

January 28, 2014

MEMORANDUM FOR: David Lane  
Acting Chief, Field Operations Division (FOD)

FROM: Richard F. Edwing  
Director, Center for Operational Oceanographic Products and  
Services (CO-OPS)

SUBJECT: CY 2014 Project Instructions – Coastal and Great Lakes Water  
Level Stations

The enclosed document, “Project Instructions: Installation, and Maintenance of Coastal and Great Lakes Water Level Stations for CY 2014,” is forwarded for implementation.

These Project Instructions are technical requirements and are provided in three parts. PART A, General Requirements, and PART B, Standing Project Instructions for the Coastal and Great Lakes Water Level Stations, Updated October 2013 are applicable to all stations. PART C, Specific Requirements, addresses NWLON and subordinate station project support, specific categories of priority work, and individual station requirements. These instructions apply to both the coastal “sea level” and Great Lakes water level stations (observing systems).

PART B, the Standing Project Instructions, provides general requirements essential for maintenance of station integrity and the collection of high quality data for the National Water Level Observation Network. Standing Project Instructions document the program standards to which the data is collected. Adherence to these standards is very important for accomplishing CO-OPS’ goals. The products derived from the observing system data are used for NOS multi-purpose applications such as the Physical Oceanographic Real-Time Systems (PORTS<sup>®</sup>), tsunami detection and notification, control for hydrographic and photogrammetric surveys, long-term sea level analysis and trends, boundary determinations, etc.

The Standing Project Instructions cannot take into account the dynamic year-to-year budget situations in CO-OPS, and when operational decisions have to be made because of the lack of funding, FOD and the Engineering Division (ED) will consult and recommend a course of action. Recommendations impacting performance measures and milestones must be approved by CO-OPS’ Director.

These instructions apply to all types of stations that are installed, maintained, or removed by CO-OPS or CO-OPS’ Indefinite Delivery Indefinite Quantity (IDIQ) contractors. The requirements are explicit; available resources throughout the year will govern actual accomplishments at each station.

Prior to the scheduling of each field trip, FOD and the Configuration and Operational Engineering Team (COET) will hold a pre-inspection meeting and customized station specific requirements for each station will be discussed, agreed, and performed. The agreed upon station specific instructions will be documented. This modified procedure is applicable only to FOD maintained stations.

PARTS A and C provide background information and list individual station requirements. An Excel file, 2014 Station Operational Lists, has been prepared to identify stations supporting various programs such as PORTS<sup>®</sup>, Operational Forecast Systems (OFS), Continuous Operating Reference Systems (CORS), climate/sea level, hydro, international treaties, tsunami/storm surge, or ecosystem restoration. The list also groups the stations according to the NOAA mission goals they support. Counters are provided at the end of the list to indicate the number of stations supporting each type of project as well as the groupings of NOAA mission goals.

The specific requirements for each station in PART C, Section 2.0 have been prioritized in descending order of importance. Field personnel will accomplish as many of the requirements as possible based on the order listed in PART C, Section 2.0.

In an effort to standardize the requirements for all of CO-OPS field efforts, and to ensure that the critical information is verified immediately by COET, submissions of the 1-day site report (eSite report, as applicable) and level abstract within one working day requirement applies to all annual maintenance and emergency maintenance activities for FOD and contractors. The 1-day site report will indicate if these requirements have been completed. Final documentation shall be submitted to COET within 30 calendar days of completion of annual maintenance and leveling for stations maintained by IDIQ contractors. FOD will also complete and strive to submit within 30 calendar days of completion of annual maintenance and leveling for stations but no later than 30 days of completion of a trip for stations maintained by FOD. COET will evaluate the station package (final documentation) and then inform the documentation submitter of any corrective actions.

The eSite report is scheduled for release to contractors in the second or third quarters of FY 2014. Training will be provided by COET personnel and will be coordinated through Marty Welch, Contracting Officer's Representative, and Brendon Johnson, Contracting Officer.

COET will provide FOD and contractors bench mark stability reports that indicate which marks were not leveled the previous year, as an aid to help ensure that all marks are leveled every two years. The reports are available on the network server for those who have access to CO-OPS' secure network. Task Managers should provide the reports to their IDIQ contractors, or COET will supply the report upon request.

When GPS observations are performed on the designated GPS bench mark (annually or every five years as indicated in the Part C), that mark shall be included in that year's level run. This is important for connecting tidal, geodetic, and ellipsoidal datums. Some pre-planning for leveling routes and schemes (which marks will be connected each year based upon the GPS observations requirement) shall be investigated.

FOD should update the planned monthly schedule of stations to visit and work to be accomplished based upon the maintenance requirements specified in PART C, Section 2.0, and the best use of their available resources.

The stations and the meteorological sensors maintained by IDIQ contractors shall follow the requirements listed in the specific Task.

FOD should take station photos which are free of debris, tools, and personnel. This effort will coincide with new CO-OPS web page allowing the photos to be displayed at a standard size because they will be of better quality and resolution. The photos required include: a general view, enclosure or shelter, interior of shelter, primary water level sensor and protective well/sump, Met mast, wind sensor, air temp sensor, and CORS antenna, SAE encoder, ETG, and sump in the Great Lakes.

This year all water level, meteorological, and real time current meter stations for NWLON and PORTS that are maintained by CO-OPS and CO-OPS' IDIQ contractors are included in these Project Instructions. The task requirements and these project instructions shall be used to maintain all PORTS stations. In addition, ADCPX upgrades are required at seven stations as identified in Section 1.13 of the PART C where PORTS partner funding is identified. CO-OPS has upgraded 14 stations with XADCP so far and when these seven stations are upgraded by the end of CY 14, all side lookers and bottom mounted ADCP for real time PORTS current meters would have been completed.

Thirty two NWLON stations have been selected for brownout and will not receive annual inspection in CY 2014. These include NWLON stations in the northeast from Eastport, ME to Wrightsville Beach, NC, except three Hydro control stations at Newport, RI; New London, CT; Duck, NC; and five hurricane Sandy damaged NWLON stations at Bridgeport, CT; Montauk, NY; Kings Point, NY; The Battery, NY; and Sandy Hook, NJ. The approved station list for brownout has been forwarded to AOB. CO-OPS has set an operational goal of 170 annual inspections in CY 2014; accomplishments towards this goal are reported at the quarterly project reviews. The CO-OPS field activities schedules and calendars on the new Google calendar shall be continually updated by assigned team leaders and contract task managers.

Enclosures

cc:

All CO-OPS Personnel



# **CY 2014 Project Instructions for Coastal and Great Lakes Water Level Stations**

January 2014

Engineering Division  
Center for Operational Oceanographic Products and Services  
National Ocean Service  
National Oceanic and Atmospheric Administration

# TABLE OF CONTENTS

## CY 2014 Project Instructions For Coastal and Great Lakes Water Level Stations

<b>PART A: GENERAL REQUIREMENTS.....</b>	<b>1</b>
1. <i>General Maintenance Guidance.....</i>	<i>1</i>
1.1    Operational Maintenance Decision-Making Support .....	1
1.2    Maintenance Requirements and Reference Document .....	2
1.3    Field Operations Division (FOD) Maintenance.....	2
2. <i>Coordination Guidance for the Installation, Maintenance, and Removal of Water Level Stations.....</i>	<i>3</i>
2.1    PORTS® .....	3
2.2    Hydrographic and Photogrammetric Surveys.....	3
2.3    NWLON Water Level Stations .....	4
2.4    COASTAL Program .....	4
2.5    Special Projects and Contract Projects .....	4
2.6    USACE Comprehensive Evaluation of Project Datums Projects .....	5
3. <i>Work Plan and Reporting .....</i>	<i>5</i>
3.1    Schedule, Reports, and Training.....	5
<b>PART B: STANDING PROJECT INSTRUCTIONS FOR THE COASTAL AND GREAT LAKES WATER LEVEL STATIONS, UPDATED AUGUST 2011 .....</b>	<b>7</b>
<b>PART C: SPECIFIC REQUIREMENTS.....</b>	<b>8</b>
1. <i>Station Operational Groups.....</i>	<i>8</i>
1.1    CY 2014 Reduced Diving Requirements for FOD Maintained Stations .....	8
1.2    PORTS® Support .....	8
1.3    Hydrographic and Photogrammetric Survey Support.....	8
1.4    Emergency Repairs and Operational Station Status .....	9
1.5    Upgraded or Relocated Stations.....	9
1.5.1    Upgraded Stations .....	9
1.5.2    Stations being upgraded with Microwave Water Level Sensors .....	9
1.5.3    Upgraded Stations through the NOAA Office of Climate Observation (OCO) ...	10
1.5.4    Hurricane Station Reconstruction/Relocations .....	10
1.5.5    Stations Planned for Continuously Operating Reference Station (CORS) Installation.....	10
1.6    Stations with Malfunctioning Primary or Backup Sensors.....	11
1.7    Stations Supporting CO-OPS COASTAL Program Projects.....	11
1.8    Stations Supporting NOAA Tsunami and Storm Surge Requirements .....	11
1.9    Special Project Stations for CY 2014 .....	12
1.9.1    Supported Projects .....	12
1.10    Global Sea Level Program .....	13
1.11    Station, Bench Mark, and Met Photographs .....	13

1.12	Other Technical Support.....	13
1.13	Current meter upgrades.....	14
1.14	Great Lakes Current meters.....	14
2.	<i>Individual Station Requirements.....</i>	<i>15</i>
2.1	FOD/AOB - East Coast Stations.....	17
2.1.1	FOD/AOB – Maine Stations.....	17
2.1.2	FOD/AOB – New Hampshire Stations.....	19
2.1.3	FOD/AOB – Massachusetts Stations.....	20
2.1.4	FOD/AOB – Rhode Island Stations.....	22
2.1.5	FOD/AOB – Connecticut Stations.....	23
2.1.6	FOD/AOB – New York Stations.....	24
2.1.7	FOD/AOB – New Jersey Stations.....	25
2.1.8	FOD/AOB – Maryland and DC Stations.....	26
2.1.9	FOD/AOB – Virginia Stations.....	27
2.1.10	FOD/AOB – North Carolina Stations.....	28
2.1.11	FOD/AOB – South Carolina Stations.....	30
2.1.12	FOD/AOB – Georgia Station.....	32
2.1.13	FOD/AOB – Florida East Coast Stations.....	33
2.2	FOD/AOB – Bermuda and the Caribbean Island Stations.....	36
2.3	FOD/AOB – Gulf Coast Stations.....	41
2.4	Air-Sea Systems - Task 11-03: Mobile Bay Storm Surge.....	49
2.5	Air-Sea Systems - Task 11-05: Mobile PORTS®.....	51
2.6	Air-Sea Systems - Task XXVIII: Lower Mississippi River PORTS®.....	53
2.7	Woods Hole Group - Task 10-02: Narragansett PORTS®.....	54
2.8	Woods Hole Group - Task 11-07: NY/NJ PORTS®.....	57
2.9	Woods Hole Group - Task 12-01: Delaware River and Bay PORTS®.....	59
2.10	Woods Hole Group - Task 12-06: Chesapeake Bay PORTS®.....	62
2.11	Conrad Blucher Institute - Task 12-03: Lake Charles PORTS®.....	69
2.12	Conrad Blucher Institute - Task 12-02: Pascagoula PORTS®.....	71
2.13	Conrad Blucher Institute - Task 13-01: Houston/Galveston PORTS®.....	73
2.14	Conrad Blucher Institute - Task 10-04: Texas Stations.....	75
2.15	FOD/AOB - Great Lakes.....	77
2.15.1	St. Lawrence River.....	77
2.15.2	Lake Ontario.....	78
2.15.3	Niagara River.....	80
2.15.4	Lake Erie.....	81
2.15.5	Detroit River.....	84
2.15.6	Lake St Clair.....	86
2.15.7	St. Clair River.....	87
2.15.8	Lake Huron.....	89
2.15.9	Lake Michigan.....	91
2.15.10	St. Mary’s River.....	95
2.15.11	Lake Superior.....	97
2.16	FOD/POB – Hawaii, Pacific Islands, West Coast, and 16 Alaska Stations.....	99
2.16.1	FOD/POB – Hawaii and the Pacific Island Stations.....	99
2.16.2	FOD/POB – California Stations.....	105

2.16.3	FOD/POB – Oregon Stations.....	114
2.16.4	FOD/POB – Washington Stations .....	118
2.16.5	FOD/POB – Alaska Stations.....	124
2.17	JOA - Task 12-08: Western Alaska Stations .....	133

## PART A: GENERAL REQUIREMENTS

These project instructions provide the requirements for installation, maintenance, and removal of water level stations in the National Ocean Service (NOS) National Water Level Observation Network (NWLON), Physical Oceanographic Real Time Systems<sup>®</sup> (PORTS<sup>®</sup>), Coastal Oceanographic Applications and Services of Tides and Lakes (COASTAL) Program, Hydrographic and Photogrammetric Survey Operations, and reimbursable special projects. These stations provide critical data to support the following activities: ensure safe navigation; determine tidal datums for the National Nautical Charting Program and Shoreline Mapping Program; determine the baseline from which marine boundaries are delineated; determine flow rates to support International treaties; National Weather Service tsunami/storm surge warning programs; coastal resource restoration and management; and long-term sea level trend analyses. The NWLON supports the following four NOAA Mission Goals: Climate Adaptation and Mitigation; Weather Ready Nation; Resilient Coastal Communities and Economies; and Healthy Oceans. These goals are directly supported by all observing systems, research and development, and modeling. The objective of the CO-OPS data collection effort is to acquire continuous, reliable, defect-free data that can be efficiently analyzed, and ensure that multi-purpose water level products are developed.

### *1. General Maintenance Guidance*

#### 1.1 Operational Maintenance Decision-Making Support

All NWLON and other subordinate water level and met stations support a variety of NOAA mission goals and projects. It is emphasized that the ultimate goal is to collect high quality data from all stations and sensors continuously. The establishment of new, or relocation of existing stations, will also be assigned the appropriate priority each year. Changes in priority may occur and will be at the direction of the Director of CO-OPS.

These instructions apply to all types of stations that are installed, maintained, or removed by CO-OPS or CO-OPS' Indefinite Delivery Indefinite Quantity (IDIQ) contractors. The requirements are explicit; available resources throughout the year will govern actual accomplishments at each station.

A listing of stations and the programs they support, such as PORTS<sup>®</sup>, hydrographic and photogrammetric surveys, treaties, tsunami, or ecosystem restoration, climate/sea level, is provided in the attached file, 2014 Station Operational Lists.xls. Counters are provided at the bottom of the list to indicate the number of stations supporting each type of project as well as the groupings of NOAA mission goals. The following provides a brief overview of the four main NOAA mission goals supported by NWLON water level stations. Some of the NWLON stations are supporting multiple program categories.

- **Mission Goal 1:** Resilient Coastal Communities and Economies

Stations supporting PORTS<sup>®</sup> activities, Hydrographic and Photogrammetric survey control activities, navigation safety, treaties, other stations supporting reimbursable and special projects, and stations supporting coastal hazard resilience and climate adaptation.

- **Mission Goal 2: Weather Ready Nation**

Stations supporting NOAA Tsunami program, NOAA Storm Surge program, and NOAA Coastal Storms Program.

- **Mission Goal 3: Climate Adaptation and Mitigation**

Stations supporting various climate monitoring programs, climate adaptation activities, and stations supporting special projects

- **Mission Goal 4: Healthy Oceans**

Stations supporting ecosystem restoration and ecosystem modeling projects

There are 34 stations identified as critical for Climate (Global Sea Level Observing System (GLOSS) program) Monitoring, 33 of which are NWLON. Bermuda is the 34<sup>th</sup> station, and is both a Global Sea Level station and a Tsunami-Capable station, but it is not a part of the NWLON.

### 1.2 Maintenance Requirements and Reference Document

Water level station standard annual maintenance shall be accomplished in accordance with the Standing Project Instructions for the Coastal and Great Lakes Water Level Stations, Updated October 2013, and specific station requirements in PART C, Section 2. All other applicable reference documents are provided in the Standing Project Instructions, Section 2.1. There are no maintenance requirements for stations where the funding is not identified, or not appropriated to perform the annual maintenance, or the annual maintenance is not required for some other reason.

Maintenance for reimbursable special projects shall be performed in accordance with their respective agreements, and all associated travel and supplies shall be charged to the appropriate reimbursable task numbers as approved in the project spending plans.

### 1.3 Field Operations Division (FOD) Maintenance

It is the responsibility of FOD to assess available resources and perform annual and emergency maintenance at any station with operational problems to restore the site to full operational capabilities with a minimum loss of data. FOD shall consult with ED, as necessary, when making operational decisions, planning annual inspections, or emergency maintenance activities. The ED Chesapeake Instrument Lab (CIL) and Seattle Instrument Lab (SIL) will coordinate with FOD to provide additional emergency maintenance support as needed.

The periodic Data Management and Assessment Team (DMAT) meeting will review any station problems of concern, and the Operations Manager shall provide direction should multiple problems compete for available resources.

There are many online resources available to personnel to assist in the evaluation of station and sensor status. A few of the more useful resources are provided in the following table.

Online IP Address	Description of Resource
<a href="http://extranet.co-ops.nos.noaa.gov/mambo/index.php">http://extranet.co-ops.nos.noaa.gov/mambo/index.php</a>	CO-OPS Extranet panel
<a href="http://extranet.co-ops.nos.noaa.gov/cgi-bin/diag_diagnostics.cgi">http://extranet.co-ops.nos.noaa.gov/cgi-bin/diag_diagnostics.cgi</a>	Diagnostic single and multiple station plotting tool, for checking the configuration of a station, or for checking the status of satellite transmissions

## 2. *Coordination Guidance for the Installation, Maintenance, and Removal of Water Level Stations*

### 2.1 PORTS®

Installation, maintenance, and removal of stations for PORTS® shall be coordinated between Darren Wright, the IDIQ Task Managers, and FOD. Contractors or local user groups maintain nearly all PORTS® projects; FOD shall support these maintenance groups as necessary. PORTS® Met only, Air Gap and Visibility station requirements are covered under each individual PORTS® operation and maintenance contract.

### 2.2 Hydrographic and Photogrammetric Surveys

The requirements for the installation and removal of subordinate water level stations for NOAA in-house hydrographic and photogrammetric surveys shall be coordinated between the Products and Services Branch (PSB) Hydrographic Planning Team (HPT), Field Operations Division (FOD), and the Operations Branch (OB) of the Hydrographic Surveys Division of the NOS Office of Coast Survey (OCS), or the Remote Sensing Division (RSD) of the National Geodetic Survey (NGS). The coordination is generally done through Laura Rear McLaughlin, Mapping and Charting Program Manager (MCPM) and Jerry Hovis, Chief PSB, as CO-OPS' representative for the tri-office survey support team. The DCP, sensor, and other equipment gauging activities shall also be coordinated between FOD and OB/RSD. The selection and installation of subordinate stations and sensors by FOD for these surveys shall be coordinated with OB/RSD and approved by MCPM, in concurrence with the ED and OD/PSB/HPT.

According to CO-OPS' policy, NOAA platforms, CO-OPS personnel or CO-OPS' IDIQ contractors shall install the subordinate stations for NOAA in-house hydrographic or photogrammetric surveys. CO-OPS is responsible for maintaining control and subordinate stations for NOAA in-house hydrographic and photogrammetric surveys. Priority stations will be added to the Hydro Hot List. For NOAA contract hydrographic or photogrammetric surveys, the subordinate stations shall be installed by OCS contractors according to the OCS Hydrographic Surveys Specifications available on the OCS web site at <http://nauticalcharts.noaa.gov/hsd/specs/specs.htm>

For NOAA contract photogrammetric surveys, the subordinate stations shall be installed by NGS contractors according to the NGS Water Level Specifications and Deliverables for Shoreline Mapping Surveys which are available on CO-OPS publications web page.

CO-OPS is in the process of transitioning the Microwave Water Level (MWWL) sensor to operations and a few stations where the transition is approved are listed in Section C. Generally, the acoustic or MWWL system shall be preferred for hydrographic or photogrammetric subordinate station installations. In cases where acoustic wells or MWWL sensor support arm cannot be installed due to terrain, or in cold climates, installation of a portable digital bubbler system is authorized. For projects in the Great Lakes, the shaft angle encoder sensor is preferred.

The Commanding Officer of the survey ship or the Chief, Hydrographic Field Party, together with CO-OPS personnel, will be jointly responsible for monitoring the proper operation of these stations during the periods of survey operations. Problems shall be reported to FOD for corrective actions. Artara Johnson of ED is designated as the technical point of contact for NOAA in-house and contract hydrographic and photogrammetric survey projects, and may be contacted for daily activities related to hydro operations. Contact Carolyn Lindley of OD/HPT regarding hydro project planning activities.

### 2.3 NWLON Water Level Stations

Installation, maintenance, and removal of subordinate stations performed by CO-OPS personnel for future NWLON, PORTS<sup>®</sup>, and COASTAL programs shall be coordinated among Kate Bosley, Robert Loesch, Manoj Samant, David Lane, Rolin Meyer, Jerry Hovis, Scott Mowery, Darren Wright, Allison Allen, Laura Rear McLaughlin, and the appropriate operational personnel in ED and FOD.

Reporting of NWLON performance metrics is coordinated in-house by David Lane of FOD via FOD ongoing plan. Data availability and number of annual inspections performed are reported now quarterly. These details must be reported well in advance of the preparation of quarterly meetings, and it is the responsibility of the AOB and POB field managers to ensure David has these statistics well in advance (at least 3 weeks prior to the quarterly meeting).

### 2.4 COASTAL Program

Installation, maintenance, and removal of stations performed by CO-OPS personnel for the COASTAL Program (including ecosystem restoration, climate, storm surge, and tsunami) shall be coordinated between COASTAL Program Manager, OD Applied Analysis Team (AAT) Lead, and COASTAL project team, as well as any additional operational ED and FOD personnel, as appropriate.

### 2.5 Special Projects and Contract Projects

Installation, maintenance, and removal of NWLON stations and subordinate stations for special projects shall be coordinated among the Task and Project Manager, Program Managers, Observing Systems Manager, ED, and FOD managers, and shall follow the guidelines and specifications provided in “Standing Project Instructions for the Coastal and Great Lakes Water Level Stations, Updated October 2013.

## 2.6 USACE Comprehensive Evaluation of Project Datums Projects

In FY 13 CO-OPS signed a MOU with the U.S. Army Corps of Engineers (USACE) for supporting their Comprehensive Evaluation of Project Datums (CEPD) Program. Twenty-one of forty-four USACE districts are coastal, and those 21 districts are required to plan CEPD projects and will need CO-OPS' help for computing and updating datums. The coordination of new projects will be done by Laura Rear McLaughlin, Robert Bassett, Jerry Hovis and Manoj Samant. Artara Johnson and Kelly Kriner are designated respectively as technical points of contact for documentation and datum computation. They should be contacted for day-to-day operations.

### **3. *Work Plan and Reporting***

To systematize operations and handle growth, CO-OPS uses an operating procedure called the Reliable Operating System (ROS). ROS has eight steps as follows:

- Step 1: Project Scoping and Approval
- Step 2: Requirements Analysis and Project Planning
- Step 3: System Design and Resource Allocation
- Step 4: Procurement, Assembly, and Testing
- Step 5: Installation and System Verification
- Step 6: Operation and Maintenance
- Step 7: Operational Declaration, Data Management and Product Delivery
- Step 8: Assessment and Outreach

Each of the steps has identified necessary products such as Standard Operating Procedures (SOP), templates, checklists, guidelines, handbooks, etc., that are relevant to the tasks for that step. CO-OPS ROS 1.0 was published in FY 13. All of the activities conveyed by these Project Instructions must follow the ROS guidelines as they are listed on the wiki pages. The products that are relevant for CO-OPS' contracts are made available on the CO-OPS web page at <http://tidesandcurrents.noaa.gov/pub.html> or through CO-OPS Field Reference Library at <http://tidesandcurrents.noaa.gov/fieldlibrary/Welcome>.

#### 3.1 Schedule, Reports, and Training

FOD shall develop and maintain an annual operations plan based upon the monthly schedule of stations' maintenance, and the work to be accomplished as required in PART C, Section 2.0, making best use of available resources. Assigned team leaders and contract task managers shall continually update the CO-OPS field activities calendar on the CO-OPS Google Calendar web site.

Contractors shall coordinate their schedules through their task managers, who in turn will coordinate with FOD to enter the contractors' schedules on the field calendar.

An annual Tides Training Class shall be offered to the appropriate personnel of the NOAA hydrographic survey ships and hydrographic field parties. Two classes shall be scheduled – one each at Chesapeake and Seattle field office– for this training as per the NOS milestone. The training class shall cover all aspects of tide station installation, operation, and maintenance. In

addition to HPT, ED/OD shall participate with FOD, as appropriate, in the annual OCS field procedures workshop held each winter to coordinate survey or training activities.

**PART B: STANDING PROJECT INSTRUCTIONS FOR THE COASTAL AND GREAT LAKES WATER LEVEL STATIONS, UPDATED AUGUST 2011**

See:

[http://tidesandcurrents.noaa.gov/publications/Standing\\_Project\\_Instructions\\_for\\_Coastal\\_and\\_Great\\_Lakes\\_Water\\_Level\\_Stations\\_Updated\\_October\\_2013.pdf](http://tidesandcurrents.noaa.gov/publications/Standing_Project_Instructions_for_Coastal_and_Great_Lakes_Water_Level_Stations_Updated_October_2013.pdf)

## **PART C: SPECIFIC REQUIREMENTS**

### ***1. Station Operational Groups***

All operational NWLON and subordinate stations are listed in the Excel file “2014 Station Operational Lists.xls”. The file contains three worksheets: 1) 2014 NWLON Station Project Support Status; 2) 2014 NWLON Great Lakes Station Project Support Status; and 3) 2014 Subordinate Station Project Support Status (all other non-NWLON). The Great Lakes stations are distinguished from the coastal stations since they support projects not common to the coastal stations. Stations supporting various programs and NOAA mission goals are indicated with an “X”. These three worksheets are provided as a reference for the field parties.

#### **1.1 CY 2014 Reduced Diving Requirements for FOD Maintained Stations**

An effort is being made to reduce the diving requirements in CY 2014 for stations maintained by FOD based on individual station characteristics. Station specific diving frequency and last dive information have been provided by ED as noted for each station in Part C, Section 2.0. It is the responsibility of FOD to determine reduced diving requirements based on field experience, and the dive frequency information listed. These reduced diving requirements only apply to CY 2014; they are being considered in light of known funding limitations and not a permanent change in requirements.

#### **1.2 PORTS® Support**

Forty-four (44) stations on the NWLON list provide support for the PORTS® navigational operations. PORTS® stations having meteorological sensors only are denoted on the subordinate station list.

In addition, in the Great Lakes, five master control stations and 18 stations supporting International treaties shall be considered highest priority for continuous data collection. These stations provide water level and flow data to support International Treaties, the International Joint Commission (IJC) and the International Boards of Control supporting the IJC, the International Forecast, Lake Regulations and Modeling efforts by the USACE and Environment Canada as well as monitoring the sharing of the water for power generation between the United States and Canada.

#### **1.3 Hydrographic and Photogrammetric Survey Support**

Control stations designated on both the NWLON and subordinate lists shall provide support for hydrographic and photogrammetric survey operations. Survey dates, platforms, and the required subordinate stations, and any changes or additions to this list will be provided in the hydro and photo project status sheet file under a separate cover. The dates listed in the period are preliminary and might change, but dates are provided for preliminary planning of field trips, as appropriate. Some of the planned NOAA in-house hydrographic and photogrammetric subordinate station installations may be handled through the IDIQ task orders. For individual hydro/photo projects, the project instructions developed by OD/HPT provide information about the number and names of subordinate projects needed for each project.

#### 1.4 Emergency Repairs and Operational Station Status

Emergency repairs to stations with sensor/system problems shall be addressed immediately; routine maintenance may follow later. In situations where stations require emergency repairs such that data transmission to SSMC has been halted but the sensors still are collecting valid data, all efforts shall be made to download the data from the station's DCP in order to fill all data gaps. These data shall be provided to OET for ingestion into the database and made available for data processing and product generation.

#### 1.5 Upgraded or Relocated Stations

##### 1.5.1 Upgraded Stations

The following stations need facilities upgrades as described. See PART C, Section 2.0., for specific requirements at each site.

8452944 Conimicut Light, RI - hardening of hurricane Sandy affected station  
8454049 Quonset Point, RI - hardening of hurricane Sandy affected station  
8467150 Bridgeport, CT - hardening of hurricane Sandy affected station  
8510560 Montauk, NY - hardening of hurricane Sandy affected station  
8516945 Kings Point, NY - hardening of hurricane Sandy affected station  
8518750 Battery, NY - hardening of hurricane Sandy affected station  
8519483 Bergen Point, NY - hardening of hurricane Sandy affected station  
8530680 Sandy Hook, NJ - hardening of hurricane Sandy affected station (Contract)  
8555889 Brandywine Shoals Light - hardening of hurricane Sandy affected station  
8741533 Pascagoula NOAA Lab, MS  
9759394 Mayaguez, PR - hardening of hurricane Sandy affected station and swapped with Agudilla for NWLON count, as agreed with PRSN.  
9410170 San Diego, CA – prepare for the upcoming relocation of the water level station sometime in the near future  
9752235 Culebra, PR – station rebuild  
db0501 Brown Shoal Light  
no3020 The Narrows

##### 1.5.2 Stations being upgraded with Microwave Water Level Sensors

The following stations will be installed/upgraded with a microwave water level sensor. See PART C, Section 2.0., for specific requirements at each site.

8452944 Conimicut Light, RI  
8454049 Quonset Point, RI  
8467150 Bridgeport, CT  
8516945 Kings Point, NY  
8531680 Sandy Hook, NJ  
8635027 Dahlgren, VA  
9414575 Coyote Creek, CA  
9439011 Hammond, OR  
9442396 La Push, WA  
9443090 Neah Bay, WA

9446484 Tacoma, WA  
9450460 Ketchikan, AK  
9461380 Adak, AK

1.5.3 Upgraded Stations through the NOAA Office of Climate Observation (OCO)  
The NOAA Climate Program Office (CPO), within NOAA’s Office of Climate Observation (OCO) generally provides funding to upgrade the redundant stations/DCPs and/or for upgrading the geodetic network, including co-location of continuous GPS stations in partnership with NOAA’s National Geodetic Survey. See PART C, Section 2.0., for specific requirements for each site.

#### 1.5.4 Hurricane Station Reconstruction/Relocations

The following two stations are proposed relocations or were damaged by hurricanes, typhoons, and/or storm surge over the last several years and need infrastructure improvements. See PART C, Section 2.0., for specific requirements for each site.

8635150 Colonial Beach, VA (to be replaced by a new installation at the Dahlgren Navy facility)  
8762372 East Bank, Bayou LaBranche, LA (funding and plan for upgrading the station are being considered by FOD and the COASTAL program manager)

1.5.5 Stations Planned for Continuously Operating Reference Station (CORS) Installation  
CO-OPS is collaborating with NGS to install a CORS site at the NWLON stations listed below. The east coast stations were selected jointly by NGS and CO-OPS as representatives of the longest data series. NGS personnel are in the process of performing a reconnaissance of these stations to determine the feasibility of a CORS installation co-located with the NWLON station. The worksheet titled “FY 2014 NWLON Station Project Support Status” of the Excel file “2014 Station Operational Lists.xls” identifies existing co-located NWLON/CORS sites.

1619910	Sand Island, Midway Islands (Planned - funding provided by NOAA OCO)
1770000	Pago Pago, American Samoa
1820000	Kwajalein
1890000	Wake Island (Planned - funding from NOAA OCO)
8418150	Portland, ME
8534720	Atlantic City, NJ (Planned - funding from NOAA OCO)
8670870	Fort Pulaski, GA
8720218	Mayport (Bar Pilots Dock), FL
8723214	Virginia Key, FL (Planned - funding from NOAA OCO)
8729840	Pensacola, FL ((Planned - funding from NOAA OCO)
9414290	San Francisco, CA (Planned - funding from NOAA OCO)
9451600	Sitka, AK (Planned - funding from NOAA OCO)
9455090	Seward, AK (Planned - funding from NOAA OCO)
9462620	Unalaska, AK (Planned - funding from NOAA OCO)
9468756	Nome, AK (Planned - funding from NOAA OCO)
9497645	Prudhoe Bay, AK (Planned - funding from NOAA OCO)
9755371	San Juan, PR
2695540	Bermuda

In FY14, CO-OPS will work with NGS not only to continue work on the Midway, Wake Island and San Francisco and to finalize the installations at Virginia Key, but will also begin work on two new CORS sites. CO-OPS and NGS envision FY14 as the third year in a five year plan to complete the co-location of CORS station on all US GLOSS stations (that are NWLON sites). This work will include both installation of new antennas and making level connections between existing/new bench marks (Antenna Reference Point) and the tide station.

Several others require, at a minimum, a level connection between the tide station and an existing monument, and upon further assessment, may also need new CORS antennas. Progress will be reported by CO-OPS to the Climate Program Office throughout the year, and input will be sought on prioritization of the planned sites. It has been tentatively planned that the two sites which will be begun in FY13 (contracts funded for an FY13 installation) are Kwajelein and Pensacola.

#### 1.6 Stations with Malfunctioning Primary or Backup Sensors

Stations with malfunctioning primary (A1) sensors or backup bubbler (B1) sensors, indicated on the CORMS control panel and the Backup Water Level Gain and Offset web page, need repair or replacement in a timely manner. Bear in mind that transmission failures will also cause station sensors to appear on these lists as failed. Failure status of a given station backup sensor may not necessarily indicate a failed sensor, but does indicate that the sensor cannot be used if needed to replace the primary sensor data for dissemination. Refer to the CORMS control panel for the station sensor status.

#### 1.7 Stations Supporting CO-OPS COASTAL Program Projects

The stations listed on the COASTAL Program web site will be supporting projects that are part of the COASTAL Program. Continuous data collection at these sites, both NWLON and subordinate, is critical to the success of the projects. See the following link for the list of stations: <http://tidesandcurrents.noaa.gov/coastal.shtml>

#### 1.8 Stations Supporting NOAA Tsunami and Storm Surge Requirements

The 2014 Station Operational Lists and the table below identify the NWLON stations supporting the NOAA Tsunami Warning Network and Storm Surge Network. Data collection platforms at all NWLON stations in the Pacific Islands, Alaska, West coast, most of the East coast and Gulf coast have been upgraded and are designated as “Tsunami-Capable”, and these stations are considered to be part of the tsunami warning network. The web link to the Tsunami web page is: <http://tidesandcurrents.noaa.gov/tsunami/> The maintenance activities at the 16 Tsunami stations listed below are funded by NWS.

9411340 Santa Barbara, CA  
9437540 Garibaldi, OR  
9441102 Westport, WA  
9442396 La Push, WA  
9451054 Port Alexander, AK  
9452634 Elfin Cove, AK  
9457804 Alitak, AK

9459881 King Cove, AK  
 9461710 Atka, Nazan Bay, AK  
 9462450 Nikolski, Mueller Cove, AK  
 9751364 Christiansted Harbor, St. Croix, VI  
 9751381 Lameshur Bay, St John, VI  
 9752235 Culebra, PR  
 9752695 Vieques Island, PR  
 9759412 Aguadilla Pier, PR  
 9759938 Mona Island, PR

## 1.9 Special Project Stations for CY 2014

### 1.9.1 Supported Projects

The stations identified in the following table are both reimbursable and non-reimbursable projects that are operating or will be operating in CY 2014 in support of reimbursable, partnership, and/or special projects. Specific station requirements, where applicable, are provided for these stations being maintained by CO-OPS.

<b>Project Station Number</b>	<b>Station Name</b>	<b>Partner</b>	<b>Funding Number</b>	<b>Control Station Number and Name</b>
9411406	Platform Harvest, CA	NASA/JPL	BK6EJP	9410660 Los Angeles, CA
9414958	Bolinas Lagoon, CA	NGS	1BK6EBL	9415020 Point Reyes, CA
9447915	Priest Point, WA	Tulalip Tribe	1BK6ETT	9447130 Seattle, WA
9448009	Tulalip Shores, WA	Tulalip Tribe	1BK6ETT	9447130 Seattle, WA
9761115	Barbuda*	Antigua-Barbuda Meteorological Services	M8K6EA2 - P00	N/A
8419317	Wells, ME	NERRS	N/A	8418150 Portland, ME
8577756	Buntings Bridge, MD	NPS	N/A	N/A
8662245	Oyster Landing, SC	Baruch	N/A	8665530 Charleston, SC
8732828	Weeks Bay, AL	NERRS	N/A	8729840 Pensacola, FL
8762482	West Bank, LA	St. Charles Parish	N/A	8761724 Grand Isle, LA
9414575	Coyote Creek, CA	USACE	N/A	9414750 Alameda, CA

\* Part of the OCO funding was banked at the end of FY 13, so FY 14 maintenance activities will be supported from FY 14 Base.

#### 1.10 Global Sea Level Program

The NOS is responsible for maintenance at the following station:

<u>Station Number</u>	<u>Station Name</u>
2695540	ESSO Pier, Bermuda

The NOS is also responsible for technical support to other countries, as approved.

#### 1.11 Station, Bench Mark, and Met Photographs

COET and the Met Team are attempting to complete the catalog of required photos of station components and bench marks for each active station. Since CY 13, we have asked for photos demonstrating the specific views that are missing from this catalog. We expect this process to be completed in CY 14. These files must be named in accordance with the format described in the Standing Project Instructions.

The photos requested in the following Station Specifics do not have to be taken this year if the field party chief can find photos recently taken showing the requested view. As long as the photo is properly named and the view represented in the photo is clear, COET will accept it. It would be advantageous to the field party if this is done prior to visiting the station in case the photos do not meet the criteria and a new photo has to be taken during the site visit.

#### 1.12 Other Technical Support

FOD shall provide technical support to various groups outside NOS as part of agreements, grants, or developing new programs. For several years, FOD has provided technical support to the Texas Coastal Ocean Observation Network (TCOON). Technical support shall also be provided to the Great Lakes Observing System (GLOS) as required, and perhaps other developing Regional Associations.

The Puerto Rican water level observation network managed by the Puerto Rico Seismic Network (PRSN) received technology transfer support and installed six water level stations at Mayaguez, Penuelas (Guayanilla), Yabucoa, Fajardo, Arecibo, and Vieques Island (Isabel Segunda) during 2007. Memorandum of Agreement between CO-OPS and PRSN has been recently prepared and expected to be signed in FY 2014. The COASTAL Program Manager shall coordinate CO-OPS support for this project with CO-OPS resource managers. There is no funding identified for this effort. CO-OPS is working with PRSN to take over the Mayaguez station as an NWLON station in CY 14 to replace the destroyed NWLON station at Aguadilla. PRSN is planning to install a station at Aguadilla which will replace Mayaguez. PRSN operates water level stations in other locations outside of Puerto Rico for which CO-OPS has not committed assistance. PRSN operates water level stations in other locations outside of Puerto Rico for which CO-OPS has not committed assistance.

### 1.13 Current meter upgrades – XADCP Upgrades for Side lookers and bottom mounts

CO-OPS has started upgrading the side lookers and bottom mounted Acoustic Doppler Current Profilers (ADCP) to XADCP systems which are based upon the Sutron 9210 DCP. The XADCP development allows integration of multiple ADCP sensor types such as Sontek, RDI, Nortek; and stores data on removable SD card. The system allows the polling of the data from remote devices via IP modem, telephone, or internet (via PORTS tag). The system transmits full data set via GOES and that includes setup parameters at sensor startup and allows setup of sensor's time/date and the time of first ping. The system also checks and adjusts time which is set to GMT. The designed and integrated system allows increased lightning protection and provides flexibility to integrate additional sensors such as meteorological and visibility.

CO-OPS has completed XADCP upgrades at 14 side lookers and bottom mounted ADCP stations so far.

MB0301	Mobile State Dock Pier E	MB0401	Mobile Container Terminal
PS0301	Northrop Grumman Pier	CP0101	Cherry Point
CB0701	Dominion Terminal	CB1301	Chesapeake City
DB0301	Philadelphia	LM0101	First Street
LM0201	Port Allen	NL0101	New London
HB0301	Chevron Pier	HB0401	Hookton Channel
LC0201	Cameron Fishing Pier	LC0301	Lake Charles City Docks

CO-OPS plans to perform XADCP upgrades at the following seven stations in CY 14 so that all side lookers and bottom mounted ADCP stations would have XADCP upgrades completed by the end of CY 14. The PORTS partners and the contracts have funding to do these upgrades in CY 14.

cb1001 Cove Point LNG Pier – Chesapeake Bay North PORTS  
cb1201 Tolchester Front Range – Chesapeake bay North PORTS  
nb0101 Providence Currents - Narragansett PORTS  
nb0201 Fall River Currents - Narragansett PORTS  
nb0301 Quonset Point Currents - Narragansett PORTS  
db0501 Brown Shoal Light - Delaware PORTS  
n03020 The Narrows - Sandy funds to replace equipment. - NY/NJ PORTS

### 1.14 Great Lakes Current meters

The following three current meters (side lookers) are maintained on 'as-needed' basis with phone support from the Chesapeake Instrument lab as necessary.

gl0101 Cuyahoga River - Lake Erie, near the Cleveland station.  
gl0201 Maumee River - Lake Erie, near the Toledo station.  
gl0301 St. Clair River - St. Clair River. This is also referred to as the Blue Water Bridge current meter. The station is located just south of Dunn Paper water level station.

## 2. *Individual Station Requirements*

The following individual station requirements, in addition to the required maintenance listed in the Standing Project Instructions (PART B), are based on the information obtained from review of field, data processing, and datum records. FOD and contractors are responsible for reviewing the NGWLMS status reports, e-mails, and CORMS morning reports for a station to determine recent station problems as part of the staging process for the annual inspection. Additional requirements or changes will be addressed in an amendment to Project Instructions. L-numbers for digital leveling are for calendar year 2014. NGS Permanent ID (PID) for the primary bench mark and station GPS mark, where available, are identified below in parenthesis for each station.

Station specific requirements grouped by Regions and Task Numbers as follows:

- |       |                               |   |
|-------|-------------------------------|---|
| 2.1.  | FOD/AOB                       | East Coast Stations   |
| 2.2.  | FOD/AOB                       | Bermuda and the Caribbean Islands Stations                            |
| 2.3.  | FOD/AOB                       | Gulf Coast Stations   |
| 2.4.  | Air-Sea Systems - Task 11-03  | Mobile Bay Storm Surge (Funded through 9/30/2014)*                    |
| 2.5.  | Air-Sea Systems - Task 11-05  | Mobile PORTS <sup>®</sup> (Funded through 9/14/2014)*                 |
| 2.6.  | Air-Sea Systems – Task XXVIII | Lower MS River PORTS <sup>®</sup> (Funded through 2/28/2014)*         |
| 2.7.  | Woods Hole Group - Task 10-02 | Narragansett PORTS <sup>®</sup> (Funded through 6/30/2014)*           |
| 2.8.  | Woods Hole Group - Task 11-07 | NY/NJ PORTS <sup>®</sup> (Funded through 7/21/2014)*                  |
| 2.9.  | Woods Hole Group - Task 12-01 | Delaware River and Bay PORTS <sup>®</sup> (Funded through 8/31/2014)* |
| 2.10. | Woods Hole Group – Task 12-06 | Chesapeake Bay PORTS <sup>®</sup> (Funded through 6/30/2014)*         |
| 2.11. | Woods Hole Group - Task 12-03 | Lake Charles PORTS <sup>®</sup> (Funded through 4/30/2014)*           |
| 2.12. | Texas A&M DNR - Task 12-02    | Pascagoula PORTS <sup>®</sup> (Funded through 4/30/2014)*             |
| 2.13. | Texas A&M DNR - Task 13-01    | Houston/Galveston PORTS <sup>®</sup> (Funded through 1/31/2015)*      |
| 2.14. | Texas A&M DNR - Task 10-04    | Texas NWLON Stations (Funded through 8/31/2014)*                      |
| 2.15. | FOD/AOB                       | Great Lakes Stations  |
| 2.16. | FOD/POB                       | Hawaii, Pacific Islands, West Coast, and 16 Alaska Stations           |
| 2.17. | JOA – Task 12-08              | Ten Alaska Stations (Funded through 9/30/2014)*                       |

\* Existing status and the ending dates of the contract tasks are shown above, as tasks are re-competed and awarded, this information will be updated. **The following tasks operations and maintenance responsibility will be taken over by Atlantic Operations Group of the Field Operations Division after the funding period as listed above is over for Task 11-05 Mobile PORTS<sup>®</sup>, Task XXVIII Lower MS River PORTS<sup>®</sup>, Task 12-03 Lake Charles PORTS<sup>®</sup>, and Task 12-02 Pascagoula PORTS<sup>®</sup>.**

## Individual Station Headers

The individual stations have header information that identifies the station and critical information required for performing annual maintenance. The station ID, station name, L-number, and leveling part # are included in the first line. The second line identifies the Primary Bench Mark (PBM) and the PBM elevation above Station Datum (SD). PBM above SD is necessary for properly abstracting the levels performed at the station. The GPS bench mark is identified and the value for Mean Sea Level (MSL) above SD is provided on the third line. MSL above SD is critical for calculating the barometer coefficient. GPS observation frequency and date of last GPS session are noted on line four. This information is essential for determining the necessity of performing GPS this year. For example, if the GPS frequency is every five years, and the last GPS session was in 2009, a session is required this year. This procedure is the same for the fifth and final line that conveys the dive inspection frequency and the date of the last dive. GPS and diving requirements **ARE NOT** identified in the individual requirements below the header.

2.1 FOD/AOB - East Coast Stations

2.1.1 FOD/AOB – Maine Stations

<b>8410140 Eastport, ME</b>	<b>L28035</b>	<b>Part 1</b>
<i>PBM:</i> 841 0140 TIDAL 3 (PD0006)		<i>PBM above SD:</i> 15.685 m
<i>GPS Bench Mark:</i> EASTPORT 1989 (PID1179)		<i>MSL above SD:</i> 4.420 m
<i>GPS Observation Frequency:</i> Every 5 years	<i>Last GPS Observation Performed:</i> 10/09	
<i>Dive Inspection Frequency:</i> Every year		<i>Last Dive:</i> 08/12

1. Perform reconnaissance for locations to install two new Class A bench marks (preferably deep rod marks or in rock outcrop settings).

<b>8411060 Cutler Farris Wharf, ME</b>	<b>L28035</b>	<b>Part 6</b>
<i>PBM:</i> 841 1060 TIDAL 10		<i>PBM above SD:</i> 10.751 m
<i>GPS Bench Mark:</i> 841 1060 A (AJ2727)		<i>MSL above SD:</i> 3.860 m
<i>GPS Observation Frequency:</i> Every 5 years	<i>Last GPS Observation Performed:</i> 08/11	
<i>Dive Inspection Frequency:</i> Every year		<i>Last Dive:</i> 08/11

1. Take digital photos of the face, setting, and 2 directional view of bench marks STEEL ROD and 841 1060 TIDAL 10.
2. Lower solar panels on fiberglass pole (may require three or four persons).
3. Install small table for laptop.

<b>8413320 Bar Harbor, ME</b>	<b>L28035</b>	<b>Part 3</b>
<i>PBM:</i> 841 3320 TIDAL 13		<i>PBM above SD:</i> 7.544 m
<i>GPS Bench Mark:</i> 841 3320 TIDAL 1 (AI8315)		<i>MSL above SD:</i> 2.786 m
<i>GPS Observation Frequency:</i> Every 5 years	<i>Last GPS Observation Performed:</i> 09/09	
<i>Dive Inspection Frequency:</i> Every year		<i>Last Dive:</i> 07/12

1. Station needs to be completely rebuilt requiring a new frame; coordinated this effort with the harbormaster and city engineer.

<b>8418150 Portland, ME</b>	<b>L28035</b>	<b>Part 4</b>
<i>PBM:</i> TIDAL 31 STA 84 (OC0005)		<i>PBM above SD:</i> 8.406 m
<i>GPS Bench Mark:</i> 841 8150 TIDAL 3		<i>MSL above SD:</i> 4.113 m
<i>GPS Observation Frequency:</i> Every 5 years	<i>Last GPS Observation Performed:</i> 09/10	
<i>Dive Inspection Frequency:</i> Every year		<i>Last Dive:</i> 08/08

1. **Unresolved from 2013 Project Instructions: FUNDING DEPENDENT** - The CT well is in place without the sensor installed. Remove the CT well if no longer needed.
2. **Unresolved from 2013 Project Instructions:** Designate a new PBM or perform a reconnaissance for a location to install a Class A mark that can be designated as the PBM in the future.
3. Recover and include bench mark TIDAL 38 STA 84 in the level run; this mark was not leveled for more than two years.

**8419317 Wells, ME (COASTAL)**

**PBM:** 841 9317 PUMP

**GPS Bench Mark:** 841 9317 A

**GPS Observation Frequency:** Every 5 years

**Dive Inspection Frequency:** Every year

Note: CO-OPS will fund the FY14 maintenance.

**L28035**

**Part 5**

**PBM above SD:** 10.000 m

**MSL above SD:** 5.961 m

**Last GPS Observation Performed:** 09/10

**Last Dive:** 07/12

1. Coordinate the annual inspection with the COASTAL program manager and notify the manager of any stations issues.
2. **Unresolved from 2013 Project Instructions:** The CT well is in place without the sensor installed. Remove the CT well if no longer needed.
3. Update XPERT Operating System, XPERT DARK Operating System, and the Satlink firmware.
4. Check and update log sizes to reflect Engineering Bulletin 09-003.

## 2.1.2 FOD/AOB – New Hampshire Stations

### **8423898 Fort Point, NH**

**L28036**

**Part 1**

***PBM:*** 842 3898 TIDAL 2

***PBM above SD:*** 7.510 m

***GPS Bench Mark:*** CONSTITUTION 147 NO 1 1941 (OC0429)

***MSL above SD:*** 2.265 m

***GPS Observation Frequency:*** Every 5 years

***Last GPS Observation Performed:*** 10/09

***Dive Inspection Frequency:*** Every year

***Last Dive:*** 08/12

Note: CO-OPS will fund the FY14 maintenance.

1. Update 9210 XPERT Operating System and the Satlink firmware.
2. Check and update log sizes to reflect Engineering Bulletin 09-003.

2.1.3 FOD/AOB – Massachusetts Stations

<b>8443970 Boston, MA</b>	<b>L28037</b>	<b>Part 1</b>
<b>PBM:</b> K 12 (MY0555)		<b>PBM above SD:</b> 6.858 m
<b>GPS Bench Mark:</b> 844 3970 D TIDAL (AJ4030)		<b>MSL above SD:</b> 2.660 m
<b>GPS Observation Frequency:</b> Every 5 years	<b>Last GPS Observation Performed:</b> 07/10	
<b>Dive Inspection Frequency:</b> Every year		<b>Last Dive:</b> 09/13

1. **Unresolved from 2011 Project Instructions:** Take location photos from two different cardinal directions of bench mark 844 3970 C.
2. Recover and include bench mark 844 3970 TIDAL 16 in the level run; this mark was not leveled for more than two years.

<b>8447435 Chatham, MA (COASTAL)</b>	<b>L28037</b>	<b>Part 5</b>
<b>PBM:</b> 844 7435 B (AA7166)		<b>PBM above SD:</b> 5.861 m
<b>GPS Bench Mark:</b> 844 7435 B TIDAL		<b>MSL above SD:</b> 1.974 m
<b>GPS Observation Frequency:</b> Every 5 years	<b>Last GPS Observation Performed:</b> 09/10	
<b>Dive Inspection Frequency:</b> Every year		<b>Last Dive:</b> 08/12

Note: FY14 operation and maintenance funded.

1. Coordinate the annual inspection with the COASTAL Program manager and notify the manager of any station issues.
2. Update 9210 XPERT Operating System and the Satlink firmware.
3. Check and update the log sizes to reflect Engineering Bulletin 09-003.

<b>8447930 Woods Hole, MA</b>	<b>L28037</b>	<b>Part 3</b>
<b>PBM:</b> 844 7930 TIDAL 11 (LW1571)		<b>PBM above SD:</b> 3.447 m
<b>GPS Bench Mark:</b> 844 7930 B TIDAL (AJ4031)		<b>MSL above SD:</b> 1.096 m
<b>GPS Observation Frequency:</b> Every 5 years	<b>Last GPS Observation Performed:</b> 06/09	
<b>Dive Inspection Frequency:</b> Every year		<b>Last Dive:</b> 09/13

1. Long-term stability analysis indicates the PBM is unstable. Change the PBM to 844 7930 B TIDAL.
2. Provide station photos of the tide house structure, shelter/DCP, sensor, Met mast, and wind sensor, etc.
3. Review the reconnaissance report submitted in FY1, establish and level two Class A bench marks, designation 844 7930 C/7930 C 2014 and 844 7930 D 2014.
4. Take the face, setting, and location photos for any newly established marks.

**8449130 Nantucket, MA**

***PBM:*** 844 9130 TIDAL 25

***GPS Bench Mark:*** 844 9130 K TIDAL (AJ4032)

***GPS Observation Frequency:*** Every 5 years

***Dive Inspection Frequency:*** Every year

**L28037**

**Part 4**

***PBM above SD:*** 3.147 m

***MSL above SD:*** 1.454 m

***Last GPS Observation Performed:*** 10/09

***Last Dive:*** 09/13

1. Provide a digital photo of the Aquatrak well.
2. Jet the primary well and clean the area surrounding the parallel plates.
3. Use a Shop-Vac and thoroughly clean the interior of the station shelter.

2.1.4 FOD/AOB – Rhode Island Stations

**8452660 Newport, RI (PORTS)**

***PBM:*** 845 2660 L

***GPS Bench Mark:*** 844 9130 L

***GPS Observation Frequency:*** Every 5 years

***Dive Inspection Frequency:*** Every year

**L28038**

**Part 1**

***PBM above SD:*** 4.113 m

***MSL above SD:*** 1.106 m

***Last GPS Observation Performed:*** 10/09

***Last Dive:*** 07/13

1. No additional requirements.

## 2.1.5 FOD/AOB – Connecticut Stations

### **8467150 Bridgeport, CT**

***PBM:*** 846 7150 A (AI1725)

***GPS Bench Mark:*** 846 7150 D TIDAL (AJ4034)

***GPS Observation Frequency:*** Every 5 years

***Dive Inspection Frequency:*** Every year

**L28039**

**Part 3**

***PBM above SD:*** 3.544 m

***MSL above SD:*** 1.708 m

***Last GPS Observation Performed:*** 11/09

***Last Dive:*** 06/12

1. **Unresolved from 2013 Project Instructions:** Station is planned to be relocated in summer 2013 due to pier demolition by the city of Bridgeport. Perform reconnaissance to re-locate the station before scheduling a site visit.
2. Install an approved MWWL sensor; if any structural modifications are required seek engineering support and Field Engineering Review Subcommittee (FERS) approval.
3. Establish and level four new bench marks, during or after the station relocation, designation/stamping as follows: 846 7150 G/7150 G 2014, 846 7150 H/7150 H 2014, 846 7150 J/7150 J 2014, and 846 7150 K/7150 K 2014.
4. Take the face, setting, and location photos of newly established bench marks.

2.1.6 FOD/AOB – New York Stations

**8510560 Montauk, NY(PORTS)**

***PBM:*** 851 0560 J (AH6725)

***GPS Bench Mark:*** TIDAL 9 STA 2 50 (LW0831)

***GPS Observation Frequency:*** Every 5 years

***Dive Inspection Frequency:*** Every year

**L28040**

**Part 1**

***PBM above SD:*** 3.618 m

***MSL above SD:*** 1.554 m

***Last GPS Observation Performed:*** 09/10

***Last Dive:*** 06/12

1. No additional requirements.

2.1.7 FOD/AOB – New Jersey Stations

**8534720 Atlantic City, NJ**

***PBM:*** 853 4720 F

***GPS Bench Mark:*** 853 4720 F

***GPS Observation Frequency:*** Every 5 years

***Dive Inspection Frequency:*** Every year

**L28041**

**Part 2**

***PBM above SD:*** 10.554 m

***MSL above SD:*** 2.186 m

***Last GPS Observation Performed:*** 08/09

***Last Dive:*** 08/09

1. **Unresolved from 2012 Project Instructions:** Re-measure the elevation of the barometer above station datum (should be ~ 10 m, but is currently documented as 1.4 m).

2.1.8 FOD/AOB – Maryland and DC Stations

**8570283 Ocean City Inlet, MD**

**PBM:** 857 0283 J TIDAL

**GPS Bench Mark:** 857 0283 J TIDAL

**GPS Observation Frequency:** Every 5 years

**Dive Inspection Frequency:** Every year

**L28044**

**Part 1**

**PBM above SD:** 4.979 m

**MSL above SD:** 2.839 m

**Last GPS Observation Performed:** 05/09

**Last Dive:** 05/13

1. No additional requirements.

**8571421 Bishops Head, MD**

**PBM:** 857 1421 A

**GPS Bench Mark:** 857 1421 GRANGER

**GPS Observation Frequency:** Every 5 years

**Dive Inspection Frequency:** Every year

**L28044**

**Part 11**

**PBM above SD:** 10.000 m

**MSL above SD:** 9.114 m

**Last GPS Observation Performed:** 05/09

**Last Dive:** 04/12

1. Recover or establish and level two surface marks, designation/stamping as follows:  
8571421 E/1421 E 2014 and 8571421 F/1421 F 2014
2. Take face, setting, and location photos from two cardinal directions of bench mark 857 1421 D.

**8571892 Cambridge, MD**

**PBM:** 857 1892 D TIDAL (AC6854)

**GPS Bench Mark:** 857 1892 D TIDAL (AC68540)

**GPS Observation Frequency:** Every 5 years

**Dive Inspection Frequency:** Every year

**L28044**

**Part 2**

**PBM above SD:** 3.344 m

**MSL above SD:** 1.060 m

**Last GPS Observation Performed:** 05/09

**Last Dive:** 04/12

1. Recover or establish and level one surface mark, designation/stamping as follows:  
857 1892 H/1982 H 2014.
2. Recover and include bench marks 857 1892 TIDAL 4 and BM USE in the level run; these marks was not leveled for more than two years.
3. Take the face, setting, and location photos of newly established bench marks.

## 2.1.9 FOD/AOB – Virginia Stations

### **8631044 Wachapreague, VA**

***PBM:*** 863 1044 B

***GPS Bench Mark:*** 863 1044 K TIDAL (AJ4587)

***GPS Observation Frequency:*** Every 5 years

***Dive Inspection Frequency:*** Every year

**L28046**

**Part 1**

***PBM above SD:*** 4.130 m

***MSL above SD:*** 1.401 m

***Last GPS Observation Performed:*** 07/09

***Last Dive:*** Unknown

1. Perform reconnaissance to relocate the MWWL sensor, seek engineering support and Field Engineering Review Subcommittee (FERS) approval of the installation design of the new station.
2. Remove the DCP 3 if data comparison analysis is complete and accepted by the MWWL TOP Committee.
3. Verify the Druck sensor serial number.
4. Replace the GPS antenna, check the GPS placement, and inspect the cable.

### **8635027 Dahlgren, Naval Proving Ground, VA**

***PBM:*** TBD

***GPS Bench Mark:*** TBD

***GPS Observation Frequency:*** Every 5 years

***Dive Inspection Frequency:*** Every year

**L28046**

**Part 3**

***PBM above SD:*** Undecided

***MSL above SD:*** TBD

***Last GPS Observation Performed:*** Unknown

1. **Unresolved from 2013 Project Instructions:** Install the new NWLON station as approved by FERS. This station is to replace the destroyed Colonial Beach NWLON station.

2.1.10 FOD/AOB – North Carolina Stations

**8651370 Duck, NC**

**PBM:** 865 1370 B TIDAL, (FW0688)  
**GPS Bench Mark:** 865 1370 C (FW0686)  
**GPS Observation Frequency:** Every 5 years  
**Dive Inspection Frequency:** Every year

**L28047**

**Part 1**

**PBM above SD:** 10.061 m  
**MSL above SD:** 6.202 m  
**Last GPS Observation Performed:** 07/08  
**Last Dive:** 03/13

1. **Unresolved from 2013 Project Instructions:** Remove or fix the Conductivity sensor during the next dive. Sensor is not collecting data currently.
2. Update the XPERT Operating System, XPERT Dark Operating System, and the Satlink firmware if the new version is approved at the time of the annual inspection.
3. Check and update the log sizes to reflect Engineering Bulletin 09-00.
4. **Unresolved from 2013 Project Instructions:** Remove or fix the conductivity sensor during the next dive.
5. Recover bench mark B 255. If bench mark is not found, mark it as destroyed in the .des file.
6. Recover and include bench marks 865 1370 C TIDAL, 865 1370 D TIDAL, and 865 1370 E TIDAL in the level run; these marks were not leveled greater than two years.

**8652587 Oregon Inlet Marina, NC**

**PBM:** 865 2587 NO 3 TIDAL (EX0150)  
**GPS Bench Mark:** 865 2587 TIDAL A  
**GPS Observation Frequency:** Every 5 years  
**Dive Inspection Frequency:** Every year

**L28047**

**Part 5**

**PBM above SD:** 5.214 m  
**MSL above SD:** 0.965 m  
**Last GPS Observation Performed:** 08/08  
**Last Dive:** 03/13

1. Update the XPERT Operating System, XPERT Dark Operating System, and the Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-00.
3. Repair and/or install parallel plates on the primary water level sensor well.

**8654467 USCG Station Hatteras, NC**

**PBM:** 865 4467 C  
**GPS Bench Mark:** H 1 NC 79  
**GPS Observation Frequency:** Every 5 years  
**Dive Inspection Frequency:** Every year

**L28047**

**Part 6**

**PBM above SD:** 10.000  
**MSL above SD:** 8.431  
**Last GPS Observation Frequency:** 04/10  
**Last Dive:** 03/12

1. Update the XPERT Operating System, XPERT Dark Operating System, and the Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-00.
3. Verify anemometer serial number.

<b>8656483 Duke Marine Lab, NC</b>	<b>L28047</b>	<b>Part 3</b>
<i>PBM:</i> 865 6483 NO 11 (AI9505)		<i>PBM above SD:</i> 3.097 m
<i>GPS Bench Mark:</i> 865 6483 E TIDAL (DE7961)		<i>MSL above SD:</i> 1.083 m
<i>GPS Observation Frequency:</i> Every 5 years	<i>Last GPS Observation Performed:</i> 08/08	
<i>Dive Inspection Frequency:</i> Every year		<i>Last Dive:</i> 01/11

1. A dive inspection **MUST** be performed during this site visit; last dive was done in (01/11). A report on the condition of marine growth on the outside of the well, around the plates and orifice, and inside the well is required on the site report under Dive comments.
2. Update the XPERT Operating System, XPERT Dark Operating System, and the Satlink firmware if the new version is approved at the time of the annual inspection.
3. Check and update the log sizes to reflect Engineering Bulletin 09-00.
4. Recover and include bench marks 865 6483 E and X 112 in the level run; these marks were not leveled greater than two years.
5. Re-describe and take face, setting, and directional photos of bench mark NCCOS BEAUFORT. The current description references random trees near the area.

<b>8658120 Wilmington, NC</b>	<b>L28047</b>	<b>Part 4</b>
<i>PBM:</i> 865 8120 D		<i>PBM above SD:</i> 2.454 m
<i>GPS Bench Mark:</i> 865 8120 C TIDAL RM 1 (EA3063)		<i>MSL above SD:</i> 1.490 m
<i>GPS Observation Frequency:</i> Every 5 years	<i>Last GPS Observation Performed:</i> 10/09	
<i>Dive Inspection Frequency:</i> Every year		<i>Last Dive:</i> 10/06

1. Recover bench marks 865 8120 TIDAL 4 and 865 8120 TIDAL 1.
2. Repair and reset bench mark 865 8120 F. This mark is severely damaged.
3. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run. The Met team suggests using a bolt at the base of the Met tower as the Met SRM.
4. Update the XPERT Operating System, XPERT Dark Operating System, and the Satlink firmware if the new version is approved at the time of the annual inspection.
6. Check and update the log sizes to reflect Engineering Bulletin 09-00.

<b>8658163 Wrightsville Beach, NC</b>	<b>L28047</b>	<b>Part 11</b>
<i>PBM:</i> 865 8163 A		<i>PBM above SD:</i> 10.000 m
<i>GPS Bench Mark:</i> C 163 (EA0631)		<i>MSL above SD:</i> 6.415 m
<i>GPS Observation Frequency:</i> Every 5 years	<i>Last GPS Observation Performed:</i> 10/09	
<i>Dive Inspection Frequency:</i> Every year		<i>Last Dive:</i> 10/09

1. Update the XPERT Operating System, XPERT Dark Operating System, and the Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-00.
3. Recover and include bench marks 865 8163 TIDAL 4, NCGS 10, and D 163 in the level run; these marks were not leveled greater than two years.

2.1.11 FOD/AOB – South Carolina Stations

**8661070 Springmaid Pier, SC**

**L28048**

**Part 1**

**PBM:** 866 1070 J TIDAL (DD1542)

**PBM above SD:** 11.948 m

**GPS Bench Mark:** K 137 (DD0853)

**MSL above SD:** 9.754 m

**GPS Observation Frequency:** Every 5 years

**Last GPS Observation Performed:** 9/12

**Dive Inspection Frequency:** Every year

**Last Dive:** 8/12

1. Update the XPERT Operating System, XPERT Dark Operating System, and the Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-00.
3. Recover or establish and level two surface marks, designation/stamping as follows:  
8661070 M/1070 M 2014 and 8661070 N/1070 N 2014
4. Recover and include bench mark K 137 in the level run; this mark was not leveled for more than two years.

**8662245 Oyster Landing, SC (COASTAL)**

**L28048**

**Part 8**

**PBM:** 866 2245 A TIDAL (DD1345)

**PBM above SD:** 2.962 m

**GPS Bench Mark:** 866 2245 A TIDAL (DD1345)

**MSL above SD:** 2.031 m

**GPS Observation Frequency:** Every 5 years

**Last GPS Observation Performed:** 8/12

**Dive Inspection Frequency:** Every year

**Last Dive:** 12/10

Note: CO-OPS will continue to support this partner station.

1. Coordinate the annual inspection with the COASTAL Program Manager. Notify the COASTAL Program Manager of any station issues.
2. **Unresolved from 2011 Project Instructions:** Relocate the Protective Well.
3. **Unresolved from 2011 Project Instructions:** Take photos of the, DCPs; the Primary Sensor; and the Protective Well.
4. Check if CIL remotely updated the DCP software to allow Tsunami data transmission. If not, update DCP software.
5. Update XPERT Operating System and the Satlink firmware if the new version is approved at the time of the annual inspection.
6. Check and update the log sizes to reflect Engineering Bulletin 09-00.

**8664753 Don Holt Bridge, SC (PORTS)**

**Air Gap Station**

1. No additional requirements.

**8665530 Charleston, SC (PORTS)**  
**PBM:** 866 5530 TIDAL 13 (CJ0085)  
**GPS Bench Mark:** PORT 1962 (CJ0326)  
**GPS Observation Frequency:** Every 5 years  
**Dive Inspection Frequency:** Every year

**L28048**

**Part 2**

**PBM above SD:** 4.020 m  
**MSL above SD:** 1.733 m

**Last GPS Observation Performed:** 11/07  
**Last Dive:** 8/12

1. Update the XPERT Operating System, XPERT Dark Operating System, and the Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-00.
3. Recover and include bench marks 866 5530 TIDAL 11 and 866 5530 TIDAL 12 in the level run; these marks were not leveled greater than two years.

**8667633 Clarendon Plantation, SC**  
**PBM:** 866 7633 A (CK2205)  
**GPS Bench Mark:** Undetermined  
**GPS Observation Frequency:** Every 5 years  
**Dive Inspection Frequency:** Every year

**L28048**

**Part 33**

**PBM above SD:** 6.242 m  
**MSL above SD:** 2.062 m

**Last GPS Observation Performed:** None  
**Last Dive:** 11/10

Note: FY14 operation and maintenance funded.

1. Perform GPS observations on the most observable mark in the network; there are no records of a GPS survey being done at this station since installation.
2. Recover and include bench mark 866 7633 TIDAL 2 in the level run; this mark was not leveled for more than two years.

2.1.12 FOD/AOB – Georgia Station

**8670870 Fort Pulaski, GA**

***PBM:*** 867 0870 TIDAL 5 (CK0697)

***GPS Bench Mark:*** 867 0870 TIDAL 5 (CK0697)

***GPS Observation Frequency:*** Yearly

***Dive Inspection Frequency:*** Every year

**L28049**

**Part 1**

***PBM above SD:*** 4.877 m

***MSL above SD:*** 2.230 m

***Last GPS Observation Performed:*** 9/12

***Last Dive:*** 11/10

1. Include the barometer in the leveling run.
2. Update the XPERT Operating System, XPERT Dark Operating System, and the Satlink firmware if the new version is approved at the time of the annual inspection.
3. Check and update the log sizes to reflect Engineering Bulletin 09-00.

2.1.13 FOD/AOB – Florida East Coast Stations

**8720030 Fernandina Beach, FL**

**PBM:** 872 0030 TIDAL 34 (BC0166)  
**GPS Bench Mark:** CONTAINER (BC2488)  
**GPS Observation Frequency:** Every 5 years  
**Dive Inspection Frequency:** Every year

**L28050**

**Part 1**

**PBM above SD:** 4.770 m  
**MSL above SD:** 1.522 m  
**Last GPS Observation Performed:** 01/09  
**Last Dive:** 01/13

1. Update the XPERT Operating System, XPERT Dark Operating System, and the Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-00.
3. Recover and include bench mark CONTAINER in the level run; this mark was not leveled for more than two years.
4. Remove bench mark 872 0030 M from the Windesc file.

**8720218 Mayport Bar Pilots Dock, FL**

**PBM:** 870 0218 A TIDAL (DI9221)  
**GPS Bench Mark:** 872 0220 A TIDAL (BC2486)  
**GPS Observation Frequency:** Every 5 years  
**Dive Inspection Frequency:** Every year

**L28050**

**Part 2**

**PBM above SD:** 5.000 m  
**MSL above SD:** 3.516 m  
**Last GPS Observation Performed:** 01/13  
**Last Dive:** 01/13

1. Repair the structure supporting the gauge house; seek engineering support and Field Engineering Review Subcommittee (FERS) approval of the design of the upgrades to the station.
2. Update the XPERT Operating System, XPERT Dark Operating System, and the Satlink firmware if the new version is approved at the time of the annual inspection.
3. Check and update the log sizes to reflect Engineering Bulletin 09-00.
4. Take face, setting, and location photos from two different cardinal directions of bench mark BM E.D.M. 15 MSL 1942.

**8721604 Trident Pier, FL**

**PBM:** 872 1604 A  
**GPS Bench Mark:** 872 1604 C TIDAL (AJ2449)  
**GPS Observation Frequency:** Every 5 years  
**Dive Inspection Frequency:** Every year

**L28050**

**Part 19**

**PBM above SD:** 9.303 m  
**MSL above SD:** 6.053 m  
**Last GPS Observation Performed:** 06/09  
**Last Dive:** 03/11

1. Update the XPERT Operating System, XPERT Dark Operating System, and the Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-00.
3. **Unresolved from 2013 Project Instructions:** Include bench mark CH-70 1975 JAX-FLA in the leveling run; this mark was not leveled in last year.

**8722670 Lake Worth Pier, FL** **L28050** **Part 6**  
*PBM: P 317 (AD2724)* *PBM above SD: 15.111m*  
*GPS Bench Mark: N 317 RESET* *MSL above SD: 9.602m*  
*GPS Observation Frequency: Every 5 years* *Last GPS Observation Performed: 06/10*  
*Dive Inspection Frequency: Every year* *Last Dive: 02/13*

1. Update the XPERT Operating System, XPERT Dark Operating System, and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-00.
3. Establish and level two surface marks and two deep rod marks, designation/stamping as follows: 872 2670 L/2670 L 2014, 872 2670 M/2670 M 2014, 872 2670 N/2670 N 2014, and 872 2670 P/2670 P 2014.
4. Take the face, setting, and location photos of newly established bench marks.

**8723214 Virginia Key, FL** **L28050** **Part 5**  
*PBM: 872 3214 B (AH5251)* *PBM above SD: 5.000 m*  
*GPS Bench Mark: 872 3214 E* *MSL above SD: 3.431 m*  
*GPS Observation Frequency: Every 5 years* *Last GPS Observation Performed: 02/09*  
*Dive Inspection Frequency: Every year* *Last Dive: 02/13*

1. Update the XPERT Operating System, XPERT Dark Operating System, and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-00.
3. Recover and include bench mark 872 3214 E in the level run; this mark was not leveled for more than two years. Verify if bench mark 872 3214 A is destroyed.

**8723970 Vaca Key, FL** **L28050** **Part 7**  
*PBM: 872 3970 M TIDAL (AA1706)* *PBM above SD: 2.285 m*  
*GPS Bench Mark: R 273 (AA0302)* *MSL above SD: 0.931 m*  
*GPS Observation Frequency: Every 5 years* *Last GPS Observation Performed: 06/09*  
*Dive Inspection Frequency: Every year* *Last Dive: 02/13*

1. Update the XPERT Operating System, XPERT Dark Operating System, and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-00.
3. Establish and level three bench marks (at least one deep rod mark), designation/stamping as follows: 872 3970 Q/3970 Q 2014, 872 3970 R/3970 R 2014, and 872 3970 S/3970 S 2014.
4. Take the face, setting, and location photos of newly established bench marks.

**8724580 Key West, FL**

***PBM:*** 872 4580 E TIDAL (AJ2450)

***GPS Bench Mark:*** 872 4580 E TIDAL (AJ2450)

***GPS Observation Frequency:*** Every 5 years

Dive Inspection Frequency: Every year

**L28050**

**Part 8**

***PBM above SD:*** 3.116 m

***MSL above SD:*** 1.662 m

***Last GPS Observation Performed:*** 06/09

Last Dive: 12/11

1. Field crew must contact Danny Franco, Maintenance Manager of the Truman Annex Master Property Owner's Association in order to survey across the property of Truman Annex. (305)296-0556, (305)923-3922, [danny@tampona.com](mailto:danny@tampona.com).
2. Update the XPERT Operating System, XPERT Dark Operating System, and Satlink firmware if the new version is approved at the time of the annual inspection.
3. Check and update the log sizes to reflect Engineering Bulletin 09-00.
4. Repair and/or remove the wind sensor.
5. Measure the elevation of the water temperature sensor above the station datum.

## 2.2 FOD/AOB – Bermuda and the Caribbean Island Stations

<b>2695540 Bermuda Esso Pier</b>	<b>L28058</b>	<b>Part 1</b>
<b>PBM:</b> 269 5540 A		<b>PBM above SD:</b> 14.298 m
<b>GPS Bench Mark:</b> 269 5540 A		<b>MSL above SD:</b> 1.434 m
<b>GPS Observation Frequency:</b> Every 5 years	<b>Last GPS Observation Performed:</b> 04/08	
<b>Dive Inspection Frequency:</b> Every year		<b>Last Dive:</b> 08/11

Note: maintenance costs for this station shall be charged to the Global Sea Level task number.

1. Update the XPERT Operating System, XPERT Dark Operating System, and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-00.
3. Recover or establish and level two surface marks, designation/stamping as follows: 2695535 J/5535 J 2014 and 2695535 K/5535 K 2014
4. Recover and include bench marks 269 5535 H in the level run; these marks were not leveled greater than two years.

<b>9751364 Christiansted Harbor, St. Croix, VI</b>	<b>L28056</b>	<b>Part 3</b>
<b>PBM:</b> 975 1364 A		<b>PBM above SD:</b> 10.000 m
<b>GPS Bench Mark:</b> 975 1364 A		<b>MSL above SD:</b> 8.367 m
<b>GPS Observation Frequency:</b> Every 5 years	<b>Last GPS Observation Performed:</b> 03/13	
<b>Dive Inspection Frequency:</b> Every year		<b>Last Dive:</b> 03/13

1. **Unresolved from 2013 Project Instructions:** Establish and level two deep rod marks or bench marks set in rock outcrop, designation/stamping as follows: 975 1364 K/1364 K 2014, 975 1364 M/1364 M 2014.
2. Update the XPERT Operating System, XPERT Dark Operating System, and Satlink firmware if the new version is approved at the time of the annual inspection.
3. Check and update the log sizes to reflect Engineering Bulletin 09-00.

<b>9751381 Lameshur Bay, St John, VI</b>	<b>L28056</b>	<b>Part 4</b>
<b>PBM:</b> 975 1381 A		<b>PBM above SD:</b> 10.000 m
<b>GPS Bench Mark:</b> 975 1381 A		<b>MSL above SD:</b> 8.924 m
<b>GPS Observation Frequency:</b> Every 5 years	<b>Last GPS Observation Performed:</b> 03/13	
<b>Dive Inspection Frequency:</b> Every year		<b>Last Dive:</b> 03/13

1. Update the XPERT Operating System, XPERT Dark Operating System, and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-00.
3. Recover or establish and level four surface marks, designation/stamping as follows:
4. 9751381 D/1381 D 2014, 9751381 E/1381 E 2014, 9751381 F/1381 F 2014 and 9751381 G/1381 G 2014
5. **Unresolved from 2013 Project Instructions:** Re-measure the elevation of the barometer above station datum (should be at an elevation of ~11 m -12 m, current elevation documented as 1.4 m).

**9751401 Lime Tree Bay, St. Croix, VI**  
**PBM:** 975 1401 M  
**GPS Bench Mark:** 975 1401 M  
**GPS Observation Frequency:** Every 5 years  
**Dive Inspection Frequency:** Every year

**L28056**

**Part 1**

**PBM above SD:** 13.612 m

**MSL above SD:** 10.501 m

**Last GPS Observation Performed:** 03/13

**Last Dive:** 03/13

1. Update the XPERT Operating System, XPERT Dark Operating System, and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-00.
3. **Unresolved from 2013 Project Instructions:** Rebuild the gauge house, seek engineering support and Field Engineering Review Subcommittee (FERS) approval of the design of the upgrades to the station.

**9751639 Charlotte Amalie, St. Thomas, VI**  
**PBM:** 975 1639 F  
**GPS Bench Mark:** 975 1639 M (TV1548)  
**GPS Observation Frequency:** Every 5 years  
**Dive Inspection Frequency:** Every year

**L28056**

**Part 2**

**PBM above SD:** 3.267 m

**MSL above SD:** 1.715 m

**Last GPS Observation Performed:** 03/13

**Last Dive:** 03/13

1. Update the XPERT Operating System, XPERT Dark Operating System, and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-00.
3. **Unresolved from 2013 Project Instructions: FUNDING DEPENDENT-** Rebuild the gauge house with custom aluminum stand and aluminum box, , seek engineering support and Field Engineering Review Subcommittee (FERS) approval of the design of the upgrades to the station.
4. **Unresolved from 2013 Project Instructions:** Verify bench marks 975 1639 TIDAL 3 and 975 1639 TIDAL 5 are destroyed. Special permission may be required to access the grounds.
5. Recover and include bench mark 872 3214 L in the level run; this mark was not leveled for more than two years

<b>9752235 Culebra, PR</b>	<b>L28055</b>	<b>Part 6</b>
<i>PBM: 975 2235 D</i>		<i>PBM above SD: 9.490 m</i>
<i>GPS Bench Mark: 975 2235 D</i>		<i>MSL above SD: 8.514 m</i>
<i>GPS Observation Frequency: Every 5 years</i>	<i>Last GPS Observation Performed: 03/08</i>	
<i>Dive Inspection Frequency: Every year</i>		<i>Last Dive: 02/12</i>

1. Please coordinate with the PRSN project manager - James Taylor, and the COASTAL Program Manager, prior to performing annual inspections in Puerto Rico.
2. Replace the Backup Orifice. Contact CO-OPS FOD for drawing and measurements of Orifice specifications.
3. Investigate Aquatrak data issues. The station is not plotting tidal curves.
4. Investigate intermittent GPS syncs.
5. Change GOES flag for the backup battery voltage to "<".
6. Replace locking top hat bolt for the Aquatrak well.
7. Recover and include bench mark 975 2235 H in the level run; this mark was not leveled for more than two years. Remove bench mark 975 2235 A from the Windesc file.

<b>9752695 Vieques Island, PR</b>	<b>L28055</b>	<b>Part 7</b>
<i>PBM: 975 2695 A TIDAL</i>		<i>PBM above SD: 10.000 m</i>
<i>GPS Bench Mark: 975 2695 A TIDAL</i>		<i>MSL above SD: 8.041 m</i>
<i>GPS Observation Frequency: Every 5 years</i>	<i>Last GPS Observation Performed: 03/13</i>	
<i>Dive Inspection Frequency: Every year</i>		<i>Last Dive: 03/13</i>

1. Please coordinate with the PRSN project manager - James Taylor, and the COASTAL Program Manager, prior to performing annual inspections in Puerto Rico.
2. Update the XPERT Operating System, XPERT Dark Operating System, and Satlink firmware if the new version is approved at the time of the annual inspection.
3. Check and update the log sizes to reflect Engineering Bulletin 09-00.
4. Replace the liquid tight for the primary well, backup orifice, and met tower with stainless steel rigid or s/s flexible conduit.

<b>9755371 San Juan, PR</b>	<b>L28055</b>	<b>Part 3</b>
<i>PBM: 975 5371 A TIDAL (TV1513)</i>		<i>PBM above SD: 2.600 m</i>
<i>GPS Bench Mark: 975 5371 M</i>		<i>MSL above SD: 1.266 m</i>
<i>GPS Observation Frequency: Every 5 years</i>	<i>Last GPS Observation Performed: 03/13</i>	
<i>Dive Inspection Frequency: Every year</i>		<i>Last Dive: 03/13</i>

1. Please coordinate with the PRSN project manager - James Taylor, and the COASTAL Program Manager, prior to performing annual inspections in Puerto Rico.
2. Update the XPERT Operating System, XPERT Dark Operating System, and Satlink firmware if the new version is approved at the time of the annual inspection.
3. Check and update the log sizes to reflect Engineering Bulletin 09-00.

**9759110 Magueyes Island, PR** **L28055** **Part 4**  
*PBM:* 975 9110 BM 1 *PBM above SD:* 4.755 m  
*GPS Bench Mark:* 975 9110 G *MSL above SD:* 1.191 m  
*GPS Observation Frequency:* Every 5 years *Last GPS Observation Performed:* 02/08  
*Dive Inspection Frequency:* Every year *Last Dive:* 04/13

1. Please coordinate with the PRSN project manager - James Taylor, and the COASTAL Program Manager, prior to performing annual inspections in Puerto Rico.
2. Update the XPERT Operating System, XPERT Dark Operating System, and Satlink firmware if the new version is approved at the time of the annual inspection.
3. Check and update the log sizes to reflect Engineering Bulletin 09-00.
4. Raise the backup orifice.
5. Establish a new bench mark suitable for GPS observations, designation/stamping as follows: 975 9110 J/9110 J 2014.
6. Take the face, setting, and location photos of newly established bench marks.

**9759394 Mayaguez, PR** **L28055** **Part 10**  
*PBM:* *PBM above SD:*  
*GPS Bench Mark:* *MSL above SD:*  
*GPS Observation Frequency:* Every 5 years *Last GPS Observation Performed:*  
*Dive Inspection Frequency:* Every year *Last Dive:*

1. Recon and design a new station, seek engineering support and Field Engineering Review Subcommittee (FERS) approval of the design of the new station.
2. Perform a reconnaissance to determine what needs to be done to bring the station to NWLON standards.
3. Install redundant DCP and sensor and bring station to NWLON standards.
4. Perform reconnaissance for the establishment of new bench marks (total 10 marks).

**9759412 Aguadilla Pier, PR** **L28055** **Part 8**  
*PBM:* 975 9412 TIDAL 3 (DE5552) *PBM above SD:* 10.000 m  
*GPS Bench Mark:* 975 9412 E *MSL above SD:* 7.087 m  
*GPS Observation Frequency:* Every 5 years *Last GPS Observation Performed:* 02/08  
*Dive Inspection Frequency:* Every year *Last Dive:* 01/11

1. **FUNDING DEPENDENT:** Perform reconnaissance and design a new station, seek engineering support and Field Review Subcommittee (FERS) approval of the design of the new station.

**9759938 Mona Island, PR****PBM:** 975 9938 A**GPS Bench Mark:** 975 9938 A**GPS Observation Frequency:** Every 5 years**Dive Inspection Frequency:** Every year**L28055****Part 9****PBM above SD:** 10.000 m**MSL above SD:** 8.842 m**Last GPS Observation Performed:** 04/13**Last Dive:** 01/12

1. Please coordinate with the PRSN project manager - James Taylor, and the COASTAL Program Manager, prior to performing annual inspections in Puerto Rico.
2. Update the XPERT Operating System, XPERT Dark Operating System, and Satlink firmware if the new version is approved at the time of the annual inspection.
3. Check and update the log sizes to reflect Engineering Bulletin 09-00.
4. **Unresolved from 2012 Project Instructions:** Take photos showing handheld GPS coordinates for all bench marks.
5. Enter the description of bench mark 975 9938 G in the Windesc file.

**9761115 Barbuda****PBM:** 976 1115 A**GPS Bench Mark:** 976 1115 J**GPS Observation Frequency:** Every 5 years**Dive Inspection Frequency:** Every year**L28057****Part 9****PBM above SD:** 10.000 m**MSL above SD:** 8.651 m**Last GPS Observation Performed:** 08/12**Last Dive:** 06/11

Note: FY14 operation and maintenance funded. Funding status will be reassessed in FY15.

1. Perform reconnaissance and design a new station, seek engineering support and Field Review Subcommittee (FERS) approval of the design of the new station.
2. Update COASTAL Program Manager on progress of station reinstall.

### 2.3 FOD/AOB – Gulf Coast Stations

NOTE: All maintenance for Tampa Bay PORTS® stations shall be coordinated with Brad Wynn and Dr. Mark Luther, Chief Operating Officer of GTBMAC/PORTS® (727-553-1528).

**The operations and maintenance responsibility for the stations listed under Task 11-05 Mobile PORTS®, Task XXVIII Lower MS River PORTS®, Task 12-03 Lake Charles PORTS®, and Task 12-02 Pascagoula PORTS® will be taken over by AOB after the funded time period is over as listed in Section 2.0.**

<b>8725110 Naples, FL</b>	<b>L28050</b>	<b>Part 9</b>
<i>PBM:</i> 872 5110 TIDAL 7 (AD5731)		<i>PBM above SD:</i> 4.225 m
<i>GPS Bench Mark:</i> 872 5110 C TIDAL (AD6337)		<i>MSL above SD:</i> 1.155 m
<i>GPS Observation Frequency:</i> Every 5 years	<i>Last GPS Observation Performed:</i> 05/09	
<i>Dive Inspection Frequency:</i> Every year		<i>Last Dive:</i> 02/13

1. Update the XPERT Operating System, XPERT Dark Operating System, and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-00.
3. Measure the elevation of the water temperature sensor above the station datum.

<b>8725520 Fort Myers, FL</b>	<b>L28050</b>	<b>Part 10</b>
<i>PBM:</i> 872 5520 A TIDAL (AD7888)		<i>PBM above SD:</i> 2.746 m
<i>GPS Bench Mark:</i> 872 5520 A TIDAL (AD7888)		<i>MSL above SD:</i> 1.522 m
<i>GPS Observation Frequency:</i> Every 5 years	<i>Last GPS Observation Performed:</i> 04/09	
<i>Dive Inspection Frequency:</i> Every year		<i>Last Dive:</i> 02/13

1. Update the XPERT Operating System, XPERT Dark Operating System, and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-00.

<b>8726384 Port Manatee, FL (PORTS)</b>	<b>L28050</b>	<b>Part 20</b>
<i>PBM:</i> 872 6384 E (AG7341)		<i>PBM above SD:</i> 2.6660 m
<i>GPS Bench Mark:</i> 872 6384 E		<i>MSL above SD:</i> 0.417 m
<i>GPS Observation Frequency:</i> Every 5 years	<i>Last GPS Observation Performed:</i> 04/09	
<i>Dive Inspection Frequency:</i> Every year		<i>Last Dive:</i> 02/13

1. Update the XPERT Operating System, XPERT Dark Operating System, and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-00.

**8726520 St. Petersburg, FL (PORTS)**  
**PBM:** 872 6520 D  
**GPS Bench Mark:** 872 6520 A  
**GPS Observation Frequency:** Every 5 years  
**Dive Inspection Frequency:** Every year

**L28050**

**Part 11**

**PBM above SD:** 2.8504 m  
**MSL above SD:** 1.394 m

**Last GPS Observation Performed:** 04/09  
**Last Dive:** 02/13

1. Update the XPERT Operating System, XPERT Dark Operating System, and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-00.

**8726607 Old Port Tampa, FL (PORTS)**  
**PBM:** 872 6607 A  
**GPS Bench Mark:** 872 6607 A  
**GPS Observation Frequency:** Every 5 years  
**Dive Inspection Frequency:** Every year

**L28050**

**Part 21**

**PBM above SD:** 10.0000 m  
**MSL above SD:** 9.012 m

**Last GPS Observation Performed:** 04/09  
**Last Dive:** 02/13

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Provide a photo of the Met SRM.
4. Provide photos of the meteorological sensor suite with the station package.
5. Take face, setting, and location photos of all existing benchmarks.

**8726667 McKay Bay Entrance, FL (PORTS)**

**L28050**

**Part 22**

**PBM:** 872 6667 J  
**GPS Bench Mark:** 872 6667 J  
**GPS Observation Frequency:** Every 5 years  
**Dive Inspection Frequency:** Every year

**PBM above SD:** 3.1200 m  
**MSL above SD:** 0.521 m

**Last GPS Observation Performed:** 04/09  
**Last Dive:** 02/13

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.

**8726724 Clearwater Beach, FL**  
**PBM:** LP 10 1 FLHD (AG7197)  
**GPS Bench Mark:** 872 6724 R 44 (AG6373)  
**GPS Observation Frequency:** Every 5 years  
**Dive Inspection Frequency:** Every year

**L28050**

**Part 12**

**PBM above SD:** 2.234 m  
**MSL above SD:** 0.980 m

**Last GPS Observation Performed:** 04/09  
**Last Dive:** 02/13

1. **Unresolved from 2013 Project Instructions:** Provide a photo of the Met SRM.
2. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
3. Check and update the log sizes to reflect Engineering Bulletin 09-003.

**8727520 Cedar Key, FL** **L28050** **Part 13**  
*PBM: TIDAL STATION 3-60 TIDAL 8 (AR1204)* *PBM above SD: 2.347 m*  
*GPS Bench Mark: 872 7520 L* *MSL above SD: 1.171 m*  
*GPS Observation Frequency: Every 5 years* *Last GPS Observation Performed: 11/10*  
*Dive Inspection Frequency: Every year* *Last Dive: 10/12*

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.

**8728690 Apalachicola, FL** **L28050** **Part 15**  
*PBM: 872 8690 TIDAL 1 (AS0240)* *PBM above SD: 5.669 m*  
*GPS Bench Mark: APALACHICOLA (AS0244)* *MSL above SD: 1.584 m*  
*GPS Observation Frequency: Every 5 years* *Last GPS Observation Performed 11/09*  
*Dive Inspection Frequency: Every year* *Last Dive: 11/12*

1. Verify the elevation difference between the digibub leveling point and the digibub orifice zero on an annual basis.
2. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
3. Check and update the log sizes to reflect Engineering Bulletin 09-003.
4. Include bench mark D 689, P 294, Q 294, and STA 3-66 West Point NO 2 in the level run as these marks have not been leveled since 1991. Contact COET for bench mark descriptions.

**8729108 Panama City, FL** **L28050** **Part 16**  
*PBM: 872 9108 L TIDAL (BE3028)* *PBM above SD: 3.965 m*  
*GPS Bench Mark: 872 9108 L TIDAL (BE3028)* *MSL above SD: 1.222 m*  
*GPS Observation Frequency: Every 5 years* *Last GPS Observation Performed: 06/09*  
*Dive Inspection Frequency: Every year* *Last Dive: 6/12*

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Include bench mark J290 FLHD in level run.

**8729210 Panama City Beach, FL** **L28050** **Part 17**  
*PBM: 872 9210 A (AJ6758)* *PBM above SD: 12.725 m*  
*GPS Bench Mark: 872 9210 1* *MSL above SD: 8.436 m*  
*GPS Observation Frequency: Every 5 years* *Last GPS Observation Performed: 09/13*  
*Dive Inspection Frequency: Every year* *Last Dive: 09/13*

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Investigate connecting AC power at the station and install a display.

<b>8729840 Pensacola, FL</b>	<b>L28050</b>	<b>Part 18</b>
<i>PBM:</i> 872 9840 M TIDAL (BG4867)		<i>PBM above SD:</i> 4.368 m
<i>GPS Bench Mark:</i> 872 9840 M TIDAL (BG4867)		<i>MSL above SD:</i> 2.757 m
<i>GPS Observation Frequency:</i> Every 5 years	<i>Last GPS Observation Performed:</i> 07/09	
<i>Dive Inspection Frequency:</i> Every year		<i>Last Dive:</i> 06/12

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.

<b>8732828 Weeks Bay, AL (COASTAL)</b>	<b>L28051</b>	<b>Part 16</b>
<i>PBM:</i> 873 2828 A		<i>PBM above SD:</i> 10.000 m
<i>GPS Bench Mark:</i> 873 2828 A		<i>MSL above SD:</i> 9.457 m
<i>GPS Observation Frequency:</i> Every year	<i>Last GPS Observation Performed:</i> 3/11	
<i>Dive Inspection Frequency:</i> Every year		<i>Last Dive:</i> 3/11

Note: CO-OPS will continue to support this partner station.

1. Coordinate requirements with the COASTAL Program Manager, and the Weeks Bay Project Manager, Virginia Dentler. Notify NERRS personnel prior to arrival.
2. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
3. Check and update the log sizes to reflect Engineering Bulletin 09-003.

<b>8747437 Bay Waveland Yacht Club, MS</b>	<b>L28052</b>	<b>Part 3</b>
<i>PBM:</i> 874 7437 TIDAL 1 (BH0937)		<i>PBM above SD:</i> 2.473 m
<i>GPS Bench Mark:</i> 876 7437 E (AB7179)		<i>MSL above SD:</i> 0.994 m
<i>GPS Observation Frequency:</i> Every 5 years	<i>Last GPS Observation Performed:</i> 09/10	
<i>Dive Inspection Frequency:</i> Every year		<i>Last Dive:</i> 11 /12

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Investigate communications issue between XPERT and XPERT Dark DCP.
4. Integrate the MWWL sensor into the primary station if the data comparison analysis is complete and accepted by the MWWL TOP Committee.
5. Verify serial number of Druck sensor.

**8760922 Pilots Station East, SW Pass, LA****L28053****Part 2****PBM:** 876 0922 C**PBM above SD:** 10.000 m**GPS Bench Mark:** 876 0922 C**MSL above SD:** 9.368 m**GPS Observation Frequency:** Every year**Last GPS Observation Performed:** 09/12**Dive Inspection Frequency:** Every year**Last Dive:** 09/12

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Investigate and fix the GPS sync issue at the remote met station.
4. Replace the water temperature sensor.
5. Measure the elevation of the wind and air temperature sensors above Met SRM.
6. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.

**8761305 Shell Beach, LA****L28053****Part 35****PBM:** 876 1305 E**PBM above SD:** 10.000m**GPS Bench Mark:** 876 1305 D**MSL above SD:** 9.765m**GPS Observation Frequency:** Every year**Last GPS Observation Performed:** 09/11**Dive Inspection Frequency:** Every year**Last Dive:** 09/11

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Replace the GPS antenna, check placement, and inspect cable.
4. Include bench mark 876 1305 A in the level run.
5. Measure the elevation of the water temperature sensor above station datum.

**8761724 Grand Isle, LA****L28053****Part 1****PBM:** 10 (AT0687)**PBM above SD:** 2.810 m**GPS Bench Mark:** 876 1724 TIDAL 11 (AT0685)**MSL above SD:** 1.980 m**GPS Observation Frequency:** Every year**Last GPS Observation Performed:** 10/11**Dive Inspection Frequency:** Every year**Last Dive:** 11/12

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Update the handheld GPS positions of all bench marks in the Windesc file.

**8761927 USCG New Canal Station, LA**  
**PBM:** ALCO (BJ1342)  
**GPS Bench Mark:** ALCO (BJ1342)  
**GPS Observation Frequency:** Every year  
**Dive Inspection Frequency:** Every year

**L28053**

**Part 10**

**PBM above SD:** 3.149 m

**MSL above SD:** 1.380 m

**Last GPS Observation Performed:** 11/12

**Last Dive:** 11/10

1. Coordinate with COASTAL and Maritime Services Program Managers prior to inspection regarding NWS partnership project to install meteorological sensors.
2. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
3. Check and update the log sizes to reflect Engineering Bulletin 09-003.
4. **Unresolved From 2012 Project Instructions:** Recover, level, take face photos and provide the handheld GPS for bench marks 876 1927 A, 876 1927 B, and X 374. If these bench marks cannot be recovered, mark them destroyed in the Windesc file.
5. Provide a description of the Met SRM and include the Met SRM in the leveling run.

**8762075 Port Fourchon, LA**

**L28053**

**Part 33**

**PBM:** 876 2075 A

**PBM above SD:** 10.000 m

**GPS Bench Mark:** 876 2075 A

**MSL above SD:** 9.183 m

**GPS Observation Frequency:** Every year

**Last GPS Observation Performed:** 10/12

**Dive Inspection Frequency:** Every year

**Last Dive:** 10/11

Note: Pending the signing of an agreement with the Port, the station will be funded by the Port in the future.

1. Update the Satlink firmware.

**8762372 East Bank 1, Bayou LaBranche, LA (COASTAL)**

**L28053**

**Part 3**

**PBM:** 876 2372 E

**PBM above SD:** 10.000 m

**GPS Bench Mark:** 876 2372 E

**MSL above SD:** 9.887 m

**GPS Observation Frequency:** Every year

**Last GPS Observation Performed:** 11/10

**Dive Inspection Frequency:** Every year

**Last Dive:** 11/10

1. **FUNDING DEPENDENT:** Please coordinate the annual inspection with the COASTAL Program Manager.
2. **FUNDING DEPENDENT:** Upon rebuild of station replace existing primary sensor with the approved MWWL sensor and if any structural modifications, seek Field Engineering Review Subcommittee (FERS) approval. The existing primary sensor must not be removed until CO-OPS has completed the comparison. This may need to be done in CY 14 depending upon the funding.
3. **FUNDING DEPENDENT:** Upon rebuild of station install a full met sensor suite for the upgrade to NWLON status.
4. **FUNDING DEPENDENT:** Upon rebuild of station provide a description and photo of the Met SRM and include the Met SRM in the leveling run.

**8762482 West Bank 1, Bayou Gauche, LA (COASTAL)**      **L28053**      **Part 4**  
*PBM: 876 2482 A*      *PBM above SD: 10.000 m*  
*GPS Bench Mark: 876 2482 G*      *MSL above SD: 9.659 m*  
*GPS Observation Frequency: Every year*      *Last GPS Observation Performed: 11/11*  
*Dive Inspection Frequency: Every year*      *Last Dive: 11/11*

1. Please coordinate the annual inspection with the COASTAL Program Manager.
2. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
3. Check and update the log sizes to reflect Engineering Bulletin 09-003.
4. **Unresolved From 2011 Project Instructions:** Take setting photos of bench mark 876 2482 G.
5. **Unresolved From 2011 Project Instructions:** Contact the phone company to troubleshoot the phone problem.
6. Measure the elevation of the wind and air temperature sensors above Met SRM.
7. Measure the elevation of the barometer above station datum.
8. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.

**8764044 Berwick, LA**      **L28053**      **Part 34**  
*PBM: 876 4044 E*      *PBM above SD: 5.000 m*  
*GPS Bench Mark: 876 4044 E*      *MSL above SD: 6.088 m*  
*GPS Observation Frequency: Every year*      *Last GPS Observation Performed: 04/12*  
*Dive Inspection Frequency: Every year*      *Last Dive: 04/12*

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Measure the elevation of the wind and air temperature sensors above Met SRM. Measure the elevation of the barometer and water temperature sensor above station datum.
4. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.
5. Establish five bench marks with the designations 876 4044 H, 876 4044 J, 876 4044 K, 876 4044 M, and 876 4044 N.
6. Take face, setting, and location photos of all existing benchmarks.

**8764227 LAWMA, Amerada Pass, LA**  
**PBM:** 876 4227 A  
**GPS Bench Mark:** GPS GAGE 36 (DJ9384)  
**GPS Observation Frequency:** Every year  
**Dive Inspection Frequency:** Every year

**L28053**

**Part 11**

**PBM above SD:** 8.759 m  
**MSL above SD:** 7.415 m

**Last GPS Observation Performed:** 06/12  
**Last Dive:** 11/12

1. Verify the elevation difference between the digibub leveling point and the digibub orifice zero on an annual basis.
2. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
3. Check and update the log sizes to reflect Engineering Bulletin 09-003.
4. Replace back up water level sensor.
5. Repair and/or replace the wind bird sensors.
6. Replace the GPS antenna, check placement, and inspect cable.
7. Perform new steel tape measurements for verification, and submit to OET.

**8766072 Freshwater Canal Locks, LA**  
**PBM:** 876 6072 A (DJ9334)  
**GPS Bench Mark:** 876 6072 C  
**GPS Observation Frequency:** Every year  
**Dive Inspection Frequency:** Every year

**L28053**

**Part 8**

**PBM above SD:** 8.887m  
**MSL above SD:** 6.764m

**Last GPS Observation Performed:** 10/10  
**Last Dive:** None

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. **Unresolved From 2011 Project Instructions:** Take a face photo of bench mark 24 R.
4. **Unresolved From 2011 Project Instructions:** Take setting photo of bench mark 876 6072 B.
5. Investigate and repair wind sensor data issues on XPERT Dark DCP.
6. Measure the elevation of the wind and air temperature sensors above Met SRM.
7. Measure the elevation of the water temperature sensor above station datum.
8. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.

## 2.4 Air-Sea Systems - Task 11-03: Mobile Bay Storm Surge

Jim Lewis, Task Manager/Technical Representative (TR)

Note: Coordinate all maintenance visits for the Mobile Bay Storm Surge stations with Thomas Landon, PL, Jim Lewis, TM and the Mobile County Commission.

### **8735391 Dog River Bridge, AL**

**L28051**

**Part 12**

**PBM:** 873 5391 E

**PBM above SD:** 10.000 m

**GPS Bench Mark:** 873 5391 E

**MSL above SD:** 9.115 m

**GPS Observation Frequency:** Every year

**Last GPS Observation Performed:** 8/13

Dive Inspection Frequency: N/A

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.

### **8735523 East Fowl River Bridge, AL**

**L28051**

**Part 13**

**PBM:** 873 5523 C

**PBM above SD:** 10.000 m

**GPS Bench Mark:** 873 5523 C

**MSL above SD:** 4.355 m

**GPS Observation Frequency:** Every year

**Last GPS Observation Performed:** 9/12

Dive Inspection Frequency: N/A

1. Inspect the RS 232 modem cables.
2. Check the communication ports settings.
3. Replace the XPERT Dark DCP GPS antenna, checking the placement, and inspecting the cable.

### **8737138 Chickasaw Creek, AL**

**L28051**

**Part 11**

**PBM:** No Stamp DOT 1

**PBM above SD:** 11.815 m

**GPS Bench Mark:** 873 7138 A

**MSL above SD:** 7.756 m

**GPS Observation Frequency:** Every year

**Last GPS Observation Performed:** 12/11

**Dive Inspection Frequency:** Every year

**Last Dive:** 11/11

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Take face, setting, and location photos of primary bench mark 873 7138 DOT 1.

### **8738043 West Fowl River Bridge, AL**

**L28051**

**Part 14**

**PBM:** 873 8043 E 482

**PBM above SD:** 10.000 m

**GPS Bench Mark:** 873 8043 E 482

**MSL above SD:** 6.223 m

**GPS Observation Frequency:** Every year

**Last GPS Observation Performed:** 9/12

**Dive Inspection Frequency:** N/A

1. Inspect the RS 232 modem cables.
2. Check the communication ports settings.
3. Provide location photos for primary bench mark 873 8043 E 482.

**8739803 Bayou LaBatre, AL**  
***PBM:*** 873 9803 A  
***GPS Bench Mark:*** 873 9803 A  
***GPS Observation Frequency:***  
***Dive Inspection Frequency:***

**L28051**

**Part 15**  
***PBM above SD:*** 10.000 m  
***MSL above SD:*** 8.406 m  
***Last GPS Observation Performed:*** 08/13  
***Last Dive:*** 08/13

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. **Unresolved from 2013:** Provide face, setting, and location photos of all bench marks.

2.5 Air-Sea Systems - Task 11-05: Mobile PORTS®  
Jim Lewis, Task Manager/Technical Representative (TR)

**The operations and maintenance responsibility for the stations listed under Task 11-05 Mobile PORTS®, will be taken over by AOB after the funded time period is over as listed in Section 2.0.**

**8734673 Fort Morgan, AL (PORTS)**

**Met Only Station**

1. Update the 9210 DCP Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Replace Yagi GOES antenna.
4. Replace IP modem.
5. Place wind bird cables.

**8735180 Dauphin Island, AL (PORTS)**

**L28051**

**Part 1**

***PBM:*** 873 5180 TIDAL 1 (BH1756)

***PBM above SD:*** 6.288 m

***GPS Bench Mark:*** 873 5180 21D – 2E

***MSL above SD:*** 1.049 m

***GPS Observation Frequency:*** Every year

***Last GPS Observation Performed:*** 08/13

***Dive Inspection Frequency:*** Every year

***Last Dive:*** 09/13

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Repair platform, as needed (i.e. bracing of the handrails, etc.), seek engineering support and Field Engineering Review Subcommittee (FERS) approval of the design of the upgrades to the station.
4. Repair the large holes and gaps in areas under the station workbench.

**8736163 Middle Bay Port, AL (PORTS)**

**Met Only Station**

1. Refer to the task order for station specific requirements.

**8736897 Coast Guard Sector Mobile, AL (PORTS)**

**L28051**

**Part 7**

***PBM:*** 873 6897 A

***PBM above SD:*** 10.000 m

***GPS Bench Mark:*** 873 6897 C

***MSL above SD:*** 8.989 m

***GPS Observation Frequency:*** Every year

***Last GPS Observation Performed:*** 9/13

***Dive Inspection Frequency:*** Every year

***Last Dive:*** 9/13

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.

**8737005 Pinto Island, AL (PORTS)**

**Met Only Station**

1. Refer to the task order for station specific requirements.

**8737048 Mobile State Docks, AL (PORTS)**

**L28051**

**Part 10**

*PBM: 873 7048 C*

*PBM above SD: 2.083 m*

*GPS Bench Mark: 873 7048 E*

*MSL above SD: 0.707 m*

*GPS Observation Frequency: Every year*

*Last GPS Observation Performed: 08/13*

*Dive Inspection Frequency: Every year*

*Last Dive: 9/13*

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Measure the elevation of the wind and air temperature sensors above Met SRM.
4. Provide a photo of the Met SRM.
5. Measure the elevation of the Met SRM above the water level. Document this elevation along with the date and time of the measurement in the comments section of the site report.

**mb0101 Mobile Bay Buoy M, AL (PORTS)**

**Current Meter Station**

1. Refer to the task order for station specific requirements.

**mb0301 Mobile State Dock Pier E, AL (PORTS)**

**Current Meter Station**

1. Refer to the task order for station specific requirements.

**mb0401 Mobile Container Terminal, AL (PORTS)**

**Current Meter Station**

1. Refer to the task order for station specific requirements.

2.6 Air-Sea Systems - Task XXVIII: Lower Mississippi River PORTS®  
Jim Lewis, Task Manager/Technical Representative (TR)

**The operations and maintenance responsibility for the stations listed under Task XXVIII Lower MS River PORTS® will be taken over by AOB after the funded time period is over as listed in Section 2.0**

<b>8760721 Pilottown, LA (PORTS)</b>	<b>L28053</b>	<b>Part 40</b>
<i>PBM: 876 0721 D</i>		<i>PBM above SD: 1.666 m</i>
<i>GPS Bench Mark: 876 0721 D</i>		<i>MSL above SD: 1.640 m</i>
<i>GPS Observation Frequency: Every year</i>	<i>Last GPS Observation Performed: 07/13</i>	
<i>Dive Inspection Frequency: Every year</i>		<i>Last Dive: 07/13</i>

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Secure the Aquatrak conduit to the deck with a 1-½ inch clamp.

<b>8761955 Carrollton, LA (PORTS)</b>	<b>L28053</b>	<b>Part 36</b>
<i>PBM: DISTRICT 1 A (AU2196)</i>		<i>PBM above LWRP: 3.075 m</i>
<i>GPS Bench Mark: DISTRICT 1 A (AU2196)</i>		<i>MSL above SD: 2.336 m</i>
<i>GPS Observation Frequency: Every year</i>	<i>Last GPS Observation Performed: 11/12</i>	
<i>Dive Inspection Frequency: Every year</i>		<i>Last Dive: 10/10</i>

**The PBM elevation is set to Mississippi River-LWRP datum for this station.**

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.

<b>8761847 Crescent City Bridge, LA (PORTS)</b>	<b>Air Gap Station</b>
---	------------------------

2. No additional requirements.

<b>8762002 Huey Long Bridge, LA (PORTS)</b>	<b>Air Gap Station</b>
---	------------------------

1. No additional requirements.

<b>lm0101 First Street Wharf, LA (PORTS)</b>	<b>Current Meter Station</b>
--	------------------------------

1. Refer to the task order for station specific requirements.

<b>lm0201 Port Allen, LA (PORTS)</b>	<b>Current Meter Station</b>
--------------------------------------	------------------------------

1. Refer to the task order for station specific requirements.

2.7 Woods Hole Group - Task 10-02: Narragansett PORTS®  
John Steponowski, Task Manager/Technical Representative (TR)

<b>8447386 Fall River, MA (PORTS)</b>	<b>L28037</b>	<b>Part 2</b>
<i>PBM: STATE (LW2264)</i>		<i>PBM above SD: 10.000 m</i>
<i>GPS Bench Mark: 844 7386 A</i>		<i>MSL above SD: 7.028 m</i>
<i>GPS Observation Frequency: Every 5 years</i>	<i>Last GPS Observation Performed: 10/09</i>	
<i>Dive Inspection Frequency: Every year</i>		<i>Last Dive: 05/13</i>

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.

**8447387 Borden Flats Light, RI (PORTS)** **Met Only Station**

1. Refer to the task order for station specific requirements.

<b>8452944 Conimicut Light, RI (PORTS)</b>	<b>L28038</b>	<b>Part 2</b>
<i>PBM: 845 2944 BOLT</i>		<i>PBM above SD: 10.532 m</i>
<i>GPS Bench Mark: N/A</i>		<i>MSL above SD: 6.291 m</i>
<i>GPS Observation Frequency: (Waived – not feasible)</i>		
<i>Dive Inspection Frequency: Every year</i>		<i>Last Dive: 05/13</i>

1. Rebuild the water level station and install an approved MWWL sensor; if any structural modifications are required seek engineering support and Field Engineering Review Subcommittee (FERS) approval.

**8452951 Potter Cove, RI (PORTS)** **Met Only Station**

1. Refer to the task order for station specific requirements.

<b>8454000 Providence, RI (PORTS)</b>	<b>L28038</b>	<b>Part 3</b>
<i>PBM: 845 4000 TIDAL 9 (LW0154)</i>		<i>PBM above SD: 4.475 m</i>
<i>GPS Bench Mark: 845 4000 L TIDAL (AJ4033)</i>		<i>MSL above SD: 1.749 m</i>
<i>GPS Observation Frequency: Every 5 years</i>	<i>Last GPS Observation Performed: 10/09</i>	
<i>Dive Inspection Frequency: Every year</i>		<i>Last Dive: 07/13</i>

1. Update solar panels serial numbers.
2. **Unresolved from 2013 Project Instructions:** Establish and level six new bench marks, designation/stamping as follows: 845 4000 P/4000 P 2013, 845 4000 Q/4000 Q 2013, 845 4000 R/4000 R 2013, 845 4000 S/4000 S 2013, 845 4000 T/4000 T 2013, and 845 4000 U/4000 U 2013.
3. Take the face, setting, and location photos of newly established bench marks.

**8454049 Quonset Point, RI (PORTS)**  
*PBM:* 845 4049 D  
*GPS Bench Mark:* 845 4049 D  
*GPS Observation Frequency:* Every 5 years  
*Dive Inspection Frequency:* Every year

**L28038**

**Part 4**

*PBM above SD:* 10.000 m  
*MSL above SD:* 7.587 m  
*Last GPS Observation Performed:* 10/09  
*Last Dive:* 06/13

1. Rebuild the water level station and install an approved MWWL sensor; if any structural modifications are required seek engineering support and Field Engineering Review Subcommittee (FERS) approval.
2. **Unresolved from 2013 Project Instructions:** Secure the well clamp that is exposed at low tide with stainless steel redheads to the concrete bulkhead.

**8461490 New London, CT (PORTS)**  
*PBM:* 846 1490 B  
*GPS Bench Mark:* 846 1490 K TIDAL (LX3418)  
*GPS Observation Frequency:* Every 5 years  
*Dive Inspection Frequency:* Every year

**L28039**

**Part 1**

*PBM above SD:* 5.032 m  
*MSL above SD:* 1.542 m  
*Last GPS Observation Performed:* 11/09  
*Last Dive:* 06/13

1. No additional requirements.

**8465705 New Haven, CT (PORTS)**  
*PBM:* 846 5705 D  
*GPS Bench Mark:* 846 5705 C  
*GPS Observation Frequency:* Every 5 years  
*Dive Inspection Frequency:* Every year

**L28039**

**Part 2**

*PBM above SD:* 10.000 m  
*MSL above SD:* 6.630 m  
*Last GPS Observation Performed:* 11/09  
*Last Dive:* 06/12

Note: The Port of New Haven funds the FY14 maintenance.

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.

**nb0101 Providence (PORTS)**

**Current Meter Station**

1. Refer to the task order for station specific requirements.
2. Perform XADCP upgrade.

**nb0201 Fall River (PORTS)**

**Current Meter Station**

1. Refer to the task order for station specific requirements.
2. Perform XADCP upgrade.

**nb0301 Quonset Point (PORTS)**

**Current Meter Station**

1. Refer to the task order for station specific requirements.
2. Perform XADCP upgrade.

**nl0101 Groton, Pier 6 (PORTS)**

**Current Meter Station**

1. Refer to the task order for station specific requirements.

2.8 Woods Hole Group - Task 11-07: NY/NJ PORTS®  
John Stepnowski, Task Manager/Technical Representative (TR)

<b>8516945 Kings Point, NY (PORTS)</b>	<b>L28040</b>	<b>Part 2</b>
<i>PBM:</i> 851 6945 A		<i>PBM above SD:</i> 9.662 m
<i>GPS Bench Mark:</i> 851 6945 TIDAL 5		<i>MSL above SD:</i> 5.113 m
<i>GPS Observation Frequency:</i> Every 5 years	<i>Last GPS Observation Performed:</i> 09/09	
<i>Dive Inspection Frequency:</i> Every year		<i>Last Dive:</i> 07/12

1. Replace the DCP and DCP components. Refer to OPS Razor ticket Issue O..1-736.
2. Install an approved MWWL sensor; if any structural modifications are required seek engineering support and Field Engineering Review Subcommittee (FERS) approval.

**8517986 Verrazano Narrows Bridge Air Gap, NY (PORTS)** **Air Gap Station**

1. No additional requirements.

<b>8518750 The Battery, NY (PORTS)</b>	<b>L28040</b>	<b>Part 3</b>
<i>PBM:</i> 851 8750 TIDAL 7 (AB6736)		<i>PBM above SD:</i> 5.470 m
<i>GPS Bench Mark:</i> R 340 (KV0587)		<i>MSL above SD:</i> 1.785 m
<i>GPS Observation Frequency:</i> Every 5 years	<i>Last GPS Observation Performed:</i> 09/09	
<i>Dive Inspection Frequency:</i> Every year		<i>Last Dive:</i> 07/12

1. Replace the Waterlog pump dryer.
2. Record handheld GPS positions for SRM BOLT.

**8519461 Bayonne Bridge Air Gap, NY (PORTS)** **Air Gap Station**

1. No additional requirements.

<b>8519483 Bergen Point, NY (PORTS)</b>	<b>L28040</b>	<b>Part 4</b>
<i>PBM:</i> 851 9483 B TIDAL (AH6737)		<i>PBM above SD:</i> 6.428 m
<i>GPS Bench Mark:</i> Undetermined		<i>MSL above SD:</i> 2.137 m
<i>GPS Observation Frequency:</i> Every 5 years	<i>Last GPS Observation Performed:</i> 09/09	
<i>Dive Inspection Frequency:</i> Every year		<i>Last Dive:</i> 09/13

1. Rebuild the water level station, seek engineering support and Field Engineering Review Subcommittee (FERS) approval of the design of the upgrades to the station.
2. **Unresolved from 2010 Project Instructions:** Relocate the met sensor tower to resolve the obstruction of winds at the present site.
3. **Unresolved from 2010 Project Instructions:** Recover or establish and level two surface marks, designation/stamping as follows if new mark(s): 851 9483 J/9483 J 2014 and 851 9483 K/9483 K 2014.
4. Designate a new mark for GPS.

**8530973 Robbins Reef, NJ (PORTS)**

**Met Only Station**

1. Refer to the task order for station specific requirements.

**8531680 Sandy Hook, NJ (PORTS)**

**L28041**

**Part 1**

*PBM:* 853 1680 D TIDAL (AB6711)

*PBM above SD:* 3.683 m

*GPS Bench Mark:* SIMPSON 2 RM 3 (KV0707)

*MSL above SD:* 1.551 m

*GPS Observation Frequency:* Every 5 years

*Last GPS Observation Performed:* 09/09

*Dive Inspection Frequency:* Every year

*Last Dive:* 07/12

1. Station destroyed by Hurricane Sandy. Rebuild the station as approved by FERS. Seek engineering support and Field Engineering Review Subcommittee (FERS) approval.
2. Install an approved MWWL sensor; if any structural modifications are required seek engineering support and Field Engineering Review Subcommittee (FERS) approval.
3. Recover and include bench marks 853 1680 TIDAL 8 and 863 1680 F in the level run; these marks were not leveled greater than two years.

**n01010 Bergen Point (PORTS)**

**Current Meter Station**

1. Refer to the task order for station specific requirements.

**n02010 Bayonne Bridge (PORTS)**

**Current Meter Station**

1. Refer to the task order for station specific requirements.

**n03020 The Narrows (PORTS)**

**Current Meter Station**

1. Refer to the task order for station specific requirements.
2. Perform XADCP upgrade

**n05010 Gowanus Flats LBB 32 (PORTS)**

**Current Meter Station**

1. Refer to the task order for station specific requirements.

2.9 Woods Hole Group - Task 12-01: Delaware River and Bay PORTS®  
John Stepnowski, Task Manager/Technical Representative (TR)

<b>8536110 Cape May, NJ (PORTS)</b>	<b>L28041</b>	<b>Part 3</b>
<i>PBM: 853 6110 TIDAL 1 (HU1194)</i>		<i>PBM above SD: 4.892 m</i>
<i>GPS Bench Mark: 853 6110 D</i>		<i>MSL above SD: 1.521 m</i>
<i>GPS Observation Frequency: Every 5 years</i>		<i>Last GPS Observation Performed: 09/09</i>
<i>Dive Inspection Frequency: Every year</i>		<i>Last Dive: 06/13</i>

1. No additional requirements.

<b>8537121 Ship John Shoal, NJ (PORTS)</b>	<b>L28041</b>	<b>Part 4</b>
<i>PBM: 853 7121 TIDAL 1</i>		<i>PBM above SD: 8.666 m</i>
<i>GPS Bench Mark: N/A</i>		<i>MSL above SD: 6.529 m</i>
<i>GPS Observation Frequency: (Waived – not feasible)</i>		
<i>Dive Inspection Frequency: Every year</i>		<i>Last Dive: 07/12</i>

1. No additional requirements.

<b>8538886 Tacony-Palmyra, NJ (PORTS)</b>	<b>L28041</b>	<b>Part 5</b>
<i>PBM: 853 8886 A</i>		<i>PBM above SD: 10.084 m</i>
<i>GPS Bench Mark: N/A</i>		<i>MSL above SD: 6.403 m</i>
<i>GPS Observation Frequency: (Waived – not feasible)</i>		
<i>Dive Inspection Frequency: Every year</i>		<i>Last Dive: 07/12</i>

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Replace the DCP enclosure, stand, and bridge cribbing.
4. Replace the primary water level sensor and well.
5. Replace the Druck conduit and tubing.

<b>8539094 Burlington Bridge, NJ (PORTS)</b>	<b>L28041</b>	<b>Part 6</b>
<i>PBM: 853 9094 F</i>		<i>PBM above SD: 9.731 m</i>
<i>GPS Bench Mark: N/A</i>		<i>MSL above SD: 6.355 m</i>
<i>GPS Observation Frequency: (Waived – not feasible)</i>		
<i>Dive Inspection Frequency: Every year</i>		<i>Last Dive: 11/13</i>

1. Replace the solar panel for the Xpert DCP.
2. Replace the GPS antenna, checking the placement, and inspecting cable.
3. Update the To Reach statement to reflect the current location of the station.

**8540433 Marcus Hook, PA (PORTS)**  
*PBM:* 854 0433 E  
*GPS Bench Mark:* 854 0433 E  
*GPS Observation Frequency:* Every 5 years  
*Dive Inspection Frequency:* Every year

**L28042**

**Part 1**

*PBM above SD:* 10.000 m  
*MSL above SD:* 7.539 m  
*Last GPS Observation Performed:* 09/09  
*Last Dive:* 07/12

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. **Unresolved from 2012 Project Instructions:** Recover or establish and level two surface marks with the designation/stamping as follows: 854 0433 H/0433 H 2014 and 854 0433 J/0433 J 2014.

**8545240 Philadelphia, PA (PORTS)**  
*PBM:* 854 5240 A  
*GPS Bench Mark:* 854 5240 C  
*GPS Observation Frequency:* Every 5 years  
*Dive Inspection Frequency:* Every year

**L28042**

**Part 2**

*PBM above SD:* 4.688 m  
*MSL above SD:* 2.228 m  
*Last GPS Observation Performed:* 09/09  
*Last Dive:* 05/13

1. Check and possibly replace the COM PORT on the XPERT DCP to troubleshoot the data download and/or setup files issues.

**8548989 Newbold, PA (PORTS)**  
*PBM:* 854 8989 A  
*GPS Bench Mark:* 854 8989 A  
*GPS Observation Frequency:* Every 5 years  
*Dive Inspection Frequency:* Every year

**L28042**

**Part 3**

*PBM above SD:* 10.000 m  
*MSL above SD:* 5.694 m  
*Last GPS Observation Performed:* 09/09  
*Last Dive:* 07/12

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.

**8551762 Delaware City, DE (PORTS)**  
*PBM:* 855 1762 C  
*GPS Bench Mark:* 855 1762 E  
*GPS Observation Frequency:* Every 5 years  
*Dive Inspection Frequency:* Every year

**L28043**

**Part 1**

*PBM above SD:* 10.000 m  
*MSL above SD:* 7.727 m  
*Last GPS Observation Performed:* 09/09  
*Last Dive:* 07/12

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.

**8555889 Brandywine Shoal Light, DE (PORTS) L28043 Part 3**  
*PBM: 855 5889 A PBM above SD: 10.3975 m*  
*GPS Bench Mark: N/A MSL above SD: 6.583 m*  
*GPS Observation Frequency: (Waived – not feasible)*  
*Dive Inspection Frequency: Every year Last Dive: 07/12*

Station was destroyed by Hurricane Sandy: PORTS manager and FOD will determine the future status of this station.

**8557380 Lewes, DE (PORTS) L28043 Part 4**  
*PBM: 855 7380 TIDAL 20 (AJ8038) PBM above SD: 3.990 m*  
*GPS Bench Mark: 855 7380 TIDAL 20 (AJ8038) MSL above SD: 1.528 m*  
*GPS Observation Frequency: Every 5 years Last GPS Observation Performed: 9/09*  
*Dive Inspection Frequency: Every Year Last Dive: 06/13*

1. Recover and include bench marks GPS S 5 and GPS S 5 A in the level run; these marks were not leveled greater than two years.

**db0201 Reedy Point (PORTS) Current Meter Station**

1. Refer to the task order for station specific requirements.

**db0301 Philadelphia (PORTS) Current Meter Station**

1. Refer to the task order for station specific requirements.

**db0501 Brown Shoal Light (PORTS) Current Meter Station**

1. Refer to the task order for station specific requirements.
2. Perform XADCP upgrade.

2.10 Woods Hole Group - Task 12-06: Chesapeake Bay PORTS®  
John Stepnowski, Task Manager/Technical Representative (TR)

<b>8551910 Reedy Point, DE (PORTS)</b>	<b>L28043</b>	<b>Part 2</b>
<i>PBM:</i> R 41 (JU2187)		<i>PBM above SD:</i> 2.031 m
<i>GPS Bench Mark:</i> 855 1910 G (AJ6314)		<i>MSL above SD:</i> 1.301 m
<i>GPS Observation Frequency:</i> Every 5 years	<i>Last GPS Observation Performed:</i> 09/09	
<i>Dive Inspection Frequency:</i> Every year		<i>Last Dive:</i> 05/13

1. Document the Aquatrak head serial number prior to replacing it.

**8551911 Reedy Point Air Gap, DE (PORTS)** **Air Gap Station**

1. No additional requirements.

<b>8573364 Tolchester Beach, MD (PORTS)</b>	<b>L28044</b>	<b>Part 3</b>
<i>PBM:</i> 857 3364 A		<i>PBM above SD:</i> 2.963 m
<i>GPS Bench Mark:</i> Undetermined		<i>MSL above SD:</i> 1.294 m
<i>GPS Observation Frequency:</i> Every 5 years	<i>Last GPS Observation Performed:</i> 08/09	
<i>Dive Inspection Frequency:</i> Every year		<i>Last Dive:</i> 5/13

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Designate a new bench mark to GPS.
4. Establish and level a deep rod mark, designation/stamping as follows:  
designation/stamping: 857 3364 E/ 3364 E 2014.
5. Take face, setting, and location photos for any newly established marks.

<b>8573927 Chesapeake City, MD (PORTS)</b>	<b>L28044</b>	<b>Part 4</b>
<i>PBM:</i> U 2 (JU1833)		<i>PBM above SD:</i> 3.158 m
<i>GPS Bench Mark:</i> 857 3927 D (PID)		<i>MSL above SD:</i> 1.432 m
<i>GPS Observation Frequency:</i> Every 5 years	<i>Last GPS Observation Performed:</i> 04/13	
<i>Dive Inspection Frequency:</i> Every year		<i>Last Dive:</i> 05/13

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.

**8573928 Chesapeake City Air Gap, MD (PORTS)** **Air Gap Station**

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.

<b>8574680 Baltimore, MD (PORTS)</b>	<b>L28044</b>	<b>Part 5</b>
<i>PBM:</i> 857 4680 TIDAL 32 (JV0586)		<i>PBM above SD:</i> 3.158 m
<i>GPS Bench Mark:</i> 857 4680 TIDAL BASIC (JV0578)		<i>MSL above SD:</i> 1.495 m
<i>GPS Observation Frequency:</i> Every 5 years		<i>Last GPS Observation Performed:</i> 08/09
<i>Dive Inspection Frequency:</i> Every year		<i>Last Dive:</i> 07/12

1. Remove bench mark 857 4680 C from the des file.

**8574728 Baltimore Key Bridge, MD (PORTS)** **Met Only Station**

1. Refer to the task order for station specific requirements.

**8574729 Francis Scott Key Bridge, NE Tower, MD (PORTS)** **Met Only Station**

1. Refer to the task order for station specific requirements.

**8575432 Bay Bridge Air Gap, MD (PORTS)** **Air Gap Station**

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.

<b>8575512 Annapolis, MD (PORTS)</b>	<b>L28044</b>	<b>Part 6</b>
<i>PBM:</i> 857 5512 B TIDAL (AC6864)		<i>PBM above SD:</i> 2.877 m
<i>GPS Bench Mark:</i> 857 5512 D TIDAL (AJ8035)		<i>MSL above SD:</i> 1.596 m
<i>GPS Observation Frequency:</i> Every 5 years		<i>Last GPS Observation Performed:</i> 08/09
<i>Dive Inspection Frequency:</i> Every year		<i>Last Dive:</i> 06/13

1. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run. The Met Team suggests using a bolt at the base of the Met tower as the met SRM.
2. Perform desktop recon for location to establish two deep rod marks. Previous site visits indicate plenty of location suitable for deep rod marks, contact and acquire permission to establish new marks from the base commander prior to leaving for site.

**8577018 Cove Point LNG Pier, MD (PORTS)** **Met Only Station**

1. Refer to the task order for station specific requirements.

<b>8577330 Solomons Island, MD (PORTS)</b>	<b>L28044</b>	<b>Part 7</b>
<i>PBM: 857 7330 E TIDAL (AJ8036)</i>		<i>PBM above SD: 4.456 m</i>
<i>GPS Bench Mark: 857 7330 J</i>		<i>MSL above SD: 1.366 m</i>
<i>GPS Observation Frequency: Every 5 years</i>		<i>Last GPS Observation Performed: 07/09</i>
<i>Dive Inspection Frequency: Every year</i>		<i>Last Dive: 05/13</i>

1. Monitor station equipment documenting any noticeable corrosion.

<b>8578240 Piney Point, MD (PORTS)</b>		<b>Met Only Station</b>
--	--	-------------------------

1. Refer to the task order for station specific requirements.

<b>8594900 Washington, DC (PORTS)</b>	<b>L28045</b>	<b>Part 1</b>
<i>PBM: 859 4900 TIDAL 1 (HV1980)</i>		<i>PBM above SD: 4.115 m</i>
<i>GPS Bench Mark: 859 4900 K</i>		<i>MSL above SD: 1.859 m</i>
<i>GPS Observation Frequency: Every 5 years</i>		<i>Last GPS Observation Performed: 06/10</i>
<i>Dive Inspection Frequency: Every year</i>		<i>Last Dive: 06/13</i>

1. Check and update the log sizes to reflect Engineering Bulletin 09-00.
2. Perform a desktop recon to set one deep rod mark and one surface mark. Make contact with the local contact to ensure the bench marks will not be destroyed by area construction.
3. Recover and include bench mark Z 1923 in the level run; this mark was not leveled for more than two years.

<b>8632200 Kiptopeke, VA (PORTS)</b>	<b>L28046</b>	<b>Part 2</b>
<i>PBM: L 418 (FW0303)</i>		<i>PBM above SD: 4.093 m</i>
<i>GPS Bench Mark: 863 2200 B TIDAL (AJ4588)</i>		<i>MSL above SD: 1.539 m</i>
<i>GPS Observation Frequency: Every 5 years</i>		<i>Last GPS Observation Performed: 03/09</i>
<i>Dive Inspection Frequency: Every year</i>		<i>Last Dive: 06/13</i>

1. Recover and include bench mark 863 2200 F in the level run; this mark was not leveled for more than two years.

<b>8632837 Rappahannock Light Front Range, VA (PORTS)</b>		<b>Met Only Station</b>
---	--	-------------------------

1. Refer to the task order for station specific requirements.

**8635750 Lewisetta, VA (PORTS)****L28046****Part 4****PBM:** 863 5750 H**PBM above SD:** 2.647 m**GPS Bench Mark:** 863 5750 J TIDAL (AJ4589)**MSL above SD:** 1.685 m**GPS Observation Frequency:** Every 5 years**Last GPS Observation Performed:** 07/09**Dive Inspection Frequency:** Every year**Last Dive:** 06/13

1. Monitor station equipment documenting any noticeable corrosion.
2. Install parallel plates on the primary water level sensor well.
3. Establish and level one new bench marks, designation/stamping as follows:  
designation/stamping: 863 5750 N/5750 N 2014.
4. Take the face, setting, and location photos of newly established bench marks.

**8636580 Windmill Point, VA (PORTS)****L28046****Part 5****PBM:** 863 6580 E**PBM above SD:** 2.189 m**GPS Bench Mark:** Undetermined**MSL above SD:** 0.903 m**GPS Observation Frequency:** Every 5 years**Last GPS Observation Performed:** Undetermined**Dive Inspection Frequency:** Every year**Last Dive:** 06/13

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Remove the DCP 3 if data comparison analysis is complete and accepted by the MWWL TOP Committee.
4. Include benchmarks 863 6580 C, 863 6580 D, and WINDMILL POINT BM 6580 A in the leveling run.
5. Establish and level one to three bench marks (depending on number marks recovered in #3), designation/stamping as follows: designation/stamping: 863 6580 L/6580 L 2014, 863 6580 M/6580 M 2014, and 863 6580 N/6580 N 2014.
6. Take face, setting, and location photos for any newly established marks.
7. Designate a new bench mark to GPS.

**8637611 York River East Range Light, VA (PORTS)****Met Only Station**

1. Refer to the task order for station specific requirements.

**8637689 Yorktown, VA (PORTS)**  
**PBM:** 863 7689 E  
**GPS Bench Mark:** 863 7689 C  
**GPS Observation Frequency:** Every 5 years  
**Dive Inspection Frequency:** Every year

**L28046**

**Part 6**  
**PBM above SD:** 2.189 m  
**MSL above SD:** 1.964 m  
**Last GPS Observation Performed:** 08/10  
**Last Dive:** 06/13

1. Update the XPERT Operating System, XPERT Dark Operating System, and the Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-00.
3. Replace the wind bird nose cone.
4. Verify solar panel serial numbers.
5. Establish and level two new deep rod bench marks, designation/stamping as follows:  
designation/stamping: 863 7689 D/7689 D 2014 and 863 7689 E/7689 E 2014.
6. Include bench mark FUEL in the level run; this mark was not leveled last year.
7. Take the face, setting, and location photos of newly established bench marks.

**8638511 Dominion Terminal, VA (PORTS)**

**Met Only Station**

1. Refer to the task order for station specific requirements.

**8638595 South Craney Island, VA (PORTS)**

**Met Only Station**

1. Refer to the task order for station specific requirements.

**8638610 Sewells Point, VA (PORTS)**

**L28046**

**PBM:** 863 8610 G TIDAL  
**GPS Bench Mark:** 863 8610 F  
**GPS Observation Frequency:** Every 5 years  
**Dive Inspection Frequency:** Every year

**Part 7**  
**PBM above SD:** 4.314 m  
**MSL above SD:** 1.748 m  
**Last GPS Observation Performed:** 05/10  
**Last Dive:** 07/13

1. **Unresolved from 2012 Project Instructions:** Verify the total length of the conductivity sensor well.
2. Update the XPERT Operating System, XPERT Dark Operating System, and the Satlink firmware if the new version is approved at the time of the annual inspection.
3. Check and update the log sizes to reflect Engineering Bulletin 09-00.
4. Recover and level bench marks 16.368 and L 308 RESET 1985 to get a geodetic connection. Marks are separated by significant distances; make sure to plan ahead to survey the bench marks.

**8638614 Willoughby Degaussing Station, VA (PORTS)**

**Met Only Station**

1. Refer to the task order for station specific requirements.

**8638863 Chesapeake Bay Bridge Tunnel, VA (PORTS)**

**L28046**

**Part 8**

**PBM:** 863 8863 NO 2 TIDAL (AJ4591)

**PBM above SD:** 15.914 m

**GPS Bench Mark:** 863 8863 NO 2 TIDAL (AJ4591)

**MSL above SD:** 8.135 m

**GPS Observation Frequency:** Every 5 years

**Last GPS Observation Performed:** 06/09

**Dive Inspection Frequency:** Every year

**Last Dive:** 07/12

1. **Unresolved from 2011 Project Instructions:** The station interior needs to be refurbished, in accordance with a plan originally developed by Mark Bushnell, if funding becomes available.
2. Remove the top cap.
3. Install additional aluminum wells, seek engineering support and Field Engineering Review Subcommittee (FERS) approval of the design of the upgrades to the station.
4. Update the XPERT Operating System, XPERT Dark Operating System, and the Satlink firmware if the new version is approved at the time of the annual inspection.
  1. Check and update the log sizes to reflect Engineering Bulletin 09-00.
  2. Repair or replace the conductivity sensor.
  3. Remove bench mark V 422 from the Windesc file.

**8638999 Cape Henry, VA (PORTS)**

**Met Only Station**

1. Refer to the task order for station specific requirements.

**8639348 Money Point, VA (PORTS)**

**L28046**

**Part 9**

**PBM:** 863 9348 E

**PBM above SD:** 10.000 m

**GPS Bench Mark:** Undetermined

**MSL above SD:** 7.064 m

**GPS Observation Frequency:** Every 5 years

**Last GPS Observation Performed:** Undetermined

**Dive Inspection Frequency:** Every year

**Last Dive:** 06/13

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.

**cb0102 Cape Henry LB 2 CH (PORTS)**

**Current Meter Station**

1. Refer to the task order for station specific requirements.

**cb0201 York Spit Channel LBB 22 (PORTS)**

**Current Meter Station**

1. Refer to the task order for station specific requirements.

**cb0301 thimble Shoal Channel LB 18 (PORTS)**

**Current Meter Station**

1. Refer to the task order for station specific requirements.

<b>cb0402 Naval Station Norfolk LB 7 (PORTS)</b>	<b>Current Meter Station</b>
1. Refer to the task order for station specific requirements.	
<b>cb0601 Newport News Channel LB 18 (PORTS)</b>	<b>Current Meter Station</b>
1. Refer to the task order for station specific requirements.	
<b>cb0701 Dominion Terminal (PORTS)</b>	<b>Current Meter Station</b>
1. Refer to the task order for station specific requirements.	
<b>cb0801 Rappahannock Shoal Channel LBB 60 (PORTS)</b>	<b>Current Meter Station</b>
1. Refer to the task order for station specific requirements.	
<b>cb0901 Potomac River Mid-Channel LWB B (PORTS)</b>	<b>Current Meter Station</b>
1. Refer to the task order for station specific requirements.	
<b>cb1001 Cove Point LNG Pier (PORTS)</b>	<b>Current Meter Station</b>
1. Refer to the task order for station specific requirements.	
2. Perform XADCP upgrade.	
<b>cb1101 Chesapeake Channel LBB 92 (PORTS)</b>	<b>Current Meter Station</b>
1. Refer to the task order for station specific requirements.	
<b>cb1201 Tolchester Front Range (PORTS)</b>	<b>Current Meter Station</b>
1. Refer to the task order for station specific requirements.	
2. Perform XADCP upgrade.	
<b>cb1301 Chesapeake City (PORTS)</b>	<b>Current Meter Station</b>
1. Refer to the task order for station specific requirements.	
<b>tplm2 Thomas Point Light (PORTS)</b>	<b>Met Only Station</b>
1. No additional requirements.	
<b>wv44099 Cape Henry (PORTS)</b>	<b>Wave Sensor Station</b>
1. Refer to the task order for station specific requirements.	

2.11 Conrad Blucher Institute - Task 12-03: Lake Charles PORTS®  
Jim Lewis, Task Manager/Technical Representative (TR)

**The operations and maintenance responsibility for the stations listed under Task 12-03 Lake Charles PORTS® will be taken over by AOB after the funded time period is over as listed in Section 2.0**

<b>8767816 Lake Charles, LA (PORTS)</b>	<b>L28053</b>	<b>Part 9</b>
<i>PBM: A 269 (BK1489)</i>		<i>PBM above SD: 10.000 m</i>
<i>GPS Bench Mark: CIVIC (BK3291)</i>		<i>MSL above SD: 8.294 m</i>
<i>GPS Observation Frequency: Every year</i>	<i>Last GPS Observation Performed: 09/13</i>	
<i>Dive Inspection Frequency: Every year</i>		<i>Last Dive: 09/12</i>

1. Perform reconnaissance to relocate the primary water level sensor, seek engineering support and Field Engineering Review Subcommittee (FERS) approval of the installation design of the new station.
2. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
3. Check and update the log sizes to reflect Engineering Bulletin 09-003.
4. Take face, setting, and location photos of primary bench mark A 269.

<b>8767931 I-210 Bridge Air Gap, LA (PORTS)</b>		<b>Air Gap Station</b>
---	--	------------------------

1. No additional requirements.

<b>8767961 Bulk Terminal, LA (PORTS)</b>	<b>L28053</b>	<b>Part 15</b>
<i>PBM: 876 7961 C</i>		<i>PBM above SD: 10.000 m</i>
<i>GPS Bench Mark: 876 7961 C</i>		<i>MSL above SD: 7.282 m</i>
<i>GPS Observation Frequency: Every year</i>	<i>Last GPS Observation Performed: 09/13</i>	
<i>Dive Inspection Frequency: Every year</i>		<i>Last Dive: 09/12</i>

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.

<b>8768094 Calcasieu Pass, East Jetty LA (PORTS)</b>	<b>L28053</b>	<b>Part 5</b>
<i>PBM: 876 8094 E (DJ9387)</i>		<i>PBM above SD: 9.9670 m</i>
<i>GPS Bench Mark: 876 8094 E TIDAL (DJ9387)</i>		<i>MSL above SD: 8.355 m</i>
<i>GPS Observation Frequency: Every year</i>	<i>Last GPS Observation Performed: 09/13</i>	
<i>Dive Inspection Frequency: Every year</i>		<i>Last Dive: 10/12</i>

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.

**lc0101 Calcasieu Channel LB 36, LA (PORTS)**

**Current Meter Station**

1. Refer to the task order for station specific requirements.

**lc0201 Cameron Fishing Pier, LA (PORTS)**

**Current Meter Station**

1. Refer to the task order for station specific requirements.

**lc0301 Lake Charles City Dock, LA (PORTS)**

**Current Meter Station**

1. Refer to the task order for station specific requirements.

2.12 Conrad Blucher Institute - Task 12-02: Pascagoula PORTS®  
John Stepnowski, Task Manager/Technical Representative (TR)

**The operations and maintenance responsibility for the stations listed under Task 12-02 Pascagoula PORTS® will be taken over by AOB after the funded time period is over as listed in Section 2.0**

**8741003 Petit Bois, MS (PORTS)**

**Met Only Station**

1. Refer to the task order for station specific requirements.

**8741041 Pascagoula Dock E, MS (PORTS)**

**L28052**

**Part 7**

**PBM:** USACE RM 1 TIDAL

**PBM above SD:** 10.000 m

**GPS Bench Mark:** 874 1041 E

**MSL above SD:** 6.829 m

**GPS Observation Frequency:** Every year

**Last GPS Observation Performed:** 03/13

Dive Inspection Frequency: Every year

Last Dive: 03/13

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.

**8741094 Rear Range, MS (PORTS)**

**Met Only Station**

1. Refer to the task order for station specific requirements.

**8741501 Dock C, MS (PORTS)**

**Met Only Station**

1. Refer to the task order for station specific requirements.

**8741533 Pascagoula NOAA Lab, MS (PORTS)**

**L28052**

**Part 6**

**PBM:** 874 1429 B 1980

**PBM above SD:** 9.1014 m

**GPS Bench Mark:** 874 1533 A

**MSL above SD:** 6.903 m

**GPS Observation Frequency:** Every year

**Last GPS Observation Performed:** 03/13

Dive Inspection Frequency: Every year

Last Dive: 03/13

1. **FUNDING DEPENDENT:** Collaborate with the Task Manager to provide an engineering design for the upgrade of this station to NWLON status. NWLON upgrade requirements: elevated frame to place DCPs above CAT 4 Storm Surge height, increase acoustic well length and add a full MET package (unless wind sensors are unfeasible). Present site is not compatible for the installation of wind sensors.

**ps0201 Pascagoula Harbor LB17, MS (PORTS)**

**Current Meter Station**

1. Refer to the task order for station specific requirements.

**ps0301 Northrop Grumman Pier, MS (PORTS)**

**Current Meter Station**

1. Refer to the task order for station specific requirements.

**ps0401 Pascagoula Harbor LB10, MS (PORTS)**

**Current Meter Station**

1. Refer to the task order for station specific requirements.

2.13 Conrad Blucher Institute - Task 13-01: Houston/Galveston PORTS®  
Jim Lewis, Task Manager/Technical Representative (TR)

<b>8770613 Morgan's Point, TX (PORTS)</b>	<b>L28054</b>	<b>Part 8</b>
<i>PBM: E 1201 (AW1556)</i>		<i>PBM above SD: 5.9855 m</i>
<i>GPS Bench Mark: 877 0613 TIDAL 10 (AW4857)</i>		<i>MSL above SD: 1.807 m</i>
<i>GPS Observation Frequency: Every year</i>	<i>Last GPS Observation Performed: 04/13</i>	
<i>Dive Inspection Frequency: Every year</i>		<i>Last Dive: 03/12</i>

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.

<b>8771013 Eagle Point, TX (PORTS)</b>	<b>L28054</b>	<b>Part 13</b>
<i>PBM: 877 1013 B</i>		<i>PBM above SD: 3.913 m</i>
<i>GPS Bench Mark: 877 1013 A (AJ4424)</i>		<i>MSL above SD: 1.467 m</i>
<i>GPS Observation Frequency: Every year</i>	<i>Last GPS Observation Performed: 03/13</i>	
<i>Dive Inspection Frequency: Every year</i>		<i>Last Dive: 04/10</i>

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.

<b>8771341 Galveston Entrance Channel, TX (PORTS)</b>	<b>L28054</b>	<b>Part 41</b>
<i>PBM: 877 1314 J</i>		<i>PBM above SD: 4.009 m</i>
<i>GPS Bench Mark: 877 1341 J</i>		<i>MSL above SD: 3.072 m</i>
<i>GPS Observation Frequency: Every year</i>	<i>Last GPS Observation Performed: 06/13</i>	
<i>Dive Inspection Frequency: Every year</i>		<i>Last Dive: 05/12</i>

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Include all marks in all future level runs.

**8771450 Galveston Pier 21, TX (PORTS)**

***PBM:*** 7.151 (AW0433)

***GPS Bench Mark:*** 877 1450 C

***GPS Observation Frequency:*** Every year

***Dive Inspection Frequency:*** Every year

**L28054**

**Part 2**

***PBM above SD:*** 3.153 m

***MSL above SD:*** 1.588 m

***Last GPS Observation Performed:*** 02/13

***Last Dive:*** 02/13

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Provide a set of new chest-high and directional photos of all bench marks, making sure to include a person or object in the directional photos delineating where the bench mark is located.
4. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.
5. Level to Met SRM.
6. Perform a steel tape measurement with levels and submit to CO-OPS.

**g06010 Galveston Bay Entrance Channel LB11, TX (PORTS)**

**Current Meter Station**

1. Refer to the task order for station specific requirements.

**g07010 ExxonMobil Baytown, TX (PORTS)**

**Current Meter Station**

1. Refer to the task order for station specific requirements.

2.14 Conrad Blucher Institute - Task 10-04: Texas Stations  
Jim Lewis, Task Manager/Technical Representative (TR)

<b>8770570 Sabine Pass North, TX (PORTS)</b>	<b>L28054</b>	<b>Part 1</b>
<i>PBM: 877 0570 A TIDAL (AV1014)</i>		<i>PBM above SD: 3.264 m</i>
<i>GPS Bench Mark: 877 0570 A TIDAL (AV1014)</i>		<i>MSL above SD: 1.343 m</i>
<i>GPS Observation Frequency: Every year</i>	<i>Last GPS Observation Performed: 11/10</i>	
<i>Dive Inspection Frequency: Every year</i>		<i>Last Dive: 11/09</i>

1. Upgrade the water level station, seek engineering support and Field Engineering Review Subcommittee (FERS) approval of the design of the upgrades to the station.
2. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
3. Check and update the log sizes to reflect Engineering Bulletin 09-003.
4. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.
5. Provide the depth of the stainless steel rod of 877 0570 K TIDAL.
6. Update the handheld GPS handheld GPS positions of all bench marks in the Windesc file.
7. Include all deep rod marks in all future leveling runs in support of stability analysis.

<b>8772447 USCG Freeport, TX</b>	<b>L28054</b>	<b>Part 47</b>
<i>PBM: 877 2447 A TIDAL</i>		<i>PBM above SD: 10.000 m</i>
<i>GPS Bench Mark: 877 2447 E TIDAL</i>		<i>MSL above SD: 8.723 m</i>
<i>GPS Observation Frequency: Every year</i>	<i>Last GPS Observation Performed: 11/11</i>	
<i>Dive Inspection Frequency: Every year</i>		<i>Last Dive: 11/11</i>

1. Upgrade the water level station, seek engineering support and Field Engineering Review Subcommittee (FERS) approval of the design of the upgrades to the station.
2. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
3. Check and update the log sizes to reflect Engineering Bulletin 09-003.
4. Measure the elevation of the wind and air temperature sensor above Met SRM.
5. Measure the elevation of the water temperature sensor and barometer above station datum.

**8774770 Rockport, TX****PBM:** 877 4770 A**GPS Bench Mark:** 877 4770 B**GPS Observation Frequency:** Every year**Dive Inspection Frequency:** Every year**L28054****Part 5****PBM above SD:** 3.207 m**MSL above SD:** 2.025 m**Last GPS Observation Performed:** 10/12**Last Dive:** 10/12

1. **FUNDING DEPENDENT:** The station is under consideration for relocation to an elevated platform outside the harbor breakwater, seek engineering support and Field Engineering Review Subcommittee (FERS) approval of the design of the upgrades to the station.
2. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
3. Check and update the log sizes to reflect Engineering Bulletin 09-003.

**8775870 Corpus Christi, TX****PBM:** 877 5870 A TIDAL (AC8459)**GPS bench mark:** 877 5870 H TIDAL (AH1762)**GPS Observation Frequency:** Every 5 years**Dive Inspection Frequency:** Every year**L28054****Part 6****PBM above SD:** 9.098 m**MSL above SD:** 6.635 m**Last GPS Observation Performed:** 03/12**Last Dive:** 03/10

1. No further requirements.

**8779770 Port Isabel, TX****PBM:** 877 9770 TIDAL 10 (AB1227)**GPS Bench Mark:** X 1406 (AB1225)**GPS Observation Frequency:** Every 5 years**Dive Inspection Frequency:** Every year**L28054****Part 7****PBM above SD:** 4.276 m**MSL above SD:** 1.423 m**Last GPS Observation Performed:** 10/12**Last Dive:** 10/12

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.

2.15 FOD/AOB - Great Lakes

2.15.1 St. Lawrence River

**8311030 Ogdensburg, NY**

**PBM:** 831 1030 A (PH0768)

**GPS Bench Mark:** 831 1030 H (DE7800)

**GPS Observation Frequency:** Every 5 years

**Dive Inspection Frequency:** Every 2 years

**L28065**

**Part 1**

**PBM Elevation (Dynamic):** 84.6140 m

**Hydraulic Corrector:** +0.000 m

**Last GPS Observation Performed:** 06/10

**Last Dive:** 05/09

1. . Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Provide bench mark description for bench mark Rock.
4. Provide the handheld GPS positions of the gauge house.
5. Provide updated GPS positions for all bench marks in the Windesc file.
6. Include bench mark OG 1 1935 MGK in level run.
7. Take a second directional photo for bench marks 831 1030 32B and 831 1030 Rock.

**8311062 Alexandria Bay, NY**

**PBM:** 831 1062 LAND (LX4057)

**GPS Bench Mark:** 831 1062 LMN (DE7816)

**GPS Observation Frequency:** Every 5 years

**Dive Inspection Frequency:** Every year

**L28065**

**Part 2**

**PBM Elevation (Dynamic):** 86.1691 m

**Hydraulic Corrector:** +0.000 m

**Last GPS Observation Performed:** 06/10

**Last Dive:** 05/11

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. **UNRESOLVED FROM 2013 PROJECT INSTRUCTIONS:** Provide a second directional photo of bench marks 831 1062 LMN, 831 1062 DEE and 831 1062 JAMISON.
4. Provide face, setting and two directional photos for bench mark 831 1062 B and new spike set in 2013.
5. Provide the handheld GPS positions of the gauge house.
6. Include bench mark 831 1062 Golf 1981 in level run.

2.15.2 Lake Ontario

**9052000 Cape Vincent, NY**

**PBM:** 905 2000 CAPE (PJ0033)

**GPS Bench Mark:** 905 2000 F (AH9230)

**GPS Observation Frequency:** Every 5 years

**Dive Inspection Frequency:** Every year

**L28066**

**Part 1**

**PBM Elevation (Dynamic):** 77.0712 m

**Hydraulic Corrector:** +0.008 m

**Last GPS Observation Performed:** 06/10

**Last Dive:** 06/09

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Provide the handheld GPS positions of the gauge house.
4. Include bench marks 905 2000 Roxy and 905 2000 G 17 in the level run.
5. Provide second directional photo for bench marks 905 2000 Mail, 905 2000 E-17, 905 2000 G-17, 905 2000 Honor and 905 2002 F.

**9052030 Oswego, NY (MASTER)**

**PBM:** 905 2030 LAKE (OF0658)

**GPS Bench Mark:** 905 2030 D (DJ5176)

**GPS Observation Frequency:** Every 5 years

**Dive Inspection Frequency:** Every 2 years

**L28066**

**Part 2**

**PBM Elevation (Dynamic):** 77.4870 m

**Hydraulic Corrector:** +0.000 m

**Last GPS Observation Performed:** 06/10

**Last Dive:** 05/09

1. Inspect all CORS station components for proper operation and notify NGS of any problems found. Indicate all findings, actions, and contact information on the station report.
2. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
3. Check and update the log sizes to reflect Engineering Bulletin 09-003.
4. Provide the handheld GPS positions of the gauge house.
5. Include bench marks Oswego and Will in the level run.
6. Provide second directional photo for bench marks 905 2030 Lake and 905 2030 Son.

**9052058 Rochester, NY**

**PBM:** 905 2058 SUB (OF1082)

**GPS Bench Mark:** 905 2058 K (AH9232)

**GPS Observation Frequency:** Every 5 years

**Dive Inspection Frequency:** Every 2 years

**L28066**

**Part 3**

**PBM Elevation (Dynamic):** 76.8041 m

**Hydraulic Corrector:** +0.006 m

**Last GPS Observation Performed:** 06/10

**Last Dive:** 05/09

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Provide the handheld GPS positions of the gauge house.
4. Provide second directional photo for all marks.

**9052076 Olcott, NY**

***PBM:*** 905 2076 WEST (OG0098)

***GPS Bench Mark:*** 905 2076 H (AH9233)

***GPS Observation Frequency:*** Every 5 years

***Dive Inspection Frequency:*** Every 2 years

**L28066**

**Part 4**

***PBM Elevation (Dynamic):*** 77.4920 m

***Hydraulic Corrector:*** +0.008 m

***Last GPS Observation Performed:*** 06/10

***Last Dive:*** 05/09

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Provide the handheld GPS positions of the gauge house.
4. Provide second directional photo for benchmark 90 52076 Motts.

### 2.15.3 Niagara River

#### **9063007 Ashland Avenue, NY**

**PBM:** 906 3007 POOL (OG0229)

**GPS Bench Mark:** N/A

**GPS Observation Frequency:** (Waived – not feasible)

**Dive Inspection Frequency:** Every year

**L28067**

**PBM Elevation (Dynamic):** 111.4279 m

**Hydraulic Corrector:** +0.000 m

**Last GPS Observation Performed:** N/A

**Last Dive:** 06/13

**Part 1**

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Provide the handheld GPS positions of the gauge house.
4. Include bench marks Wing and 906 3007 E in level run.
5. Provide second directional photo for all benchmarks.

#### **9063009 American Falls, NY**

**PBM:** 906 3009 FRONTIER (OG0223)

**GPS Bench Mark:** W 411 (OG0350)

**GPS Observation Frequency:** Every 5 years

**Dive Inspection Frequency:** Diving Not Allowed

**L28067**

**PBM Elevation (Dynamic):** 171.8554 m

**Hydraulic Corrector:** +0.000 m

**Last GPS Observation Performed:** Unknown

**Part 2**

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Provide the handheld GPS positions of the gauge house.
4. Include bench marks 906 3009 F, 906 3009 Grate, 906 3009 Park, and U 411RESET 2003 in level run.
5. Provide second directional photo for all benchmarks.

#### **9063012 Niagara Intake, NY**

**PBM:** 906 3012 Intake (OG0215)

**GPS Bench Mark:** 906 3012 RAIL (OG0217)

**GPS Observation Frequency:** Every 5 years

**Dive Inspection Frequency:** Diving Not Allowed

**L28067**

**PBM Elevation (Dynamic):** 173.3803 m

**Hydraulic Corrector:** +0.000 m

**Last GPS Observation Performed:** 06/10

**Part 3**

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Provide the handheld GPS positions of the gauge house.
4. Include bench marks 906 3012 NW Bolt and 906 3012 Tower Use in level run.

#### 2.15.4 Lake Erie

##### **9063020 Buffalo, NY**

**PBM:** 906 3020 MACHINE (NC0403)

**GPS Bench Mark:** 906 3020 H (AH9234)

**GPS Observation Frequency:** Every 5 years

**Dive Inspection Frequency:** Every 2 years

**L28068**

**Part 1**

**PBM Elevation (Dynamic):** 176.5548 m

**Hydraulic Corrector:** -0.026 m

**Last GPS Observation Performed:** 06/10

**Last Dive:** 05/13

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Inspect all CORS station components for proper operation and notify NGS of any problems found. Indicate all findings, actions, contact, and other information on the station report.
4. Provide the handheld GPS positions of the gauge house.

##### **9063028 Sturgeon Point, NY**

**PBM:** 906 3028 WATER (NC0430)

**GPS Bench Mark:** 906 3028 L (DE7802)

**GPS Observation Frequency:** Every 5 years

**Dive Inspection Frequency:** Every 2 years

**L28068**

**Part 2**

**PBM Elevation (Dynamic):** 197.5510 m

**Hydraulic Corrector:** -0.023 m

**Last GPS Observation Performed:** 06/10

**Last Dive:** 04/04

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Provide a steel tape measure from the ETG to the platform.
4. Measure the elevation of the air temperature sensor above Met SRM.
5. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.
6. Provide the handheld GPS positions of the gauge house.
7. Provide second directional photo for all benchmarks.

##### **9063038 Erie, PA**

**PBM:** 906 3083 POPLAR (ND0161)

**GPS Bench Mark:** D 362 (ND0163)

**GPS Observation Frequency:** Every 5 years

**Dive Inspection Frequency:** Every 2 years

**L28068**

**Part 3**

**PBM Elevation (Dynamic):** 174.6781 m

**Hydraulic Corrector:** -0.025 m

**Last GPS Observation Performed:** 06/10

**Last Dive:** 05/13

1. Verify/record the handheld GPS positions of the gauge house. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Provide station photo showing an overhead view of the sump.
4. Provide second directional photo for all benchmarks.

**9063053 Fairport, OH (MASTER)****PBM:** K 321 (MB1625)**GPS Bench Mark:** 906 3053 F (AH9235) & X 323 (MB1620)**GPS Observation Frequency:** Every year**Dive Inspection Frequency:** Every 2 years**L28068****PBM Elevation (Dynamic):** 175.9180 m**Hydraulic Corrector:** +0.000 m**Last GPS Observation Performed:** 06/10**Last Dive:** 04/08**Part 4**

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Subsidence of all bench marks by 5 or more centimeters due to salt mining was verified by NGS during a geodetic level connection to the National Spatial Reference System (NSRS) in September 2006. Bench mark heights need to be re-evaluated by CO-OPS. Coordinate with NGS to connect again in 2014 to NSRS to monitor movement. Indicate all findings, actions, contact, and other information on the station report.
4. Yearly GPS observations on GPSBM required due to subsidence issues.
5. Provide the handheld GPS positions of the gauge house.
6. Provide met sensor photos.
7. Install and maintain CORS station if/when provided by Morton Salt.
8. Provide station photo of the ETG.
9. Provide second directional photo for all benchmarks.

**9063063 Cleveland, OH****PBM:** G 321 (MB1563)**GPS Bench Mark:** G 321 (MB1563)**GPS Observation Frequency:** Every year**Dive Inspection Frequency:** Every 2 years**L28068****PBM Elevation (Dynamic):** 177.7308 m**Hydraulic Corrector:** +0.010 m**Last GPS Observation Performed:** 06/10**Last Dive:** 05/13**Part 5**

1. Inspect all CORS station components for proper operation and notify NGS of any problems found. Indicate all findings, actions, contact, and other information on the station report.
2. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
3. Check and update the log sizes to reflect Engineering Bulletin 09-003.
4. Provide elevation of base of stand-alone Met station above mean sea level (MSL) by measuring down to the water level and noting date/time.
5. Yearly GPS observations on GPSBM required due to subsidence issues.
6. Provide the handheld GPS positions of the gauge house.
7. Provide station photo looking down into the sump.
8. Provide face, setting, and two directional photos for benchmark 906 3063 Steps.
9. Provide second directional photo for all benchmarks.

**9063079 Marblehead, OH**  
**PBM:** Z 317 (MC0984)  
**GPS Bench Mark:** 906 3079 J (AH9236)  
**GPS Observation Frequency:** Every 5 years  
**Dive Inspection Frequency:** Every year

**L28068** **Part 6**  
**PBM Elevation (Dynamic):** 177.2379 m  
**Hydraulic Corrector:** -0.006 m  
**Last GPS Observation Performed:** 06/10  
**Last Dive:** 05/13

1. Inspect all CORS station components for proper operation and notify NGS of any problems found. Indicate all findings, actions, contact, and other information on the station report.
2. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
3. Check and update the log sizes to reflect Engineering Bulletin 09-003.
4. Inspect/replace primary float. 2013 AI showed signs of pitting and compromised paint.
5. Measure the height of air temperature and relative humidity sensors.
6. Provide photos of air temperature and relative humidity sensors.
7. Provide face, setting and two directional photos for benchmarks 906 3079 F, 906 3079 H, and 906 3079 J.
8. Provide second directional photo for all benchmarks.

**9063085 Toledo, OH**  
**PBM:** 906 3085 NAVAL (MC0269)  
**GPS Bench Mark:** 906 3085 G (AH9237)  
**GPS Observation Frequency:** Every 5 years  
**Dive Inspection Frequency:** Every 2 years

**L28068** **Part 7**  
**PBM Elevation (Dynamic):** 175.4592 m  
**Hydraulic Corrector:** -0.005 m  
**Last GPS Observation Performed:** 06/10  
**Last Dive:** 04/09

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Repair the holes in the roof.
4. Paint the gauge house.
5. Provide the handheld GPS positions of the gauge house.
6. Provide second directional photo for all benchmarks.

**9063090 Fermi Power Plant, MI**  
**PBM:** 906 3090 POWER (MC0873)  
**GPS Bench Mark:** 906 3090 G (AH9238)  
**GPS Observation Frequency:** Every 5 years  
**Dive Inspection Frequency:** Every 2 years

**L28068** **Part 8**  
**PBM Elevation (Dynamic):** 177.5893 m  
**Hydraulic Corrector:** +0.023 m  
**Last GPS Observation Performed:** 06/10  
**Last Dive:** 11/09

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Verify, or upgrade to, the new style XPERT DCP GPS antenna and XPERT external BEI display. (Display left for contractor to install on next visit)
4. Provide the handheld GPS positions of the gauge house.
5. Provide station photo looking down into the sump.

## 2.15.5 Detroit River

### **9044020 Gibraltar, MI**

**PBM:** M 234 (NE0857)

**GPS Bench Mark:** H 115 X (NE0516)

**GPS Observation Frequency:** Every 5 years

**Dive Inspection Frequency:** Every 2 years

**L28069**

**Part 1**

**PBM Elevation (Dynamic):** 176.6298 m

**Hydraulic Corrector:** 0.000 m

**Last GPS Observation Performed:** 06/10

**Last Dive:** 11/08

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Include bench mark 904 4020 Reynolds in the level run.

### **9044030 Wyandotte, MI**

**PBM:** 904 4030 CHIEF (NE0577)

**GPS Bench Mark:** Select most stable mark observable

**GPS Observation Frequency:** Every 5 years

**Dive Inspection Frequency:** Every 2 years

**L28069**

**Part 2**

**PBM Elevation (Dynamic):** 176.1190 m

**Hydraulic Corrector:** 0.000 m

**Last GPS Observation Performed:** Unknown

**Last Dive:** 11/08

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Include bench mark 904 4030 Bank in the level run.

### **9044036 Fort Wayne, MI**

**PBM:** 904 4036 RAMP (NE0622)

**GPS Bench Mark:** FORT WAYNE A (AA8055)

**GPS Observation Frequency:** Every 5 years

**Dive Inspection Frequency:** Every 2 years

**L28069**

**Part 3**

**PBM Elevation (Dynamic):** 175.2317 m

**Hydraulic Corrector:** 0.000 m

**Last GPS Observation Performed:** 06/10

**Last Dive:** 11/08

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Install new gauge table. The current gauge table is old and may start to warp, effecting data quality. Note: Work may be performed by Great Lakes contractor prior to annual inspection.
4. Outside of the block building needs to be sand blasted or pressure washed and re-painted.
5. Re-sleeve bench mark 904 4036 Carpenter.
6. Replace the cover on bench mark 904 4036 Fort Wayne A.

**9044049 Windmill Point, MI****L28069****Part 4****PBM:** 904 4049 USPHS (NE0136)**PBM Elevation (Dynamic):** 176.5770 m**GPS Bench Mark:** Select most stable mark observable**Hydraulic Corrector:** 0.000 m**GPS Observation Frequency:** Every 5 years**Last GPS Observation Performed:** Unknown**Dive Inspection Frequency:** Every 2 years**Last Dive:** 11/08

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Obtain permission to: establish, describe, and connect via levels one 3D rod mark, designation/stamping: 904 4049 M/4049 M 2014. This mark should be open to the sky for GPS observations.

## 2.15.6 Lake St Clair

### **9034052 St. Clair Shores, MI (MASTER)**

***PBM:*** 904 4052 FOOD (NE0165)

***GPS Bench Mark:*** N 235 (NE0898)

***GPS Observation Frequency:*** Every 5 years

***Dive Inspection Frequency:*** Every 2 years

### **L28070**

### **Part 1**

***PBM Elevation (Dynamic):*** 176.9698 m

***Hydraulic Corrector:*** 0.000 m

***Last GPS Observation Performed:*** 06/10

***Last Dive:*** 11/08

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.

## 2.15.7 St. Clair River

<b>9014070 Algonac, MI</b>	<b>L28071</b>	<b>Part 1</b>
<b>PBM:</b> 901 4070 TREAT (NE0255)	<b>PBM Elevation (Dynamic):</b> 176.8682 m	
<b>GPS Bench Mark:</b> Select most stable mark observable	<b>Hydraulic Corrector:</b> 0.000 m	
<b>GPS Observation Frequency:</b> Every 5 years	<b>Last GPS Observation Performed:</b> Unknown	
<b>Dive Inspection Frequency:</b> Every year	<b>Last Dive:</b> 11/11	

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Include benchmark 903 4052 Y 235 in the level run.

<b>9014080 St. Clair State Police, MI</b>	<b>L28071</b>	<b>Part 2</b>
<b>PBM:</b> A 237 (NE0943)	<b>PBM Elevation (Dynamic):</b> 176.5847 m	
<b>GPS Bench Mark:</b> 901 4080 F (AC9129)	<b>Hydraulic Corrector:</b> 0.000 m	
<b>GPS Observation Frequency:</b> Every 5 years	<b>Last GPS Observation Performed:</b> 06/10	
<b>Dive Inspection Frequency:</b> Every 2 years	<b>Last Dive:</b> 10/08	

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Include benchmark 904 1080 IBM 43 IBC in the level run.

<b>9014087 Dry Dock, MI</b>	<b>L28071</b>	<b>Part 3</b>
<b>PBM:</b> Z 236 (NE0953)	<b>PBM Elevation (Dynamic):</b> 180.7617 m	
<b>GPS Bench Mark:</b> Select most stable mark observable	<b>Hydraulic Corrector:</b> 0.000 m	
<b>GPS Observation Frequency:</b> Every 5 years	<b>Last GPS Observation Performed:</b> Unknown	
<b>Dive Inspection Frequency:</b> Every 2 years	<b>Last Dive:</b> 10/08	

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Include bench mark Wall in the level run.
4. Provide second directional photo for bench marks Z236, 901 4087 Step, 901 4087 Grate Bar A, 901 4087 Wall, and 901 4087 F.

**9014090 Mouth of the Black River, MI (NEW)****PBM:** Z 43 (NE0088)**GPS Bench Mark:** 901 4090 D (NE0955)**GPS Observation Frequency:** Every 5 years**Dive Inspection Frequency:** Every year**L28071****PBM Elevation (Dynamic):** 178.9323 m**Hydraulic Corrector:** 0.000 m**Last GPS Observation Performed:** 06/10**Last Dive:** 10/10**Part 4**

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Provide description for bench mark MBR 2008 in Windesc.
4. Include bench mark 901 4090 CURB in the leveling run.
5. Provide face, setting, and two directional photos for bench mark 901 4090 K.

**9014096 Dunn Paper, MI****PBM:** 3060 (NE0081)**GPS Bench Mark:** Select most stable mark observable**GPS Observation Frequency:** Every 5 years**Dive Inspection Frequency:** Every year**L28071****PBM Elevation (Dynamic):** 179.1206 m**Hydraulic Corrector:** 0.000 m**Last GPS Observation Performed:** Unknown**Last Dive:** 09/13**Part 5**

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Provide two directional photos for all bench marks.
4. Provide face, setting and two directional photos for bench mark 901 4096 BWB-HPile.

**9014098 Fort Gratiot, MI****PBM:** 901 4098 RETAINING WALL (OJ0009)**GPS Bench Mark:** 901 4098 RETAINING WALL (OJ0009)**GPS Observation Frequency:** Every 5 years**Dive Inspection Frequency:** Every 2 years**L28071****PBM Elevation (Dynamic):** 179.5533 m**Hydraulic Corrector:** 0.000 m**Last GPS Observation Performed:** 06/10**Last Dive:** 09/06**Part 6**

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Provide second directional photo for all bench marks.

2.15.8 Lake Huron

**9075002 Lakeport, MI**

**PBM:** 907 5002 BURTCH (OJ0036)  
**GPS Bench Mark:** LAKEPORT RM 2 (OJ0599)  
**GPS Observation Frequency:** Every 5 years  
**Dive Inspection Frequency:** Every 2 years

**L28072**

**Part 1**

**PBM Elevation (Dynamic):** 178.7965 m  
**Hydraulic Corrector:** +0.013 m  
**Last GPS Observation Performed:** 06/10  
**Last Dive:** 08/13

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Provide second directional photo for all bench marks.

**9075014 Harbor Beach, MI (MASTER)**

**PBM:** GRIST (OJ0219)  
**GPS Bench Mark:** LSC 5C93 (OJ0517) & 907 5014 GRIST (OJ0219)  
**GPS Observation Frequency:** Every 5 years  
**Dive Inspection Frequency:** Every 2 years

**L28072**

**Part 2**

**PBM Elevation (Dynamic):** 180.2756 m  
**Hydraulic Corrector:** 0.000 m  
**Last GPS Observation Performed:** 06/10  
**Last Dive:** 09/08

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Provide the inside and outside intake invert elevations.
4. Provide picture of face, setting and two directional photos of bench mark 907 5014 J.
5. Include bench mark 907 5014 Rail A in the level run.

**9075035 Essexville, MI**

**PBM:** 907 5035 CON (OJ0526)  
**GPS Bench Mark:** ESSEX A (AA8053)  
**GPS Observation Frequency:** Every year  
**Dive Inspection Frequency:** Every 2 years

**L28072**

**Part 3**

**PBM Elevation (Dynamic):** 179.1734 m  
**Hydraulic Corrector:** -0.002 m  
**Last GPS Observation Performed:** 06/10  
**Last Dive:** 08/06

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Provide second directional photo for all bench marks.
4. Verify contact information is correct for local/owner.
5. Provide station photo looking down into the sump.
6. Yearly GPS observations on GPSBM required due to subsidence issues.
7. Include benchmarks 907 5035 H, 907 5035 Essex B, 907 5035 Essex CG, and 907 5035 Yacht in the level run.

**9075065 Alpena, MI**  
**PBM:** 907 5065 POST OFFICE (GJ0009)  
**GPS Bench Mark:** 907 5065 G  
**GPS Observation Frequency:** Every 5 years  
**Dive Inspection Frequency:** Every 2 years

**L28072** **Part 7**  
**PBM Elevation (Dynamic):** 180.1536 m  
**Hydraulic Corrector:** +0.031 m  
**Last GPS Observation Performed:** Unknown  
**Last Dive:** 09/10

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Inspect all CORS station components for proper operation and notify NGS of any problems found. Indicate all findings, actions, contact, and other information on the station report. Crew identified missing components during FY13 AI
4. Provide the handheld GPS positions of the gauge house.
5. Provide the outside intake invert elevation.
6. Provide second directional photo for all benchmarks.

**9075080 Mackinaw City, MI**  
**PBM:** J 299 (QK0428)  
**GPS Bench Mark:** 907 5080 STATE DOCK (QK0428)  
**GPS Observation Frequency:** Every 5 years  
**Dive Inspection Frequency:** Every 2 years

**L28072** **Part 5**  
**PBM Elevation (Dynamic):** 179.6082 m  
**Hydraulic Corrector:** +0.043 m  
**Last GPS Observation Performed:** 07/10  
**Last Dive:** 08/13

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Inspect all CORS station components for proper operation and notify NGS of any problems found. Indicate all findings, actions, contact, and other information on the station report. Make sure all wiring installed by NGS is run through Panduit and the installation is clean.
4. Provide face, setting and two directional photos for benchmark 907 5080 Mackinaw City.
5. Provide second directional photo for all benchmarks.

**9075099 Detour Village, MI (PORTS)**  
**PBM:** L 293 (QJ0086)  
**GPS Bench Mark:** DETOUR MARINA (AH9228)  
**GPS Observation Frequency:** Every 5 years  
**Dive Inspection Frequency:** Every 2 years

**L28072** **Part 6**  
**PBM Elevation (Dynamic):** 179.7044 m  
**Hydraulic Corrector:** +0.005 m  
**Last GPS Observation Performed:** 06/10  
**Last Dive:** 09/10

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Provide face, setting and two directional photos for bench mark 907 5099 Harry.
4. Provide second directional photo for all bench marks.

## 2.15.9 Lake Michigan

### **9087023 Ludington, MI**

**PBM:** J 318 (OL0303)

**GPS Bench Mark:** J 318 (OL0303)

**GPS Observation Frequency:** Every 5 years

**Dive Inspection Frequency:** Every 2 years

**L28073**

**Part 1**

**PBM Elevation (Dynamic):** 177.9833 m

**Hydraulic Corrector:** +0.087 m

**Last GPS Observation Performed:** 07/10

**Last Dive:** 07/09

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Include bench marks 908 7023 WALBAR in the level run. Note for mark 908 7023 WALBAR: Contact marina to access, update recovery notes, and survey to mark
4. Inspect all CORS station components for proper operation and notify NGS of any problems found. Indicate all findings, actions, contact, and other information on the station report.
5. Provide a face, setting and two directional photos for bench mark 908 7023 WALBAR.
6. Provide second directional photo for all benchmarks.
7. Clean inside and outside of the gauge house from the old roof leaks. Fill holes in walls and install new door rubber.
8. Provide the handheld GPS positions of the gauge house.

### **9087031 Holland, MI**

**PBM:** 908 7031 K

**GPS Bench Mark:** 908 7031 J (AH5303)

**GPS Observation Frequency:** Every 5 years

**Dive Inspection Frequency:** Every 2 years

**L28073**

**Part 2**

**PBM Elevation (Dynamic):** 177.9714 m

**Hydraulic Corrector:** +0.090 m

**Last GPS Observation Performed:** 07/10

**Last Dive:** 07/09

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Provide the outside intake invert elevation.
4. Provide the handheld GPS positions of the gauge house.
5. Provide second directional photo for benchmarks 908 7031 Sarah, 908 7031 Nancy, 908 7031 Crib and 908 7031 Holland.

**9087044 Calumet Harbor, IL**  
**PBM:** 908 7044 COM (ME2189)  
**GPS Bench Mark:** 908 7044 H (AE9231)  
**GPS Observation Frequency:** Every 5 years  
**Dive Inspection Frequency:** Every 2 years

**L28073** **Part 3**  
**PBM Elevation (Dynamic):** 178.0648 m  
**Hydraulic Corrector:** +0.104 m  
**Last GPS Observation Performed:** 07/10  
**Last Dive:** 07/09

1. Inspect all CORS station components for proper operation and notify NGS of any problems found. Indicate all findings, actions, contact, and other information on the station report.
2. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
3. Check and update the log sizes to reflect Engineering Bulletin 09-003.
4. Provide the outside intake invert elevation.
5. Provide the handheld GPS positions of the gauge house.

**9087057 Milwaukee, WI**  
**PBM:** NAVY (OL0278)  
**GPS Bench Mark:** MILWAUKEE A (AA8061)  
**GPS Observation Frequency:** Every 5 years  
**Dive Inspection Frequency:** Every 2 years

**L28073** **Part 4**  
**PBM Elevation (Dynamic):** 182.9494 m  
**Hydraulic Corrector:** +0.106 m  
**Last GPS Observation Performed:** 07/10  
**Last Dive:** 09/12

1. UNRESOLVED FROM 2013 PROJECT INSTRUCTIONS - Gauge house needs interior and door painting plus general maintenance. Contact FOD for more information.
2. Regarding level run: note that United States Naval Reserve Center is closed on weekends.
3. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
4. Check and update the log sizes to reflect Engineering Bulletin 09-003.
5. Provide the handheld GPS positions of the gauge house.
6. Include bench mark 908 7057 Cap in level run.

**9087068 Kewaunee, WI**  
**PBM:** 908 7068 ROD (PM0373)  
**GPS Bench Mark:** 908 7068 H (AH5304)  
**GPS Observation Frequency:** Every 5 years  
**Dive Inspection Frequency:** Every year

**L28073** **Part 5**  
**PBM Elevation (Dynamic):** 177.9684 m  
**Hydraulic Corrector:** +0.114 m  
**Last GPS Observation Performed:** 07/10  
**Last Dive:** 07/09

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Install a new well pipe.
4. Replace the box and stand for the BEI.
5. Provide the handheld GPS positions of the gauge house.
6. Provide the serial number for the DCP.

**9087069 Kewaunee Met, WI**

**Met Only Station**

1. Update the XPERT Dark Operating System to v3.4.0.6.

**9087072 Sturgeon Bay Canal, WI**  
**PBM:** 908 7072 GARAGE (PM0361)  
**GPS Bench Mark:** STURGEON A (AA8057)  
**GPS Observation Frequency:** Every 5 years  
**Dive Inspection Frequency:** Every 2 years

**L28073** **Part 6**  
**PBM Elevation (Dynamic):** 181.8608 m  
**Hydraulic Corrector:** +0.106 m  
**Last GPS Observation Performed:** 07/10  
**Last Dive:** 07/09

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Provide the handheld GPS positions of the gauge house.
4. Provide benchmark description for bench mark 908 7072 F.
5. Replace the wheel shaft of valve is broken below waterline.
6. Include bench mark Sturgeon A in level run.

**9087079 Green Bay, WI**  
**PBM:** 908 7078 WIS (PN0090)  
**GPS Bench Mark:** 908 7078 E (PN0840)  
**GPS Observation Frequency:** Every 5 years  
**Dive Inspection Frequency:** Every year

**L28073** **Part 7**  
**PBM Elevation (Dynamic):** 179.6563 m  
**Hydraulic Corrector:** +0.114 m  
**Last GPS Observation Performed:** 07/10  
**Last Dive:** 08/08

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Provide the handheld GPS positions of the gauge house.
4. Include bench mark 908 7078 H in level run to determine if mark is still stable after disc was snapped off deep rod mark.
5. Replace waterlog float.
6. New door needs NOAA sticker.
7. Include bench mark T 227 in level run.

**9087088 Menominee, WI**  
**PBM:** 908 7088 D (DI7587)  
**GPS Bench Mark:** 35 A (DI7590)  
**GPS Observation Frequency:** Every 5 years  
**Dive Inspection Frequency:** Every year

**L28073** **Part 9**  
**PBM Elevation (Dynamic):** 178.0211 m  
**Hydraulic Corrector:** +0.184 m  
**Last GPS Observation Performed:** 07/10  
**Last Dive:** 07/09

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Provide the handheld GPS positions of the gauge house.
4. Verify the angle of the solar panels.
5. Provide a description for benchmark Menominee 2009 in Windesc file.
6. Include bench marks 908 7088 35 B, 908 7088 73 30, 908 7088 73-3297 and 908 7088 93 2 in the level run.
7. Provide station photo looking down into the sump.

**9087096 Port Inland, MI**  
**PBM:** 908 7096 G (AC8317)  
**GPS Bench Mark:** 908 7096 J (DJ5177)  
**GPS Observation Frequency:** Every 5 years  
**Dive Inspection Frequency:** Every year

**L28073** **Part 8**  
**PBM Elevation (Dynamic):** 181.3705 m  
**Hydraulic Corrector:** +0.046 m  
**Last GPS Observation Performed:** 07/10  
**Last Dive:** 08/13

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Include bench mark 908 7096 H RESET 2001 in the level run.
4. Level to the Met SRM as stated in Section 3.0 of the Guidelines for Meteorological Station Reconnaissance and Meteorological Sensor Height Measurements, Updated January 2011.
5. Please provide a second directional photo of bench mark 908 7096 H RESET 2001. Confirm if searched for but not recovered or destroyed. If possible, provide photographic evidence.
6. Provide the handheld GPS positions of the gauge house.

2.15.10 St. Mary's River

**9076024 Rock Cut, MI (PORTS)**

**PBM:** 907 6024 B (DJ5178)

**GPS Bench Mark:** 907 6024 B (DJ5178)

**GPS Observation Frequency:** Every 5 years

**Dive Inspection Frequency:** Every year

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Inspect intake for possible clogging.
4. Repair water level sensor wells.
5. Provide the handheld GPS positions of the gauge house.
6. Include bench mark 907 6024 ENG 1988 in level run.
7. Recover bench mark 907 6024 F 297.
8. Provide face, setting, and two directional photos for bench mark 907 6024 SM 24.  
Provide second directional photo for all benchmarks.

**L28074**

**Part 3**

**PBM Elevation (Dynamic):** 178.0183 m

**Hydraulic Corrector:** 0.000 m

**Last GPS Observation Performed:** 06/10

**Last Dive:** 08/13

**9076027 West Neebish Island, MI (PORTS)**

**PBM:** E 297 (RJ0670)

**GPS Bench Mark:** 907 6027 DOCK (RJ0186)

**GPS Observation Frequency:** Every 5 years

**Dive Inspection Frequency:** Every 2 years

1. Inspect all CORS station components for proper operation and notify NGS of any problems found. Indicate all findings, actions, contact, and other information on the station report.
2. Provide the handheld GPS positions of the gauge house.
3. Provide station photo of zoomed in wind sensors.
4. Provide second directional photo for all benchmarks.

**L28074**

**Part 6**

**PBM Elevation (Dynamic):** 178.7844 m

**Hydraulic Corrector:** 0.000 m

**Last GPS Observation Performed:** Unknown

**Last Dive:** 08/13

**9076033 Little Rapids (NEW), MI (PORTS)**

**PBM:** D 293 (RJ0616)

**GPS Bench Mark:** FERRY DOCK (RJ0617)

**GPS Observation Frequency:** Every 5 years

**Dive Inspection Frequency:** Every year

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Confirm/Provide a bench mark description for TBM 907 6033 Spike.
4. Provide face, setting, and two directional photos for benchmark 907 6033 Little Rapids 2.
5. Provide second directional photo for all benchmarks.

**L28074**

**Part 5**

**PBM Elevation (Dynamic):** 178.3058 m

**Hydraulic Corrector:** 0.000 m

**Last GPS Observation Performed:** 07/10

**Last Dive:** 09/13

**9076060 U.S. Slip, MI (PORTS)**  
**PBM:** C 293 (RJ0613)  
**GPS Bench Mark:** C 293 (RJ0613)  
**GPS Observation Frequency:** Every 5 years  
**Dive Inspection Frequency:** Every 2 years

**L28074** **Part 1**  
**PBM Elevation (Dynamic):** 184.3007 m  
**Hydraulic Corrector:** 0.000 m  
**Last GPS Observation Performed:** 06/10  
**Last Dive:** 01/05

1. Contact Ken Smith, with the COE SOO Area Office @ (906)635-3455 or (906)440-7592 (cell) while in the area. Ken is the local observer of both of the COE, SOO Locks PORTS gauges, U.S. Slip and S.W. Pier. Ensure that all gauges have been operating correctly. Indicate all findings, actions, contact, and other information on the station report.
2. To access the PBM inside Brady Park and on the Indian grounds contact Mr. Cecil Pavlat with the Tribal Council, office @ 906-632-7480 or 906-440-7849 cell.
3. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
4. Check and update the log sizes to reflect Engineering Bulletin 09-003.
5. Include bench mark 907 6060 Warehouse E in level run.
6. Provide second directional photo for all benchmarks.

**9076070 S.W. Pier, MI (PORTS)**  
**PBM:** V 295 (RJ0608)  
**GPS Bench Mark:** UNIT 10 106 (AE8008)  
**GPS Observation Frequency:** Every 5 years  
**Dive Inspection Frequency:** Every 2 years

**L28074** **Part 2**  
**PBM Elevation (Dynamic):** 186.0904 m  
**Hydraulic Corrector:** 0.000 m  
**Last GPS Observation Performed:** 06/10  
**Last Dive:** 06/04

1. **UNRESOLVED FROM 2013 PROJECT INSTRUCTIONS** - Determine inside intake invert elevation, as long as interior subfloor structure is safe to work on.
2. Contact Ken Smith, with the COE SOO Area Office @ (906)635-3455 or (906)440-7592 (cell) while in the area. Ken is our local observer for both of the COE, SOO Locks PORTS' gauges, and stations at U.S. Slip, and S.W. Pier. Ensure that all gauges have been operating correctly. Indicate all findings, actions, contact, and other information on the station report.
3. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
4. Check and update the log sizes to reflect Engineering Bulletin 09-003.
5. Provide second directional photo for all benchmarks.

2.15.11 Lake Superior

**9099004 Point Iroquois, MI (PORTS)**

**PBM:** A 293 (RJ0586)

**GPS Bench Mark:** A 293 (RJ0586)

**GPS Observation Frequency:** Every 5 years

**Dive Inspection Frequency:** Every 2 years

**L28075**

**Part 1**

**PBM Elevation (Dynamic):** 187.7989 m

**Hydraulic Corrector:** -0.100 m

**Last GPS Observation Performed:** 07/10

**Last Dive:** 09/07

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Inspect all CORS station components for proper operation and notify NGS of any problems found. Indicate all findings, actions, contact, and other information on the station report.
4. Include bench mark 909 9004 Iroquois 1 in the level run. Please provide a second directional photo of bench marks for all bench marks.
5. Provide the handheld GPS positions of the gauge house.
6. Station block mortar is deteriorating and needs to be monitored for future repair.

**9099018 Marquette, MI (MASTER)**

**PBM:** NO.11 (RK0113)

**GPS Bench Mark:** 909 9018 K (AH7272)

**GPS Observation Frequency:** Every 5 years

**Dive Inspection Frequency:** Every 2 years

**L28075**

**Part 2**

**PBM Elevation (Dynamic):** 188.9570 m

**Hydraulic Corrector:** 0.000 m

**Last GPS Observation Performed:** 07/10

**Last Dive:** 07/13

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Inspect all CORS station components for proper operation and notify NGS of any problems found. Indicate all findings, actions, contact, and other information on the station report.
4. Provide the handheld GPS positions of the gauge house.
5. Include bench marks 909 9018 K and 909 9018 Tri in the level run.
6. Provide second directional photo for bench mark 909 9018 Lighthouse N.

**9099044 Ontonagon, MI**  
**PBM:** 909 9044 VFW (AE8284)  
**GPS Bench Mark:** 909 9044 L (DJ5175)  
**GPS Observation Frequency:** Every 5 years  
**Dive Inspection Frequency:** Every 2 years

**L28075** **Part 3**  
**PBM Elevation (Dynamic):** 186.0416 m  
**Hydraulic Corrector:** +0.049 m  
**Last GPS Observation Performed:** 07/10  
**Last Dive:** 08/08

1. **UNRESOLVED FROM 2013 PROJECT INSTRUCTIONS** - Provide a face, setting and two directional photos of bench marks 909 9044 2, 909 9044 D 135 Reset and 909 9044 H. NOTE: 904 9044 2 is located on a lighthouse and requires special access with the lighthouse society, set up appointment with tour personnel on day of visit. Confirm if bench mark 909 9044 H is destroyed. If possible, provide photographic evidence.
2. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
3. Check and update the log sizes to reflect Engineering Bulletin 09-003.
4. Include bench marks 909 9044 2 and 909 9044 D 135 Reset in the level run.
5. Provide second directional photo for all benchmarks.

**9099064 Duluth, MN**  
**PBM:** 909 9064 F (AE8288)  
**GPS Bench Mark:** 602 (AE8289)  
**GPS Observation Frequency:** Every 5 years  
**Dive Inspection Frequency:** Every 2 years

**L28075** **Part 4**  
**PBM Elevation (Dynamic):** 184.7100 m  
**Hydraulic Corrector:** +0.079 m  
**Last GPS Observation Performed:** 07/10  
**Last Dive:** 09/07

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Replace the GPS antenna, check the placement, and inspect the cable.
4. Include bench mark 909 9064 60 in the level run.
5. Provide second directional photo for bench mark 909 9064 Tower Base.

**9099090 Grand Marais, MN**  
**PBM:** 909 9090 SCOTT (SH0674)  
**GPS Bench Mark:** MARAIS RESET (AA2869)  
**GPS Observation Frequency:** Every 5 years  
**Dive Inspection Frequency:** Every 2 years

**L28075** **Part 5**  
**PBM Elevation (Dynamic):** 184.9850 m  
**Hydraulic Corrector:** +0.046 m  
**Last GPS Observation Performed:** 07/10  
**Last Dive:** 08/10

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Inspect all CORS station components for proper operation and notify NGS of any problems found. Indicate all findings, actions, contact, and other information on the station report.

## 2.16 FOD/POB – Hawaii, Pacific Islands, West Coast, and 16 Alaska Stations

### 2.16.1 FOD/POB – Hawaii and the Pacific Island Stations

#### **1611400 Nawiliwili, HI**

**PBM:** 161 1400 TIDAL 14

**GPS Bench Mark:** 161 1400 TIDAL 5

**GPS Observation Frequency:** Every 5 years

**Dive Inspection Frequency:** Every 2 years

**L28063**

**Part 1**

**PBM above SD:** 3.155 m

**MSL above SD:** 0.949 m

**Last GPS Observation Performed:** 01/08

**Last Dive:** 02/12

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Replace the storage cards.
4. Re-install GOES antenna and cable at the water level station.
5. Replace/repair standalone Met station.
6. Replace the upper 6-inch well clamp.
7. Replace the DCP3 battery.
8. Replace the water temperature sensor.

#### **1612340 Honolulu, HI**

**PBM:** 161 2340 BM 8 (TU0286)

**GPS Bench Mark:** GSL 2340 1987

**GPS Observation Frequency:** Every 5 years

**Dive Inspection Frequency:** Every 2 years

**L28063**

**Part 2**

**PBM above SD:** 3.734 m

**MSL above SD:** 1.412 m

**Last GPS Observation Performed:** 02/08

**Last Dive:** 01/11

1. **Unresolved from the 2012 Project Instructions.** Replace all four ¾” brass bolts for the well flange.
2. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
3. Check and update the log sizes to reflect Engineering Bulletin 09-003.
4. Replace DCP1, DCP2, and pump batteries.
5. Replace the concrete kick block and aluminum lid for bench mark 161 2340 A.
6. Collect the handheld GPS coordinates for all marks and update the Windesc file .

**1612480 Mokuoloe, HI****PBM:** 161 2480 NO 1**GPS Bench Mark:** 161 2480 TIDAL 2 (AA3575)**GPS Observation Frequency:** Every 5 years**Dive Inspection Frequency:** Every 2 years**L28063****Part 3****PBM above SD:** 1.969 m**MSL above SD:** 1.210 m**Last GPS Observation Performed:** 02/08**Last Dive:** 01/11

1. A dive inspection **MUST** be performed during this site visit; last dive was done in 01/11. A report on the condition of the marine growth on the outside of the well, around the plates, and inside the well is required on the Site report under the Dive comments.
2. **Unresolved from the 2012 Project Instructions.** Install new setup files on DCP3 to include logging to storage card.
3. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
4. Check and update the log sizes to reflect Engineering Bulletin 09-003.
5. Replace the GPS antenna and/or cable at DCP3.
6. Replace DCP1, DCP2, and pump batteries.
7. Replace the water temperature sensor.
8. Replace the 1/4" Nylock nuts (12) which support the mast structure, with non-nylock SS nuts.
9. Replace the air temperature housing.
10. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run. The Met team suggests using a bolt at the base of wind tower.

**1615680 Kahului, HI****PBM:** 161 5680 A (DK4805)**GPS Bench Mark:** 161 5680 A (DK4805)**GPS Observation Frequency:** Every 5 years**Dive Inspection Frequency:** Every year**L28063****Part 4****PBM above SD:** 3.007 m**MSL above SD:** 1.075 m**Last GPS Observation Performed:** 01/08**Last Dive:** 02/12

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Provide photos of the wind sensors and the well without any persons being present in the photos.
4. Replace the DCP3 battery.
5. Replace the DCP2 and pump batteries.
6. Replace the storage cards.

**1617433 Kawaihae, HI****PBM:** 161 7433 B (DK3434)**GPS Bench Mark:** 161 7433 B (DK3434)**GPS Observation Frequency:** Every 5 years**Dive Inspection Frequency:** Every year**L28063****Part 5****PBM above SD:** 3.094 m**MSL above SD:** 1.134 m**Last GPS Observation Performed:** 02/08**Last Dive:** 02/11

1. A dive inspection **MUST** be performed during this site visit; last dive was done in (02/11). A report on the condition of marine growth on the outside of the well, around the plates, and inside the well is required on the Site Report under Dive comments.
2. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
3. Check and update the log sizes to reflect Engineering Bulletin 09-003.
4. Replace storage cards.
5. Replace the water temp sensor.
6. Replace the protective well copper insert.
7. Replace the conduit for the backup bubbler tubing; work with the state of Hawaii for permission to perform this work.
8. Repair the top portion of the met mast.
9. Replace the 10W solar panel pump.

**1617760 Hilo, HI****PBM:** 161 7760 TIDAL 4 (TU0020)**GPS Bench Mark:** 161 7760 A**GPS Observation Frequency:** Every 5 years**Dive Inspection Frequency:** Every 2 years**L28063****Part 6****PBM above SD:** 4.663 m**MSL above SD:** 1.545 m**Last GPS Observation Performed:** 01/08**Last Dive:** 01/09

1. Coordinate the annual inspection with the COASTAL Program Manager and the AAT Lead.
2. Establish the digibub leveling point and measure the elevation difference between the digibub leveling point and the digibub orifice zero.
3. Establish and level a leveling point for the backup orifice.
4. Update the XPERT Operating System.
5. Replace the DCP1 and pump batteries.
6. Replace storage cards.
7. Install 1/2" eyebolts for fall protection anchor near wind mast.
8. Provide updated handheld GPS positions for bench mark 161 7760 TIDAL 4.
9. Provide station photos of the tide house structure, inside of shelter/DCP, primary sensor, met mast, and wind sensor if equipment is present at the station. Be sure no persons are present in the photos.
10. Repair and replace the water temperature sensor.

**1619910 Sand Island, Midway Islands**  
**PBM:** 161 9910 TIDAL 21  
**GPS Bench Mark:** 161 9910 A  
**GPS Observation Frequency:** Every 5 years  
**Dive Inspection Frequency:** Every year

**L28064**

**Part 1**  
**PBM above SD:** 3.243 m  
**MSL above SD:** 1.020 m  
**Last GPS Observation Performed:** 10/09  
**Last Dive:** 11/12

1. Move the redundant station to the smallest pier inside the harbor, contingent on a new agreement.
2. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
3. Check and update the log sizes to reflect Engineering Bulletin 09-003.
4. Install an Iridium modem.
5. Replace T1 and T2 20 m cables with water tight connectors on one end (include mating connector separately.)
6. Replace padlock.
7. Replace Xpert (DCP 1 and 3) and Xpert Dark (DCP 2 and 4) batteries.
8. Replace the Xpert Dark (DCP 2) pump battery.
9. Include bench marks 1619910 C and 1619910 TIDAL 2 in the level run; these marks indicate possible movement.
10. Coordinate with the COASTAL Program Manager to determine whether any support is needed for a CORS installation.

**1630000 Guam**  
**PBM:** 163 0000 TIDAL 6 (TW0043)  
**GPS Bench Mark:** 163 0000 TIDAL 6 (TW0043)  
**GPS Observation Frequency:** Every 5 years  
**Dive Inspection Frequency:** Every year

**L28064**

**Part 2**  
**PBM above SD:** 2.364 m  
**MSL above SD:** 0.826 m  
**Last GPS Observation Performed:** 03/10  
**Last Dive:** 03/13

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Replace the battery in DCP3.
4. Replace the storage cards.

**1631428 Pago Bay, Guam****PBM:** 163 1428 B (DH3105)**GPS Bench Mark:** 163 1428 1214 (DH2988)**GPS Observation Frequency:** Every 5 years**Dive Inspection Frequency:** Every year

Note: Station upgrades are being funded by NWS.

**L28064****Part 3****PBM above SD:** 10.000 m**MSL above SD:** 7.740 m**Last GPS Observation Performed:** 04/10**Last Dive:** 09/11

1. Update the COASTAL Program Manager on the status of the installation.
2. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
3. Check and update the log sizes to reflect Engineering Bulletin 09-003.
4. Install DCP 1 and DCP2 orifices on the reef (NWS funding) and establish and level the orifice leveling points.
5. Replace battery for DCP 2.
6. Clean, repaint, and replace reef orifice baffle.
7. Replace hose clamps on reef orifice baffle.
8. Establish and level a second reef orifice.
9. Replace the battery in DCP3.
10. Replace the storage cards.

**1770000 Pago Pago****PBM:** 177 0000 W**GPS Bench Mark:** 177 0000 S (DE8786)**GPS Observation Frequency:** Every 5 years**Dive Inspection Frequency:** Every year**L28064****Part 4****PBM above SD:** 4.345 m**MSL above SD:** 1.194 m**Last GPS Observation Performed:** 12/09**Last Dive:** 11/12

1. Establish the digibub leveling points for DCP 1, 2, 3, and 4 and measure the elevation difference between the digibub leveling point and digibub orifice zero.
2. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
3. Check and update the log sizes to reflect Engineering Bulletin 09-003.
4. Replace all DCP1 components.
5. Relocate DCP1 GOES antenna and install a new cable.
6. Re-secure cable conduit using sheetrock anchors.
7. Replace DCP1 battery.
8. Install an air temperature sensor on DCP3.
9. Remove the wind sensor on DCP2 and re-install the wind sensor on DCP3.
10. Replace the storage cards.

**1820000 Kwajalein****PBM:** 182 0000 TIDAL 8 (DK7537)**GPS Bench Mark:** 182 0000 TIDAL 12**GPS Observation Frequency:** Every 5 years**Dive Inspection Frequency:** Every year**L28064****Part 5****PBM above SD:** 2.853 m**MSL above SD:** 1.457 m**Last GPS Observation Performed:** 03/10**Last Dive:** 10/10

1. A dive inspection **MUST** be performed during this site visit; last dive was done in (10/10). A report on the condition of marine growth on the outside of the well, around the plates and orifice, and inside the well is required on the Site Report under Dive comments.
2. Verify the elevation difference between the digibub leveling point and the digibub orifice zero on an annual basis.
3. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
4. Check and update the log sizes to reflect Engineering Bulletin 09-003.
5. Replace the Aquatrak sensor, top hat fan, and the 30-ft cable.
6. Attach 10 small stainless steel conduit clamps on wind bird flex conduit (3/4" or 1").
7. Attach 4 stainless steel conduit clamps on the Aquatrak conduit (1 1/2").
8. Patch bench marks with Quik-Crete, as needed.
9. Remove old clamps and old ADR well supports around tide house (tripping hazard).
10. Replace DCP1, DCP2, DCP3, and DCP4 batteries.
11. Replace the storage cards.

**1890000 Wake Island****PBM:** 189 0000 TIDAL 12 (TW0169)**GPS Bench Mark:** 161 0000 L**GPS Observation Frequency:** Every 5 years**Dive Inspection Frequency:** Every year**L28064****Part 6****PBM above SD:** 4.353 m**MSL above SD:** 1.608 m**Last GPS Observation Performed:** 11/06**Last Dive:** 11/10

1. A dive inspection **MUST** be performed during this site visit; last dive was done in (11/10). A report on the condition of marine growth on the outside of the well, around the plates and orifice, and inside the well is required on the Site Report under Dive comments.
2. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
3. Check and update the log sizes to reflect Engineering Bulletin 09-003.
4. Coordinate with the COASTAL Program Manager to determine whether any support is needed for a CORS recon.
5. Replace the water temperature sensor.
6. Replace protective well copper insert in Aquatrak well.
7. Replace batteries for DCP 4, and the pump batteries for DCPs 2 and 4.
8. Replace the storage cards.

## 2.16.2 FOD/POB – California Stations

### 9410170 San Diego, CA

L28059

Part 1

**PBM:** 941 0170 TIDAL 12 (DC0891)

**PBM above SD:** 6.325 m

**GPS Bench Mark:** 941 0170 W

**MSL above SD:** 2.052 m

**GPS Observation Frequency:** Every 5 years

**Last GPS Observation Performed:** 03/11

**Dive Inspection Frequency:** Every 2 years

**Last Dive:** 04/13

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Contact USS Midway and the City of San Diego for updates regarding plans to relocate the tide station and determine if an updated recon will be required.
4. Inspect bottom well bracket whenever diving is performed.
5. Replace the Digital I/O module in DCP1 to be v2.04 or higher.
6. Replace the wind bird wire.
7. Install additional surface marks near new station site when tide station is moved.

### 9410172 USS MIDWAY South Navy Pier, San Diego, CA

Met Only Station

1. **Unresolved from 2012 PI:** Measure/verify the elevations of the wind and air temperature sensors above the Met SRM (suggest using the deck).
2. **Unresolved from 2012 PI:** Measure the Met SRM height above water and document this elevation along with the date/time in the comments section of the site report.
3. Upgrade the DCP Operating System.
4. Replace batteries for 9210 DCP and IP modem.

### 9410230 La Jolla, CA

L28059

Part 2

**PBM:** 941 0230 TIDAL 7 (DC0986)

**PBM above SD:** 12.299 m

**GPS Bench Mark:** 941 0230 M TIDAL (DC1313)

**MSL above SD:** 2.163 m

**GPS Observation Frequency:** Every 5 years

**Last GPS Observation Performed:** 03/11

**Dive Inspection Frequency:** Every year

**Last Dive:** 04/13

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Replace the batteries in DCP1 and DCP2.
4. Replace the water temp sensor.
5. Level to Met SRM.
6. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.
7. Recover or establish and level one deep rod mark, designation/stamping as follows: 941 0230 U/0230 U 2014.
8. Take the face, setting, and location photos of newly established bench marks.

**9410660 Los Angeles, CA (PORTS)****L28059****Part 3****PBM:** 941 0660 TIDAL 8 (DY1083)**PBM above SD:** 5.361 m**GPS Bench Mark:** 941 0660 TIDAL 8 (DY1083)**MSL above SD:** 2.028 m**GPS Observation Frequency:** Every 5 years**Last GPS Observation Performed:** 03/11**Dive Inspection Frequency:** Every year**Last Dive:** 04/13

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Monitor condition of underwater Uni-Strut brackets holding bubbler tubing conduit annually.
4. Verify old PORTS - DAS radio is not being used and remove from tide house.
5. Change lithium battery in Xpert Dark module.
6. Replace the batteries in DCP1, DCP2, and the pump.

**9410689 Gerald Desmond Bridge Air Gap, CA (PORTS)****Air Gap Only Station**

1. **NOTE:** Coordinate with ED Great Lakes Expert for trig levels support if levels are required.
2. Investigate upgrade to Air Gap sensor with a laser.

**9410840 Santa Monica, CA****L28059****Part 4****PBM:** 941 0840 TIDAL 12 (EW6840)**PBM above SD:** 15.060 m**GPS Bench Mark:** 941 0840 N TIDAL (AH7469)**MSL above SD:** 1.594 m**GPS Observation Frequency:** Every 5 years**Last GPS Observation Performed:** 03/11**Dive Inspection Frequency:** Every year**Last Dive:** 04/13

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Replace the Digital I/O modules in both DCP1 and DCP2 to be v2.04 or higher.
4. Replace second from bottom piling clamps (20" concrete piling). Plan one day of diving for marine growth removal prior to installation.

**9411340 Santa Barbara, CA****L28059****Part 16****PBM:** 941 1340 S**PBM above SD:** 4.141 m**GPS Bench Mark:** 941 1340 SB2 RESET**MSL above SD:** 1.824 m**GPS Observation Frequency:** Every 5 years**Last GPS Observation Performed:** 03/11**Dive Inspection Frequency:** Every year**Last Dive:** 03/11

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Investigate DCP 1 power issues. Station continues to blow one amp fuse.
4. Replace the 5W solar panels with a standard 40W solar panel.
5. Replace the batteries in DCP1 and DCP2.
6. Measure the elevation of the water temperature sensor above station datum.

**9411406 Oil Platform Harvest, CA (TOPEX)****L28059****Part 19****PBM:** 941 1406 NO STAMPING (+20 LEG 1992)**PBM above SD:** 20.150 m**GPS Bench Mark:** N/A**MSL above SD:** 14.467 m**GPS Observation Frequency:** Not required**Last GPS Observation Performed:** N/A**Dive Inspection Frequency:** Every year**Last Dive:** 10/12

1. **NOTE: Use of optical levels at this station is authorized.** There is a permanent GPS unit on site maintained by JPL and connected by leveling to the water level sensor.
2. **NOTE: Dive inspection by CO-OPS is not permitted.** Diving is performed by TOPEX contractors and is paid for by JPL.
3. Replace DCP1 and DCP2.
4. Replace the DCP2 battery.
5. Install dual pump power box.
6. Check the GOES antenna for corrosion.
7. Plumb new orifice.
8. Bring hex key set for NOAA tool kit in shelter.
9. Bring Leica survey rod and a rod level for +20 deck surveys
10. Bring mount kit for spare Stevens GOES antenna.
11. Research a location to install a cell antenna.
12. Install two IP modems and Yagi antennas.

**9412110 Port San Luis, CA****PBM:** 941 2110 TIDAL 6 (FV0898)**GPS Bench Mark:** 941 2110 TIDAL 6 (FV0898)**GPS Observation Frequency:** Every 5 years**Dive Inspection Frequency:** Every year**L28059****Part 5****PBM above SD:** 5.691 m**MSL above SD:** 2.149 m**Last GPS Observation Performed:** 02/11**Last Dive:** 03/11

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Replace the Digital I/O modules in both DCP1 and DCP2 to be v2.04 or higher.
4. Replace the batteries in DCP1 and DCP2.

**9413450 Monterey, CA****PBM:** 941 3450 TIDAL 2 (GU2090)**GPS Bench Mark:** 941 3450 M TIDAL (GU4116)**GPS Observation Frequency:** Every 5 years**Dive Inspection Frequency:** Every year**L28059****Part 6****PBM above SD:** 5.669 m**MSL above SD:** 1.893 m**Last GPS Observation Performed:** 02/11**Last Dive:** 12/11

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Update the DCP3 Satlink2 firmware version to be v6.40.
4. Replace the water temp sensor.
5. Pivot met tower to lower through the gate.
6. Replace the battery in DCP2.

**9414290 San Francisco, CA (PORTS)****PBM:** 941 4290 TIDAL 180 (HT0702)**GPS Bench Mark:** 941 4290 TIDAL 180 (HT0702)**GPS Observation Frequency:** Every 5 years**Dive Inspection Frequency:** Every year**L28059****Part 7****PBM above SD:** 5.794 m**MSL above SD:** 2.773 m**Last GPS Observation Performed:** 08/10**Last Dive:** 10/12

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Replace the Digital I/O module in DCP1 to be v2.04 or higher.
4. Replace the wind bird wire.
5. Bring replacement Swagelok fitting for backup orifice in case of extreme corrosion.
6. Recon for appropriate site for one new bench mark set in bedrock or on a deep rod, preferably to the SE of the tide station.

**9414523 Redwood City, CA (PORTS)**  
**PBM:** 941 4523 TIDAL 13 (HT2319)  
**GPS Bench Mark:** 941 4508 C  
**GPS Observation Frequency:** Every 5 years  
**Dive Inspection Frequency:** Every year

**L28059**

**Part 8**

**PBM above SD:** 5.993 m  
**MSL above SD:** 3.378 m

**Last GPS Observation Performed:** 10/09  
**Last Dive:** 10/12

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Replace XPERT Dark DCP with an A/C power compatible unit. Replace T1 and T2 sensors (black side on sounding tube only) due to deteriorating insulation on wires.
4. Replace the Digital I/O module in DCP1 to be v2.04 or higher.
5. Replace the batteries in DCP1 and DCP2.
6. Install new pump power box.

**9414575 Coyote Creek, CA (COASTAL)**  
**PBM:** 941 4575 TIDAL 1  
**GPS Bench Mark:** Undetermined  
**GPS Observation Frequency:** Every 5 years  
**Dive Inspection Frequency:** Every year

**L28059**

**Part 20**

**PBM above SD:** 5.405 m  
**MSL above SD:** 1.388 m

**Last GPS Observation Performed:** N/A  
**Last Dive:** N/A

1. Install an approved MWWL sensor; if any structural modifications are required seek engineering support and Field Engineering Review Subcommittee (FERS) approval.

**9414750 Alameda, CA (PORTS)**  
**PBM:** 941 4750 TIDAL 8 (HT0890)  
**GPS Bench Mark:** 941 4750 TIDAL 7 (HT0882)  
**GPS Observation Frequency:** Every 5 years  
**Dive Inspection Frequency:** Every year

**L28059**

**Part 9**

**PBM above SD:** 4.795 m  
**MSL above SD:** 2.067 m

**Last GPS Observation Performed:** 08/10  
**Last Dive:** 10/12

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Monitor MHHW clamp, fiberglass coated timbers, steel piling attachments, and bubbler conduit clamps annually and evaluate for future replacement with plastic timbers.
4. Replace XPERT Dark DCP with an A/C power compatible unit.
5. Bring replacement Swagelok fitting for backup orifice in case of extreme corrosion.
6. Replace the battery in DCP1.
7. Replace the Water Temp sensor.
8. Install a new pump power box.
9. Install a new solar panel for pump power box.

**9414863 Richmond, CA (PORTS)****L28059****Part 10****PBM:** TIDAL 3 STA III 23 (HT0940)**PBM above SD:** 6.376 m**GPS Bench Mark:** 941 4863 M**MSL above SD:** 4.520 m**GPS Observation Frequency:** Every 5 years**Last GPS Observation Performed:** 10/09**Dive Inspection Frequency:** Every year**Last Dive:** 10/12

1. **Unresolved from 2011 PI:** Take one directional photo of 941 4863 E.
2. **Unresolved from 2012 PI:** Install a new bench mark with designation/stamping: 941 4863 P/4863 P 2014 to replace the destroyed bench mark TIDAL 1 STA III 23.
3. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
4. Check and update the log sizes to reflect Engineering Bulletin 09-003.
5. Replace Xpert Dark DCP with an A/C power compatible unit.
6. Bring replacement Swagelok fitting for backup orifice in case of extreme corrosion.
7. Replace the DCP1 Digital I/O module to be v2.04 or higher.
8. Replace the GOES antenna and cable.
9. Replace battery in Xpert and the pump power box.

**9414958 Bolinas Lagoon, CA (COASTAL)****L28059****Part 17****PBM:** 941 4958 F**PBM above SD:** 4.823 m**GPS Bench Mark:** 941 4958 F**MSL above SD:** 1.437 m**GPS Observation Frequency:** Every 5 years**Last GPS Observation Performed:** 06/09**Dive Inspection Frequency:** Every year**Last Dive:** 08/11

Note: FY14 operation and maintenance funded.is funded.

1. Coordinate the annual inspection with the COASTAL project manager - Artara Johnson, and the COASTAL Program Manager. Notify James Raives, Marin County Open Space District, prior to any site visit.
2. Update the XPERT Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
3. Check and update the log sizes to reflect Engineering Bulletin 09-003.
4. Replace the DCP and pump batteries.

**9415020 Point Reyes, CA****PBM:** B 243 (HT1839)**GPS Bench Mark:** 941 5020 Q TIDAL (HT3505)**GPS Observation Frequency:** Every 5 years**Dive Inspection Frequency:** Every year**L28059****Part 11****PBM above SD:** 4.977 m**MSL above SD:** 2.152 m**Last GPS Observation Performed:** 10/10**Last Dive:** 12/11

1. **Unresolved from 2011 PI:** Remove the derelict ADR and ETG wells.
2. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
3. Check and update the log sizes to reflect Engineering Bulletin 09-003.
4. Relocate all the station electronics into the APX enclosures. Seek engineering support and FERS approval as needed.
5. Install protective junction box for T1/T2/WT sensor terminal; strip or pull all new grey side cables that are continuous from the DCP to the well.
6. Replace the batteries in DCP1, DCP2, and the pump.
7. Level to the Met SRM.
8. Install new GPS antenna, cable & bracket outside tide house.
9. Remove and return existing puck antennas to inventory.
10. Install new witness post and replace PVC casing for bench mark A 243.

**9415102 Martinez Amorco Pier, CA (PORTS)****PBM:** 941 5102 D**GPS Bench Mark:** 941 5102 D**GPS Observation Frequency:** Every 5 years**Dive Inspection Frequency:** Unknown**L28059****Part 16****PBM above SD:** 20.000 m**MSL above SD:** Unknown**Last GPS Observation Performed:** 5/12**Last Dive:** No Dive to Date

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Measure and provide the depths of the three rod marks (941 5102 D, 941 5102 E and 941 5102 F) below the surface of the ground and update the rod mark descriptions.
4. Bring a stylus for the Xpert.

**9415144 Port Chicago, CA (PORTS)****L28059****Part 12****PBM:** 941 5144 H (AH7472)**PBM above SD:** 4.209 m**GPS Bench Mark:** 941 5144 H TIDAL (AH7472)**MSL above SD:** 1.996 m**GPS Observation Frequency:** Every 5 years**Last GPS Observation Performed:** 08/10**Dive Inspection Frequency:** Every year**Last Dive:** 10/11

1. Replace existing primary sensor with the approved MWWL sensor and if any structural modifications, seek Field Engineering Review Subcommittee (FERS) approval.
2. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
3. Check and update the log sizes to reflect Engineering Bulletin 09-003.
4. Replace and/or remove the orifice if needed.
5. Replace the battery in DCP1.
6. Replace the Water Temp sensor.
7. Update the handheld GPS coordinates of 941 5144 P RESET in the Windesc file.

**9416841 Arena Cove, CA****L28059****Part 13****PBM:** 941 6841 TIDAL 6 (JT9392)**PBM above SD:** 11.604 m**GPS Bench Mark:** 941 6841 J TIDAL (JT9387)**MSL above SD:** 9.786 m**GPS Observation Frequency:** Every 5 years**Last GPS Observation Performed:** 12/11**Dive Inspection Frequency:** Every year**Last Dive:** 05/13

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Replace the battery in DCP1.
4. Replace the DCP1 Digital I/O module to be v2.04 or higher.
5. Repair phone line from demarcation to the tide house.
6. Replace the light bulbs for the tide house.
7. Level to the Met SRM.

**9418767 North Spit, CA (PORTS)****L28059****Part 14****PBM:** 941 8767 TIDAL 9 (LV0361)**PBM above SD:** 9.205 m**GPS Bench Mark:** 941 8767 B TIDAL (LV0632)**MSL above SD:** 5.562 m**GPS Observation Frequency:** Every 5 years**Last GPS Observation Performed:** 05/11**Dive Inspection Frequency:** Every year**Last Dive:** 12/11

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Replace the battery in DCP1.
4. Provide a photo of the Met SRM.
5. **Unresolved from 2013 Project Instructions:** Change kick blocks for two of the deep rod marks to accommodate the invar rods.
6. Take new face and setting photographs of the marks with new kick blocks.
7. Level to the barometer to verify its height above station datum.

**9419750 Crescent City, CA**

**L28059**

**Part 15**

**PBM:** 941 9750 TIDAL 20 RESET (LV0110)

**PBM above SD:** 5.227 m

**GPS Bench Mark:** 941 9750 TIDAL 20 RESET (LV0110)

**MSL above SD:** 2.254 m

**GPS Observation Frequency:** Every 5 years

**Last GPS Observation Performed:** 04/11

**Dive Inspection Frequency:** Every 2 years

**Last Dive:** 12/11

1. **Unresolved from 2013 Project Instructions:** Establish a level connection between the station bench mark network and the newly established CORS station (within 1km).
2. **Unresolved from 2013 Project Instructions:** Replace the kick block for bench mark 941 9750 S TIDAL with 6" PVC and logo cap lid before leveling. (Note: Contact USA North two to fourteen days in advance of the annual inspection to ensure that utilities in the vicinity of any digging are properly marked. <http://www.usanorth.org/>)
3. **Unresolved from 2013 Project Instructions:** Install a new logo cap lid for bench mark 941 9750 V TIDAL.
4. **Unresolved from 2013 Project Instructions:** Replace missing parallel plates on Aquatrak well.
5. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
6. Check and update the log sizes to reflect Engineering Bulletin 09-003.
7. Replace missing parallel plates on Aquatrak well.
8. Replace the DCP1 Digital I/O module to be v2.04 or higher.
9. Replace the batteries in DCP1 and the pump.

### 2.16.3 FOD/POB – Oregon Stations

#### **9431647 Port Orford, OR**

**L28060**

**Part 1**

**PBM:** 941 1647 TIDAL 6 (OA0075)

**PBM above SD:** 12.256 m

**GPS Bench Mark:** 943 1647 TIDAL LEAD (OA0790)

**MSL above SD:** 8.224 m

**GPS Observation Frequency:** Every 5 years

**Last GPS Observation Performed:** 04/11

**Dive Inspection Frequency:** Every year

**Last Dive:** 10/12

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Inspect B1 orifice for corrosion and replace if necessary.
4. Replace the DCP1 Digital I/O module to be v2.04 or higher.

#### **9432780 Charleston, OR**

**L28060**

**Part 2**

**PBM:** 943 2780 A TIDAL (OA0650)

**PBM above SD:** 5.895 m

**GPS Bench Mark:** 943 2780 A TIDAL (OA0650)

**MSL above SD:** 2.390 m

**GPS Observation Frequency:** Every 5 years

**Last GPS Observation Performed:** 04/11

**Dive Inspection Frequency:** Every year

**Last Dive:** 03/12

1. **Unresolved from 2012 PI:** Take setting photo of bench mark 941 2780 TIDAL 10 and submit to COET.
2. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
3. Check and update the log sizes to reflect Engineering Bulletin 09-003.
4. Replace the water temperature sensor.
5. Move air temperature sensor to the met station.
6. Install new setups on DCP3 to accommodate the Air Temp.
7. Provide photographs and description of the met SRM, wind and air temperature sensors.
8. Level to the Met SRM.

**9435380 South Beach, OR****PBM:** C 590 (QE1114)**GPS Bench Mark:** 943 5380 D TIDAL (QE1615)**GPS Observation Frequency:** Every year**Dive Inspection Frequency:** Every year**L28060****Part 3****PBM above SD:** 6.194 m**MSL above SD:** 2.806 m**Last GPS Observation Performed:** 07/11**Last Dive:** 03/12

1. **Unresolved from 2011 PI:** Evaluate the second clamp below the pier deck and the bottom clamp for future replacement.
2. If the CORS has been established by the date of the annual inspection, establish a level connection to the CORS.
3. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
4. Check and update the log sizes to reflect Engineering Bulletin 09-003.
5. Replace the batteries in DCP1 and DCP2.
6. Perform reconnaissance for at least three new bench mark locations (both surface and deep rod) to established south of bench mark 943 5380 L.
7. Include bench mark 943 5380 L in all future leveling runs until stability concerns have been resolved.
8. Change GPS bench mark to either of the following bench marks: 943 5380 C, 943 5380 G, 943 5380 L or 943 5380 Y2.

**9437540 Garibaldi, OR****PBM:** 943 7540 A**GPS Bench Mark:** 943 7540 H**GPS Observation Frequency:** Every 5 years**Dive Inspection Frequency:** Every year**L28060****Part 5****PBM above SD:** 5.827 m**MSL above SD:** 2.577 m**Last GPS Observation Performed:** 07/11**Last Dive:** 03/12

1. **Unresolved from 2011 PI:** Take setting photos of bench marks 943 7540 TIDAL B and 943 7540 D.
2. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
3. Check and update the log sizes to reflect Engineering Bulletin 09-003.
4. Remove old GPS antenna from Met station (exterior wall) if GPS sync remains consistent during the year.
5. Remove old radio antenna from USCG boathouse during remodel.
6. Install IP modem and antenna at existing radio antenna location prior to catwalk removal.
7. Install new setup files on DCP3 to accommodate the Air Temp.
8. Replace the batteries in DCP2 and DCP2 pump, DCP3, DCP3 IP modem, and other DCP3 battery.
9. Determine the elevation of Met SRM for winds above water level and note the date/time of the observation in the site report.
10. Relocate air temperature sensor to Met station and measure new elevation above the Met SRM.
11. Take setting photos of bench marks 943 7540 B and 943 7540 D.

**9439011 Hammond, OR (PORTS)** **L28060** **Part 8**  
*PBM: 943 9011 A TIDAL (AC5405)* *PBM above SD: 6.190 m*  
*GPS Bench Mark: 943 9011 A TIDAL (AC5405)* *MSL above SD: 2.135 m*  
*GPS Observation Frequency: Every 5 years* *Last GPS Observation Performed: 08/11*  
*Dive Inspection Frequency: Every year* *Last Dive: 09/13*

1. Replace existing primary sensor with the approved MWWL sensor and if any structural modifications, seek Field Engineering Review Subcommittee (FERS) approval.
2. Install new setup files on DCP1 to accommodate the MWWL sensor.

**9439040 Astoria, OR (PORTS)** **L28060** **Part 4**  
*PBM: 943 9040 TIDAL 11 (SC1053)* *PBM above SD: 5.934 m*  
*GPS Bench Mark: 943 9040 TIDAL 12 (SC1055)* *MSL above SD: 2.054 m*  
*GPS Observation Frequency: Every 5 years* *Last GPS Observation Performed: 07/11*  
*Dive Inspection Frequency: Every 2 years* *Last Dive: 06/11*

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Replace the Digital I/O module in both DCP1 and DCP2 to be v2.04 or higher.
4. Replace the water temp sensor.
5. Replace the battery in the pump.
6. Establish and level one deep rod mark: designation/stamping 943 9040 D/9040 D 2014.

**9439099 Wauna, OR (PORTS)** **L28060** **Part 6**  
*PBM: 943 9909 H* *PBM above CRD: 4.481 m*  
*GPS Bench Mark: 943 9099 A TIDAL (SC1086)* *MSL above SD: 1.332 m*  
*GPS Observation Frequency: Every 5 years* *Last GPS Observation Performed: 08/09*  
*Dive Inspection Frequency: Every year* *Last Dive: 08/12*

1. Update the XPERT Operating System.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Replace DCP2 with a new unit with AC power supply.
4. Reconfigure DCP2 pump to pull power from XPERT Dark battery.
5. Replace the batteries in DCP1 and DCP2.

**9439201 St. Helens, OR (PORTS)**

**L28060**

**Part 7**

***PBM:*** 943 9201 A

***PBM above CRD:*** 20.534 m

***GPS Bench Mark:*** 943 9201 OSMB 0502

***MSL above SD:*** 1.047 m

***GPS Observation Frequency:*** Every 5 years

***Last GPS Observation Performed:*** 08/09

***Dive Inspection Frequency:*** Every year

***Last Dive:*** 08/12

1. Update the XPERT Operating System.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Replace DCP2 with a new unit with AC power supply.
4. Reconfigure DCP2 pump to pull power from XPERT Dark battery.
5. Replace the batteries in DCP1, DCP2, pump 1, and pump 2.
6. Swap both primary and backup storage cards to fix both DCP log sizes.

#### 2.16.4 FOD/POB – Washington Stations

##### **9440083 Vancouver, WA (PORTS)**

**PBM:** 944 0083 D

**GPS Bench Mark:** 944 0083 F

**GPS Observation Frequency:** Every 5 years

**Dive Inspection Frequency:** Every year

**L28061**

**Part 11**

**PBM above CRD:** 9.470 m

**MSL above SD:** 0.940 m

**Last GPS Observation Performed:** 08/09

**Last Dive:** 08/12

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Replace tide house heater.
4. Replace DCP1 and pump solar panels.
5. Replace the battery in DCP1.
6. Update the handheld GPS handheld GPS positions of bench mark 944 0083 A in the Windesc file.

##### **9440422 Longview, WA (PORTS)**

**PBM:** 944 0422 E

**GPS Bench Mark:** 944 0422 TIDAL 5 (SC1112)

**GPS Observation Frequency:** Every 5 years

**Dive Inspection Frequency:** Every year

**L28061**

**Part 12**

**PBM above CRD:** 8.949 m

**MSL above SD:** 1.385 m

**Last GPS Observation Performed:** 08/09

**Last Dive:** 08/12

1. **Unresolved from 2012 PI:** Contact Norm Krehbiel regarding availability of funds for future relocation of tide house; seek engineering support and Field Engineering Review Subcommittee (FERS) approval of the design of the upgrades to the station. Port of Longview Engineers - 360.425.3305
2. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
3. Check and update the log sizes to reflect Engineering Bulletin 09-003.
4. Replace the DCP1 Paros sensor.
5. Replace the DCP2 solar panel.

**9440569 Skamokawa, WA (PORTS)**  
**PBM:** N 317 (SC0338)  
**GPS Bench Mark:** 944 0569 C  
**GPS Observation Frequency:** Every 5 years  
**Dive Inspection Frequency:** Every year

**L28061**

**Part 13**  
**PBM above CRD:** 7.232 m  
**MSL above SD:** 1.269 m  
**Last GPS Observation Performed:** 09/10  
**Last Dive:** 08/12

1. **Unresolved from 2009 PI:** Raise the tide house three feet with plastic timbers, placing the tide house above the waterline; contingent upon Port of Portland funding; seek Field Engineering Review Subcommittee (FERS) approval.
2. Update the XPERT Operating System.
3. Check and update the log sizes to reflect Engineering Bulletin 09-003.
4. Replace DCP2 with new unit with AC power supply.
5. Replace GOES antenna and cable.
6. Replace tide house heater.
7. Separate solar panels to eliminate shading.

**9440910 Toke Point, WA**  
**PBM:** 944 0910 P  
**GPS Bench Mark:** FLAG (SC0916)  
**GPS Observation Frequency:** Every 5 years  
**Dive Inspection Frequency:** Every year

**L28061**

**Part 1**  
**PBM above SD:** 5.408 m  
**MSL above SD:** 2.836 m  
**Last GPS Observation Performed:** 03/11  
**Last Dive:** 04/12

1. **Unresolved from 2012 PI:** Add a 5-inch PVC and lid with concrete kick block for bench mark 944 0910 K.
2. **Unresolved from 2012 PI:** Verify the barometer serial #.
3. Replace existing primary sensor with the approved MWWL sensor and if any structural modifications, seek Field Engineering Review Subcommittee (FERS) approval.
4. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
5. Check and update the log sizes to reflect Engineering Bulletin 09-003.
6. Install new leveling point for the backup orifice.
7. Recover or establish and level one surface mark, designation/stamping as follows: 944 0910 T/0910 T 2014.
8. Verify bench Mark 944 0910 R was dropped from the network in 2012.
9. Measure the elevations of the wind & air temp sensors above Met SRM.
10. Provide a description & photo of Met SRM and perform tape down measurement to water level. Include the date/time of this measurement in the site report.
11. Level to the Met SRM.

**9441102 Westport, WA****L28061****Part 2****PBM:** 944 1102 K**PBM above SD:** 5.604 m**GPS Bench Mark:** 944 1102 K**MSL above SD:** 2.386 m**GPS Observation Frequency:** Every 5 years**Last GPS Observation Performed:** 06/11**Dive Inspection Frequency:** Every year**Last Dive:** 07/13

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Replace the batteries in DCP1, DCP2 and the pump.
4. Replace the GPS Antenna and/or cable.

**9442396 La Push, WA****L28061****Part 3****PBM:** 944 2396 TIDAL 7 (SD0158)**PBM above SD:** 10.400 m**GPS Bench Mark:** 944 2396 G**MSL above SD:** 2.979 m**GPS Observation Frequency:** Every 5 years**Last GPS Observation Performed:** 06/11**Dive Inspection Frequency:** Every year**Last Dive:** 07/13

1. Install an approved MWWL sensor; if any structural modifications are required seek engineering support and Field Engineering Review Subcommittee (FERS) approval.
2. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
3. Check and update the log sizes to reflect Engineering Bulletin 09-003.
4. Install new setup files on DCP3 to accommodate the Air Temp sensor.
5. Relocate air temperature sensor to the mast at the met station.
6. Replace the batteries in DCP3 and IP modem.
7. Replace the lid cover of bench mark 944 2396 F.

**9443090 Neah Bay, WA****L28061****Part 4****PBM:** 944 3090 TIDAL 19 (TS0161)**PBM above SD:** 6.507 m**GPS Bench Mark:** 944 3090 TIDAL 19 (TS0161)**MSL above SD:** 1.925 m**GPS Observation Frequency:** Every 5 years**Last GPS Observation Performed:** 06/11**Dive Inspection Frequency:** Every year**Last Dive:** 05/12

1. Install an approved MWWL sensor; if any structural modifications are required seek engineering support and Field Engineering Review Subcommittee (FERS) approval.
2. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
3. Check and update the log sizes to reflect Engineering Bulletin 09-003.
4. Replace existing 50' coaxial GOES cable for DCP 3 with 75' coaxial cable.
5. Replace the Digital I/O module in DCP1 to be v2.04 or higher.
6. Replace the water temp sensor.
7. Replace the batteries in DCP1, DCP2, and the pump.

**9444090 Port Angeles, WA****L28061****Part 5****PBM:** L 467 (TR0790)**PBM above SD:** 14.475 m**GPS Bench Mark:** L 467 (TR0790)**MSL above SD:** 10.534 m**GPS Observation Frequency:** Every 5 years**Last GPS Observation Performed:** 08/11**Dive Inspection Frequency:** Every 2 years**Last Dive:** 06/12

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Replace the batteries in DCP1, DCP2, and the pump.
4. Replace the concrete kick blocks on bench marks 944 4090 A and 944 4090 C.
5. Replace the lid on bench mark 944 4090 B.

**9444900 Port Townsend, WA****L28061****Part 6****PBM:** 944 4900 C TIDAL**PBM above SD:** 5.004 m**GPS Bench Mark:** 944 4900 D TIDAL (AI2202)**MSL above SD:** 2.547 m**GPS Observation Frequency:** Every 5 years**Last GPS Observation Performed:** 08/11**Dive Inspection Frequency:** Every 2 years**Last Dive:** 06/12

1. Level to both the Aquatrak and MWWL sensors in support of ongoing sensor comparison study.
2. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
3. Check and update the log sizes to reflect Engineering Bulletin 09-003.
4. Replace the water temperature sensor.
5. Verify the phone line was restored by WSF construction crew.
6. Replace the concrete kick blocks on bench marks 944 4900 A TIDAL and 944 4900 C.
7. Provide updated handheld GPS coordinates for bench marks 944 4900 NO 9 and 944 4900 NO 10.
8. Replace the batteries in DCP1 and DCP2.

**9446484 Tacoma, WA (PORTS)****L28061****Part 7****PBM:** 944 6484 A**PBM above SD:** 5.326 m**GPS Bench Mark:** 944 6484 B**MSL above SD:** 2.269 m**GPS Observation Frequency:** Every 5 years**Last GPS Observation Performed:** 04/10**Dive Inspection Frequency:** N/A**Last Dive:** 04/10

1. Install an approved MWWL sensor; if any structural modifications are required seek engineering support and Field Engineering Review Subcommittee (FERS) approval.
2. Repair and/or replace the Druck sensor.

**9446482 Tacoma Met, WA (PORTS)****Met Only Station**

1. No additional requirements

**9447130 Seattle, WA** **L28061** **Part 8**  
*PBM: 944 7130 TIDAL 23* *PBM above SD: 8.851 m*  
*GPS Bench Mark: DAVE* *MSL above SD: 4.443 m*  
*GPS Observation Frequency: Every 5 years* *Last GPS Observation Performed: 03/07*  
*Dive Inspection Frequency: Every 2 years* *Last Dive: 04/12*

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Replace the water temperature sensor.
4. Replace the batteries in DCP1, DCP2, and the pump.

**9447195 Priest Point, WA (COASTAL)** **L28061** **Part 15**  
*PBM: Undetermined* *PBM above SD: Undetermined*  
*GPS Bench Mark: Undetermined* *MSL above SD: Undetermined*  
*GPS Observation Frequency: N/A* *Last GPS Observation Performed: N/A*  
*Dive Inspection Frequency: N/A* *Last Dive: N/A*

1. Coordinate the installation with the COASTAL project manager Jean Kent, and the COASTAL Program Manager.

**9448009 Tulalip Shores, WA (COASTAL)** **L28061** **Part 15**  
*PBM: Undetermined* *PBM above SD: Undetermined*  
*GPS Bench Mark: Undetermined* *MSL above SD: Undetermined*  
*GPS Observation Frequency: N/A* *Last GPS Observation Performed: N/A*  
*Dive Inspection Frequency: N/A* *Last Dive: N/A*

1. Coordinate the installation with the COASTAL project manager Jean Kent, and the COASTAL Program Manager.

**9449424 Cherry Point, WA (PORTS)** **L28061** **Part 9**  
*PBM: 944 9424 TIDAL 1* *PBM above SD: 11.226 m*  
*GPS Bench Mark: 941 9424 J TIDAL (AI2204)* *MSL above SD: 3.543 m*  
*GPS Observation Frequency: Every 5 years* *Last GPS Observation Performed: 04/11*  
*Dive Inspection Frequency: Every year* *Last Dive: 05/11*

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Replace rusty cotter pins on SS Met mast break over plate with new SS pins.

**9449419 Cherry Point at South Dock, WA (PORTS)** **Met Only Station**

1. Update the XPERT Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.

**cp0101 Cherry Point (PORTS)**

**Current Meter Station**

1. No additional requirements.

**9449880 Friday Harbor, WA**

**L28061**

**Part 10**

***PBM:*** 944 9880 TIDAL 10

***PBM above SD:*** 4.892 m

***GPS Bench Mark:*** 944 9880 C TIDAL (AI2205)

***MSL above SD:*** 2.561 m

***GPS Observation Frequency:*** Every 5 years

***Last GPS Observation Performed:*** 08/11

***Dive Inspection Frequency:*** Every year

***Last Dive:*** 08/12

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Replace 40W solar panel for DCP 2.
4. Replace the batteries in DCP2, DCP3, and the pump.

## 2.16.5 FOD/POB – Alaska Stations

### **9450460 Ketchikan, AK**

**PBM:** 945 0460 TIDAL 24

**GPS Bench Mark:** 945 0460 TIDAL 37

**GPS Observation Frequency:** Every 5 years

**Dive Inspection Frequency:** Every year

**L28062**

**Part 1**

**PBM above SD:** 8.946 m

**MSL above SD:** 4.345 m

**Last GPS Observation Performed:** 07/11

**Last Dive:** 07/12

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Install an approved MWWL sensor; if any structural modifications are required seek engineering support and Field Engineering Review Subcommittee (FERS) approval.
4. Replace the water temperature sensor.
5. Replace the solar panel array, if necessary.
6. Replace the battery in DCP1 with a 40Ah unit.
7. Replace the DCP2 battery.
8. Install a metal witness post marking bench mark 9450460 E.
9. Re-measure the elevation of the wind sensor above the Met SRM.

### **9451054 Port Alexander, AK**

**PBM:** 945 1054 TIDAL 1

**GPS Bench Mark:** 945 1054 TIDAL 2

**GPS Observation Frequency:** Every 5 years

**Dive Inspection Frequency:** Every year

**L28062**

**Part 2**

**PBM above SD:** 6.148 m

**MSL above SD:** 2.871 m

**Last GPS Observation Performed:** 06/13

**Last Dive:** 06/13

1. Verify the elevation difference between the digibub leveling point and the digibub orifice zero on an annual basis.
2. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
3. Check and update the log sizes to reflect Engineering Bulletin 09-003.
4. Replace the DCP1 Digital I/O module to be firmware v2.04 or higher.
5. Replace the upper foot on XPERT Dark DCP, including brass sleeve insert.
6. Recover or establish and level one surface mark preferably in bedrock, designation/stamping as follows: 945 1054 J/1054 J 2014.
7. Provide station photos of DCP and inside of shelter, primary sensor, met mast, and wind sensor if equipment is present at the station. Be sure no persons are present within the photos.
8. Provide a second directional photo for each bench mark.

**9451600 Sitka, AK****L28062****Part 3****PBM:** 945 1600 L**PBM above SD:** 13.669 m**GPS Bench Mark:** 945 1600 N**MSL above SD:** 2.989 m**GPS Observation Frequency:** Every 5 years**Last GPS Observation Performed:** 05/11**Dive Inspection Frequency:** Every 2 years**Last Dive:** 05/11

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Replace combination lock.
4. Replace phone switch.
5. Provide a photo of the met SRM.
6. Replace the batteries in DCP1, DCP2, and the pump.
7. Establish and level one surface mark, designation/stamping as follows: 945 1600 U/1600 U 2014.
8. Provide station photos of the met mast, and wind sensor if equipment is present at the station. Be sure no persons are present within the photos.
9. Take face, setting, and location photos for any newly established marks.

**9452210 Juneau, AK****L28062****Part 4****PBM:** 945 2210 C**PBM above SD:** 10.161 m**GPS Bench Mark:** 945 2210 JNU TIDAL GPS (AI4908)**MSL above SD:** 3.712 m**GPS Observation Frequency:** Every year**Last GPS Observation Performed:** 07/12**Dive Inspection Frequency:** Every year**Last Dive:** 07/12

1. Verify the elevation difference between the digibub leveling point and the digibub orifice zero on an annual basis.
2. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
3. Check and update the log sizes to reflect Engineering Bulletin 09-003.
4. Inspect orifice fittings annually for corrosion.
5. Install new access cap on orifice stop.
6. Replace the batteries in DCP1, DCP2, pump 1 and pump 2.
7. Provide station photos of the Primary Sensor (and protective well if it is an Aquatrak). Be sure no persons are present within the photos.

**9452400 Skagway, AK**

**PBM:** 945 2400 TIDAL 11

**GPS Bench Mark:** 945 2400 C (AI4931)

**GPS Observation Frequency:** Every year

**Dive Inspection Frequency:** Every year

**L28062**

**Part 5**

**PBM above SD:** 11.646 m

**MSL above SD:** 3.494 m

**Last GPS Observation Performed:** 07/12

**Last Dive:** 07/11

1. Verify the elevation difference between the digibub leveling point and the digibub orifice zero on an annual basis.
2. A dive inspection **MUST** be performed during this site visit; last dive was done in (07/11). A report on the condition of marine growth on the outside of the well, around the plates and orifice, and inside the well is required on the Site Report under Dive comments.
3. **Unresolved from 2012 Project Instructions.** Install two new stainless steel bandits to both the primary and backup orifice conduits.
4. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
5. Check and update the log sizes to reflect Engineering Bulletin 09-003.
6. Replace the GOES antenna and cable.
7. Replace the batteries in DCP1, DCP2, pump 1 and pump 2.
8. Verify bench mark 9452400 J is destroyed and update the Windesc file.
9. Recover and level the bench mark at the top of the boat ramp in the small boat harbor.
10. Install metal witness signs above bench marks 945 2400 TIDAL 11, 945 2400 TIDAL 8, and 945 2400 G.
11. Include all marks in all future leveling runs to support stability analysis efforts.
12. Provide station photos of the primary sensor met mast, and wind sensor if equipment is present at the station. Be sure no persons are present within the photos.

**9452634 Elfin Cove, AK****PBM:** 945 2634 TIDAL 4**GPS Bench Mark:** 945 2634 F**GPS Observation Frequency:** Every year**Dive Inspection Frequency:** Every year**L28062****Part 6****PBM above SD:** 9.365 m**MSL above SD:** 4.637 m**Last GPS Observation Performed:** 05/13**Last Dive:** 05/13

1. Verify the elevation difference between the digibub leveling point and the digibub orifice zero on an annual basis.
2. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
3. Check and update the log sizes to reflect Engineering Bulletin 09-003.
4. Install new air temperature sensor on the primary solar panel pole.
5. Replace the batteries in DCP1, DCP2, pump 1, pump 2, and pump 3.
6. Install a witness post near bench mark 945 2634 G.
7. Establish a met SRM at the base of the mounting structure and include the met SRM in the leveling run.
8. Measure the air temperature sensor above Met SRM and the barometric pressure sensor above station datum.
9. Provide station photos for the tide house structure, primary sensor and wind sensor if equipment is present at the station. Be sure no persons are present within the photos.

**9453220 Yakutat, AK****PBM:** 945 3220 Z**GPS Bench Mark:** 945 3220 AA**GPS Observation Frequency:** Every year**Dive Inspection Frequency:** Every year**L28062****Part 7****PBM above SD:** 8.745 m**MSL above SD:** 2.159 m**Last GPS Observation Performed:** 05/11**Last Dive:** 05/11

1. A dive inspection **MUST** be performed during this site visit; last dive was done in (05/11). A report on the condition of marine growth on the outside of the well and inside the well is required on the Site Report under Dive comments.
2. Perform reconnaissance to relocate the MWWL sensor, seek engineering support and Field Engineering Review Subcommittee (FERS) approval of the installation design of the new station.
3. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
4. Check and update the log sizes to reflect Engineering Bulletin 09-003.
5. Replace the Water Temp sensor.
6. Replace the batteries in DCP1 and the pump.
7. Updated the handheld GPS positions of all bench marks in the Windesc file as needed.
8. Verify 945 3200 W and 945 3200 X is destroyed and update the Windesc file.
9. Provide station photos for the met mast and wind sensor if equipment is present at the station. Be sure no persons are present within the photos.

**9454050 Cordova, AK****L28062****Part 8****PBM:** 945 4050 S**PBM above SD:** 10.178 m**GPS Bench Mark:** 945 4050 TIDAL 13**MSL above SD:** 3.972 m**GPS Observation Frequency:** Every 5 years**Last GPS Observation Performed:** 05/11**Dive Inspection Frequency:** Every year**Last Dive:** 05/11

1. A dive inspection **MUST** be performed during this site visit; last dive was done in (05/11). A report on the condition of marine growth on the outside of the well and inside the well is required on the Site Report under Dive comments.
2. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
3. Check and update the log sizes to reflect Engineering Bulletin 09-003.
4. Replace XPERT Dark DCP phone module, board and ribbon cable.
5. Replace the water temperature sensor.
6. Replace the batteries in DCP1, DCP2, and the pump.
7. Establish and level one surface mark and preferably two 3D rod marks (or marks set in bedrock), designation/stamping as follows: 945 4050 Z/4050 Z 2014; 945 4050 AA/4050 AA 2014; and 945 4050 BB/4050 BB 2014.
8. Take face, setting, and location photos for any newly established marks.

**9454240 Valdez, AK****L28062****Part 9****PBM:** 945 4240 TIDAL 21**PBM above SD:** 8.327 m**GPS Bench Mark:** 945 4240 T**MSL above SD:** 4.035 m**GPS Observation Frequency:** Every 5 years**Last GPS Observation Performed:** 07/11**Dive Inspection Frequency:** Every 2 years**Last Dive:** 07/11

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Replace the water temperature sensor.
4. Replace the batteries in DCP1, DCP2, and the pump.
5. Recover or establish and level one surface mark, designation/stamping as follows: 945 4240 Z/4240 Z 2014.
6. Take face, setting, and location photos for any newly established marks.

**9455090 Seward, AK****PBM:** 945 5090 N**GPS Bench Mark:** 945 5090 L**GPS Observation Frequency:** Every 5 years**Dive Inspection Frequency:** Every 2 years**L28062****Part 10****PBM above SD:** 7.717 m**MSL above SD:** 3.566 m**Last GPS Observation Performed:** 06/11**Last Dive:** 06/11

1. A dive inspection **MUST** be performed during this site visit; last dive was done in (05/11). A report on the condition of marine growth on the outside of the well and inside the well is required on the Site Report under Dive comments.
2. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
3. Check and update the log sizes to reflect Engineering Bulletin 09-003.
4. Check all charging system wiring in DCP1.
5. Replace the AC power supply, power distribution board.
6. Repair the cement around bench mark 945 5090 J on the pier.
7. Provide station photos of the met mast and wind sensor if equipment is present at the station. Be sure no persons are present within the photos.

**9455500 Seldovia, AK****PBM:** 945 5500 B**GPS Bench Mark:** 945 5500 TIDAL 22**GPS Observation Frequency:** Every year**Dive Inspection Frequency:** Every year**L28062****Part 11****PBM above SD:** 13.331 m**MSL above SD:** 5.080 m**Last GPS Observation Performed:** 6/13**Last Dive:** 05/12

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Set three bench marks.
4. Replace Dark phone module, board and ribbon cable.
5. Recover or establish and level three bench marks, designation/stamping as follows: 945 5500 G/5500 G 2014; 945 5500 H/5500 H 2014; and 945 5500 J/5510 J 2014.
6. Take face, setting, and location photos for any newly established marks.
7. Provide station photos of the met mast and wind sensor if equipment is present at the station. Be sure no persons are present within the photos.

**9455760 Nikiski, AK (PORTS)****L28062****Part 12****PBM:** 945 5760 L**PBM above SD:** 14.850 m**GPS Bench Mark:** 945 5760 L**MSL above SD:** 5.541 m**GPS Observation Frequency:** Every year**Last GPS Observation Performed:** 06/13**Dive Inspection Frequency:** No dive requirement

1. Verify the elevation difference between the digibub leveling point and the digibub orifice zero on an annual basis.
2. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
3. Check and update the log sizes to reflect Engineering Bulletin 09-003.
4. Reposition GOES & GPS antennas, if necessary.
5. Install two IP modem.
6. Replace the water temperature sensor.
7. Replace the batteries in DCP1, DCP2, pump 1, and pump 2.
8. Take digital photos of the met SRM (may need to receive permission prior to visit).
9. Measure the elevation of the water temperature sensor above station datum.
10. Provide station photos of the primary sensor. Be sure no persons are present in the photos.

**9455920 Anchorage, AK (PORTS)****L28062****Part 13****PBM:** 945 5920 TIDAL 15 1966 (TT0711)**PBM above SD:** 13.231 m**GPS Bench Mark:** 945 5920 TIDAL 16 (TT0713)**MSL above SD:** 6.931 m**GPS Observation Frequency:** Every year**Last GPS Observation Performed:** 06/13**Dive Inspection Frequency:** No dive requirement

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Replace the upper orifice sensor.
4. Replace the Digital I/O modules in DCP1 and DCP2 to be v2.04 or higher.
5. Replace the Analog I/O module in DCP2 to be v2.01 or higher.
6. Replace the water temperature sensor.
7. Replace the batteries in DCP2, pump 1 and pump 2.
8. Recover or establish and level three bench marks, designation/stamping as follows 945 5920 J/5920 J 2014; 945 5920 K/5920 K 2014; and 945 5920 L/5920 L 2014.
9. Take face, setting, and location photos for any newly established marks.
10. Measure the elevation of the water temperature sensor above station datum.
11. Provide station photos of the primary sensor, met mast and wind sensor if equipment is present at the station. Be sure no persons are present within the photos.
12. Perform a reconnaissance for a new Class A bench mark location on the eastern side of the port facility.

**9457292 Kodiak, AK****PBM:** 945 7292 B**GPS Bench Mark:** 945 7292 TIDAL 16**GPS Observation Frequency:** Every year**Dive Inspection Frequency:** Every 2 years**L28062****Part 14****PBM above SD:** 14.124 m**MSL above SD:** 9.160 m**Last GPS Observation Performed:** 07/12**Last Dive:** 07/11

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Replace Satlink 1 with Satlink 2.
4. Replace the batteries in DCP1, DCP2, and the pump.
5. Provide station photos of the primary sensor (and protective well if it is an Aquatrak). Be sure no persons are present in the photos.

**9457804 Alitak, AK****PBM:** 945 7804 TIDAL 6**GPS Bench Mark:** 945 7804 B**GPS Observation Frequency:** Every 5 years**Dive Inspection Frequency:** Every year**L28062****Part 15****PBM above SD:** 7.521 m**MSL above SD:** 3.574 m**Last GPS Observation Performed:** 07/11**Last Dive:** 07/11

1. Verify the elevation difference between the digibub leveling point and the digibub orifice zero on an annual basis.
2. A dive inspection MUST be performed during this site visit; last dive was done in (07/11). A report on the condition of marine growth around the plates and orifice is required on the Site Report under Dive comments.
3. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
4. Check and update the log sizes to reflect Engineering Bulletin 09-003.
5. Replace the batteries in DCP1 pump and DCP 3 pump.
6. Provide station photos of the general tide house location, tide house structure, and primary sensor. Be sure no persons are present in the photos.

**9497645 Prudhoe Bay, AK**

***PBM:*** 949 7645 CELL 4B

***GPS Bench Mark:*** 949 7645 WINDSOCK

***GPS Observation Frequency:*** Every 5 years

***Dive Inspection Frequency:*** Diving Not Allowed

**L28062**

**Part 26**

***PBM above SD:*** 16.389 m

***MSL above SD:*** 11.018 m

***Last GPS Observation Performed:*** 07/11

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. **Unresolved from 2012 Project Instructions:** Take setting photos and one general location of all existing bench marks.
4. Replace the DCP1 Digital I/O module to be v2.04 or higher.
5. Replace the batteries in DCP1 and DCP2.
13. Include bench marks 949 7645 Windsock, 949 7645 NW Bridge, and 949 7645 BM NE Bridge in the level run; these marks were not leveled last year.
14. Establish the met SRM at the base of the building housing the DCPs and include the Met SRM in the leveling run.

2.17 JOA - Task 12-08: Western Alaska Stations  
Drew Maczko, Task Manager/Technical Representative (TR)

<b>9459450 Sand Point, AK</b>	<b>L28062</b>	<b>Part 16</b>
<i>PBM:</i> 945 9450 R		<i>PBM above SD:</i> 13.894 m
<i>GPS Bench Mark:</i> 945 9450 TIDAL 1293-1		<i>MSL above SD:</i> 10.482 m
<i>GPS Observation Frequency:</i> Every 5 years	<i>Last GPS Observation Performed:</i> 05/11	
<i>Dive Inspection Frequency:</i> Every 2 years		<i>Last Dive:</i> 06/12

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.

<b>9459881 King Cove, AK</b>	<b>L28062</b>	<b>Part 17</b>
<i>PBM:</i> 945 9881 D		<i>PBM above SD:</i> 6.888 m
<i>GPS Bench Mark:</i> KCH-1 1998		<i>MSL above SD:</i> 2.354 m
<i>GPS Observation Frequency:</i> Every 5 years	<i>Last GPS Observation Performed:</i> 05/11	
<i>Dive Inspection Frequency:</i> Every year		<i>Last Dive:</i> 07/13

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Inspect and repair the concrete block supporting the met mast.
4. Install a new padlock.
5. Reattach water temp sensor with stainless steel banding or extra heavy duty zip ties and 6.3 m of conduit.
6. Verify the DCP display SN and the DCP box SN.
7. Replace the batteries in DCP1 and DCP2.

<b>9461380 Adak, AK</b>	<b>L28062</b>	<b>Part 18</b>
<i>PBM:</i> 946 1380 TIDAL 18 (UW7919)		<i>PBM above SD:</i> 6.700 m
<i>GPS Bench Mark:</i> 946 1380 TIDAL 18 (UW7919)		<i>MSL above SD:</i> 1.553 m
<i>GPS Observation Frequency:</i> Every 5 years	<i>Last GPS Observation Performed:</i> 07/11	
<i>Dive Inspection Frequency:</i> Every year		<i>Last Dive:</i> 07/11

1. A dive inspection MUST be performed during this site visit; last dive was done in (07/11). A report on the condition of marine growth around the plates and orifice is required on the Site Report under Dive comments.
2. Install approved MWWL sensor on DCP 5, if any structural modifications are required seek engineering support and Field Engineering Review Subcommittee (FERS) approval.
3. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
4. Check and update the log sizes to reflect Engineering Bulletin 09-003.
5. Provide station photos of primary sensor. Be sure no persons are present in the photos.
6. Replace the batteries in DCP2, the pump, and three batteries in the Pier 5 station.

**9461710 Atka, Nazan Bay, AK****L28062****Part 19****PBM:** 946 1710 B**PBM above SD:** 15.000 m**GPS Bench Mark:** 946 1710 G**MSL above SD:** 8.804 m**GPS Observation Frequency:** Every 5 years**Last GPS Observation Performed:** 08/11**Dive Inspection Frequency:** Every year**Last Dive:** 05/13

1. Verify the elevation difference between the digibub leveling point and the digibub orifice zero on an annual basis.
2. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
3. Check and update the log sizes to reflect Engineering Bulletin 09-003.
4. Replace the DCP1 and DCP2 Digital I/O module to be firmware v2.04 or higher.
5. Replace the Satlink1 installed in DCP2 with a Satlink2.
6. Re-orientate the wind birds so that their black boxes are pointing due south (instead of due north as they are now).

**9462450 Nikolski, Mueller Cove, AK****L28062****Part 20****PBM:** 945 2450 F**PBM above SD:** 7.782 m**GPS Bench Mark:** 945 2450 ASTRO**MSL above SD:** 1.936 m**GPS Observation Frequency:** Every 5 years**Last GPS Observation Performed:** 08/11**Dive Inspection Frequency:** Every year**Last Dive:** 08/11

1. Verify the elevation difference between the digibub leveling point and the digibub orifice zero on an annual basis.
2. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
3. Check and update the log sizes to reflect Engineering Bulletin 09-003.
4. Repair the N1 DCP1 (reef) orifice.
5. Replace the Swagelok fittings to the orifices if needed.
6. Replace the DCP1 Digital I/O module to be firmware v2.04 or higher.
7. Replace air temperature sensor.
8. Replace the batteries in DCP1 and DCP2.

**9462620 Unalaska, AK****PBM:** 946 2620 TIDAL 7**GPS Bench Mark:** 946 2620 TIDAL 19**GPS Observation Frequency:** Every 5 years**Dive Inspection Frequency:** Every year**L28062****Part 21****PBM above SD:** 3.597 m**MSL above SD:** 1.427 m**Last GPS Observation Performed:** 08/11**Last Dive:** 6/13

1. Install approved MWWL sensor on DCP 5, if any structural modifications are required seek engineering support and Field Engineering Review Subcommittee (FERS) approval.
2. Contact TelAlaska (907.581.1399) and initiate a work request to fix the phone line.
3. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
4. Check and update the log sizes to reflect Engineering Bulletin 09-003.
5. Replace the water temp sensor.
6. Replace the battery in the backup pump.
7. Recover or establish and level one surface mark, designation/stamping as follows: 946 2620 R/2620 R 2014.
8. Take face, setting, and location photos for any newly established marks.
9. Provide station photos of primary sensor. Be sure no persons are present in the photos.

**9463502 Port Moller, AK****PBM:** 946 3502 B**GPS Bench Mark:** 946 3502 H**GPS Observation Frequency:** Every 5 years**Dive Inspection Frequency:** Every year**L28062****Part 22****PBM above SD:** 15.422 m**MSL above SD:** 10.683 m**Last GPS Observation Performed:** 09/11**Last Dive:** 09/11

1. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
2. Check and update the log sizes to reflect Engineering Bulletin 09-003.
3. Replace the backup pump.

**9464212 Village Cove, AK****L28062****Part 23****PBM:** 946 4212 RBD 1**PBM above SD:** 9.074 m**GPS Bench Mark:** 946 4212 P**MSL above SD:** 0.974 m**GPS Observation Frequency:** Every 5 years**Last GPS Observation Performed:** 10/11**Dive Inspection Frequency:** Dive not needed; station inspected using waders

1. Verify the elevation difference between the digibub leveling point and the digibub orifice zero on an annual basis.
2. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
3. Check and update the log sizes to reflect Engineering Bulletin 09-003.
4. Investigate data discrepancies seen in the lower Paros (N1) sensor.
5. Replace zinc on each orifice pipe (the circular zinc fits 1 1/4" OD of pipe) and inspect both pipes for corrosion.
6. Inspect and if necessary, replace the stainless steel u-bolts that attach the 1 inch pipe to the ladder rungs. Use approximately 6 - 5/16" x 1 3/4" x 3" stainless steel u-bolts.
7. Provide photos of the primary sensor. Be sure no persons are present in the photos.

**9468756 Nome, AK****L28062****Part 24****PBM:** 946 8756 SHEET PILE C**PBM above SD:** 5.611 m**GPS Bench Mark:** 946 8756 K**MSL above SD:** 1.375 m**GPS Observation Frequency:** Every 5 years**Last GPS Observation Performed:** 06/11**Dive Inspection Frequency:** Every year**Last Dive:** 06/11

1. Verify the elevation difference between the digibub staff stop and the digibub orifices zero on an annual basis.
2. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
3. Check and update the log sizes to reflect Engineering Bulletin 09-003.
4. Replace the lower Paros (N1) sensor.
5. Repair the junction box conduit for the bubbler orifice tubing.
6. Provide photos of the primary sensor. Be sure no persons are present in the photos.

**9491094 Red Dog, AK*****PBM:*** 949 1094 A TIDAL***GPS Bench Mark:*** 949 1094 B***GPS Observation Frequency:*** Every 5 years***Dive Inspection Frequency:*** Every year**L28062****Part 25*****PBM above SD:*** 4.696 m***MSL above SD:*** 1.719 m***Last GPS Observation Performed:*** 10/11***Last Dive:*** 10/11

1. Verify the elevation difference between the digibub leveling point and the digibub orifice zero on an annual basis.
2. Update the XPERT Operating System, XPERT Dark Operating System and Satlink firmware if the new version is approved at the time of the annual inspection.
3. Check and update the log sizes to reflect Engineering Bulletin 09-003.
4. Replace the upper Paros (T1) sensor (GFE).
5. Replace the water temperature sensor (GFE).
6. Replace the DCP1 Digital I/O module to be v2.04 or higher.
7. Replace the batteries in DCP1, DCP2, and pump1.
8. Measure the elevations of the water temperature sensor above station datum.