FLORIDA DEPARTMENT OF Environmental Protection

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Ron DeSantis
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VIA EMAIL
Read receipt requested

June 20, 2022

Mike Drennan, Senior Environmental Specialist
Orange County Environmental Protection Division
3165 McCrory Pl #200
Orlando, FL 32803
Email: Mike.Drennan@ocfl.net

Re: Final Audit Report for Stream Condition Index Laboratory Records Audit of Orange County Environmental Protection Division

Dear Mr. Drennan:

Thank you for responding to the preliminary audit report for this Stream Condition Index (SCI) Laboratory Records Audit. The Florida Department of Environmental Protection (department) has reviewed your response and determined that the SCI data produced by Orange County Environmental Protection Division (OCEPD) meet the department's data quality objectives upon implementation of corrective actions from this audit.

Attached is the final audit report detailing the audit procedure, details of the department's review, and the department's recommendation for usability of the data. The final audit report will also be posted on the department's website at https://floridadep.gov/dear/florida-dep-laboratory/content/fdep-biological-and-audit-report-search. As noted in the report, the department's Aquatic Ecology and Quality Assurance Section has determined that your invertebrate taxonomy analysis procedures after implementing corrective actions from this audit meet the data quality objectives for SCI data for the sample types covered in this audit, and recommends that the data may be used for DEP related purposes and in support of the scope of projects covered in this audit. The usability of the audited data for other purposes must be determined separately according to applicable requirements in Rule 62-160.670, Florida Administrative Code (F.A.C).

Under Chapter 120 of the Florida Statutes, you and any other person whose substantial interests are affected by the department's agency action may challenge the attached final audit report, including the corrective actions and the data usability analysis. The process to challenge any portion of this agency action is described below in the Notice of Rights section.

If you have any questions or concerns about this final audit report, please feel free to contact Sarah Noble at (850) 245-8533 or Jennifer Piacente at (850) 245-8073.

Notice of Rights

This action is final and effective on the date mailed (via e-mail) unless a sufficient petition for an administrative hearing is timely filed under sections 120.569 and 120.57 of the Florida Statutes as provided below. If a sufficient petition for an administrative hearing is timely filed, this agency action becomes only proposed agency action, subject to the result of the administrative review process. Therefore, on the filing of a timely and sufficient petition, this action will not be final and effective until further order of the department. Because an administrative hearing may result in the reversal or substantial modification of this action, the petitioner is advised not to proceed until the deadlines noted below for filing a petition for an administrative hearing or request for an extension of time have expired. Mediation is not available.

A person whose substantial interests are affected by the department's action may petition for an administrative proceeding (hearing) under sections 120.569 and 120.57 of the Florida Statutes. The petition must contain the information set forth below and must be filed (received by the clerk) in the Office of General Counsel of the department at 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida 32399-3000. The petitioner shall also mail a copy of the petition to Orange County Environmental Protection Division, at the address indicated above, at the time of filing.

Under rule 62-110.106(4), F.A.C., a person whose substantial interests are affected by the department's action may also request an extension of time to file a petition for an administrative hearing. The department may, for good cause shown, grant the request for an extension of time. Requests for extension of time must be filed with the Office of General Counsel of the department at 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida 32399-3000, before the applicable deadline. A timely request for extension of time shall toll the running of the time period for filing a petition until the request is acted upon. If a request is filed late, the department may still grant it upon a motion by the requesting party showing that the failure to file a request for an extension of time before the deadline was the result of excusable neglect.

If a timely and sufficient petition for an administrative hearing is filed, other persons whose substantial interests will be affected by the outcome of the administrative process have the right to petition to intervene in the proceeding. Intervention will be permitted only at the discretion of the presiding officer upon the filing of a motion in compliance with rule 28-106.205, F.A.C.

In accordance with rules 28-106.111(2) and 62-110.106(3)(a), F.A.C., petitions for an administrative hearing by the petitioner must be filed within 21 days of receipt of this written notice. Petitions filed by any persons who were not entitled to written notice under section 120.60(3) of the Florida Statutes must be filed within 21 days of publication of the notice, if published, or within 21 days of receipt of the written notice, whichever occurs first. Under section 120.60(3) of the Florida Statutes, however, any person who has asked the department for notice of agency action may file a petition within 21 days of receipt of such notice, regardless of the date of publication.

The failure of any person to file a petition for an administrative hearing within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under sections 120.569 and 120.57 of the Florida Statutes.

A petition that disputes the material facts on which the department's action is based must contain the following information: (a) The name and address of each agency affected and each agency's file or identification number, if known; (b) The name, address, and telephone number of the petitioner; the name, address, and telephone number of the petitioner's representative, if any, which shall be the address for service purposes during the course of the proceeding; and an explanation of how the petitioner's substantial interests are or will be affected by the agency determination; (c) A statement of when and how the petitioner received notice of the agency decision; (d) A statement of all disputed issues of material fact. If there are none, the petition must so indicate; (e) A concise statement of the ultimate facts alleged, including the specific facts that the petitioner contends warrant reversal or modification of the agency's proposed action; (f) A statement of the specific rules or statutes that the petitioner contends require reversal or modification of the agency's proposed action, including an explanation of how the alleged facts relate to the specific rules or statutes; and (g) A statement of the relief sought by the petitioner, stating precisely the action that the petitioner wishes the agency to take with respect to the agency's proposed action.

A petition that does not dispute the material facts on which the department's action is based shall state that no such facts are in dispute and otherwise shall contain the same information as set forth above, as required by rule 28-106.301, F.A.C. Under paragraphs 120.569(2)(c) and (d) of the Florida Statutes, a petition for administrative hearing must be dismissed by the agency if the petition does not substantially comply with the above requirements or is untimely filed.

This agency action constitutes an order of the department. Subject to the provisions of paragraph 120.68(7)(a) of the Florida Statutes, which may require a remand for an administrative hearing, the applicant has the right to seek judicial review of the order under section 120.68 of the Florida Statutes, by the filing of a notice of appeal under rule 9.110 of the Florida Rules of Appellate Procedure with the Clerk of the department in the Office of General Counsel, 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida, 32399-3000; and by filing a copy of the notice of appeal accompanied by the applicable filing fees with the appropriate district court of appeal. The notice of appeal must be filed within 30 days from the date when the final order is filed with the Clerk of the Department.

Executed in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL PROTECTION



David Whiting, Deputy Director
Division of Environmental Assessment and Restoration
2600 Blair Stone Road
Tallahassee, FL 32399
Tel No.: (850) 245-8191

Attachments:
Final Audit Report

Copies furnished to:

Kenneth Hayman, DEP Office of General Counsel
Kevin O'Donnell, DEP Watershed Assessment Section
File

CERTIFICATE OF SERVICE

The undersigned duly designated deputy clerk hereby certifies that this agency action, including all copies, was e-mailed before the close of business on June 21, 2022, to the above listed persons.

FILING AND ACKNOWLEDGMENT

FILED, on this date, pursuant to 120.52(7)
Florida Statutes, with the designated Department Clerk,
receipt of which is hereby acknowledged.

Clerk 6/21/2022 Date

Final Audit Report

Orange County Environmental Protection Division

Stream Condition Index Laboratory Records Audit

Aquatic Ecology and Quality Assurance Section
Water Quality Standards Program
Division of Environmental Assessment and Restoration
Florida Department of Environmental Protection

June 2022

STREAM CONDITION INDEX LABORATORY RECORDS AUDIT REPORT

Scope of Audit

In 2020, Orange County Environmental Protection Division (OCEPD) began processing and identifying their own Stream Condition Index (SCI) samples and plans to submit the data to the Florida Department of Environmental Protection (DEP or department) for waterbody assessment per Chapter 62-303, Florida Administrative Code (F.A.C.), the Impaired Waters Rule. The DEP Aquatic Ecology and Quality Assurance Section (AEQAS) conducted a records audit of the OCEPD SCI laboratory to ensure their processes adhere to DEP SOP SCI 2000, the DEP standard operating procedure (SOP) applicable to SCI sample processing. This audit assesses items that can be evaluated via laboratory records provided by OCEPD and covers the scope of samples that OCEPD processed in 2020 and 2021.

In October 2021, DEP auditors from AEQAS requested records from Senior Environmental Specialist, Mike Drennan. DEP received all requested records on December 6th, 2021. Table 1 lists the samples that were reviewed as part of this audit, as well as dates of collection, Sample IDs, and monitoring locations. All samples were collected, sorted, and identified by OCEPD staff.

Records Evaluated:

- List of the taxonomic keys most commonly consulted in the lab (requested a minimum of the ten most relied upon; online references are acceptable if regularly consulted)
- List of taxa in the lab's specimen reference collection, including the verifying taxonomists' names
- Sorting efficiency tracking records for employees associated with requested samples
- Taxonomic quality control (QC) tracking records for employees associated with requested samples
- Brief description of lab protocols for precautionary and corrective measures taken if sorting efficiency or taxonomic QC results fail to meet the required targets
- All raw bench sheets associated with requested samples
- Final taxonomic list used to calculate metrics, indicating which taxa were used in each metric
- Raw metric and index calculation data and final metric and index scores for each replicate

Table 1. Stream Condition Index samples reviewed as part of this audit.

Sample Date	Sample ID	Location Code	Waterbody/Sample Location
07/01/2020	AC17126	BWKP	Big Wekiva (Kelly Park)
12/15/2020	AC18110	LET	Little Econ T (Berry Dease Rd.)
01/04/2021	AC18167	LWD	Little Wekiva D (Oranole Rd)

Findings

A preliminary audit report was sent to OCEPD on February 23rd, 2022 and OCEPD provided responses to the preliminary report on April 8th, 2022 (Table 2). DEP found that OCEPD's responses

and proposed corrective actions were acceptable. OCEPD has revised and implemented procedures in response to this audit to follow DEP SOP SCI 2000, as discussed below.

Lab Quality System: OCEPD maintains copies of pertinent taxonomic identification keys for specimens sampled in Orange County, FL.

OCEPD uses a well-organized voucher collection, with all but two specimens verified by extramural experts. However, the collection has not been updated since 2016. Furthermore, several taxa found in the samples reviewed by the auditor were not included in the voucher collection (Table 3). Per DEP SOPs, laboratories are required to maintain a current reference collection which shall contain at least one specimen of all taxa identified. OCEPD will note when organisms are not found in their voucher collection, remove them from the sample, and send to an extramural expert for verification. Taxa in Table 3 will be sent to an extramural expert for identification by July 1, 2022.

Sample Sorting and Identification Process: Overall, OCEPD is properly following DEP SOPs for sample sorting and identification with a few exceptions. Samples are properly homogenized and subdivided at prescribed levels. Documentation was available for the majority of items listed in SCI 2110. There were a few documentation items consistently missing, such as date of sorting completion, total number of mounted microscope slides, and indication of when specimens are permanently removed from the sample vial (i.e., placed in reference collection). The appropriate benchsheets have been revised as of May 1, 2022 to include these documentation requirements.

There were a few instances in which taxa identified to higher levels were not collapsed appropriately. In AC17126 (Rep A), one specimen was identified by the taxonomist to family level (Naididae) but with an older synonym for the family (Tubificidae). Since the individual was identified at the family level, the SCI protocols require that individual to be assigned to the most likely genus and species within the same family (*Limnodrilus hoffmeisteri)* per the collapsing protocols. It may be that this individual was not collapsed because the family synonymy was not recognized in the collapsing procedure. OCEPD must resolve taxonomic synonyms before collapsing. Also, in AC17126 (Rep A), *Cricotopus* sp. should have been collapsed into *Cricotopus bicinctus* but was left at the genus level. In the same sample, *Dicrotendipes* sp. should have been collapsed into *Dicrotendipes neomodestus* but was left at genus level. In AC18167 (Rep A), *Oecetis georgia* was collapsed into *Oecetis persimilis,* but these are two separate species and thus should not have been combined. OCEPD is reviewing their collapsing procedures and will make any necessary corrections in their database by July 1, 2022 to comply with SCI 2100, Section 4.

Sample Sorting QC: OCEPD's sample sorting protocols were thorough, however documentation was not always clear. OCEPD has an SCI tracking list that indicates QC checks are conducted for every sample, and according to their internal SOP, the QC check is done for 10% of all aliquots processed for each original SCI lab replicate. However, the auditor could not locate the percentage of aliquots QC'd in the documentation provided and thus could not confirm this process. OCEPD clarified that they QC 100% of each sample replicate that has been picked/sorted. A column will be added to their picking log to identify this QC rate per sample replicate.

Sorting efficiency is tracked for each analyst, and sorting efficiency calculation is conducted per DEP SOP SCI 2210. Furthermore, during the time frame of samples that this audit covers, cumulative sorting efficiency remained 95% or greater for the sorting analysts. Although the correct sorting efficiency calculation is documented on OCEPD's Macroinvertebrate Picking QC Log, cumulative sorting efficiency was not always calculated correctly. For example, the sorter for sample AC17126 (Rep B) had a cumulative sorting efficiency of 95.18% prior to picking the sample. The sample was picked at an efficiency of 92.5%, but the cumulative sorting efficiency increased to 97.3% following this sample. As a corrective action, OCEPD has created an electronic spreadsheet to ensure cumulative sorting efficiency is calculated correctly and consistently.

According to OCEPD's internal SOP, precautionary measures and corrective actions are taken when a single-analyst cumulative sorting efficiency falls below 95% and 90% respectively. As a corrective action, OCEPD's protocols indicate "when an analyst failed to meet sorting efficiency criteria, a case narrative is submitted to the QAO with an action plan." Although OCEPD's internal SOP documents that precautionary measures are taken when a single-analyst cumulative sorting efficiency falls below 95%, OCEPD does not clarify what those precautionary measures entail. Following the preliminary audit report, OCEPD clarified that if an individual analyst falls below the continued demonstration value of ≥ 95% picking efficiency they shall revert to training status until they can achieve ≥ 95% picking efficiency on three consecutive sample replicates. As a corrective action, this clarification will be added to OCEPD's internal SOP by June 1, 2022.

Taxonomic Identification QC**:** Any taxonomic discrepancies observed on OCEPD's Macroinvertebrate Picking and ID QC benchsheet were sent out for external verification, which was indicated in the comments section of the benchsheet.

For samples reviewed as a part of this audit, taxa were not always identified to lowest practical taxonomic level. These higher level identifications could affect SCI scores as some specimens require lower taxonomic identifications to be included in SCI metric calculations. However, DEP understands that this is not always possible due to size, specimen quality, etc. However, the department requires that taxonomists verify that each taxon is identified to lowest taxonomic level per DEP SOPs, or if specimens cannot be identified to the appropriate taxonomic level (e.g. too small), that notation is provided. As of May 1, 2022 OCEPD will indicate in the notes section of the newly edited "Macroinvertebrate Taxonomy Bench Sheet" when specimens can't be identified to lowest practical taxonomic level due to specimen quality, size, or other factors.

Cumulative correct identification rates were over 95% for each taxonomist, however, cumulative correct identification rate is required per DEP SOPs for both individuals and taxa. Only one of these are provided on OCEPD's Identification Efficiency QC Log, however, the auditor could not tell which identification rate (taxa or individuals) was being documented. Additionally, OCEPD documentation was missing for the results of corresponding QC samples, which includes the name and number of organisms identified for each taxon. A newly developed document based off "FDEP Macroinvertebrate Taxonimic Internal QC Resolution (IZ- QC-1.1)" will be implemented to clearly identify cumulative ID rate for total taxa and total numbers of organisms identified.

According to OCEPD's internal SOP, "5% of total vials are QC'd." However, based on OCEPD's Macroinvertebrate Picking and ID QC sheet, multiple vials are used per sample replicate. According to DEP SOP's, 5% of all replicates (or 1/year, whichever is greater) must be QC'd and all specimens in the sample replicate QC'd must be verified. OCEPD clarified that a sample replicate contains multiple vials. Each vial contains organisms ID'd by the original taxonomist. OCEPD's internal SOPs will be updated by June 1, 2022 to reflect that at least 5% of sample replicates will be ID QC'd or one per year whichever is greater.

Metric and Index Calculation**:** OCEPD only samples within Orange County, so all samples will be assigned to the Peninsula Bioregion. This practice is correct and is documented in the OCEPD internal SOP.

There were numerous instances where taxa were not correctly assigned to a metric category due to inaccurate data within OCEPD's Bug Library database. *Dubiraphia vittata*, *Cricotopus bicintus*, *Cricotopus* sp., *Polypedilum flavum*, *Polypedilum illinoense* grp;, *Polypedilum scalaenum* grp., *Tricorythodes* sp., *Hetaerina titia*, *Argia sedula*, *Oecetis* sp., *Dubiraphia* sp., *Corydalus cornutus*, *Oecetis persimilis*, *Argia* sp. and *Microcylloepus pusillus* were incorrectly assigned as clingers. *Rheotanytarsus* sp., *Rheotanytarsus pellucidus*, *Dicrotendipes* sp., *Dicrotendipes neomodestus*, and *Rheotanytarsus exiguus* grp. should have been but were not labeled as filter feeders. *Hydropsyche rossi* was incorrectly

labelled as a filter feeder. *Lebertia* sp. and *Tricorythodes* sp. should have been but were not labeled as sensitive. Furthermore, it is also unclear within OCEPD's metadata whether they distinguish between half and full filter feeder status per DEP SOP SCI 2100 Section 5.5. As a corrective action, labeling of sensitive, clinger, and filter feeder habits will be reviewed and corrected according to the SBIO Taxonomic Lists.

For all samples, taxa are correctly assigned as Ephemeroptera, Trichoptera, and Tanytarsini. Metric calculations are correct for Ephemeroptera and Trichoptera, however for samples AC18167 (Rep A) and AC18110 (Reps A and B), Tanytarsini metric calculations differed from auditor calculations. The auditor is unsure whether OCEPD is calculating the metrics using number of individuals or number of taxa or if it is a rounding issue, but the correct method of calculation for the Tanytarsini metric uses the percentage of individuals in the sample that are in the Tanytarsini group. OCEPD will review, revise, and test accuracy of Tanytarsini calculations to ensure calculations are in accordance with SCI 2100 Section 5.4.

Metric calculations were not correctly calculated for the long-lived, sensitive, or percent tolerant SCI metrics. For long-lived and sensitive metrics, OCEPD was using number of individuals instead of number of taxa to calculate the associated SCI metrics. This difference will drastically inflate the scores for these metrics and will thus inflate the final SCI score. For percent tolerant, the percent tolerant value OCEPD used to calculate the final metric score is correct, but the final metric scores documented by OCEPD for all sample replicates is different than the auditor's calculations indicating an error in the percent tolerant equation used by OCEPD. As a corrective action, Long-lived and Sensitive metrics will be calculated using number of taxa. Furthermore, percent tolerant final metric score will be calculated, inspected, and calculated per DEP SOPs. These corrective actions will be implemented by OCEPD by July 1, 2022.

Data Usability Recommendation

Based on the results of this audit, DEP's use of OCEPD SCI data for assessment purposes is contingent upon OCEPD's implementation of corrective actions from this audit. Furthermore, OCEPD must correct and revise previously processed samples that were not collapsed or calculated properly prior to submitting the data to the Department. DEP may use OCEPD SCI data collected from 2020 and ongoing if all corrective actions are complete and if previously processed samples are recalculated as specified above. DEP may elect to follow-up with OCEPD once samples have been processed using the procedures updated and implemented as a result of this audit to ensure corrective actions have been executed appropriately.

Table 2. Audit findings of deficiency and/or requests for additional information for the Laboratory Records Audit of selected SCI sample data produced by OCEPD, and OCEPD responses to audit findings.

SOP Reference	Sample ID	Audit Finding	Recommended or Required Corrective Action(s)	OCEPD Response	Corrective Action and Implementation Date	DEP Comments
SCI 2200 Section 1	All samples	Voucher collection has not been updated since 2016 and does not include several taxa from samples included in this audit (Table 3). Labs must contain a current reference collection which shall contain at least one specimen of all taxa identified.	**Required:** As OCEPD identifies taxa not currently in their voucher collection, remove the physical specimen from the sample and add the specimen to the voucher collection. These new taxa shall be verified by an extramural expert as time allows for OCEPD.	Organisms not found in our voucher collection will be noted on the bench sheet, removed from the sample and sent to an extramural expert for ID and added to our voucher collection. Taxa in table 3 have been set aside and will be sent to an extramural expert.	Organisms in Table 3 to be verified by extramural expert by July 1, 2022.	The corrective action is acceptable.
SCI 2200 Section 1	All samples	Two taxa (*Myxosargus* sp. and *Tropisterunus* sp.) in voucher collection not verified by extramural expert. All specimens in reference collection must be verified by an extramural expert.	**Required:** Obtain external verifications for these two taxa as time allows for OCEPD.	These taxa will be pulled from our voucher collection and send out for extramural verification.	These organisms will be verified by an extramural expert by July 1, 2022.	The corrective action is acceptable.
SCI 2110	All samples	Documentation missing on benchsheets for date of sorting completion and total number of mounted microscope slides used.	**Required:** Record date of sorting completion and total number of mounted microscope slides used on appropriate benchsheets.	Sorting date completion and total # of mounted microscope slides used will be added to the appropriate bench sheets.	Bench Sheet updated by May 1, 2022	The corrective action is acceptable.
SCI 2100 Section 3.3.2.6	All samples	Taxonomic benchsheet does not indicate when specimens are permanently removed from sample vial and added to the laboratory's reference collection.	**Required:** Record when specimens are permanently removed from sample vial and added to reference collection. **Recommended:** Add a column or a footnote on the benchsheet to document when specimens are permanently removed from a sample vial.	A "notes" section will be added to the taxonomic bench sheet to provide a space to indicate that a specimen has been removed (or any other relevant note) and added to the reference collection.	Bench Sheet updated by May 1, 2022	The corrective action is acceptable.

SOP Reference	Sample ID	Audit Finding	Recommended or Required Corrective Action(s)	OCEPD Response	Corrective Action and Implementation Date	DEP Comments
SCI 2100 Section 4	AC17126, AC18167	Collapsing procedures not conducted per DEP SOPs. In AC17126 (Rep A), *Cricotopus* sp. should have been collapsed into *Cricotopus bicinctus*, *Dicrotendipes* sp. should have been collapsed into *Dicrotendipes neomodestus*, and Naididae (Family Tubificidae) should have been collapsed into *Limnodrilus hoffmeisteri*. In AC18167 (Rep A), *Oecetis georgia* was collapsed into *Oecetis persimilis*. These are two separate species and thus should not be combined.	**Required:** Review SCI 2100 Section 4 and adjust OCEPD protocols appropriately to ensure taxa are being collapsed correctly.	Collapsing procedures are being reviewed and corrected according to SCI 2100 section 4.	Database updates will be completed by July 1, 2022.	The corrective action is acceptable.
SCI 2200 Section 1.5	All samples	Auditor could not locate the percentage of sorted aliquots per sample QC'd in the documentation provided and thus could not verify that 10% of all aliquots processed were QC checked.	**Required:** Provide auditor with documentation of the percentage of aliquots QC'd.	OCEPD QC's 100% of each sample replicate that has been picked/sorted. A column will be added to the picking log to identify this QC rate per sample replicate.	Picking log will be updated by May 1, 2022.	The corrective action is acceptable.
SCI 2210 Section 2	All samples	Although the correct sorting efficiency calculation is documented on OCEPD's Macroinvertebrate Picking QC Log, cumulative sorting efficiency was not always calculated correctly. For example, the sorter for sample BWKP-B had a cumulative sorting efficiency of 95.18% prior to picking the sample. The sample was picked at an efficiency of 92.5%, but the cumulative sorting efficiency	**Required:** Correct any incorrect cumulative sorting efficiency percentages on the Macroinvertebrate Picking QC Log and adjust OCEPD protocols appropriately to ensure cumulative sorting efficiency is calculated correctly and consistently.	An electronic spreadsheet has been created to ensure cumulative sorting efficiency is calculated correctly and consistently.	Picking log will be updated by May 1, 2022	The corrective action is acceptable.

SOP Reference	Sample ID	Audit Finding	Recommended or Required Corrective Action(s)	OCEPD Response	Corrective Action and Implementation Date	DEP Comments
		increased to 97.3% following this sample.				
SCI 2210 Section 2	All samples	The OCEPD internal SOP states that precautionary measures are taken when single-analyst cumulative sorting efficiency falls below 95%. However, there is no description of the precautionary measure(s) in the SOP.	**Required:** Add description in internal SOP of precautionary measures taken when single-analyst cumulative sorting efficiency falls below 95%.	If an individual analyst falls below the continued demonstration value of ≥ 95% picking efficiency they shall revert to training status until they can achieve ≥ 95% picking efficiency on three consecutive sample replicates.	SOP updates will be completed by June 1, 2022.	The corrective action is acceptable.
SCI 2100 Section 3.3.2.4	All samples	Taxa not always identified to lowest practical taxonomic level. For example, *Tribelos* sp. and *Argia* sp. are required to be identified to species level but were only identified to genus level. While DEP understands this is not always possible due to size, specimen quality, etc., DEP requires taxa are identified to lowest possible taxonomic level when possible.	**Required:** Identify taxa to lowest possible taxonomic level when possible. **Recommended:** Add a footnote at the bottom of the benchsheet that specifies taxa were identified to lowest possible taxonomic level considering the size, quality of specimen, etc.	Taxa will be identified to at least the lowest taxonomical level as outlined in SCI 2230. Any exception to this rule will be accounted for in the notes section of the newly edited "Macroinvertebrate Taxonomy Bench Sheet".	Bench Sheet updated by May 1, 2022.	The corrective action is acceptable.
SCI 2221	All samples	Required documentation missing for single analyst cumulative ID rate for both taxa and total number of organisms identified. OCEPD only records one of these documentation requirements, however the auditor cannot decipher whether OCEPD is documenting the ID rate for taxa or individual specimens.	**Required:** Record single analyst cumulative ID rate for both total taxa and total number of organisms identified. **Recommended:** Revise Macroinvertebrate Identification Efficiency QC Log to include and/or clarify the documentation of single analyst cumulative ID rate for	A newly developed document based off "FDEP Macroinvertebrate Taxonimic Internal QC Resolution (IZ-QC-1.1)" will be implemented to clearly identify cumulative ID rate for total taxa and total numbers of organisms identified.	New tracking sheet created by May 1, 2022. SOP updates will be completed by June 1, 2022.	The corrective action is acceptable.

SOP Reference	Sample ID	Audit Finding	Recommended or Required Corrective Action(s)	OCEPD Response	Corrective Action and Implementation Date	DEP Comments
			total taxa and total number of organisms identified.			
SCI 2220 Section 3	All samples	OCEPD performs ID QC on 5% of vials. However, based on OCEPD's Macroinvertebrate Picking and ID QC sheet, multiple vials are used per sample replicate. ID QC must be conducted on 5% of processed replicates or at least one replicate per year (whichever is greater).	**Required:** Perform ID QC on 5% of processed replicates or at least one replicate per year (whichever is greater). Revise internal OCEPD SOP to reflect this corrective action.	Each OCEPD sample replicate contains multiple vials. Each vial contains organisms ID'd by the original taxonomist (at the lowest possible taxonomic level). At least 5% of sample replicates will be ID QC'd or one per year whichever is greater.	SOP updates will be completed by June 1, 2022.	The corrective action is acceptable.
SCI 2220 Section 3.3, SCI 2221	All samples	Name and number of individual organisms identified for each taxon enumerated in the ID QC sample is not documented.	**Required:** Record name and number of individual organisms identified for each taxon in the QC identifications. **Recommended:** Record name and number of taxa on the Macroinvertebrate Picking and ID QC benchsheet for the 2nd Identification in the existing columns.	A newly developed document based off "FDEP Macroinvertebrate Taxonimic Internal QC Resolution" (IZ-QC-1.1) will be implemented to clearly identify cumulative ID rate for total taxa and total numbers of organisms identified.	New tracking sheet created by May 1, 2022. SOP updates will be completed by June 1, 2022.	The corrective action is acceptable.
SCI 2100 Section 5.2	AC17126	Labelling of sensitive taxa incorrect. *Lebertia* sp. and *Tricorythodes* should be labeled as sensitive.	**Required:** Update OCEPD database metadata with the current taxonomic lists available on the DEP website (SBIO Taxonomic Lists).	Labeling of sensitive taxa will be reviewed and corrected according to the SBIO Taxonomic Lists.	Database updates will be completed by July 1, 2022.	The corrective action is acceptable.
SCI 2100 Section 5.5	All samples	Twenty-one instances of incorrect labelling of clinger or filter feeder habit.	**Required:** Update OCEPD database metadata with the current taxonomic lists available on the DEP website (SBIO Taxonomic Lists).	Labeling of clinger and filter feeder habits will be reviewed and corrected according to the SBIO Taxonomic Lists.	Database updates will be completed by July 1, 2022.	The corrective action is acceptable.

SOP Reference	Sample ID	Audit Finding	Recommended or Required Corrective Action(s)	OCEPD Response	Corrective Action and Implementation Date	DEP Comments
SCI 2100 Section 5.4	AC18110, AC18167	Tanytarsini calculations incorrect for samples that contain Tanytarsini taxa.	**Required:** Calculate Tanytarsini SCI metric using percent Tanytarsini individuals in the Tanytarsini group within the aliquot.	Tanytarsini calculations are being reviewed, revised, and will be tested for accuracy.	Database updates will be completed by July 1, 2022.	The corrective action is acceptable.
SCI 2100 Sections 5.1-5.2	All samples	Long-lived and Sensitive SCI metrics are being calculated using number of individuals in the replicate.	**Required:** Calculate Long-lived and Sensitive SCI metrics using number of taxa.	Long-lived and Sensitive metrics will be calculated using number of taxa.	Database updates will be completed by July 1, 2022.	The corrective action is acceptable.
Table SCI 2100-1	All samples	Percent tolerant value correct, but final metric score incorrect indicating percent tolerant metric is not calculated correctly.	**Required:** Review % tolerant metric calculation and ensure the equation is correct and is being calculated per DEP SOPs.	Percent tolerant final metric score will be calculated, inspected, and calculated per DEP SOPs.	Database updates will be completed by July 1, 2022.	The corrective action is acceptable.

Table 3. List of taxa found in the samples reviewed by the auditor that were not included in OCEPD's voucher collection.

Sample(s) Where Taxon Were Found	Phylum	Class	Order	Family	Genus Species
AC17126A, AC17126B	Annelida	Hirudinea	Rhynchobdellida	Glossiphoniidae	*Gloiobdella elongata*
AC18167B	Annelida	Hirudinea	Rhynchobdellida	Glossiphoniidae	*Helobdella stagnalis*
AC18167A	Annelida	Hirudinea	Rhynchobdellida	Glossiphoniidae	*Helobdella triserialis*
AC18167B	Arthropoda	Arachnida	Acariformes	Hygrobatidae	*Hygrobates sp.*
AC17126A, AC17126B	Arthropoda	Arachnida	Acariformes	Lebertiidae	*Lebertia sp.*
AC17126A, AC17126B	Arthropoda	Arachnida	Acariformes	Limnesiidae	*Limnesia sp.*
AC18167A, AC18167B	Arthropoda	Arachnida	Acariformes	Unionicolidae	*Neumania sp.*
AC17126A, AC17126B	Arthropoda	Crustacea	Isopoda	Sphaeromatidae	*Cassidinidea ovalis*
AC17126A	Arthropoda	Hexapoda	Diptera	Chironomidae	*Endotribelos hesperium*
AC18110B	Arthropoda	Hexapoda	Diptera	Chironomidae	*Stelechomyia perpulchra*
AC18110 A	Arthropoda	Hexapoda	Diptera	Chironomidae	*Thienemanniella similis*
AC18110 A, AC18110B	Arthropoda	Hexapoda	Ephemeroptera	Heptageniidae	*Maccaffertium exiguum*
AC17126B	Arthropoda	Hexapoda	Heteroptera	Corixidae	N/A
AC18167A	Arthropoda	Hexapoda	Heteroptera	Gerridae	*Limnoporus sp.*
AC17126B, AC18110B	Arthropoda	Hexapoda	Heteroptera	Veliidae	*Rhagovelia sp.*
AC18167A, AC18167B	Arthropoda	Hexapoda	Megaloptera	Corydalidae	*Corydalus cornutus*
AC18167B	Arthropoda	Hexapoda	Odonata	Coenagrionidae	*Enallagma cardenium*
AC18110B, AC 18167B	Arthropoda	Hexapoda	Odonata	Coenagrionidae	*Enallagma divagans*
AC17126A, AC17126B	Arthropoda	Hexapoda	Trichoptera	Hydropsychidae	*Hydropsyche rossi*
AC17126A	Arthropoda	Hexapoda	Trichoptera	Hydroptilidae	*Oxyethira sp.*
AC18167A, AC18167B	Arthropoda	Hexapoda	Trichoptera	Leptoceridae	*Oecetis persimilis*
AC17126A, AC18167B	Mollusca	Gastropoda	Basommatophora	Ancylidae	N/A
AC17126A, AC17126B	Mollusca	Gastropoda	Mesogastropoda	Pilidae	*Pomacea paludosa*