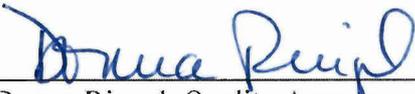
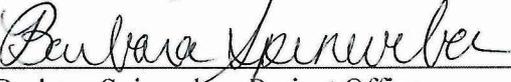


**2016 State of the Bay Report
Barnegat Bay Partnership
Quality Assurance Project Plan**

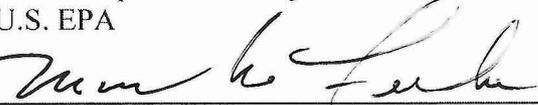
**Barnegat Bay Partnership
October 2015**

Approved by: 
Donna Ringel, Quality Assurance Officer
U.S. EPA Region 2

3/9/2016
date

Approved by: 
Barbara Spinweber, Project Officer
U.S. EPA

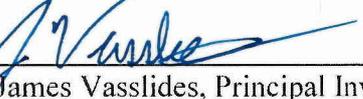
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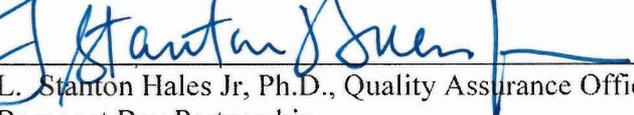
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U.S. EPA REGION 2
CLEAN WATER REGULATORY BR

Approved by: 
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QAPP distribution list

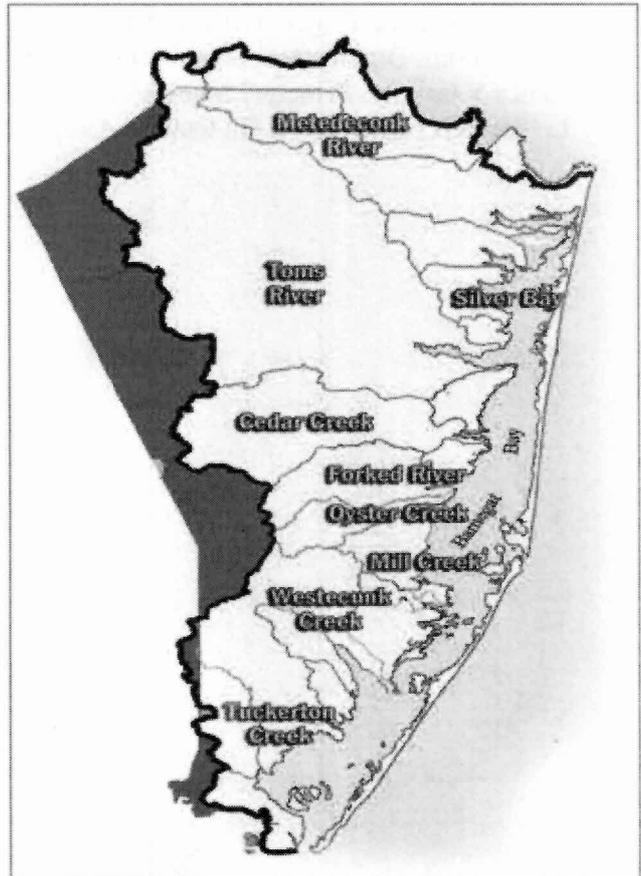
Signed copies of this Quality Assurance Project Plan (QAPP) and all subsequent revisions will be sent to the following individuals by electronic mail:

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1. Project Objectives, Organization, and Responsibilities

1.1. Purpose of Study and Background Information

The Barnegat Bay Partnership (BBP), authorized in 1995 as the Barnegat Bay Estuary Program by the U.S. Environmental Protection Agency, is one of 28 National Estuary Programs throughout the US. The BBP is a partnership of federal, state, county, municipal, academic, business, and private stakeholders in the Barnegat Bay watershed working together to help restore, maintain, protect, and enhance the natural resources of the Barnegat Bay estuary and its contributing watershed. The Barnegat Bay-Little Egg Harbor estuary ("Barnegat Bay") covers over 42 miles of shoreline from the Point Pleasant Canal to the north to Little Egg Harbor Inlet in the south and is composed of three shallow, micro-tidal bays: Barnegat Bay, Manahawkin Bay, and Little Egg Harbor. A nearly continuous barrier island complex runs along the eastern edge of Barnegat Bay, separating it from the Atlantic Ocean. Seawater enters the Barnegat Bay system through the Point Pleasant Canal via the Manasquan Inlet in the north and the Barnegat Inlet and Little Egg Inlet in the south.



The primary planning document produced by BBP to guide its efforts is the Comprehensive Conservation and Management Plan (CCMP), which was signed by the governor of New Jersey and the EPA Region 2 Administrator in the spring of 2002 (Barnegat Bay National Estuary Program, 2002). The CCMP outlines a comprehensive strategy to achieve BBP's goal of establishing and maintaining a healthy and productive ecosystem with full beneficial uses. In the spring of 2008 the Barnegat Bay Partnership completed a 12-month collaborative effort resulting in a three-year Strategic Plan (2008-2011) identifying the key priority issues to focus on over the three-year time period (Barnegat Bay National Estuary Program, 2008). In 2012 an update to the Strategic Plan was completed for 2012-2016 (BBP 2012).

In 1995 the Barnegat Bay Partnership convened a science and technical workshop to develop a Monitoring Program Plan (MPP) for the estuary. The MPP identifies a set of environmental parameters that could serve as indicators to measure the success of CCMP implementation. The MPP, completed in May 2003, includes recommendations to periodically assess and report on a

number of these environmental indicators to evaluate whether BBP's goals and objectives are being met (Barnegat Bay National Estuary Program, 2003).

The State of the Bay Report will report on progress in the environmental condition of the Barnegat Bay by presenting data on the status and trends for a series of environmental indicators. This report is intended for a general audience that may not be aware of, or initially interested in, environmental issues in the Barnegat Bay. Therefore, environmental data, which will be displayed primarily in charts and maps, will be accompanied by background information, discussion of any trends, current and past efforts by BBP and its partners to improve environmental conditions, pictures, resources for more information, and tips on how to get involved.

1.2. Project Objectives

The main objectives of the State of the Bay report are to:

1. Report on the status and trends in several indicators of the environmental condition of Barnegat Bay;
2. Serve as an education and outreach tool by presenting this information to a wide audience to:
 - a. Increase knowledge and appreciation, and foster stewardship, of the shared resources in the Barnegat Bay, and
 - b. Increase awareness and support of the BBP's work; and
3. Uncover new sources of environmental data

Secondary data will be presented to show whether the condition of the bay is improving, deteriorating, or showing no trend over time, and thus whether or not the BBP's goals for the Barnegat Bay are being met.

1.3. Secondary Data Needed

The secondary data needed are environmental data that are measured in the same manner periodically and serve as indicators of the bay's ecological condition. These data shall cover the main primary causes of ecosystem impairments on which the Barnegat Bay Partnership's Strategic Plan focuses: water quality degradation within the ecosystem, especially eutrophication in the bay and stormwater and non-point source pollution in the watershed, water supply and flow issues, habitat loss and degradation, and fisheries decline. It is our intent to utilize the indicators from the 2011 State of the Bay Report where sufficient data for the time frame exists. Additional indicators may be added as need to ensure that all focus areas of the Strategic Plan are addressed.

Examples of environmental data sets that will be needed include measures of water quality

(concentrations of nitrogen and other nutrients, fecal coliform and other bacteria), extent of various habitats (e.g., acreage of tidal wetlands, sea grass beds), and abundance of key species (e.g., hard clams and other fish and crustaceans).

Because environmental data tend to fluctuate widely, it is often the case that trends can only be detected upon evaluating long time-series of data. Thus, new data which have been added to existing datasets since the publication of our previous *State of the Bay* reports should not be presented and assessed in isolation but within the context of all available historical data. Therefore, this edition of the *State of the Bay* will include (for all indicators covered) data already presented in the 2005 and 2011 reports and the newly available data. However, if a more complete or otherwise superior dataset is uncovered, it will be preferred. This may result in (presumably slightly) different results than those presented in the previous editions. Even if the same dataset is used, the inclusion of new data may change the conclusions drawn previously (e.g., a formerly inconclusive trend could now be clearly defined). Regardless of the dataset used, all trends will be explained and compared to our previous findings. In particular, any changes resulting from the inclusion of a different dataset will be noted in the report.

Broad spatial coverage within the entire bay would be preferred as it would allow a more representative depiction of conditions, but even data from a few or a single location would be useful, as long as data are collected in a consistent manner (e.g., same sites, or same sampling design). In order to show temporal trends of the various indicators, datasets should ideally include recent measures (a few years old at most), go back in time for as long as available, and be relatively frequent (see Section 3.1 Quality Requirements).

Data of the best quality available will be preferred. However, data with deficiencies or gaps will not necessarily be excluded: these data could still be valuable to illustrate the state of knowledge and uncertainties in bay conditions, and make the case for better or additional monitoring programs.

1.4. Planned Approach

Assessing the status and trends in various environmental indicators is the only project objective that involves data analysis. The goal is to use the value of a given environmental parameter (e.g., dissolved oxygen, areal coverage of seagrass) to determine the current condition of the indicator (very good, good, above average, average, below average, moderately degraded, severely degraded) and whether the values have increased, decreased, remained the same over time, or showed no consistent trend. In most cases, the data which will be used in this project have been collected for similar purposes as ours, and studied in detail and assessed for status and trends by the data generator and/or other scientists and experts involved in the subject (e.g., data on fecal coliform levels collected by Ocean County Health Department has been examined at length by this agency and other parties). This project will rely on these available results and conclusions whenever possible.

For indicators where such previous analysis is not readily available, we will consult with scientists and other knowledgeable individuals (including those in our review team) as needed, to

determine if there is a consensus position within the scientific community about the status and trends. For environmental parameters with established quality criteria (dissolved oxygen, for example), the current values will be compared against those to determine the status. For parameters where no criteria are clearly defined the working group will use best professional judgement to set the status. For trend determination this process may require visual inspection of the time series and possibly trend tests (*e.g.*, regression analysis, and Mann-Kendall-based tests, provided that sufficient data are available to apply such statistical tools). It is anticipated that for some indicators, a trend may be apparent, but data will not be sufficient to conclusively establish a trend. In those cases, the apparent trend may be mentioned, but the uncertainties and need for additional data will be noted. It is also expected that in some cases determining whether the data show a trend, or are otherwise “telling a story” may not be straightforward and may require a careful analysis of different datasets and professional judgment. We will rely for these interpretations on scientists and experts who have been studying these issues at length.

In all cases, the report will be subject to review by both the Working Group and the STAC to ensure that the contents are scientifically sound and reflect the most current views within the scientific community.

1.5. Project Organization and Responsibilities

The BBP Principal Investigator is responsible for overseeing the completion of this report, with assistance from a working group solicited from STAC member organizations. More details are provided in the following list of project participants and their responsibilities.

- o **Principal Investigator:** James Vasslides, Program Scientist, BBP
 - Responsible for overseeing implementation of the project work plan, reviewing drafts of the report, managing the project budget, issuing contracts and agreements for any needed professional services, and processing invoices.
 - Responsible for implementing the project work plan with assistance from the State of the Bay Working Group, Science and Technical Advisory Committee (STAC), other BBP partners, data providers, and team of reviewers. Specific responsibilities include:
 - Assuring State of the Estuary QAPP secondary data quality, performing data analyses where necessary and appropriate, creating maps and charts, providing the data, maps and charts to the graphic designer, and working with the web developer to prepare a version of the report for the web site.
 - Reporting, writing, substantive editing and copy editing, assigning articles, managing the review process, obtaining photographs and images, providing ideas to the graphic designer for layout and design, and managing outside contractors, including a printer, and possibly illustrator and photographer.

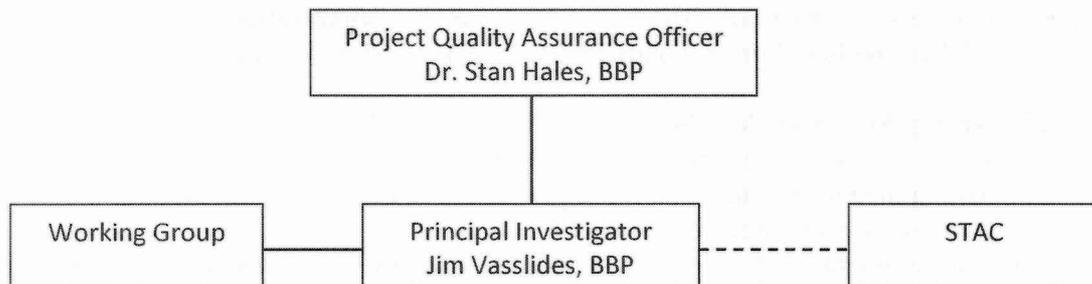
- o **Project Quality Assurance Officer:** Dr. L. Stanton Hales Jr, Director, Barnegat Bay Partnership
 - Responsible for reviewing drafts of the report and approving the final report prior to printing.

o **State of the Bay Report Working Group:** Dr. Ron Baker and Christine Weiben, US Geological Survey – New Jersey Water Science Center; Robert Schuster, NJDEP – Bureau of Marine Water Monitoring; Alena Baldwin-Brown, NJDEP – Division of Water Monitoring and Standards; Charles Caruso, Pinelands Preservation Alliance, Robert Karl and Will Ruocco, Brick Municipal Utilities Authority; Barbara Spinweber and Brent Gaylord, US Environmental Protection Agency Region 2, and Scott Bruinooge, Ocean County College.

- Responsible for providing general guidance and advice on all scientific and technical aspects of the report, including: selecting an adequate set of indicators for the report, reviewing this Quality Assurance Project Plan and providing guidance as needed in its implementation, suggesting possible sources of data, and reviewing the report.

o **STAC:** The BBP’s Science and Technical Advisory Committee will review the contents of the report to ensure that it is scientifically sound, assessing it for adequate data interpretation and accurate background information. If the STAC does not feel it has the expertise to review a particular topic it will seek the assistance of knowledgeable individuals. A list of individuals who have reviewed the report as part of this process will be available and kept as part of the project files.

Organizational Chart. Connecting lines represent the proper lines of communication between individuals. Dotted lines represent general guidance and feedback



1.6. Project Schedule

The tentative schedule for the project is provided in Table 1.

	Task	Start Date	End Date
QAPP	QAPP preparation	September 2015	October 2015
	Define contents	September 2015	September 2015
Report contents	Collect and review data	September 2015	November 2015
	Select Indicators	October 2015	February 2016
	Write sections	September 2015	December 2015
	Conduct review and edit	December 2015	February 2016
Report graphics	Obtain pictures	September 2015	March 2016
	Create charts & maps	September 2015	March 2016
Layout	Work with designer	September 2015	May 2016
	Produce 1st draft layout	January 2016	February 2016
	Produce 2nd draft layout	March 2016	April 2016
Report Printing	Printing	April 2016	April 2016
Report Distribution	Create distribution lists & labels	April 2016	April 2016
	Report distribution	May 2016	

2. Sources of Secondary Data

2.1. Data Sources

This project will rely entirely on existing data, which will be obtained primarily from agencies, institutions and companies already conducting monitoring programs such as the United States Geological Survey, New Jersey Department of Environmental Protection's Bureau of Marine Water Monitoring, the BBP, and academic institutions. Data sources include published reports and, most frequently, databases. Databases can typically be downloaded in their entirety, or queried for specific subsets of data, either by the user (BBP) or by the data generators/managers via a formal or informal data request.

The sources of data used in the 2011 *State of the Bay Report* are included in Table 2 below. It is anticipated that these data sources will be used for the 2016 report as well.

Table 2: Indicators and data sources for the 2011 <i>State of the Bay Report</i>.	
Indicator	Data source
Nitrogen Load	USGS report “Contributions of Nitrogen to the BB-LEH Estuary: Updated Loading Estimates”
Harmful Algal Blooms	NJDEP Bureau of Marine Water Monitoring and Rutgers University
Macroalgal Blooms	Rutgers University
Dissolved Oxygen	NJDEP Bureau of Marine Water Monitoring, Bureau of Water Quality Standards and Assessment, Monmouth University
Turbidity	NJDEP Bureau of Marine Water Monitoring
Temperature and pH	USEPA STORET data warehouse
Freshwater Macroinvertebrates	NJDEP AMNET program
Bathing Beach Closures	Ocean County Health Department
Shellfish Bed Closures	NJDEP Bureau of Marine Water Monitoring
Shallow Groundwater Quality	Ocean County Health Department and USGS
Streamflow	USGS
Water Withdrawals	USGS Aggregated Water Use Data System
Seagrass	Rutgers University
Watershed Integrity Measures	Pinelands Commission
Land Use – Land Cover	Rutgers University
Wetlands	Richard Stockton College
Protected Lands	Ocean County Natural Lands Trust, US Fish and Wildlife Service, NJDEP Green Acres
Shellfish Resources	Rutgers Cooperative Extension
Rare, Threatened, and Endangered Animals	NJDEP Endangered and Non-game Species Program

This project is exploratory in nature and one of its objectives is precisely to uncover new data sources that may be used to track progress in the environmental health of the Barnegat Bay. Therefore, it is possible that additional data sources will be identified during the course of the project, as we interact more closely with scientists and experts. In addition, not all data obtained will necessarily be used, even if of adequate quality. Because of size constraints, the printed report can only include a handful of indicators that will be selected upon obtaining and evaluating the data, based not only on their quality but also on the relevance and expected ability to engage the intended audience. The first task of the Work Group will be to review the data sources available and decide on the specific indicators to be included based on data availability and quality, ease of conveying a clear and relevant message to the public, and indicators included in similar reports that are also targeted to the general public. This process will be documented in Working Group meeting minutes that will be kept as part of the project files.

All data sources will be fully referenced, including links to databases, and any documentation of data quality.

2.2. Data Generators

Data generators are, generally speaking, the agencies, research institutions, and other organizations that collect (or have collected) suitable (in terms of type of data being relevant to BBP's goals, covering an adequate geographic and temporal scale, and being of adequate quality) environmental data.

The Science and Technical Advisory Committee to the Barnegat Bay Partnership held a series of workshops in 2001 and 2002 to obtain input in developing the Program's Monitoring Program Plan. A diverse group of scientists, managers, and others attended these workshops and identified a suite of approximately 30 indicators that could be used to monitor environmental improvement within BBP's geographic area of concern, along with regional monitoring programs which could provide appropriate data for each of the indicators. A subset of these programs were selected for inclusion in the 2006 and 2011 reports based on the suitability of the data.

It is anticipated that the same data generators included in Table 2 will be used to update the indicators used in the 2011 report. In addition, it is possible that data providers, scientists and researchers contacted in the preparation of this report may be able to point to other suitable monitoring programs unbeknownst to us, that we will, in turn, pursue and evaluate for relevance and adequacy. Furthermore, the BBP will issue a "call for data" through our various media outlets.

2.3. Hierarchy of Data Sources

In general, data from ongoing environmental monitoring programs going as far back in time as possible; carried out by trusted agencies, universities, or research institutions; and with known and adequate quality control and quality assurance procedures will be preferred. If these conditions are not met, less desirable data may be gathered if they can provide at least partial indication of the condition of the Estuary. Any limitations and gaps in data included in the report will be fully disclosed, and it will be noted that the data should be used with caution. For example, for certain indicators, available data may only cover a limited window in time but still be crucial to complement and put in perspective other available data. Even if data are not of the best quality, they may represent the best available knowledge of the system and may not only provide a glimpse into current conditions, but also point to the need for improved data collection efforts.

2.4. Rationale for Selecting Data Sources

Given the specificity of this project's data needs (*i.e.*, various types of environmental monitoring data collected from the Barnegat Bay, covering several years), in many cases there may be a single data source available. If more than one data source is available, all will be evaluated and

the highest quality, most complete (in terms of spatial and temporal coverage) data sources will be used.

2.5. List of Sources of Secondary Data

The sources of all secondary data presented will be identified in any report or other project deliverables. Links to published data or online databases will be provided.

3. Quality of Secondary Data

3.1. Quality Requirements

Data should meet the following quality requirements. However, given the paucity of environmental data within our study area for some indicators, it is likely that some datasets will not meet one or more requirements. These data may still be valuable for our purposes and, if used, any shortcomings will be noted.

- Data were generated by a reliable source. Although the identity of the data generator does not guarantee data quality, it provides a simple screening criterion when multiple data sources are available. The following are indicators of data source reliability.
 - o Data generator is generally trusted and respected (federal, state, and local agencies, or research institutions; examples include, but are not limited to, U.S. EPA, NOAA, USGS, NJDEP, Rutgers University, Monmouth University, Montclair State University).
 - o Data are published in peer-reviewed articles or publications.
- Data have been collected for purposes similar to ours; *i.e.*, to assess the status and trends in a particular environmental indicator.
- Monitoring Program has a QAPP or similar plan documenting quality assurance and quality control procedures to ensure data accuracy, precision, representativeness, and comparability.
- Data have been widely used and/or trusted by scientists and professionals in the subject.
- Completeness
 - o Spatial coverage
 - Dataset provides good coverage of the geographic area of interest (*e.g.*, as many of the main bays and tributaries in the Estuary as possible are represented) and the same sites are included in each sampling effort.
 - o Temporal coverage
 - Enough historical data are available (the farther back in time, the better) to allow assessing any trends in the various environmental indicators.
 - Adequate sampling frequency. In general, the more frequent the sampling, the better. In general, yearly (or even less frequent) data may be adequate to assess long-term trends. More frequent data may allow

showing short-term changes; while this is not the main goal of the report, it may provide an interesting piece of information and may help clarify or illustrate certain concepts (e.g., how seasonal conditions affect algal growth and, consequently, chlorophyll and dissolved oxygen concentrations).

- Data are more or less evenly distributed throughout the sampling period. In other words, there are no major periods where no data were collected. Evenly spaced sampling intervals are desirable but not strictly necessary.
- Monitoring program is ongoing. This is not strictly required, but highly desirable as the availability of future data would facilitate the preparation of upcoming reports on the State of the bay

3.2. Data Review and Evaluation

The quality of the secondary data will be based on data quality requirements defined in Section 3.1 of this document. In determining data quality, the completeness of the dataset will be assessed first, by inspecting data description (usually metadata) or the dataset itself (whichever is more easily available). If completeness is deemed adequate, other quality requirements will be assessed by inspecting the QAPP, other QA/QC documentation, metadata, and/or other information obtained from data providers. This will be accomplished by the Principal Investigator through the use of a Region 2 Data Usability Assessment Checklist (Appendix 1). The completed checklist will be maintained with the dataset per the records management standards (Section 4.4).

3.3. Disclaimers

All project deliverables will inform of the existence of this QAPP. As stated previously, any limitations in data quality will be fully disclosed. If a decision is made to use data of unknown quality, this will be indicated in a disclaimer that will be added to any project deliverable. The disclaimer will read: "These data are of unknown quality and presented here for illustrative purposes only. No inferences regarding the environmental condition of the Barnegat Bay should be made based on these data until their quality can be determined."

4. Data Reporting, Data Reduction, Data Validation, and Records Management

4.1. Data Reduction

In general, data will be manipulated as little as possible. Data reduction may be required to graphically display the information in a condensed, more easily understandable format and, in some cases, to establish or show specific data trends or characteristics.

The following are some examples of anticipated or possible data reduction procedures (provided that adequate data are available):

- For most indicators, the presence or absence of a trend over time will be shown by means of an x-y chart. It is anticipated that all available data will be plotted. However, for indicators for which there are large numbers of data points (*e.g.*, sea level, water quality parameters), it will be considered whether plotting monthly or yearly average values provides a clearer depiction of trends.
- Indicators that involve counts or otherwise depend on the level of effort will be normalized and reported per unit effort whenever possible. For example, fish landings will be divided by the number of fishing trips or other form of effort.
- Data units may need to be changed for report consistency and/or to allow comparisons across data sources
- Certain datasets may be reduced and presented as percentages (*e.g.*, percentage of time a beach was closed during the swimming season, or percentage of water open to shellfish harvesting)
- Some data reduction may also be needed to display data in map form (maps will normally be intended to summarize some of the available information). Possible data reductions include the following.
 - o Average values for a given water quality parameter (*e.g.*, fecal coliform cell concentrations) across sampling locations within a sub-region of the Estuary (*e.g.*, Manahawkin bay) at a given date.
 - o Data may be reduced to show whether or not they comply with a given benchmark. For example, concentrations of toxic compounds in sediments may be compared to the effects range-median (ER-M) and data displayed as above or below this benchmark.

4.2. Data Validation

The reporting of accurate project data will generally be ensured by carefully conducting and clearly expressing data reduction (if and when needed) and visual inspection of data before including in final report. Specifically, we will follow the following validation process.

- A copy of every original dataset obtained from each data source will be saved as a read-only, protected file in the event the integrity of the working datasets is compromised.
- Working data will be stored in spreadsheet format and will include all relevant raw data, which will be locked for editing.
- Data manipulation will be minimized to decrease the chances of inadvertently introducing errors. If any data reduction or manipulation is needed, it will be calculated starting from the raw, protected dataset. All formulas, along with units and conversion factors, will be shown in the spreadsheet; in addition, the formulas will be visible in each cell containing the reduced values. The formulas used will be checked by the

BBP Quality Assurance Officer, as will 10 percent of the calculations. If errors are encountered the percentage to be checked will increase to 25.

- Prior to inclusion in the final report, raw and/or reduced data will be displayed in graphic form and inspected to detect any anomalous value. Most environmental indicators to be displayed have been measured in the past and values are expected to fluctuate between “generally accepted values.” If apparently anomalous values are detected, any data reduction will be verified. If the seeming anomaly is present in the original dataset, the data generator will be contacted for clarification and/or the issue will be discussed with the STAC and other appropriate parties. Any decision to eliminate “anomalous values” will be documented in the working data spreadsheets which will be kept as part of the project files.
- In rare occasions, a dataset may only be available in hard copy format. In these cases, data will be manually entered into a spreadsheet. To ensure an error-free copy, summary statistics will be checked if possible, and 10 percent of the data will be spot-checked by the BBP Quality Assurance Officer. If errors are encountered the percentage to be checked will increase to 25.

4.3. Deliverables

The deliverable of this project will be a report. A special edition of BBP’s newsletter will be produced based on summary findings of the final report. Both the report and the summary will be available in hard copy and online.

4.4. Records Management

The following project-related documents and records will be kept by the Barnegat Bay Program office for as long as possible and for a minimum of three years from the date of the final Financial Status Report to EPA, as stipulated by 40 CFR § 31.42:

- Original files and materials (either electronic or in print) obtained from the data providers, including datasets, data quality information, reports, and other relevant information pertaining the data and data interpretation;
- Working data spreadsheets which will document any data reduction, anomalous data removal, and other issues;
- Draft and final versions of the report;
- Minutes from any meetings held in relation with the preparation of the report, including Working Group meetings;
- List of report reviewers and their written comments;
- Files exchanged with graphic designer, printer, and other contractors; and

- Other relevant documents and materials.

5. References

Barnegat Bay National Estuary Program. 2002. Final Comprehensive Conservation and Management Plan. May 2002. <http://bbp.ocean.edu/pages/129.asp>

Barnegat Bay National Estuary Program. 2003. Monitoring Program Plan. May 2003. <http://bbp.ocean.edu/Reports/BBNEP%20Monitoring%20Plan%20-%202005.pdf>

Barnegat Bay National Estuary Program. 2005. 2005 State of the Bay Technical Report. August 2005. http://bbp.ocean.edu/Reports/2005-state_of_bay_tech.pdf

Barnegat Bay National Estuary Program. 2008. Strategic Plan 2008-2011. May 2008. <http://bbp.ocean.edu/pages/131.asp>

Barnegat Bay Partnership. 2011. 2011 State of the Bay Report. May 2011. <http://bbp.ocean.edu/pages/345.asp>

Barnegat Bay Partnership. 2012. 2012-2016 Strategic Plan. <http://bbp.ocean.edu/pages/131.asp>

Appendix 1: USEPA Region 2 Data Usability Checklist

Data Usability Assessment Checklist

for projects involving use of data from the same project and/or external or existing data

Project Name	
Phase	

Checklist prepared by		Date
Organization/Affiliation		
Contractor/Grantee/In-house Project Manager review		Date
Quality Assurance Office review		Date
EPA Project Manager review and approval		Date

If there are two or more distinct sampling designs (for multiple media or parameter sets), describe each in Question 2. A separate checklist answering Questions 4 through 67 should be completed for each design.

Purpose	1. Briefly state the purpose of this project.
	2. Briefly describe the type(s) of sampling design(s) used.
	3. Briefly provide supporting rationale justifying the appropriateness of the sampling design(s) for this project.

Answer the following questions by placing a Y in the appropriate column to the right.		Yes	No	N/A	Comments
Planning	4. Were project planning documents fully approved by the Quality Assurance Office (QAO) before this data collection or use event occurred? If not, explain under Comments.				
	5. Were project planning documents made available to all project personnel involved with the planning, sampling, analyses, review, and assessment portions of the project?				
	6. Were copies of project planning documents filed so that they are available for future reference?				
	7. Were laboratory standard operating procedures (SOPs) and Quality Management Plans (QMPs) evaluated to ensure that they were capable of meeting project needs?				
	8. If required, were pre- and/or post-award laboratory onsite evaluations performed?				
	9. Were laboratories outside of the current EPA regional analytical system (EPA Regional Laboratory, National Contract Laboratory Program, state laboratory, etc.) used to support this project?				
	10. Were field based analytical procedures or a mobile laboratory approved for use? If yes, note under Comments what percentage of samples were confirmed by a fixed laboratory.				
	11. Were sub-contractors (for sampling or analytical purposes) approved for use in support of this project?				

Answer the following questions by placing a Y in the appropriate column to the right.		Yes	No	N/A	Comments
Planning, Cont.	12. Were sub-contractors, other than those previously approved, used?				
	13. For laboratories outside of the current EPA regional analytical system, were SOPs and QMPs evaluated to ensure that they were capable of meeting project needs?				
	14. Were sampler, driller, etc. qualifications, SOPs, and QMPs evaluated to ensure that they were capable of meeting project needs?				
Sampling	15. Was the sampling design(s) adhered to as outlined in the project planning documents? If not, explain under Comments.				
	16. Were deviation reports prepared to capture deviations or variances to the sampling design(s)?				
	17. Were sampling SOPs adhered to as outlined in the project planning documents?				
	18. Were sampler=s field notes and documentation filed so that they are available for future reference?				

Answer the following questions by placing a Y in the appropriate column to the right.		Yes	No	N/A	Comments
Analysis	19. Were all samples analyzed successfully?				
	20. If any problems were encountered, were they documented by the laboratory and communicated to project management?				
	21. Were analytical procedures adhered to as outlined in the project planning documents? If not, explain under Comments.				
	22. Did laboratory deliverables meet the project requirements?				
	23. Were laboratory data backed-up by the laboratory and retained so that they can be made available at a later date, if needed?				
	24. Are the locations of project data deliverables being tracked?				

Review	25. Did planning documents have data review/validation criteria?				
	26. Were laboratory data deliverables reviewed for quality control exceedances?				
	27. Were laboratory data deliverables reviewed for adherence to project measurement quality objectives?				
	28. Were data reviewed/validated as outlined in the project planning documents? If not, explain under Comments.				
	29. Were data review/validation reports generated?				
	30. Were copies of the data review/validation reports filed so that they are available for future reference?				
	31. Were data quality problems identified during the data review/validation process?				

Answer the following questions by placing a Y in the appropriate column to the right.		Yes	No	N/A	Comments
Corrective Actions	32. Were sampling and/or analytical corrective actions necessary?				
	33. Were sampling and/or analytical corrective actions approved by the EPA Project Manager before implementation, documented, and distributed to all involved personnel?				
	34. Were sampling and/or analytical corrective actions successful in remediating the identified problems?				
	35. Were sampling and/or analytical corrective actions documented and filed so that they are available for future reference?				
Secondary Use of Data	36. Did the planning documents for this project account for the use of existing data, including the specification of measurement quality objectives (MQOs) and other relevant data quality considerations (such as spatial and temporal representativeness)?				

If this project included the secondary use of existing data, separate sets of responses should be prepared for Questions 37 through 62. One set is needed for the current project and an additional set for each external data source. Label each set of responses to indicate clearly that the answers relate to use of data collected by this project or to use of external/existing data.

Check one: Data from __ Current Project or Data from __ Existing or External Source

Answer the following questions by placing a Y in the appropriate column to the right.		Yes	No	N/A	Comments
Secondary Use of Data, Cont.	37. Was sufficient documentation of the quality of the existing data available for assessing conformance to the MQOs for this project?				
	38. Was an assessment of the acceptability of the existing data performed for this project?				
	39. Were standard sampling methods cited and used as documented for the original project? If non-standard (or innovative) sampling methods were used, describe under Comments.				
	40. Were standard analytical methods cited and used as documented for the original project? If non-standard (or innovative) analytical methods were used, describe under Comments.				
	41. Were any changes to the sampling and/or analytical methods in the original project documented?				
Additional Project Oversight	42. Did project planning documents require submission of performance evaluation (PE) samples during this event?				
	43. Were any PE samples submitted to the laboratories during this event?				
	44. Were all PE samples determined to be within acceptable ranges? If not, describe under Comments.				
	45. Were PE sample evaluations filed so that they are available for future reference?				
	46. Were split samples collected during this event?				

Answer the following questions by placing a Y in the appropriate column to the right.		Yes	No	N/A	Comments
Additional Project Oversight Activities, Cont.	47. Did results reported by primary and referee laboratories agree within project acceptance limits? If not, describe under Comments.				
	48. Were split sample evaluations filed so that they are available for future reference?				
	49. Were collection of Field quality control (QC) samples required in the project planning documents?				
	50. Were Field QC samples collected and submitted to the laboratories during this event?				
	51. Were laboratory reported results for Field QC samples within project acceptance limits? If not, describe under Comments.				

Data Usability Assessment	52. Were any sampling issues determined to have negatively impacted data usability? If so, describe under Comments.				
	53. Were any analytical issues determined to have negatively impacted data usability? If so, describe under Comments.				
	54. Did data meet measurement performance criteria (MPC) for precision? If not, describe under Comments.				
	55. Did data meet MPC for accuracy? If not, describe under Comments.				
	56. Did data meet MPC for representativeness? If not, describe under Comments.				

Answer the following questions by placing a Y in the appropriate column to the right.		Yes	No	N/A	Comments
Data Usability Assessment, Cont.	57. Did data meet MPC for comparability? If not, describe under Comments.				
	58. Did data meet MPC for completeness? If not, describe under Comments.				
	59. Did data meet MPC for sensitivity? If not, describe under Comments.				
	60. Were project measurement quality objectives met? If not, describe under Comments.				
	61. Were project data quality objectives met? If not, describe under Comments.				
	62. For all MPC, MQO, and/or DQO non-attainments, exceedances, data flags, etc., provide estimates on: a. The resulting effects on the usability of the data. b. The resulting effects on the end use of the data (such as qualifiers on or uncertainty in the decision to be made, or limitations on the types of decisions that can be made with the data). This information can be provided either under Comments or as an attachment to the checklist.				

Answer the following questions by placing a Y in the appropriate column to the right.		Yes	No	N/A	Comments
DUA, cont	63. Were usable (acceptable) sample results found to be above action or regulatory levels?				
	64. Were regulatory or enforcement actions taken based upon usable (acceptable) data?				
	65. Conclusions on Data Usability:				

Further Action(s)	66. Have similar data quality problems, as those identified, been encountered during previous sampling events? If yes, describe under Comments.				
	67. Will more samples need to be collected to address resulting data gaps? If yes, describe under Comments.				
	68. Will there be any further action(s) on this project that may involve collection and analysis of site samples? If yes, describe under Comments.				

Questions should be directed to John Kushwara of the EPA Region 2 Monitoring and Assessment Branch at 732-321-6686 or at kushwara.john@epa.gov.