measures is appropriate for a feasibility study which could also include consideration of delisting criteria. Also note that the ICI cannot be calculated for these streams (see response to comment on Section 3.2). No changes have been made to the report.

Introduction chapter

While I understand the need to provide a brief overview of the complex and interwoven history of development and impacts in these watersheds, the text completely leaves out the significant role and footprint of the various commercial, transportation, and industrial facilities in these watersheds, in both the physical and chemical stressors sections. While that role is generally alluded to in the “Industrial Revolution” comment, the focus of the discussion is on converting swamp to agricultural and to general urban runoff. That does not provide an accurate or holistic description of these watersheds.

A direct attributable impact to the changing watersheds can be historically traced from the first Klondike well and Ironville docks in the late 1800’s through today with continual changes to the Port of Toledo, re-development of old brownfields, changing commercial businesses and more. A relevant discussion of the long history of industrial and commercial development should be included as pertinent introduction for the reader.

In addition, discussion within 1.2.3 should include a more detailed discussion of the post Clean Water Act when many permitted discharges have impacted the creeks. Unfortunately even the permitted discharges can carry contaminants, can exceed their permit limits, can have unforeseen spills, breaks, and by passes. In addition, some acknowledgement of unfortunate spills, some of those sizeable and significant, within the watersheds should be incorporated. I am not suggesting that “fingers are pointed” or “names named” of facilities but that a more accurate reflection of the historical and current conditions within the watershed be included.

An interesting historical perspective of the changing watersheds has already been compiled by US EPA (2005 I think) in an aerial photographic analysis for Duck and Otter Creeks from 1920 through 1990s (previously provided to the Partners, Ohio EPA, US EPA and the Duck and Otter Creeks Partnership). Several thumbnails in a collage of historical and current (through Bing or Google Earth) would visually familiarize the reader in the general introduction with the changing landscape over time.

Page 1-5, last paragraph: The following statement in the report is particularly broad and unsupported by the data within the report and should be re-stated or removed; “Because there was about a century of wastewater discharge to the streams prior to the Clean Water Act, there may be chemical contamination in the subsurface sediments as well.” While there certainly were “discharges” prior, they were not limited to wastewater nor are they likely to be the sole contributing factor to any possible subsurface sediment contamination. A 1976 report (reference below) details the conditions at that time and in previous decades of Otter Creek that would provide the authors with an informative background from which to describe historical physical and chemical stressors, in more detail than current reports.

Assessment of the Present and Projected Conditions of Otter Creek, Vol. 1 & 2	Thomas Balduf, Carol A. Berg, Gary Martin, James A. Orlemann, Robert C. Sturtz (1976)
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Response: We agree that providing historical context for the reader is important and appreciate the suggestions; however, the history of the Duck and Otter Creeks watersheds is well-documented in other reports, including those referenced in this comment. While the additional information could contribute to better understanding of how the current conditions were arrived at the objectives and scope of work for the DGI were focused on data gaps, and historical documentation was not identified as a data gap in the proposal or scope of work for the investigation. The first two paragraphs of Section 1.2.3 have been revised to read as follows:

“In addition to the physical habitat modifications of Duck and Otter Creeks, extensive industrial and urban development has resulted in chemical contamination of the creek sediments. Also, some of the chemicals in creek sediments are a natural component of soil and sediment due to weathering of materials that comprise the Earth’s crust (i.e., naturally-occurring background) and as the result of human activities such as the combustion of fossil fuels and use of pesticides (i.e., anthropogenic background). Excessive concentrations of chemicals in surface water and/or sediments can stress aquatic life and result in impaired biological communities. Sediment contamination has been the focus of several previous investigations of Duck and Otter Creeks, as well as other streams within the Maumee River AOC. Previous investigations have measured a

variety of chemicals in bulk sediment samples and determined that concentrations of some chemicals exceed conservative benchmarks that are used for assessing sediment quality.”

PCS Comments on specific Chapters and sections:

Chapter 3

Chapter 3, page 3-1 (and Executive Summary and Discussion chapter 4-3): “The sediment sampling team recorded observance of sheen following disturbance of the sediments at several sampling locations in Otter Creek...” This should be corrected to more accurately reflect that 7 of 28 samples, or one-fourth, showed sheen. In addition, nearly half were reported with odor or sheen (13 of 28 samples). Again on page 3-3, first sentence of the first paragraph should reflect, not several, but nearly one-third (14 of 40 samples) were recorded with odor or sheen.

Response: The sediment sampling locations that were selected for the data gap investigation were not evenly distributed throughout Duck and Otter Creeks. Rather, the locations were selected for one or more specific purposes such as measuring the bioavailability of a class of contaminants across the full range of sediment concentrations that was observed in prior studies. The data gap investigation did not attempt to represent visual and olfactory observations equally for all stream segments; therefore, reporting these observations as frequencies could mislead readers about the general stream conditions in Duck and Otter Creeks. Moreover, visual and olfactory observations are anecdotal, and potentially subjective, because there is no information that indicates that standard methodologies were used, that calibrations were performed, or that quality control procedures were followed to ensure that these measurements were conducted in a consistent and reproducible manner. The lack of a representative study design, and the lack of documentation that a standardized methodology was used, makes it inappropriate to calculate statistics with the field observation data of sheens and odors as suggested. However, the report could benefit from noting when multiple lines of evidence demonstrate a consistent or converging interpretation, which involves Segment A of Otter Creek. Two changes to the report were warranted:

- *The following text was added to the fourth bullet in the “Conclusions” section of the Executive Summary: “the frequent observation of petroleum odor and sheen during field sampling...”*
- *The following text was added to the fifth paragraph of Section 4.6: “the frequent observation of sheen and petroleum odor during field sampling (Table 3-1);...”*

Chapter 3, section 3.2:

Generally, why wasn’t an ICI generated using the macro-invertebrate data collected? Without an ICI this data is not comparable to State of Ohio standards and criteria, as well as past Ohio EPA data. There should be a discussion in section 3.2 to put the macro-invertebrate data into context—what are the standards in Ohio, what is “healthy” abundance and percent distribution for taxa, what is the scale for taxa richness?

Response: We understand that the State of Ohio no longer calculates ICI values for streams that are this small, because the quantitative ICI sampling methodology uses artificial substrate samplers, which require a minimum water flow velocity to produce representative results. Ohio EPA only uses qualitative methods to evaluate benthic invertebrate community status in streams

as small as Duck and Otter Creeks (e.g., OEPA 2010)¹. The appropriate context for biocriteria is typically provided by data from a regional “healthy” reference stream. However, reference streams have not been identified for the Maumee Lake Plains Ecoregion (57a), and during scope development it was agreed that collection of reference stream data as defined by Ohio EPA was not the intent of comparable data collection. Comparable data were collected from two urban comparison streams to provide context. The following clarification has been added to Section 1.3.2 (end of last paragraph):

“The macroinvertebrate community sampling methods applied in this data gap investigation were based on the qualitative OEPA methods (OEPA 2010); but multiple transects and consistent sampling efforts for each transect were used to provide a more quantitative assessment than is typically conducted with kick nets and D-nets.”

Also, why don’t the percentages of sensitive taxa and tolerant taxa add up to 100% in every sample (some samples do, some don’t) in Table 3-2? Is data missing? What other taxa were found or why weren’t they included? For instance, DC 3-1, across the row for abundance only adds up to 69% --where’s the remaining 23% of macros?

Response: Not all taxa are “sensitive” or “tolerant”, so the “moderate” taxa, which would represent the remaining 23% in the example, are not included in table 3-2. The full benthic macroinvertebrate data set is included in Appendix B; it is too extensive to include in the body of the report. The following footnote has been added to Table 3-2: “Percentages do not necessarily sum to 100% because some benthic taxa are not designated as either sensitive or tolerant.”

Discussion should also be added to point out the wide variability in the total abundance amongst samples (per stream). Abundance varies from 49 to 734 for Duck Creek (not including longitudinal) and from 3 to 734 in Otter Creek – widely affecting the overall mean and with no discussion of other potential factors (possibly weather, chemical concentration in the sediment, difference in samplers, samples compromised at the lab?) or if there’s no clear explanation, at least discuss the variability.

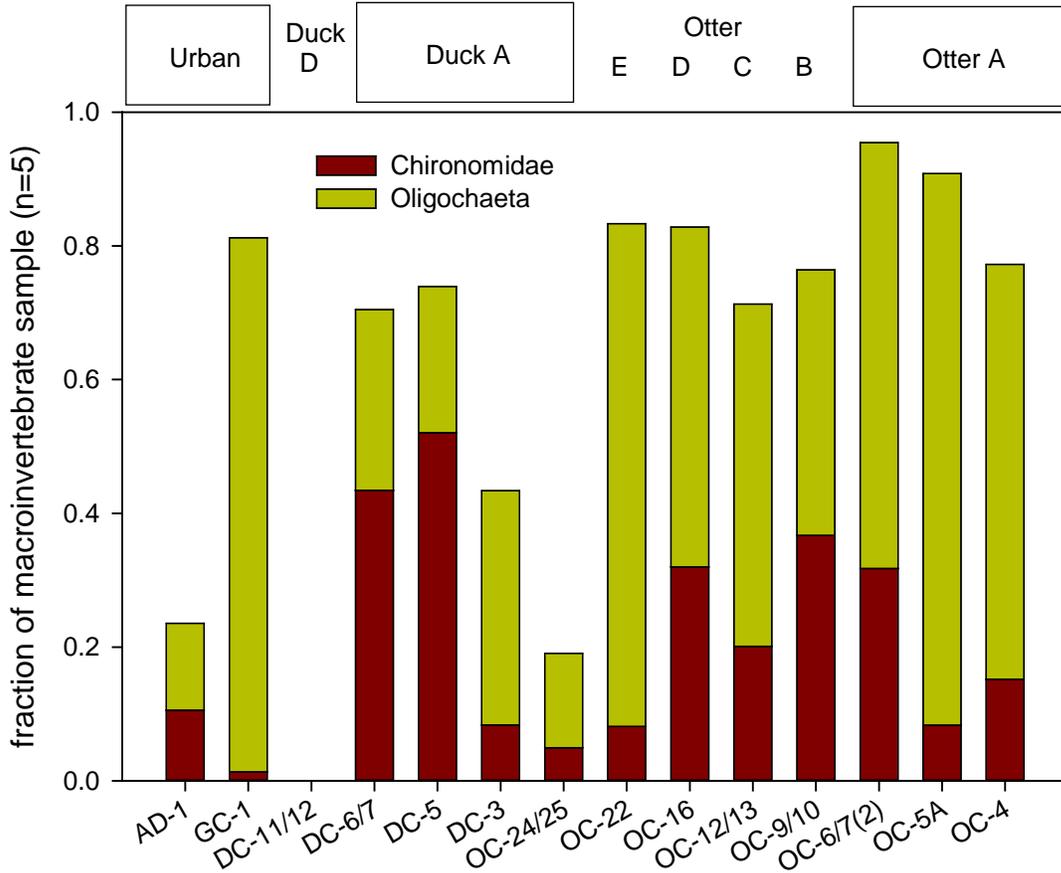
Response: Variations in stream microhabitats can greatly affect the distribution and abundance of benthic macroinvertebrates, which is discussed in Section 2.4, which is why four transverse and one longitudinal sampling transects were used for sampling. Moreover, standard methods were conducted by experienced field and laboratory staff to ensure consistency in data collection. Additional discussions about other possible factors would be speculative, are beyond the scope of the investigation, and are not necessary to support the results, conclusions or recommendations of the report. No changes have been made to the report.

This section also needs charts comparing the relative abundance of sensitive vs. tolerant species by sample location, by creek, not the Figure 3-2 and Figure 3-3, which provide no comparative or informative value.

Response: The existing graphs include information regarding sensitive and tolerant species by location, as does Table 3-2. The figures are placed on the same page with the same scales so the reader can view the relative abundance of sensitive vs. tolerant taxa by comparing the top and

¹ OEPA. 2010. Biological and Water Quality Study of the Portage River Basin, Select Lake Erie Tributaries, and Select Maumee River Tributaries, 2006 – 2008. Ohio EPA Technical Report EAS/2010-4-4. Ohio Environmental Protection Agency, Columbus, Ohio.

bottom charts, respectively. Information about stream segments has been added to the top of Figure 3-3 to enhance cross-references of locations.



Page 3-20:

“Restoration of beneficial uses within Duck and Otter Creeks would benefit from, and possible require, enhancement of the stream habitats even in cases where other stream restoration measures are warranted.” I agree and would strongly recommend that any future GLLA funded work include extensive in stream, wetland, and riparian corridor habitat improvement projects in conjunction with sediment remediation. In fact, under the current GLLA it would be required. If for some reason a future GLLA agreement is stalled or not reached between the Partners and US EPA, I would strongly encourage that extensive habitat restoration (including all of the above) move forward with alternative funding or through negotiated NRDA actions. Areas that have shown the most minimal chemical sediment concentration could be prioritized for in stream work, while all areas of both Duck and Otter Creeks would benefit from additional wetland and riparian corridor enhancement. As the Partners are aware, a previous study provided by Duck and Otter Creeks Partnership, Inc. provided proposed restoration concepts for a number of areas in both creeks. In addition, there is an extensive list in Appendix A of the “Wetlands Identification and Restoration Plan for the Duck and Otter Creeks Watershed (2003)” that includes areas that could not be developed into concept plans (but were identified through the desktop mapping and drive-by field assessments) that were (at the time) suitable for possible restoration.

In addition, a new GIS-based modeling tool and accompanying report will be published this July by US EPA and Ohio EPA that includes these watersheds and could be useful in identifying potential restoration areas. Although urban, and developed, there are still many useful and creative restoration projects that could be undertaken in these watersheds that would not supplant, but would augment sediment remediation work. Without sediment remediation, it is likely that the full benefit of BUI improvement would not be realized even with extensive habitat or storm water best management practices (BMPs).

Response: The comments regarding the benefits of restoration are appreciated; no changes to the report are required or have been made.

Table 3-6: There is no explanation for the asterisk in the table headers for Amlosch Ditch.

*Response: The following footnote for the asterisk has been added to Table 3-6: “*Due to roads and culverts the sample station for Amlosch Ditch was limited to 195 meters.”*

Pg 3-20, Metric 1: A discussion should be re-stated here that acknowledges that a storm occurred during the period of QHEI evaluation that could have influenced or contributed to the low substrate scores (by increasing sediment transport, turbidity, and flow).

Response: The precipitation that occurred during the QHEI evaluations did not alter turbidity, as seen in the field photos (Figure 3-10 and Appendix C), or transport sediments on those days. The discussion requested in this comment could give a reader the impression that the Metric 1 scores were caused by weather conditions during the survey, which would be incorrect. The existing text already discusses the relationship between sediment transport and high-flow events and the effect on substrate scores throughout all of the streams. The possible effects of recent precipitation on water depth and current velocity is already discussed in the first paragraph of Section 3.3.1, so the report was not revised.

Pg 3-21, Metric 3: I disagree with the overly broad statement as follows: “Given the prevalence of private property and the highly-developed nature of the watersheds, it would likely be infeasible to add meanders to several reaches within Duck or Otter Creeks for the purpose of improving stream habitat;” This should be re-stated to acknowledge that some limitations or challenges may exist in these watersheds, but that projects have been and could be developed to incorporate meanders into some reaches of Duck and Otter Creek.

As discussed above, an existing 2003 report identifies potential areas, a new GIS-based tool is being developed, and field observations indicate numerous reaches that could provide carefully constructed meanders. Many of those “private property” owners are large corporations, right of ways, public property, or undeveloped stretches of private land that are too wet (as floodplain or wetlands) to otherwise develop. For instance, within the Lutheran Home and Consaul St landfill section of Duck Creek there is plenty of room for gentle meanders. Within the previous Chevron property (now Port of Toledo) there is significant room to meander both creeks, especially if that area is developed – co-current development plans could incorporate in stream restoration, wetland protection, and riparian corridor expansion with many acres left for development. Headwaters portions of Otter Creek are suitable for 2-stage ditch design as well as riparian corridor enhancement. Partners for Clean Streams would be open to working with

interested partners to identify experts that could inform future habitat restoration projects and identify potential funding opportunities.

Response: The restoration idea is appreciated; the sentence language has been changed to “Given the prevalence of private property and the highly-developed nature of the watersheds, some limitations or challenges may exist in these watersheds for adding meanders to improve stream habitat; however, some projects have been and could potentially be developed to incorporate meanders into some reaches of Duck and Otter Creeks.”

Metric 4: Just a response- The “A” segments of both streams are both primarily owned, and access controlled, by several large corporations, making management and control of invasive species much easier to implement and monitor. In addition, an aggressive control program coupled with a dense replanting of non-invasive, native habitat would decrease re-invasion and also provide more significant riparian corridor without significantly disrupting current land uses.

Response: Comment noted; no changes to the report are required or have been made.

Metric 5: I just want to point out that a more holistic discussion would indicate that OC9-10, where a 15% inclusion of a riffle/run and pool/glide sequence scored the highest, there were also sensitive benthic taxa found.

Response: Comment noted; no changes to the report are required or have been made.

Pg 3-21, last paragraph: The last sentence acknowledges that the land use data was not refined enough to provide comparable level of detail as the Triad data and so it is not included in the report: however, the discussions in the report certainly include or allude to the assumptions gathered during the land use evaluations and some data is included (such as Figure 3-17, Table 3-9, etc). This statement is misleading and confusing.

Response: The last sentence has been modified/replaced with: “The land use evaluation described in Section 3.3.3. was conducted at the watershed scale of aggregation (not on the basis of individual locations or stream segments), which does not provide equal precision for the following statistical evaluations. Consequently, land use data are not included in Tables 3-7or 3-8, or the corresponding discussion.

Pg. 3-22, Table 3-7: Why is zero listed for median sensitive taxa in OC 22, OC21, OC16, OC 9/10 (and perhaps others that I missed) when there are % of sensitive species listed in Table 3-2? Even a small median number, other than zero, should be included here or add a clear statement on why smaller percentages were dropped.

Response: The median is the middle value and is the appropriate statistic for representing the central tendency of data that are not normally distributed. In many of these data sets, the middle value is a zero, which is reflected in Table 3-7. The following sentence has been added to the footnote for clarification: “Median (middle) values were used instead of mean (average) values to represent the (statistical) central tendency because most data sets were not normally distributed.”

Pg 3-23, first bullet: The last sentence is overly broad and a generalization that is not supported by this investigation. In particular the reference to “within the urbanized streams of the Greater Toledo area;” there are many more urbanized streams in “Greater Toledo” that were covered by the scope of this investigation. It should be more accurately stated as “ within the streams evaluated under the scope of this investigation” or something similar to limit the statements to Duck, Otter, Grassy, and Amlosch Ditch (which I agree show a range of conditions). In fact this “Greater Toledo” statement is used repeatedly throughout the report (especially in section 3 and the Executive Summary; twice on page 3-23 alone) and should be corrected as discussed above.

Response: The “Greater Toledo area” statement has been replaced with “the streams sampled in this investigation” throughout the report.

Bullet 4: In response to the discussion in this bullet, the unusual relationship of tolerant taxa being more abundant in higher substrate scoring areas indicates to me that other inhibiting factors could be influencing the general absence of sensitive species (to put it another way). For instance, discussion here should compare the chemical sample concentration found in the Triad locations (isn't this why the “triad” approach was included?) to determine if a relationship exists. Or other discussion could indicate that the highest scoring QHEI area (OC 9/10) while having the same substrate score as OC 12/13, OC 9/10 had sensitive taxa and a moderate taxa richness. Perhaps there is not enough information to draw conclusions to explain the “unusual” relationship.

Response: The comparison of Triad elements is sequential in the report. In Section 3.3.1, the habitat and biological components of the Triad are compared. The chemistry data are presented in Section 3.5., so it would be premature to discuss chemistry in Section 3.3. No changes have been made to the report.

Section 3.3.4

Page 3-32, first sentence: Please correct the name of the stakeholder group. It should be “Duck and Otter Creeks Partnership, Inc.” It is a separate 501c3 that included representation from the “Partner” industries, as well as citizens and various government agencies. The statement as written leads the reader to believe the “Partners” as used in the GLLA agreement terminology is or was the same as the Duck and Otter Creeks Partnership, which is not accurate. In addition, the funder should be identified for the report, which was US EPA. The date in the reference in the report is also wrong; it was 2003, not 2006. In this first paragraph, the report content should be better explained. The report not only included identification (as indicated in the text) but also conceptual restoration plans for each of the selected sites and a list of proposed candidate sites for future consideration.

Response: The name has been changed to “Duck and Otter Creeks Partnership, Inc, and the date has been changed to 2003.”

General comment for section **3-32:** I also find it interesting that the authors chose to select the above report as the only instance in which external data from outside this Data Gaps Investigation was specifically included (i.e. the ORAM or QHEI scores from 2002-2003 field

work). Why isn't other relevant external data included to present a more holistic representation of the streams? A plethora of additional external data exists, including QHEI data from Ohio EPA, past 2007 sediment investigation data from Partners for Clean Streams, previous sampling and databases from US EPA, Ohio EPA TMDL data, University of Toledo data for Duck and Otter Creeks, facility-generated data from permitting requirements and facility closure and remedial investigations, VAP data from facilities within the watershed, QHEI and ORAM data from wetland investigations on private property within the watershed (but submitted to public agencies), etc. An extensive data set from investigations outside this Data Gaps Investigation exists and should be reviewed and incorporated into a more robust analysis of the current and/or past conditions of Duck and Otter Creek. This Data Gaps Investigation was meant to fill in data "gaps" not supplant all prior data. So I concur with the recommendation from the Executive Summary that the 2007 and 2010 data sets be further reviewed; however, would also stress that other high quality and relevant data would be useful that wasn't previously available should be co-currently reviewed, such as Ohio EPA's TMDL data, US EPA's confluence data, and if available, data collected for the ongoing NRDA investigation. This should be done prior to any further work on Segment A, as implied by the priorities in the recommendations, so that the best possible management decisions can be made for the streams as a whole, even if on-the-ground (or in-the-water) work is prioritized in the future (by segment as suggested or by hot spot prioritization or other measures). While I appreciate the challenges with incorporating other data, I believe that by focusing only on the 2010 data, the Partners artificially limit the quantity and spacial coverage of the data presented in this report and therefore influence or constrain the potential validity of the conclusions proposed, based only on a single data set.

Response: Comments noted; additional data evaluations are planned for the next phase of the project and no changes to the report are required or have been made.

Additional comment for page 3-32: Duck Creek 1 and Duck Creek 4 sites have both had significant physical changes since the 2003 report was published. Both sites should be re-evaluated for current QHEI and ORAM scores. Duck Creek 1 has had some habitat improvement work on surrounding properties and Hecky's Pond had some lake improvements. Duck Creek 4 has been modified for development.

Response: The following sentence has been added to the end of the second paragraph for Duck Creek 1: "Duck Creek 1 has changed following restoration efforts in the pond in 2007 and the information from 2003 may no longer be accurate." The following sentence has been added to the end of the second paragraph for Duck Creek 4: "Duck Creek 4 has been modified for development since 2003 and the information provided above might no longer be accurate."

Pg. 3-34, 2nd paragraph and again in discussion on page 4-3: Why is there language here narratively comparing the 2010 results and the 2007 data? This report is clear that it focuses on only the 2010 data and if the authors are going to draw comparisons between the two data sets then it should be consistently applied throughout the report to compare or combine the two data sets. This statement should be removed or the comparisons and/or discussions of sediment chemical concentrations and toxicity expanded to include the full 2007 data set.

Response: Both comparisons to 2007 data have been removed from the report.

Overall, it's difficult to tell how many core samples were taken (should be more clearly presented in section 3.4 and also included as a comment to Section 3.5). So assume only one core sample at each location. The report indicates that 10% of the samples were duplicated. How did those duplicates turn out? Was the variability considered in the final evaluation? Were those duplicate cores or just duplicate analytical samples? It seems that perhaps single data points were used in many cases. This variability is unavoidable and replication is so very expensive but assuming the concentration is a point value is just not accurate.

Response: Each sediment toxicity test involved 8 replicates, as indicated by the eight columns of data and the letters A-H. Sediment chemistry was measured on the composite sample that was used for the toxicity test; it was not repeated on each of the 8 replicates. Field duplicate samples were used for quality control and may have been addressed during data validation by Weston. Cardno ENTRIX was provided with a validated database, but no data validation reports were transmitted so field duplicate sample information was not available for the DGI report. No changes have been made to the report.

Unfortunately in the sediment toxicity tests, many of the data points were eliminated due to the presence of planaria (predators). The report states below that this did not impact test results because they just eliminated duplicates. However, this is still quite significant. What if duplicates indicated a very different outcome? And the authors indicate that in the sentence highlighted below.

Response: Loss of test organisms from predation could not be separated from loss of test organisms from chemical exposure, so sediment toxicity from chemical exposure was evaluated using only chambers where predators were not present. For Duck and Otter Creek locations, data were available for at least 7 of the 8 original replicates. The urban comparison streams were re-tested, and the pooled data from both tests yielded 7 replicates for Amlosch Ditch and 10 replicates for Grassy Creek. Had the Planaria not been observed and the affected samples not been isolated from the statistical tests, then Grassy Creek sediments would have been erroneously identified as toxic, which would not have improved the data gap investigation. By identifying the predation problem and re-testing the urban comparison stream locations, the statistical design of the sediment toxicity test remained balanced; very little, if any information was lost from the 2010 sediment toxicity data set. No changes are needed, or have been made to the report.

Page 4-3 "In the DGI sediment toxicity tests, a careful examination of the exposure chambers at the end of the test revealed that indigenous sediment predators severely affected the survival of test organisms in the majority (9 of 14) sample locations in this study. These predatory flatworms (Planaria) were not mentioned in the 2007 study report. The statistical tests for this DGI were conducted in way that the presence of indigenous organisms did not affect the data interpretation (i.e., affected replicate test chambers were excluded from the analysis)."

So, is this assessment still adequate or accurate, even with the disclaimer in place here? But then the report goes on to say no toxicity later in that paragraph (causing confusion). It is also unclear sure how reliable the Sediment Quality Triad was in this study. Is there a way to test

reliability? A robust discussion about the limitations, uncertainty, and test reliability should be included as a chapter.

Response: As described above, the statement about the 2007 data has been removed from the report. The 2010 study carefully isolated sediment predation from sediment toxicity to ensure that the results and the Sediment Quality Triad remained reliable. Toxicity test reliability is assessed through survival of the test organisms in control sediments, which is discussed in Appendix G and the first paragraph of Section 3.4. The only limitation noted in the data gap investigation, uniformly low in-stream habitat quality and predominantly silty substrates, and the influence those conditions have had on the stream benthic macroinvertebrate community, is addressed several times in the report, including Sections 4.4 and 4.6. Speculation about other potential uncertainties would neither improve the report, nor alter the findings, conclusions or recommendations. No changes are needed, or have been made to the report.

Chapter 4, section 4.7

Page 4-7: In response to the conclusion statement “ The 2010 data do not indicate there are sediment contamination or toxicity issues within Duck Creek and the stream segments of Otter Creek that lie south of Millard Avenue.” In my opinion, this statement should be revisited during the second recommended conclusion- a more thorough and comprehensive review of at least the 2007 and 2010 data sets. It’s also interesting to note that the 2010 DGI report data for Duck Creek differed significantly from the Ohio EPA’s prior sampling as reflected below (excerpted from the recent TMDL report, page 92-93):

“In the selected Maumee River tributaries, sediments were collected from Grassy Creek (RM 0.98) in 2006 and from Duck Creek (RMs 4.00, 3.10, and 2.52) in 2008 (Tables 13 & 16). There were no exceedances of Ohio SRVs in Grassy Creek, but 10 PAHs were detected, with 6 greater than the TEC or PEC. Duck Creek sediments were extremely contaminated, although no results were available for some of the heavy metals (Table 13). Mercury exceeded the Ohio SRV at RM 4.00 (just downstream of the Hecklinger Pond outlet), and zinc exceeded the SRV and the TEC at both RMs 4.00 & 3.10. concentrations exceeded the SRV at all 3 sites. Calcium and magnesium also exceeded the SRVs at the 2 most downstream sites. Both PAHs and PCBs were also detected in Duck Creek. The most contaminated site, and the only site where PCBs were detected, was the most downstream site, RM 2.52 (York St.). Fourteen different PAH compounds were detected, with 6-8 PAH compounds exceeding the Consensus-Based PECs at each site (Table 16). The highly contaminated sediments in the headwaters are a result of the intensive urban landscape, while further downstream historical intensive industrial land use, uncontrolled waste sites and historical spills were likely responsible for the contaminated sediments.” (DSW/EAS 2010-4-4 Portage River Basin, Select Lake Erie Tributaries, and Select Maumee River Tributaries March 9, 2010)

It also differed significantly from the 2007 Partners for Clean Streams report (and sample data); again a difference worth exploring and explaining in a future review of the combined data sets before deciding on future remedial actions for Duck Creek. The 2010 data set was intended to fill in “gaps” and augment relevant past sediment sampling, not supplant it.

In addition, any future report should also consider and discuss the mobility of sediments (and potentially contaminants). The grain size, distribution, etc as well as past transect data about the depth of sediments within the creeks should be better discussed. It is difficult, or impossible, in this report to tell if the sediments are mobile (and thus potential for the contaminants to re-distribute). This information and discussion would better inform section 1.3.5 for potential development of a feasibility study or if necessary, a variety of in situ remedial alternatives.

Response: Comparisons of 2007 data with 2010 data have been removed from the report, and are planned for the next phase of the project. No further changes related to 2007 data are needed, or have been made to the report. However, the statement cited in this comment has been modified slightly, because specific definition of the spatial extent of potential toxicity in lower Otter Creek will be addressed in the next project phase. The bullet now reads: “The 2010 data do not indicate there are sediment contamination or toxicity issues within Duck Creek or the upper segments of Otter Creek.”

Comments on References section:

The author’s references (in the document and in the reference page) include a 2005 version of the Delisting Targets for Ohio Areas of Concern. A most current 2008 version is publically available and should be reviewed and incorporated.

Response: The 2005 delisting targets (Letterhos et al 2005) have been replaced with the following reference:

*Letterhos, J., C. C. Blair, T. Conlin, K. Rogers, and N. Farber. 2008. Delisting Targets for Ohio Areas of Concern: Ashtabula River * Black River * Cuyahoga River * Maumee River. December 2008 (as revised from 2005 version).*

References are also included from IDEM 2002 “Indiana water quality standards;” from IEPA 207 “General Use Chronic Aquatic Life Criteria;” and from MDEQ 2003 “Michigan water quality standards.” These do not seem to apply to Ohio and yet there is no reference to Ohio EPA’s water quality standards guidance. This is either a glaring error or the incorrect standards were utilized. If the correct references were not used for understanding Ohio’s water quality standards (narratives, free forms, and applicable indices) then the data should be carefully re-reviewed in light of the applicable Ohio guidance. The Ohio EPA references are limited to only two documents.

Response: The references for Indiana and Michigan standards have been removed as they were not used in the data evaluation; the reference to Ohio standards has been added:

OEPA 2009. Lake Erie Basin Aquatic Life and Human Health Tier I Criteria, Tier II Values and Screening Values (SV) contained in and developed pursuant to Chapters 3745-1 and 3745-2 of the Ohio Administrative Code (OAC). Ohio EPA, Division of Surface Water. October 20, 2009.

Two references are also included that are from specific research in California (Holmes, R.W for pyrethroid pesticides and Hickman, James C. for California plants). How applicable (or not) is this to Ohio conditions and why was it incorporated for this report, out of context? No discussion in the report explains that these references were incorporated in development of the report or in reviewing the DGI data set, but in a different context relevant to Ohio conditions.

Response: The Holmes document is referenced in Table 1-5 in the rationale for evaluating pyrethroid pesticides in urban stream sediments. The Hickman reference was included in error, and has been removed from the report.

There also appear to be several missing references, ones that were used and included in the body of the report but not included in the references section. For instance the landsat, spacial, and GIS-based imagery references are not included in this references section. In addition, the Executive Summary (and the Introduction) refers to “ the Maumee River Remedial Action Plan [Ohio Environmental Protection Agency (OEPA, 1990)] and (TMACOG 1991)”, but the reference for this document missing and is incomplete in text as well.

Response: The references to the Maumee RAP (1990) has been changed to Stage 2 Document by the Maumee RAP, TMAGOG and OEPA (2006); the following references have been added:

TMACOG. 1991. Maumee River Basin Area Of Concern Remedial Action Plan. Volume 4. Recommendations for Implementation. Toledo Metropolitan Area Council of Governments, Toledo Ohio, July 1991.

USGS. 2006. National Land Cover Database. 2006. Multi-Resolution Land Characteristics Consortium (MRLC), Accessed online at: <http://www.mrlc.gov/website/mrlc/index.php> last updated July 21, 2009.

An additional reference that should have been incorporated because it is repeatedly referred to in the text is the “SulTRAC 2007” data – what report is this found in? What reference? Another reference that should have been reviewed, incorporated, and provided as a reference is: TetraTech EMI 2008 Screening and Baseline Ecological Risk Assessment; Duck and Otter Creeks; Toledo and Oregon, Ohio; Prepared for: Partners For Clean Streams, Inc. (etc). This is the companion report to the TetraTech Human Health report included in the references; however, the Ecological Health Risk Assessment is actually the more relevant report. The Partners were previously provided with a copy of the report.

Response: “SULTRAC 2007” refers to the 12/21/2007 GLNPO Duck and Otter Creek sediment sampling project performed by SulTRAC. Comparisons of DGI data with the data collected by SulTRAC in 2007 have been removed because that work was deferred. Interpretations of those data, when needed, are included in the missing Tetra Tech EMI Ecological Risk Assessment document, which has been added to the references:

TetraTech EMI. 2008. Screening and Baseline Ecological Risk Assessment; Duck and Otter Creeks; Toledo and Oregon, Ohio; Prepared for: Partners For Clean

Streams, Inc., Bowling Green, Ohio. Prepared by Tetra Tech EM Inc. Chicago, Illinois. December 2008.