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January 22, 2009

MEMORANDUM FOR: Michael C. O'Hargan  
Chief, Field Operations Division (FOD)

FROM: Michael W. Szabados  
Director, Center for Operational Oceanographic Products and  
Services (CO-OPS)

SUBJECT: 2009 Project Instructions – Coastal and Great Lakes Water Level  
Station Components

The enclosed document, "Project Instructions: Installation, and Maintenance of Coastal and Great Lakes Water Level Stations for 2009," is forwarded for implementation.

The Project Instructions are divided into three parts. PART A, General Requirements, and PART B, Standing Project Instructions for the Coastal and Great Lakes Water Level Stations, Updated November 2008 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.

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 Program (NWLP). Thus, Standing Project Instructions document the NWLP standards to which the data is collected. Since the products derived from the NWLON stations are used for NOS multi-purpose applications such as PORTS<sup>®</sup>, tsunami detection and notification, control for hydrographic and photogrammetric surveys, long term sea level analysis and trends, boundary determinations, etc., adherence to NWLP standards is very important for accomplishing CO-OPS' goals. The Standing Project Instructions can not take into account the dynamic year-to-year changing budget situations in CO-OPS, and when operational decisions have to be made because of the inappropriate level of budget or lack of budget, FOD shall consult the Engineering Division. 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; actual accomplishments at each station will be governed by available resources throughout the year.

PARTS A and C provide background information and list individual station requirements. An Excel file, 2009 Station Operational Lists, has been prepared to replace the pages of priority lists

and stations supporting various programs such as PORTS<sup>®</sup>, hydro, international treaties, tsunami/storm surge, or COASTAL. 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.

FOD shall perform maintenance activities at stations, based on the available resources, for the directed priorities in descending order as described here: PORTS<sup>®</sup> and navigational safety, stations providing tsunami support, international treaties, new or relocated station installations, stations not receiving a complete maintenance visit during the previous year or years, and stations with a malfunctioning primary or backup sensor. The 2009 Station Operational Lists provide information about all the various projects and mission goals that each station supports; this will serve as a relative priority ranking.

In CY 2009, CO-OPS intends to install meteorological sensors at 30 stations as identified in the “FY09 NWLON Met Upgrade Plan” spreadsheet, and also in the station specific requirements for the affected stations in PART C. Section 2.9 of the Standing Project Instructions provides requirements and guidance for measuring the meteorological sensor heights. FOD shall make every effort to measure the sensor heights for the installed sensors during the annual maintenance visits and report that information as required.

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 OET, submissions of draft site report (e-site report when available) and level abstract within one working day requirement applies to all annual maintenance and emergency maintenance activities for FOD and contractors. The intent is to verify that the station specific requirements are completed, or explained if not completed. This includes also the standard requirements for an annual head swap for acoustic sensors and the leveling of all bench marks at least every two years. The draft site report will indicate if both these requirements have been completed. Final documentation shall be submitted to OET within 30 calendar days of completion of annual maintenance and leveling. OET will evaluate the station package (final documentation) within 10 working days and then inform the person or appropriate party who submitted the documentation of any corrective actions.

OET will provide FOD and contractors 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.

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. CO-OPS has set corporate targets of 180 annual inspections and 30 met sensor upgrades in FY09; monthly accomplishments towards these deliverables are reported to NOS. Development of a monthly schedule and availability over the web at the FOD web site is desirable since it can be accessed real time and information can be updated dynamically by FOD. PRO has an Outlook-based calendar available via internet; ISD is working on a similar calendar, perhaps Google-based, for ARO.

Recently, CO-OPS has updated the GPS requirements to account for the development of OPUS-DB. At a station where GPS observations are required as specified in PART C, Section 2.0, minimum four hours of GPS observations shall be performed on a single bench mark at a station; this bench mark is designated as GPS mark for each station. At least 17 hours after the GPS data collection, the data shall be submitted to OPUS-DB and a solution shall be obtained. The ellipsoid height and the position (latitude and longitude) shall be reported on the site report. The new GPS requirements are provided in the "User's Guide for GPS Observations, Updated November 2008.

#### Enclosures

cc:

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**Coastal and Great Lakes Water Level Station Components**

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## **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; 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: Ecosystem Management, Climate, Weather and Water, and Commerce and Transportation. The objective of this 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.

### **1.0. 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. The relative ranking of stations based upon the NOAA goals is provided below so that management and operational decisions for the maintenance of stations can be made, realizing 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 importance each year. Changes in priority may occur and will be at the direction of the Director of CO-OPS.

##### Relative Ranking

- First Priority: PORTS<sup>®</sup> sites and stations in support of Hydrographic and Photogrammetric Surveys (Commerce and Transportation goal); Great Lakes (GL) stations supporting navigation safety and treaties; GL master control stations; stations not meeting the NWLON operational status performance criteria in 2008; and GL station upgrades under CELRE contract.
- Second Priority: NWLON stations supporting NWS tsunami/storm surge warning programs (Weather and Water goal); NOAA Climate Program (Climate goal); and coastal ecosystem management objectives through the CO-OPS' COASTAL Program (Ecosystems goal).
- Third Priority: Reimbursable and special project stations and all other stations.

A listing of stations and the programs they support, such as PORTS<sup>®</sup>, hydrographic and photogrammetric surveys, treaties, tsunami, or COASTAL, are provided in the attached file, 2009 Station Operational Lists.xls. 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 following provides a brief overview of the four NOAA mission goals supported by NWLON coastal water level stations. Some of the NWLON stations are supporting multiple program categories.

- **Mission Goal 1: Ecosystems**  
Stations supporting CO-OPS COASTAL program
- **Mission Goal 2: Climate**  
Stations supporting various climate monitoring programs and stations supporting special projects
- **Mission Goal 3: Weather and Water**  
Stations supporting NOAA Tsunami program, NOAA Storm Surge program, and NOAA Coastal Storms Program.
- **Mission Goal 4: Commerce and Transportation**  
Stations supporting PORTS<sup>®</sup> program, Hydrographic and Photogrammetric survey control stations, navigation safety, treaties, and other stations supporting reimbursable and special projects

There are a total of 34 stations which have been identified as critical for Climate (program) Monitoring, 33 of which are NWLON. Bermuda is the 34<sup>th</sup> station, and is considered both a Global Sea Level station and a Tsunami-Capable station, but 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 November 2008, 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 the 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 the Engineering Division (ED), as necessary, when making operational decisions, planning annual inspections, or emergency maintenance activities.



The weekly Operations 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 field and HQ personnel to assist in the evaluation of station and sensor status. A few of the more useful resources are provided below.

Online IP Address	Description of Resource
<a href="http://neap.pactide.noaa.gov/fod/">http://neap.pactide.noaa.gov/fod/</a>	FOD QA/QC Tools – For PRO calendar
<a href="https://corms.nos.noaa.gov/ccp/">https://corms.nos.noaa.gov/ccp/</a>	CORMS Control Panel – status of primary and ancillary sensors (not backup sensor)
<a href="http://extranet.co-ops.nos.noaa.gov/ssboard.shtml">http://extranet.co-ops.nos.noaa.gov/ssboard.shtml</a>	WL Station Status Board – operational status of all stations and associated sensors
<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 station plotting tool, for checking the configuration of a station, or for checking the status of satellite transmissions
<a href="http://extranet.co-ops.nos.noaa.gov/invalid/">http://extranet.co-ops.nos.noaa.gov/invalid/</a>	Invalid sensor report – Non configured sensors in DMS

## 2.0. 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, Task Managers, and FOD. Nearly all PORTS® projects are maintained by contractors or local user groups; FOD shall support these maintenance groups as necessary.

### 2.2. HYDROGRAPHIC AND PHOTOGRAMMETRIC SURVEYS

Installation and removal of subordinate water level stations for NOAA in-house hydrographic and photogrammetric surveys shall be coordinated between the Field Operations Division (FOD) and the Operations Branch (OB) of the Hydrographic Surveys Division of the NOS Office of Coast Survey, or the Remote Sensing Division (RSD) of NGS, through Peter Stone of the Oceanographic Division (OD). Peter Stone is the CO-OPS point of contact for all hydro and photo support matters. 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 Peter Stone, in concurrence with the ED.

According to CO-OPS' policy, either CO-OPS 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. 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 website at <http://nauticalcharts.noaa.gov/hsd/specs/specs.htm>. For NOAA contract remote sensed (photogrammetric) surveys, the subordinate stations shall be installed by NGS contractors according to the NGS Water Level Specifications and Deliverables for the Shoreline Mapping Surveys.

Generally, the portable acoustic system shall be preferred for hydrographic or photogrammetric subordinate station installation. In cases where acoustic wells can not 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 shall be 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. Manoj Samant 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 Craig Martin of OD 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 the Operations Manager, Tom Landon, Darren Wright, Allison Allen, and the appropriate operational personnel in ED and FOD.

Reporting of NWLON performance metrics is coordinated by Tom Landon, through the Deputy Director of CO-OPS, and on to NOS management. Data availability, number of met sensor upgrades, and number of annual inspections performed are reported monthly usually no later than the 7<sup>th</sup> of the month. These details must be reported well in advance of the preparation of monthly reports, and it is the responsibility of the ARO and PRO field managers to ensure Tom has these statistics by the 5<sup>th</sup> of the month.

### **2.4. COASTAL PROGRAM**

Installation, maintenance, and removal of stations performed by CO-OPS personnel for the COASTAL Program shall be coordinated between Allison Allen and her 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 between the Task and Project Manager, ED, and FOD, and shall follow the guidelines and specifications provided in “Standing Project Instructions for the Coastal and Great Lakes Water Level Stations, Updated November 2008”.

## **3.0. Work Plan and Reporting**

To systematize operations and handle growth, CO-OPS uses an operating procedure called the Reliable Operating System (ROS). ROS has been subcategorized into 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 Operational Acceptance
- Step 6: Operation and Maintenance
- Step 7: Data Management and Product Delivery
- Step 8: Assessment

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 coordinators are developing these tools. All of the activities conveyed by these Project Instructions must follow the ROS guidelines as they are developed. As these products are developed these products are made available on CO-OPS wiki page. The products that are relevant for CO-OPS’ contracts are made available on CO-OPS web page at <http://tidesandcurrents.noaa.gov/pub.html>.

## **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. Development of a monthly schedule that is available on the FOD web site is desirable since it can be accessed in real time and information can be updated dynamically by FOD. Contractors shall coordinate their schedules through their task managers, who in turn will coordinate with FOD.

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 – for this training as per the NOS milestone. The training class shall cover all aspects of tide station installation, operation, and maintenance. In addition, 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  
NOVEMBER 2008**

See

[http://tidesandcurrents.noaa.gov/publications/Standing\\_Project\\_Instructions\\_for\\_Coastal\\_and\\_Great\\_Lakes\\_Water\\_Level\\_Stations\\_updated\\_November2008.pdf](http://tidesandcurrents.noaa.gov/publications/Standing_Project_Instructions_for_Coastal_and_Great_Lakes_Water_Level_Stations_updated_November2008.pdf)

## **PART C: SPECIFIC REQUIREMENTS**

### **1.0 Station Operational Groups**

All operational NWLON and subordinate stations are listed in the Excel file “2009 Station Operational Lists.xls”. The file contains three worksheets: 1) FY09 NWLON Station Project Support Status; 2) FY09 NWLON Great Lakes Station Project Support Status; and 3) FY09 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 reference for the field parties.

#### **1.1. PORTS<sup>®</sup> SUPPORT**

Thirty-eight stations on the NWLON list provide support for the PORTS<sup>®</sup> navigational operations. PORTS<sup>®</sup> stations having meteorological sensors only are denoted on the subordinate station list.

Also, 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 supporting the IJC, the International Forecast, Lake Regulations and Modeling efforts by the Corps of Engineers and Environment Canada as well as monitoring the sharing of the water for power generation between the United States and Canada.

#### **1.2. 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 time frame 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.

#### **1.3. OPERATIONAL STATIONS NOT MAINTAINED IN CY08 AND EMERGENCY REPAIRS**

Some stations were determined to be not fully operational during 2008 and some stations did not receive full annual maintenance (including dive inspection) in 2007 or 2008. These stations must be serviced as soon as possible in 2009.

Emergency repairs to stations with sensor/system problems shall be addressed immediately; routine maintenance may follow at a later date. See the CORMS control panel for station sensor status, [https://corms.nos.noaa.gov/ccp\\_tol\\_mod.html](https://corms.nos.noaa.gov/ccp_tol_mod.html) Stations not visited in CY08 **MUST** be visited as early as possible in 2009 - maintenance shall include a dive inspection, full

maintenance of the equipment, and levels to all bench marks or as specified in the individual station requirements, as appropriate.

The seven stations supporting the Soo Locks PORTS<sup>®</sup> shall be visited each year in March for at least an abbreviated maintenance visit to ensure full operational status prior to the opening of the Soo Locks in late March.

#### **1.4. NEW, RELOCATED, OR UPGRADED STATIONS**

The following stations are classified as new, relocated, or upgraded stations. The upgrades necessary are listed in the specific station requirements in PART C, Section 2.0. It is also understood that construction/relocation schedules may impact the planned priorities, and that some stations may need to be treated as lower priorities for this reason. The priority order for these installations, relocations, and upgrades is as follows.

##### ***1.4.1. New Station Installations***

The following stations shall be installed as new NWLON stations in the Great Lakes. The priority order for these installations/rebuilds will be variable depending on the progress of the US Army Corps of Engineers' contract for each site. As the contracts are awarded and construction begun, a more certain schedule will become available.

9087031      Holland, Lake Michigan, MI  
9087088      Menominee, WI

In addition to supporting the existing PORTS<sup>®</sup> activities in FY09, the following water level and meteorological stations have been planned at the following new PORTS. The sensors are listed in parentheses. The current meter locations are not listed here but are available in PORTS<sup>®</sup> plans.

##### **(A) Lower Mississippi River PORTS<sup>®</sup>**

- (1) 8761955 Carrollton, LA (WL only)
- (2) 8761847 Crescent City Bridge (Air gap and side looker)
- (3) 8762002 Huey Long Bridge (Air Gap only)

##### **(B) Sabine Neches, TX, PORTS<sup>®</sup>**

- (1) 8770570 Sabine Pass (existing NWLON - add full Met including 2 wind sensors)
- (2) 8770520 Rainbow Bridge, TX (TCOON WL station – add side looker)

##### ***1.4.2. Upgraded Stations***

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

8418150      Portland, ME – possible station relocation depending on waterfront developments  
8725520      Fort Myers, FL – replace shelter with enclosure on an elevated frame

### ***1.4.3. Upgraded Stations through the NWS Climate Program Office (CPO)***

The NWS CPO – Office of Global Programs (OGP) through the Integrated Ocean Observing System (IOOS) generally provides funding to upgrade the redundant stations/DCPs and/or for upgrading the geodetic network. Funding shall also be used for O&M support and performance of GPS observations at all Pacific Island sites. See PART C, Section 2.0., for specific requirements for each site.

In FY 09, OGP funding has been requested to procure equipment as redundant DCP and sensors to be installed at Adak, AK, in FY 10.

### ***1.4.4. Hurricane Station Reconstruction/Relocations***

The following 14 stations are proposed relocations, future NWLON stations, or were affected by hurricanes, typhoons, and/or storm surge over the last several years and need infrastructure improvements. All 14 are listed here for documentation. See PART C, Section 2.0., for specific requirements for each site.

8635150	Colonial Beach, VA (hurricane destruction)
8654400	Cape Hatteras, NC (hurricane destruction)
8722670	Lake Worth Pier, FL (NDBC partner, pier being rebuilt in 2007-2008)
8723214	Virginia Key, FL (to be relocated by Air-Sea Systems)
8723962	Key Colony Beach, FL (hurricane destruction)
8725858	Venice Pier, FL (NDBC partner – data acceptance still under consideration)
8727520	Cedar Key, FL (hurricane damage; pier was rebuilt in 2008)
8728690	Apalachicola, FL (to be relocated by Air-Sea Systems)
8729210	Panama City Beach, FL (to be rebuilt by Air-Sea Systems – pier under reconstruction in 2009)
8743281	Ocean Springs-Biloxi, MS (to be reinstalled through future IDIQ task order, if funding is identified)
8764044	Tesoro Marine Terminal, LA (upgrade postponed, to be done in the future)
8771450	Galveston Pier 21 (temporary site to be installed by DNR)
8774770	Rockport, TX (to be upgraded through Texas O&M contract)
8779770	Port Isabel, TX (to be upgraded through Texas O&M contract)

### ***1.4.5. Stations Planned for Continuously Operating Reference Station (CORS) Installation***

CO-OPS is partnering with NGS to install a CORS site at the NWLON stations listed below. These stations were selected jointly by NGS and CO-OPS as representatives of the longest data series on the east coast. 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 NWLON stations at Boston, MA and Wilmington, NC have been determined to be unsuitable for a CORS. CORS sites were established at Key West, FL and Charleston, SC during 2007.

1890000	Wake Island (funding provided by NWS CPO OGP)
8418150	Portland, ME
8518750	The Battery, NY
8670870	Fort Pulaski, GA
8720218	Mayport (Bar Pilots Dock), FL
9453220	Yakutat, AK

### **1.5. STATIONS WITH MALFUNCTIONING PRIMARY OR BACKUP SENSOR(S)**

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 following link for the resources: [https://corms.nos.noaa.gov/ccp\\_tol\\_mod.html](https://corms.nos.noaa.gov/ccp_tol_mod.html)

### **1.6. 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>

### **1.7. STATIONS SUPPORTING NOAA TSUNAMI AND STORM SURGE REQUIREMENTS**

NWLON stations supporting the NOAA Tsunami Warning Network and Storm Surge Network are indicated on the 2009 Station Operational Lists. 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.

As of December 1, 2008, only 2 NWLON stations (excluding the 4 non-operational NWLON stations) on the East Coast and Gulf Coast are not Tsunami-Capable and shall be made Tsunami-Capable in FY09. Every effort shall be made to upgrade the software at these during the annual maintenance visits or emergency trips.

8720218 Mayport, Bar Pilots Dock, FL\*  
8723214 Virginia Key, FL \*

\* Once the stations are upgraded, then they should be made Tsunami-Capable.

In addition 4 other NWLON stations are not Tsunami-Capable because they are not operational. These stations are 8635150 Colonial Beach, VA; 8654400 Cape Hatteras, NC; 8723962 Key Colony Beach, FL; and 8743281 Ocean Springs, MS.



## 1.8. PLANNED REIMBURSABLE PROJECTS FOR CY09

The NWLON stations listed below are operating or will be operational in CY 2009 in support of reimbursable, partnership, and special projects. Specific station requirements are provided for stations being maintained by CO-OPS.

<b>Project Station</b>			<b>Task</b>	<b>Control Station</b>
<b><u>Number</u></b>	<b><u>Name</u></b>	<b><u>Partner</u></b>	<b><u>Number</u></b>	<b><u>Number and Name</u></b>
1631428	Guam, Pago Bay	WES	1RK6EPG	1630000 Guam
8662245	Oyster Landing, SC	Baruch	NA	8665530 Charleston, SC
9411406	Platform Harvest	NASA/JPL	BK6EJP	9410660 Los Angeles, CA

## 1.9. GLOBAL SEA LEVEL PROGRAM

The NOS is responsible for maintenance at the following station:

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

The NOS is also responsible for technical support to other countries such as Argentina. This includes technical guidance as requested, procurement of equipment, and shipping. The logistics of such support will be coordinated between FOD and ED.

## 1.10. 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 both the Florida Department of Environmental Protection (FDEP) and 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 Rican 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. Allison Allen, CO-OPS project manager, will prepare a Memorandum of Agreement between CO-OPS and PRSN, and a project plan for FY09. Allison Allen shall coordinate CO-OPS support for this project with CO-OPS resource managers. There is no funding identified for this effort as of January 2009.

## 2.0. 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 2009. 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 are grouped by Regions and Tasks Numbers as follows:

FOD/ARO	East coast stations
FOD/ARO	Gulf coast and Caribbean Islands stations
Air-Sea Systems - Task XVI	Florida through Louisiana Stations
Air-Sea Systems - Task XXVIII	Lower Mississippi PORTS <sup>®</sup>
Texas A&M DNR - Task XX	Mobile PORTS <sup>®</sup>
Texas A&M DNR - Task XXIV	Gulfport and Pascagoula PORTS <sup>®</sup>
Texas A&M DNR - Task XIII	Houston Galveston PORTS <sup>®</sup>
Texas A&M DNR - Tasks XXIII	Sabine-Neches PORTS <sup>®</sup>
Texas A&M DNR - Tasks XXVII	Texas stations
FOD/ARO	Great Lakes Stations
FOD/PRO	Hawaii, Pacific Islands, and West Coast stations
EHI - Task XXI	California and Oregon stations
DEA - GSA Contract	Alaska stations

## 2.1. FOD/ARO - EAST COAST STATIONS

### 8410140 Eastport, ME

L27188

Part 1

**PBM:** 841 0140 TIDAL 3 (PD0006)

**PBM above SD:** 15.685 m

**GPS Bench Mark:** 841 0140 TIDAL 4 (PD0007)

**MSL above SD:** 4.420 m

**GPS Observation Frequency:** Every five years (Required in 2009)

**Dive Inspection Frequency:** Annually

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
2. **Unresolved from 2007 Project Instructions.** Take one general location photo showing the water level station in relationship to its supporting structure and the local body of water. Take digital photos of the setting (waist or chest high view) and general location of all existing bench marks. Take face, setting, and location photos for any newly established marks.
3. Include bench mark 841 0140 K TIDAL, 841 0140 L, 40 USGS, 841 0140 TIDAL 10, 841 0140 TIDAL 2, 841 0140 TIDAL 8 in the level run; these marks were not leveled last year.

### 8411250 Cutler, ME

L27188

Part 2

**PBM:** 841 1250 M TIDAL (AJ2727)

**PBM above SD:** 15.725 m

**GPS Bench Mark:** 841 1250 M TIDAL (AJ2727)

**MSL above SD:** 8.921 m

**GPS Observation Frequency:** Every five years (Required in 2009)

**Dive Inspection Frequency:** Annually

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
2. Include Bench Marks 841 1250 K, 841 1250 L, 841 1250 N in the level run; these marks were not leveled last year.

### 8413320 Bar Harbor, ME

L27188

Part 3

**PBM:** 841 3320 TIDAL 13 (No PID)

**PBM above SD:** 7.544 m

**GPS Bench Mark:** 841 3320 TIDAL 1 (AI8315)

**MSL above SD:** 2.786 m

**GPS Observation Frequency:** Every five years (Required in 2009)

**Dive Inspection Frequency:** Annually

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
2. Replace the old tide house with a new one; the Harbor Master's office needs to be called to remove camera and electronic equipment from building in advance. The Harbor Master's phone number: 207-288-9690.
3. Include Bench Marks K 22 1934, 841 3320 TIDAL 14, TIDAL 6 STA 11, TIDAL 8 STA 11, TIDAL 9 STA 11 in the level run; these marks were not leveled last year.

**8418150 Portland, ME****L27188****Part 4*****PBM:*** TIDAL 31 STA 84 (OC0005)***PBM above SD:*** 8.406 m***GPS Bench Mark:*** 841 8150 TIDAL (AJ2726)***MSL above SD:*** 4.113 m***GPS Observation Frequency:*** Every five years (Required in 2009)***Dive Inspection Frequency:*** Annually

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
2. Install met sensors during FY09 (barometer and air temperature sensors only – all equipment GFE). Notes shall be provided on the site report if the wind sensors are not feasible due to obstructions. Provide sensor heights and digital photos as specified in the section 2.9 of the Standing Project Instructions, Updated November 2008.
3. Contact the Maine State Pier regarding plans for its redevelopment and relocation of the water level station.
4. Include Bench Marks TIDAL 38 STA 84, 841 8150 C, 841 8150 TIDAL 43, TIDAL 2 USE STA 84, and TIDAL 33 STA 84 in the level run; these marks were not leveled last year.

**8419317 Wells, ME****L27188****Part 5*****PBM:*** 841 9317 PUMP (No PID)***PBM above SD:*** 10.000 m***GPS Bench Mark:*** LORD (OC2106)***MSL above SD:*** 5.933 m***GPS Observation Frequency:*** Every five years (Required in 2009)***Dive Inspection Frequency:*** Annually

1. Coordinate the annual inspection with the COASTAL program manager and Wells Project Manager.
2. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
3. Check serial numbers for both the Xpert and the Dark. (From future work request)
4. Include Bench Marks A 161, B 161, LORD 1975, in the level run; these marks were not leveled last year.
5. Take digital photos of the setting (waist or chest high view) and general location of Bench Marks A 161, B 161, LORD 1975. Take face, setting, and location photos for any newly established marks.

**8423898 Fort Point, NH**

**L27189**

**Part 1**

**PBM:** 842 3898 TIDAL 2 (No PID)

**PBM above SD:** 7.510 m

**GPS Bench Mark:** Undetermined

**MSL above SD:** 2.258 m

**GPS Observation Frequency:** Every five years (Required in 2009)

**Dive Inspection Frequency:** Annually

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
2. Update the bench mark sketch with a clearer image of the area. The current benchmark sketch is unclear.

**8443970 Boston, MA**

**L27190**

**Part 1**

**PBM:** K 12 (MY0555)

**PBM above SD:** 6.858 m

**GPS Bench Mark:** 844 3970 D TIDAL (AJ4030)

**MSL above SD:** 2.660 m

**GPS Observation Frequency:** Every five years (Required in 2009)

**Dive Inspection Frequency:** Annually

1. Install met sensors during FY09 (barometer and air temperature sensors only – all equipment GFE). Notes shall be provided on the site report if the wind sensors are not feasible due to obstructions. Provide sensor heights and digital photos as specified in the section 2.9 of the Standing Project Instructions, Updated November 2008.
2. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
3. **Unresolved from 2007 Project Instructions.** Take one general location photo showing the water level station in relationship to its supporting structure and the local body of water. Take digital photos of the setting (waist or chest high view) and general location of all existing bench marks. Take face, setting, and location photos for any newly established marks.
4. Include Bench Marks 844 3970 D, E 44, 844 3970 TIDAL 1, H 44, 844 3970 TIDAL 15 in the level run; these marks were not leveled last year.

**8447386 Fall River, MA (PORTS)****L27190****Part 2****PBM:** STATE (LW2264)**PBM above SD:** 10.000 m**GPS Bench Mark:** Undetermined**MSL above SD:** 7.029 m**GPS Observation Frequency:** Every five years (Required in 2009)**Dive Inspection Frequency:** Annually

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
2. **Unresolved from 2008 Project Instructions.** Provide sensor heights and digital photos of all installed sensors as specified in the section 2.9 of the Standing Project Instructions, updated November 2008.
3. Include Bench Marks 844 7386 D, 844 7386 E, 844 7386 G, STATE RM 1 in the level run; these marks were not leveled last year.

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

1. Replace wind sensor nose cone.
2. Take one general location photo showing the met station in relationship to its supporting structure and the local body of water.
3. Provide sensor heights and digital photos of all installed sensors as specified in the section 2.9 of the Standing Project Instructions, updated November 2008.

**8447930 Woods Hole, MA****L27190****Part 3****PBM:** 844 7930 TIDAL 11 (LW1571)**PBM above SD:** 3.447 m**GPS Bench Mark:** 844 7930 B TIDAL (AJ4031)**MSL above SD:** 1.096 m**GPS Observation Frequency:** Every five years (Required in 2009)**Dive Inspection Frequency:** Annually

1. Install met sensors during FY09 (barometer and air temperature sensors only – all equipment GFE). Notes shall be provided on the site report if the wind sensors are not feasible due to obstructions. Provide sensor heights and digital photos as specified in the section 2.9 of the Standing Project Instructions, Updated November 2008.
2. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
3. Photos for Bench Mark 844 7930 B have not been submitted. Please submit photos of this bench mark.

**8449130 Nantucket, MA****L27190****Part 4****PBM:** 844 9130 TIDAL 25 (No PID)**PBM above SD:** 3.147 m**GPS Bench Mark:** 844 9130 K TIDAL (AJ4032)**MSL above SD:** 1.454 m**GPS Observation Frequency:** Every five years (Required in 2009)**Dive Inspection Frequency:** Annually

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
2. Include Bench Marks 844 9130 TIDAL 17, 844 9130 TIDAL 24, in the level run; these marks were not leveled last year.

**8452660 Newport, RI (PORTS)****L27191****Part 1****PBM:** 845 2660 TIDAL 6 (LW0493)**PBM above SD:** 2.813 m**GPS Bench Mark:** 845 2660 TIDAL 6 (LW0493)**MSL above SD:** 1.106 m**GPS Observation Frequency:** Every five years (Required in 2009)**Dive Inspection Frequency:** Annually

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
2. Include Bench Marks 845 2660 TIDAL 7, 845 2660 TIDAL 1, NPRI A, NPRI A in the level run; these marks were not leveled last year.
3. Take digital photos of the setting (waist or chest high view) and general location of all existing bench marks. Take face, setting, and location photos for any newly established marks.
4. Update bench mark sketch to a digitized version. Hand drawn sketches will not be accepted anymore. Acceptable bench mark sketch formats include: Google Earth images, AutoCAD drawings, and electronic street maps.
5. Provide a chart section. Previously submitted chart section is illegible.

**8452944 Conimicut Light, RI (PORTS)****L27191****Part 2****PBM:** 845 2944 BOLT**PBM above SD:** 10.532 m**GPS Bench Mark:** N/A**MSL above SD:** 6.290 m**GPS Observation Frequency:** (Waived – not feasible)**Dive Inspection Frequency:** Annually

1. **Unresolved from 2007 Project Instructions.** Take one general location photo showing the water level station in relationship to its supporting structure and the local body of water. Take digital photos of the setting (waist or chest high view) and general location of all existing bench marks. Take face, setting, and location photos for any newly established marks.
2. **Unresolved from 2007 Project Instructions.** Provide sensor heights and digital photos of all installed sensors as specified in the section 2.9 of the Standing Project Instructions, updated November 2008.

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

1. Replace wind sensor nose cone.
2. Take one general location photo showing the met station in relationship to its supporting structure and the local body of water.
3. Provide sensor heights and digital photos of all installed sensors as specified in the section 2.9 of the Standing Project Instructions, updated November 2008.

**8454000 Providence, RI (PORTS)****L27191****Part 3****PBM:** 845 4000 TIDAL 6 RESET (LW0150)**PBM above SD:** 4.493 m**GPS Bench Mark:** 845 4000 L TIDAL (AJ4033)**MSL above SD:** 1.749 m**GPS Observation Frequency:** Every five years (Required in 2009)**Dive Inspection Frequency:** Annually

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
2. Include Bench Marks 845 4000 A TIDAL, 845 4000 B, 845 4000 L, 845 4000 M, 845 4000 N in the level run; these marks were not leveled last year.

**8454049 Quonset Point, RI (PORTS)****L27191****Part 4****PBM:** 845 4049 D (No PID)**PBM above SD:** 10.000 m**GPS Bench Mark:** Undetermined**MSL above SD:** 7.580 m**GPS Observation Frequency:** Every five years (Required in 2009)**Dive Inspection Frequency:** Annually

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
2. **Unresolved from 2006 Project Instructions.** Replace the Vitel gage due to multiple sensor problems.

**8461490 New London, CT****L27192****Part 1****PBM:** 846 1490 TIDAL 15 (LX0157)**PBM above SD:** 4.880 m**GPS Bench Mark:** 846 1490 K TIDAL (LX3418)**MSL above SD:** 1.542 m**GPS Observation Frequency:** Every five years (Required in 2009)**Dive Inspection Frequency:** Annually

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
2. **Unresolved from 2006 Project Instructions.** A dive inspection **MUST** be performed during this site visit; last dive was done in 7/04.
3. Include Bench Marks Y 10, Y 5, 846 1490 M, 846 1490 A in the level run; these marks were not leveled last year.



**8465705 New Haven, CT (PORTS)**  
**(2008 E-site rejected)**

**L27192**

**Part 2**

**PBM:** 846 5705 D (No PID)

**PBM above SD:** 10.000 m

**GPS Bench Mark:** Undetermined

**MSL above SD:** 6.622 m

**GPS Observation Frequency:** Every five years (Required in 2009)

**Dive Inspection Frequency:** Annually

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
2. Search the NGS database for any geodetic marks within one mile leveling distance; if recovered, add to the station network and include them in the level run. NGS marks V 34 (LX0389) and W 34 (LX0393) are located at the head of the harbor but their distance from the station is uncertain.

**8467150 Bridgeport, CT**

**L27192**

**Part 3**

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

**PBM above SD:** 3.544 m

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

**MSL above SD:** 1.708 m

**GPS Observation Frequency:** Every five years (Required in 2009)

**Dive Inspection Frequency:** Annually

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
2. Take digital photos of 846 7150 TIDAL 14.

**8510560 Montauk, NY****L27193****Part 1****PBM:** 851 0560 J (AH6725)**PBM above SD:** 3.618 m**GPS Bench Mark:** TIDAL 9 STA 2 50 (LW0831)**MSL above SD:** 1.554 m**GPS Observation Frequency:** Every five years (Required in 2009)**Dive Inspection Frequency:** Annually

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
2. Install a met tower and met sensors during FY09 (including dual winds, barometer and air temperature sensors – all equipment GFE). Notes shall be provided on the site report if the wind sensors are not feasible due to obstructions. Provide sensor heights and digital photos as specified in the section 2.9 of the Standing Project Instructions, updated November 2008.
3. **Unresolved from 2007 Project Instructions.** A dive inspection **MUST** be performed during this site visit; last dive was done in 10/04.
4. **Unresolved from 2007 Project Instructions.** Take one general location photo showing the water level station in relationship to its supporting structure and the local body of water. Take digital photos of the setting (waist or chest high view) and general location of all existing bench marks. Take face, setting, and location photos for any newly established marks.

**8516945 Kings Point, NY (PORTS)****L27193****Part 2****PBM:** 851 6945 A (No PID)**PBM above SD:** 9.662 m**GPS Bench Mark:** 851 6945 TIDAL 5 (No PID)**MSL above SD:** 5.103 m**GPS Observation Frequency:** Every five years (Required in 2009)**Dive Inspection Frequency:** Annually

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
2. **Unresolved from 2007 Project Instructions.** Only seven bench marks exist at the station. If nearby marks are not found in the NGS database, then establish, describe, and connect via levels three marks stamped 6945 F 2009, 6945 G 2009, and 6945 H 2009. **(Per Task Manager, Brad Wynn, efforts are underway to identify suitable locations, gain required authorizations from property managers, and establish the required additional benchmarks. This work should remain as pending.)**
3. Provide sensor heights and digital photos of all installed sensors as specified in the section 2.9 of the Standing Project Instructions, updated November 2008. **(This will be completed during the November routine service and copies of the digital photos will be provided following the service visit.)**

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

1. Provide sensor heights and digital photos of all installed sensors as specified in the section 2.9 of the Standing Project Instructions, updated November 2008.

**8518750 The Battery, NY (PORTS)****L27193****Part 3****PBM:** 851 8750 TIDAL 7 (AB6736)**PBM above SD:** 5.470 m**GPS Bench Mark:** R 340 (KV0587)**MSL above SD:** 1.785 m**GPS Observation Frequency:** Every five years (Required in 2009)**Dive Inspection Frequency:** Annually

1. Install a met tower and met sensors during FY09 (barometer and air temperature sensors only, winds are not feasible – all equipment GFE). Notes shall be provided on the site report if the wind sensors are not feasible due to obstructions. Provide sensor heights and digital photos as specified in the section 2.9 of the Standing Project Instructions, updated November 2008. Per Brad Wynn not required. **(Response: Per Task Manager, Brad Wynn, air temperature and barometric pressure data for this site are taken from the nearby Robbins Reef met station. No enhancements to the Battery station were requested of the maintenance contractors during this project year. Digital photos of sensors will be taken during the routine November service visit and submitted at that time.)**
2. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
3. **Unresolved from 2007 Project Instructions.** Only seven good bench marks exist at the station. If nearby marks are not found in NGS database, then establish, describe, and connect via levels three new marks, at least one being a 3D rod mark. Stamp the marks 8750 B 2009, 8750 C 2009, 8750 D 2009. **(Response: Per Task Manager, Brad Wynn, efforts are underway to identify suitable locations and work with city surveyors to establish the required additional benchmarks. This will remain as a pending item.)**
4. Take digital photos of the setting (waist or chest high view) and general location of bench mark S 340 Reset 1991.

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

1. Provide sensor heights and digital photos of all installed sensors as specified in the section 2.9 of the Standing Project Instructions, updated November 2008.

**8519483 Bergen Point, NY (PORTS)****L27193****Part 4****PBM:** 851 9483 B TIDAL (AH6737)**PBM above SD:** 6.428 m**GPS Bench Mark:** 851 9483 E (No PID)**MSL above SD:** 2.137 m**GPS Observation Frequency:** Every five years (Required in 2009)**Dive Inspection Frequency:** Annually

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
2. Take digital photos of the setting (waist or chest high view) and general location of Bench Marks 2089 BOR, and 52 C.
3. Repair AC feed at bulkhead. NOAA and/or WHG contact property owner to repair AC.

**8530973 Robbins Reef, NY (PORTS)****Met Only Station**

1. Take one general location photo showing the met station in relationship to its supporting structure and the local body of water.
2. Provide sensor heights and digital photos of all installed sensors as specified in the section 2.9 of the Standing Project Instructions, updated November 2008.

**8531680 Sandy Hook, NJ (PORTS)****L27194****Part 1****PBM:** 853 1680 A TIDAL (KV3519)**PBM above SD:** 3.578 m**GPS Bench Mark:** SIMPSON 2 RM 3 (KV0707)**MSL above SD:** 1.551 m**GPS Observation Frequency:** Every five years (Required in 2009)**Dive Inspection Frequency:** Annually

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
2. **Unresolved from 2007 Project Instructions.** Include in the leveling run one GPS reference mark: AB3784.
3. **Unresolved from 2006 Project Instructions.** Relocate station back to pier.
4. Take one general location photo showing the water level station in relationship to its supporting structure and the local body of water.
5. Pursue AC power supply and phone line installations through USCG.

**8534720 Atlantic City, NJ****L27194****Part 2****PBM:** 853 4720 F (No PID)**PBM above SD:** 10.554 m**GPS Bench Mark:** Undetermined**MSL above SD:** 2.186 m**GPS Observation Frequency:** Every five years (Required in 2009)**Dive Inspection Frequency:** Annually

1. Install met sensors during FY09 (barometer and air temperature sensors only all equipment GFE). Notes shall be provided on the site report if the wind sensors are not feasible due to obstructions. Provide sensor heights and digital photos as specified in the section 2.9 of the Standing Project Instructions, Updated November 2008.
2. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
3. **Unresolved from 2007 Project Instructions.** Develop plans for relocation of the gauge and recon new sites for bench marks, if needed. Install a temporary gauge when given notice to remove the NWLON gauge, as appropriate.
4. Include Bench Marks 27659, 853 4720 I, TIDAL 31 RESET 1973, in the level run; these marks were not leveled last year.

**8536110 Cape May, NJ (PORTS)**

**L27194**

**Part 3**

**PBM:** 853 6110 TIDAL 1 (HU1194)

**PBM above SD:** 4.892 m

**GPS Bench Mark:** J 79 (HU1197)

**MSL above SD:** 1.521 m

**GPS Observation Frequency:** Every five years (Required in 2009)

**Dive Inspection Frequency:** Annually

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
2. **Unresolved from 2007 Project Instructions.** A dive inspection **MUST** be performed during this site visit; last dive was done in 8/04.
3. Include Bench Marks 853 6110 N, 853 6110 R, NO 5 RESET 1986 in the level run; these marks were not leveled last year.
4. Provide sensor heights and digital photos of all installed sensors as specified in the section 2.9 of the Standing Project Instructions, updated November 2008.

**8537121 Ship John Shoal, NJ (PORTS)**

**L27194**

**Part 4**

**(2008 Annual Inspection not done)**

**PBM:** 853 7121 TIDAL 1 (No PID)

**PBM above SD:** 8.666 m

**GPS Bench Mark:** Undetermined

**MSL above SD:** 6.498 m

**GPS Observation Frequency:** Every five years (Required in 2009)

**Dive Inspection Frequency:** Annually

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
2. **Unresolved from 2007 Project Instructions.** Take digital photos of the setting (waist or chest high view) and general location of all existing bench marks.
3. Provide sensor heights and digital photos of all installed sensors as specified in the section 2.9 of the Standing Project Instructions, updated November 2008.

**8538886 Tacony-Palmyra, NJ (PORTS)**

**L27194**

**Part 5**

**PBM:** 853 8886 A (No PID)

**PBM above SD:** 10.084 m

**GPS Bench Mark:** Undetermined

**MSL above SD:** 6.395 m

**GPS Observation Frequency:** Every five years (Required in 2009)

**Dive Inspection Frequency:** Annually

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
2. **Unresolved from 2008 Project Instructions.** Take digital photos of the setting (waist or chest high view) and general location of all existing bench marks.
3. Repair the 3/4 inch liquid tight that is hanging loose under the deck of the cribbing and clean solar panels and replace the batteries.

**8539094 Burlington Bridge, NJ (PORTS)****L27194****Part 6****PBM:** 853 9094 F (No PID)**PBM above SD:** 9.731 m**GPS Bench Mark:** Undetermined**MSL above SD:** 6.313 m**GPS Observation Frequency:** Every five years (Required in 2009)**Dive Inspection Frequency:** Annually

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
2. **Unresolved from 2008 Project Instructions.** Take digital photos of the setting (waist or chest high view) and general location of all existing bench marks. Take face, setting, and location photos for any newly established marks.
3. A dive inspection **MUST** be performed during this site visit; last dive was done in 06/07.
4. Include Bench Marks 9094 A 1977, 9094 B 1977, 9094 C 1977, 9094 D 1977, 9094 E 1977 in the level run; these marks were not leveled last year.

**8540433 Marcus Hook, PA (PORTS)****L27195****Part 1****(2008 Annual Inspection not done)****PBM:** 854 0433 E (No PID)**PBM above SD:** 10.000 m**GPS Bench Mark:** Undetermined**MSL above SD:** 7.546 m**GPS Observation Frequency:** Every five years (Required in 2009)**Dive Inspection Frequency:** Annually

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
2. Take one general location photo showing the water level station in relationship to its supporting structure and the local body of water. Take digital photos of the setting (waist or chest high view) and general location of all existing bench marks. Take face, setting, and location photos for any newly established marks.
3. Provide sensor heights and digital photos of all installed sensors as specified in the section 2.9 of the Standing Project Instructions, updated November 2008.

**8545240 Philadelphia, PA (PORTS)****L27195****Part 2****PBM:** 854 5240 A (No PID)**PBM above SD:** 4.688 m**GPS Bench Mark:** 854 5240 J TIDAL (AJ2129)**MSL above SD:** 2.211 m**GPS Observation Frequency:** Every five years (Required in 2009)**Dive Inspection Frequency:** Annually

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
2. Include Bench Marks 854 5530 TIDAL 23, 854 5530 TIDAL 35, 854 5240 E, in the level run; these marks were not leveled last year.
3. Take digital photos of the setting (waist or chest high view) and general location of bench mark 854 5530 TIDAL 23 and 854 5530 TIDAL 35.

**8548989 Newbold, PA (PORTS)**  
**(2008 docs not submitted yet)**

**L27195**

**Part 3**

**PBM:** 854 8989 A (No PID)

**PBM above SD:** 10.000 m

**GPS Bench Mark:** Undetermined

**MSL above SD:** 5.634 m

**GPS Observation Frequency:** Every five years (Required in 2009)

**Dive Inspection Frequency:** Annually

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
2. **Unresolved from 2006 Project Instructions.** A dive inspection **MUST** be performed during this site visit; last dive was done in 9/02.
3. Take digital photos of the setting (waist or chest high view) and general location of all existing bench marks. Take face, setting, and location photos for any newly established marks.
4. Provide sensor heights and digital photos of all installed sensors as specified in the section 2.9 of the Standing Project Instructions, updated November 2008.

**8551762 Delaware City, DE (PORTS)**  
**(2008 docs not submitted yet)**

**L27196**

**Part 1**

**PBM:** 855 1762 C (No PID)

**PBM above SD:** 10.000 m

**GPS Bench Mark:** Undetermined

**MSL above SD:** ?

**GPS Observation Frequency:** Every five years (Required in 2009)

**Dive Inspection Frequency:** Annually

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
2. Take one general location photo showing the water level station in relationship to its supporting structure and the local body of water. Take digital photos of the setting (waist or chest high view) and general location of all existing bench marks. Take face, setting, and location photos for any newly established marks.
3. Provide sensor heights and digital photos of all installed sensors as specified in the section 2.9 of the Standing Project Instructions, updated November 2008.

**8551910 Reedy Point, DE (PORTS)**

**L27196**

**Part 2**

**PBM:** R 41 (JU2187)

**PBM above SD:** 2.031 m

**GPS Bench Mark:** 855 1910 B TIDAL (JU2189)

**MSL above SD:** 1.301 m

**GPS Observation Frequency:** Every five years (Required in 2009)

**Dive Inspection Frequency:** Annually

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
2. Update bench mark sketch to a digitized version. Hand drawn sketches will not be accepted anymore. Acceptable bench mark sketch formats include: Google Earth images, AutoCAD drawings, and electronic street maps.
3. Include Bench Marks RV 1=TIDAL BM, 855 1910 R 72 W, PORT PENN RM 1, 855 1910 K in the level run; these marks were not leveled last year.

**8551910 Reedy Point Air Gap, DE (PORTS)**

**Met Only Station**

1. Provide digital photos of all installed sensors as specified in the section 2.9 of the Standing Project Instructions, updated November 2008.

**8555889 Brandywine Shoal Light, DE (PORTS)**

**L27196**

**Part 3**

**(2008 Annual Inspection not done)**

**Temp. PBM:** 855 5889 BOLT 1 (No PID)

**PBM above SD:** 8.478 m

**GPS Bench Mark:** Undetermined

**MSL above SD:** 6.590 m

**GPS Observation Frequency:** Every five years (Required in 2009)

**Dive Inspection Frequency:** Annually

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
2. Take digital photos of the setting (waist or chest high view) and general location of all existing bench marks. Take face, setting, and location photos for any newly established marks.



**8557380 Lewes, DE (PORTS)****L27196****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 five years (Required in 2009)**Dive Inspection Frequency:** Annually

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
2. Take one general location photo showing the water level station in relationship to its supporting structure and the local body of water. Take digital photos of the setting (waist or chest high view) and general location of all existing bench marks. Take face, setting, and location photos for any newly established marks.
3. Provide sensor heights and digital photos of all installed sensors as specified in the section 2.9 of the Standing Project Instructions, updated November 2008.
4. Include Bench Marks 855 7380 TIDAL 37, 855 7380 B, 855 7380 D, GPS S 5 A, GPS S 5 in the level run; these marks were not leveled last year.

**8570283 Ocean City Inlet, MD****L27197****Part 1****PBM:** 857 0283 J (No PID)**PBM above SD:** 4.979 m**GPS Bench Mark:** SPEICHER (HU0266)**MSL above SD:** 2.829 m**GPS Observation Frequency:** Every five years (Required in 2009)**Dive Inspection Frequency:** Annually

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
2. Include Bench Marks TIDAL 6 STA 1, F 104, 857 0283 11/11 INLET, 857 0283 OCM 1B, SPEICHER, in the level run; these marks were not leveled last year.

**8571359 Snow Hill, MD****L27197****Part 20****PBM:** 21 BALTO (No PID)**PBM above SD:** 10.000 m**GPS Bench Mark:** Undetermined**MSL above SD:** 4.057 m**GPS Observation Frequency:** Every five years (Not required this year)**Dive Inspection Frequency:** Annually

1. This station will remain in operation to support Photogrammetric projects.

**8571421 Bishops Head, MD****L27197****Part 11*****PBM:*** 857 1421 A (No PID)***PBM above SD:*** 10.000 m***GPS Bench Mark:*** 857 1421 GRANGER (No PID)***MSL above SD:*** 9.111 m***GPS Observation Frequency:*** Every five years (Required in 2009)***Dive Inspection Frequency:*** Annually

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
2. Coordinate with the COASTAL program manager to ensure that educational material is provided to the Karen Noonan Center. This was a condition of our agreement to establish the station.
3. **Unresolved from 2007 Project Instructions (no photos submitted).** Take one general location photo showing the water level station in relationship to its supporting structure and the local body of water. Take digital photos of the setting (waist or chest high view) and general location of all existing bench marks. Take face, setting, and location photos for any newly established marks.
4. Provide sensor heights and digital photos of all installed sensors as specified in the section 2.9 of the Standing Project Instructions, updated November 2008.

**8571559 McCready's Creek, MD****L27197****Part 8*****PBM:*** 857 1559 B (No PID)***PBM above SD:*** 3.157 m***GPS Bench Mark:*** Undetermined***MSL above SD:*** 2.400 m***GPS Observation Frequency:*** Every five years (Not required this year)***Dive Inspection Frequency:*** Annually

1. This station will remain in operation to support COASTAL Program and the Photogrammetric project in Chesapeake Bay.

**8571773 Vienna, MD****L27197****Part 21*****PBM:*** 857 1773 X5 RESET (HU0640)***PBM above SD:*** 10.000 m***GPS Bench Mark:*** Undetermined***MSL above SD:*** 6.907 m***GPS Observation Frequency:*** Every five years (Not required this year)***Dive Inspection Frequency:*** Annually

1. This station will remain in operation to support Photogrammetric projects.

**8571892 Cambridge, MD**  
**(2008 does not submitted yet)**

**L27197**

**Part 2**

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

**PBM above SD:** 3.344 m

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

**MSL above SD:** 1.060 m

**GPS Observation Frequency:** Every five years (Not required this year)

**Dive Inspection Frequency:** Annually

1. Submit all documentation from 2008 GPS survey.
2. **Unresolved from 2007 Project Instructions (no photos submitted).** Take one general location photo showing the water level station in relationship to its supporting structure and the local body of water. Take digital photos of the setting (waist or chest high view) and general location of all existing bench marks. Take face, setting, and location photos for any newly established marks.
3. Provide sensor heights and digital photos of all installed sensors as specified in the section 2.9 of the Standing Project Instructions, updated November 2008.

**8573349 Crumpton, MD**

**L27197**

**Part 26**

**PBM:** 857 3349 A (No PID)

**PBM above SD:** 10.000 m

**GPS Bench Mark:** Undetermined

**MSL above SD:** 3.714 m

**GPS Observation Frequency:** Every five years (Not required this year)

**Dive Inspection Frequency:** Annually

**Only three marks originally installed by FOD.**

1. This station will remain in operation to support Photogrammetric projects.
2. FOD to install two additional marks, either rod or surface, prior to next leveling by the contractor. Update the bench mark sketch, provide bench mark descriptions and take required photos for each mark.
3. **Unresolved from 2007 Project Instructions (no photos submitted).** Take digital photos of the setting (waist or chest high view) and general location of all existing bench marks. Take face, setting, and location photos for any newly established marks.

**8573364 Tolchester, MD (PORTS)**

**L27197**

**Part 3**

**PBM:** 857 3364 A (No PID)

**PBM above SD:** 2.963 m

**GPS Bench Mark:** 857 3364 B TIDAL (AJ8034)

**MSL above SD:** 1.295 m

**GPS Observation Frequency:** Every five years (Required in 2009)

**Dive Inspection Frequency:** Annually

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
2. Include bench mark 857 3364 KNOB in the level run; this mark was not leveled last year or indicates possible movement.
3. Take digital photos of the setting (waist or chest high view) and general location of 857 3364 KNOB bench mark. Take face, setting, and location photos for any newly established marks.

**8573927 Chesapeake City, MD (PORTS)****L27197****Part 4****PBM:** U 2 (JU1833)**PBM above SD:** 3.158 m**GPS Bench Mark:** Undetermined**MSL above SD:** 1.417 m**GPS Observation Frequency:** Every five years (Not required this year)**Dive Inspection Frequency:** Annually

1. **Unresolved from 2007 Project Instructions. No comments were provided in the Site Report indicating if this task was completed, no photos were submitted, and bench mark sketch was not sent.** Recover bench mark 857 3927 A. Provide digital photos, add the mark to the bench mark sketch, and include it in the level run.

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

1. Leveling requirements not yet determined for air gap sensors; no action necessary this year unless this requirement is defined at a later date.

**8574680 Baltimore, MD (PORTS)****L27197****Part 5****PBM:** 857 4680 TIDAL 32 (JV0586)**PBM above SD:** 3.158 m**GPS Bench Mark:** 857 4680 TIDAL BASIC (JV0578)**MSL above SD:** 1.495 m**GPS Observation Frequency:** Every five years (Required in 2009)**Dive Inspection Frequency:** Annually

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
2. Take digital photos of the setting (waist or chest high view) and general location of all existing bench marks. Take face, setting, and location photos for any newly established marks.

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

1. Replace wind sensor nose cone.
2. **Unresolved from 2007 Project Instructions (no photos submitted).** Take one general location photo showing the met station in relationship to its supporting structure and the local body of water.
3. Provide sensor heights and digital photos of all installed sensors as specified in the section 2.9 of the Standing Project Instructions, updated November 2008.

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

1. Replace wind sensor nose cone.
2. Provide sensor heights and digital photos of all installed sensors as specified in the section 2.9 of the Standing Project Instructions, updated November 2008.
3. Take one general location photo showing the met station in relationship to its supporting structure and the local body of water.

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

**Met Only Station**

1. Provide sensor heights and digital photos of all installed sensors as specified in the section 2.9 of the Standing Project Instructions, updated November 2008.

**8575512 Annapolis, MD (PORTS)**

**L27197**

**Part 6**

**PBM:** 857 5512 TIDAL 7 (HV0207)

**PBM above SD:** 2.877 m

**GPS Bench Mark:** 857 5512 D TIDAL (AJ8035)

**MSL above SD:** 1.596 m

**GPS Observation Frequency:** Every five years (Required in 2009)

**Dive Inspection Frequency:** Annually

1. Install a met tower and met sensors during FY09 (including dual winds, barometer and air temperature sensors – all equipment GFE). Notes shall be provided on the site report if the wind sensors are not feasible due to obstructions. Provide sensor heights and digital photos as specified in the section 2.9 of the Standing Project Instructions, updated November 2008.
2. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
3. FOD was denied permission to relocate the station outside of the lab. FOD will continue to investigate other locations for the station.

**8577330 Solomons Island, MD (PORTS)**

**L27197**

**Part 7**

**PBM:** 857 7330 E TIDAL (AJ8036)

**PBM above SD:** 4.456 m

**GPS Bench Mark:** 857 7330 E TIDAL (AJ8036)

**MSL above SD:** 1.366 m

**GPS Observation Frequency:** Every five years (Required in 2009)

**Dive Inspection Frequency:** Annually

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
2. Provide sensor heights and digital photos of all installed sensors as specified in the section 2.9 of the Standing Project Instructions, updated November 2008.

**8577018 Cove Point, MD (PORTS)**

**Met Only Station**

1. Replace wind sensor nose cone.
2. **Unresolved from 2007 Project Instructions (no photos submitted).** Take one general location photo showing the met station in relationship to its supporting structure and the local body of water.
3. Provide sensor heights and digital photos of all installed sensors as specified in the section 2.9 of the Standing Project Instructions, updated November 2008.

**8578240 Piney Point, MD (PORTS)****Met Only Station**

1. Replace wind sensor nose cone.
2. **Unresolved from 2007 Project Instructions (no photos submitted).** Take one general location photo showing the met station in relationship to its supporting structure and the local body of water.
3. Provide sensor heights and digital photos of all installed sensors as specified in the section 2.9 of the Standing Project Instructions, updated November 2008.

**8579542 Lower Marlboro, MD****L27197****Part 28****PBM:** 857 9542 TIDAL 5**PBM above SD:** 10.000 m**GPS Bench Mark:** Undetermined**MSL above SD:** 2.879 m**GPS Observation Frequency:** Every five years (Required in 2009)**Dive Inspection Frequency:** Annually

1. This station will remain in operation to support Photogrammetric projects.
2. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
3. **Unresolved from 2007 Project Instructions (no photos submitted).** Take one general location photo showing the water level station in relationship to its supporting structure and the local body of water. Take digital photos of the setting (waist or chest high view) and general location of all existing bench marks. Take face, setting, and location photos for any newly established marks.

**8594900 Washington, DC (PORTS)****L27198****Part 1****PBM:** 859 4900 TIDAL 1 (HV1980)**PBM above SD:** 4.115 m**GPS Bench Mark:** 859 4900 TIDAL 4 (HV9068)**MSL above SD:** 1.859 m**GPS Observation Frequency:** Every five years (Required in 2009)**Dive Inspection Frequency:** Annually

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
2. **Unresolved from 2007 Project Instructions.** Install a special clamp made to attach to the lower unprotected section of the well. (No comment was provided in FY08 package.)
3. Take one general location photo showing the water level station in relationship to its supporting structure and the local body of water. Take digital photos of the setting (waist or chest high view) and general location of all existing bench marks. Take face, setting, and location photos for any newly established marks.

**8631044 Wachapreague, VA****L27199****Part 1****(Waiting on E-site)****PBM:** 863 1044 B (No PID)**PBM above SD:** 4.130 m**GPS Bench Mark:** 863 1044 K TIDAL (AJ4587)**MSL above SD:** 1.401 m**GPS Observation Frequency:** Every five years (Required in 2009)**Dive Inspection Frequency:** Annually

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.

**8632200 Kiptopeke, VA (PORTS)****L27199****Part 2****PBM:** L 418 (FW0303)**PBM above SD:** 4.093 m**GPS Bench Mark:** 863 2200 B TIDAL (AJ4588)**MSL above SD:** 1.539 m**GPS Observation Frequency:** Every five years (Required in 2009)**Dive Inspection Frequency:** Annually

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
2. Update bench mark sketch to a digitized version. Hand drawn sketches will not be accepted anymore. Acceptable bench mark sketch formats include: Google Earth images, AutoCAD drawings, and electronic street maps.

**8632837 Rappahannock Light, VA (PORTS)****Met Only Station**

1. Replace wind sensor nose cone.
2. **Unresolved from 2007 Project Instructions (no photos submitted).** Take one general location photo showing the met station in relationship to its supporting structure and the local body of water.
3. Provide sensor heights and digital photos of all installed sensors as specified in the section 2.9 of the Standing Project Instructions, updated November 2008.

**8635150 Colonial Beach, VA (PORTS)****L27199****Part 3****PBM:** 863 5150 E (No PID)**PBM above SD:** 2.729 m**GPS Bench Mark:** 863 5150 TIDAL 8 (HV8249)**MSL above SD:** 1.099 m**GPS Observation Frequency:** Every five years (Required in 2009)**Dive Inspection Frequency:** Annually

1. **Unresolved from 2007 Project Instructions.** Rebuild the station if an appropriate location and structure are identified; the city has declined permission for using the city pier. The station was destroyed by Hurricane Isabel in 2003.
2. If station rebuild is feasible, then perform a reconnaissance of the site to find an appropriate location for installing a meteorological sensor package (tower with dual wind birds, air temperature sensor, and barometer) in FY09, using CO-OPS Water Level and Meteorological Site Reconnaissance Procedures (updated March 2007) as a guideline, and provide a report with digital photos, measurements, and notes along with the required documentation from the Annual Inspection.
3. If the station is re-installed, GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.

**8635750 Lewisetta, VA (PORTS)****L27199****Part 4****PBM:** R 462 (GV0156)**PBM above SD:** 2.874 m**GPS Bench Mark:** 863 5750 J TIDAL (AJ4589)**MSL above SD:** 1.685 m**GPS Observation Frequency:** Every five years (Required in 2009)**Dive Inspection Frequency:** Annually

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
2. Include Bench Mark 863 5750 G in the level run; this mark was not leveled last year.
3. Take digital photos of the setting (waist or chest high view) and general location Bench Mark 863 5750 G. Take face, setting, and location photos for any newly established marks.



**8636580 Windmill Point, VA (PORTS)****L27199****Part 5****PBM:** 863 6580 B (No PID)**PBM above SD:** 1.842 m**GPS Bench Mark:** Undetermined**MSL above SD:** 0.903 m**GPS Observation Frequency:** Every five years (Required in 2009)**Dive Inspection Frequency:** Annually

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
2. **Unresolved from 2007 Project Instructions.** Investigate moving protective well to a deeper location. Well consistently silts in and the data becomes degraded.
3. Only three bench marks exist at this station. If nearby marks are not found in the NGS database, then establish, describe, and connect via levels two marks stamped 6580 E 2009 and 6580 F 2009.
4. Update bench mark sketch to a digitized version, including the new marks. Hand drawn sketches will not be accepted anymore. Acceptable bench mark sketch formats include: Google Earth images, AutoCAD drawings, and electronic street maps.
5. Take digital photos of the setting (waist or chest high view) and general location of bench marks 863 6580 SRM. Take face, setting, and location photos for any newly established marks.

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

1. Replace wind sensor nose cone.
2. **Unresolved from 2007 Project Instructions (no photos submitted).** Take one general location photo showing the met station in relationship to its supporting structure and the local body of water.
3. Provide sensor heights and digital photos of all installed sensors as specified in the section 2.9 of the Standing Project Instructions, updated November 2008.

**8637689 Yorktown, VA (PORTS)****L27199****Part 6****PBM:** 863 7689 B (No PID)**PBM above SD:** 5.070 m**GPS Bench Mark:** Undetermined**MSL above SD:** 1.981 m**GPS Observation Frequency:** Every five years (Required in 2009)**Dive Inspection Frequency:** Annually

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
2. The tower needs to be disconnected and all the solar panels, GOES, windbird, etc. need to have their wires lengthened, to allow the tower to be lowered for service.

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

**Met Only Station**

1. Replace wind sensor nose cone
2. **Unresolved from 2007 Project Instructions (no photos submitted).** Take one general location photo showing the water level station in relationship to its supporting structure and the local body of water.
3. Provide sensor heights and digital photos of all installed sensors as specified in the section 2.9 of the Standing Project Instructions, updated November 2008.

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

**Met Only Station**

1. Replace wind sensor nose cone
2. **Unresolved from 2007 Project Instructions (no photos submitted).** Take one general location photo showing the water level station in relationship to its supporting structure and the local body of water.
3. Provide sensor heights and digital photos of all installed sensors as specified in the section 2.9 of the Standing Project Instructions, updated November 2008.

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

**Met Only Station**

1. Replace wind sensor nose cone
2. Take one general location photo showing the water level station in relationship to its supporting structure and the local body of water.
3. Provide sensor heights and digital photos of all installed sensors as specified in the section 2.9 of the Standing Project Instructions, updated November 2008.

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

**L27199**

**Part 7**

**PBM:** TIDAL 6 STA 97 (No PID)

**PBM above SD:** 5.197 m

**GPS Bench Mark:** L 308 RESET (FX4422)

**MSL above SD:** 1.748 m

**GPS Observation Frequency:** Every five years (Required in 2009)

**Dive Inspection Frequency:** Annually

1. GPS observations are required this year. Refer to the User’s Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
2. Upgrade the tsunami software.

**8638863 Chesapeake Bay Bridge Tunnel, VA (PORTS) L27199**

**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 five years (Required in 2009)

**Dive Inspection Frequency:** Annually

1. GPS observations are required this year. Refer to the User’s Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
2. **Unresolved from 2007 Project Instructions.** Station interior needs to be refurbished. The top cap needs to be removed and new additional aluminum wells need to be jacked into ocean bottom and secured to building floor with additional access holes.

**8638979 Chesapeake Light, VA (PORTS)**  
**(IS THIS STATION OPERATIONAL?)**

**Met Only Station**

1. **Unresolved from 2007 Project Instructions (no photos submitted).** Take one general location photo showing the water level station in relationship to its supporting structure and the local body of water.
2. Provide sensor heights and digital photos of all installed sensors as specified in the section 2.9 of the Standing Project Instructions, updated November 2008.
3. Replace wind sensor nose cone

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

**Met Only Station**

1. Replace wind sensor nose cone
2. **Unresolved from 2007 Project Instructions (no photos submitted).** Take one general location photo showing the water level station in relationship to its supporting structure and the local body of water.
3. Provide sensor heights and digital photos of all installed sensors as specified in the section 2.9 of the Standing Project Instructions, updated November 2008.

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

**L27199**

**Part 9**

**(Waiting on E-site submission)**

**PBM:** 863 9348 E (No PID)

**PBM above SD:** 10.000 m

**GPS Bench Mark:** 863 9348 D TIDAL (AJ4592)

**MSL above SD:** 7.067 m

**GPS Observation Frequency:** Every five years (Required in 2009)

**Dive Inspection Frequency:** Annually

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
2. **Unresolved from 2007 Project Instructions.** Replace the brass section of the sounding tube. Replace wind sensor nose cone.
3. **Unresolved from 2007 Project Instructions (no photos submitted).** Take one general location photo showing the water level station in relationship to its supporting structure and the local body of water. Take digital photos of the setting (waist or chest high view) and general location of all existing bench marks. Take face, setting, and location photos for any newly established marks.
4. Include Bench Mark DRAW RM 2, DRAW RM 1 in the level run; these marks were not leveled last year.

**8639207 Rudee Inlet, VA**  
**(2008 docs not submitted yet)**

**L27199**

**Part 12**

**PBM:** 863 9207 C

**PBM above SD:** 2.440 m

**GPS Bench Mark:** undetermined

**MSL above SD:** 1.317 m

**GPS Observation Frequency:** Every five years (Required in 2009)

**Dive Inspection Frequency:** Annually

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
2. Perform closing levels to all marks and remove the hydro gauge after HPT notifies its removal status.

**8651370 Duck, NC**

**L27200**

**Part 1**

**PBM:** 865 1370 B TIDAL, (FW0688)

**PBM above SD:** 10.061 m

**GPS Bench Mark:** 865 1370 C (FW0686)

**MSL above SD:** 6.202 m

**GPS Observation Frequency:** Every five years (Not required this year)

**Dive Inspection Frequency:** Annually

1. Include Bench Marks C 255, B 255, 865 1370 A TIDAL, 865 1370 C TIDAL, 865 1370 D TIDAL, 865 1370 E TIDAL, 865 1370 F TIDAL in the level run; these marks were not leveled last year.

**8652587 Oregon Inlet Marina, NC**

**L27200**

**Part 5**

**PBM:** 865 2587 NO 3 TIDAL (EX0150)

**PBM above SD:** 5.214 m

**GPS Bench Mark:** 865 2587 TIDAL A

**MSL above SD:** 0.979 m

**GPS Observation Frequency:** Every five years (Not required this year)

**Dive Inspection Frequency:** Annually

1. No further requirements.

**8654400 Cape Hatteras, NC****L27200****Part 2****PBM:** 865 4400 NO 1 TIDAL (EX0250)**PBM above SD:** 3.408 m**GPS Bench Mark:** 865 4400 NO 2 TIDAL (EX0249)**MSL above SD:** 1.453 m**GPS Observation Frequency:** Every five years (Required in 2009)**Dive Inspection Frequency:** Annually

1. **Unresolved from 2007 Project Instructions:** FOD has evaluated the new pier structure to be unacceptable for long term data collection. An alternate site is being investigated at the Coast Guard Station at Hatteras Inlet. The station shall be relocated if this site is determined to be acceptable and permission is obtained. The DCPs shall be upgraded to the Sutron Xpert and Xpert Dark when the station is installed.
2. Perform a reconnaissance of the site to find an appropriate location for installing a meteorological sensor package (tower with dual wind birds, air temperature sensor, and barometer) in FY09, using CO-OPS Water Level and Meteorological Site Reconnaissance Procedures (updated March 2007) as a guideline, and provide a report with digital photos, measurements, and notes along with the required documentation from the Annual Inspection.
3. If the station is re-installed, GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.

**8656483 Duke Marine Lab, NC****L27200****Part 3****PBM:** 865 6483 NO 11 (AI9505)**PBM above SD:** 3.097 m**GPS Bench Mark:** 865 6483 E TIDAL (DE7961)**MSL above SD:** 1.083 m**GPS Observation Frequency:** Every five years (Not required this year)**Dive Inspection Frequency:** Annually

1. Only eight bench marks exist at this station. If nearby marks are not found in the NGS database, then establish, describe, and connect via levels two marks stamped 6483 J 2009 and 6483 K 2009.
2. Update the bench mark sketch with the new marks.
3. Take digital photos of the setting (waist or chest high view) and general location of bench mark 865 6483 E. Take face, setting, and location photos for any newly established marks.

**8658120 Wilmington, NC****L27200****Part 4****PBM:** 865 8120 D (No PID)**PBM above SD:** 2.454 m**GPS Bench Mark:** 865 8120 C TIDAL RM 1 (EA3063)**MSL above SD:** 1.490 m**GPS Observation Frequency:** Every five years (Required in 2009)**Dive Inspection Frequency:** Annually

1. Install met sensors during FY09 (barometer and air temperature sensors only – all equipment GFE). Notes shall be provided on the site report if the wind sensors are not feasible due to obstructions. Provide sensor heights and digital photos as specified in the section 2.9 of the Standing Project Instructions, Updated November 2008.
2. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
3. **Unresolved from 2007 Project Instructions:** Take one general location photo showing the water level station in relationship to its supporting structure and the local body of water. Take digital photos of the setting (waist or chest high view) and general location of all existing bench marks. Take face, setting, and location photos for any newly established marks.

**8658163 Wrightsville Beach, NC****L27200****Part 11****PBM:** 865 8163 A (No PID)**PBM above SD:** 10.000 m**GPS Bench Mark:** C 163 (EA0631)**MSL above SD:** 6.446 m**GPS Observation Frequency:** Every five years (Required in 2009)**Dive Inspection Frequency:** Annually

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
2. Check field barometer per barometer calibration guidelines for existing barometer installation. Compute and store new barometer coefficient C2. (The barometer was not tested because the field party did not have a handheld barometer tester).
3. Take digital photos of the setting (waist or chest high view) and general location of bench mark D 163 1963. Take face, setting, and location photos for any newly established marks.
4. Recover and provide description for Bench Mark 865 8163 TIDAL 7.

**8661070 Springmaid Pier, SC****L27201****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 five years (Not required this year)**Dive Inspection Frequency:** Annually

1. Replace the hinges on the trap door in the pier deck.
2. Provide sensor heights and digital photos of all installed sensors as specified in the section 2.9 of the Standing Project Instructions, updated November 2008.

**8662245 Oyster Landing, SC            L27201            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:** 2.007 m

**GPS Observation Frequency:** Every five years (last completed in 2007)

**Dive Inspection Frequency:** Annually

1. Add the standard title block to the bench mark sketch.

**8665530 Charleston, SC**

**L27201**

**Part 2**

**PBM:** 866 5530 TIDAL 13 (CJ0085)

**PBM above SD:** 4.020 m

**GPS Bench Mark:** 866 5530 TIDAL 13 (CJ0085)

**MSL above SD:** 1.733 m

**GPS Observation Frequency:** Every five years (Not required this year)

**Dive Inspection Frequency:** Annually

1. Install a met tower and met sensors during FY09 (including dual winds, barometer and air temperature sensors – all equipment GFE). Notes shall be provided on the site report if the wind sensors are not feasible due to obstructions. Provide sensor heights and digital photos as specified in the section 2.9 of the Standing Project Instructions, updated November 2008.
2. **Unresolved from 2007 Project Instructions:** Take digital photos of the setting (waist or chest high view) and general location of all existing bench marks. Take face, setting, and location photos for any newly established marks.
3. Include Bench Marks 866 5530 TIDAL 7, TIDAL 9, TIDAL 11, and TIDAL 12 in the level run; these marks were not hit last year.

**8670870 Fort Pulaski, GA**

**L27201**

**Part 1**

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

**PBM above SD:** 4.877 m

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

**MSL above SD:** 2.230 m

**GPS Observation Frequency:** Every five years (last completed in 2007)

**Dive Inspection Frequency:** Annually

1. Adjust the tight fitting door.
2. Include Bench Marks 867 0870 TIDAL 1 and TIDAL 2 in the level run; these marks were not hit last year.

**8677344 St. Simons Island, GA**

**L27201**

**Part 2**

**PBM:** TIDAL 2 (BR0078)

**PBM above SD:** 5.606m

**GPS Bench Mark:** Undetermined

**MSL above SD:** 1.606m

**GPS Observation Frequency:** Every five years (last completed in 2007)

**Dive Inspection Frequency:** Annually

1. Remove the station when notified that it is no longer needed for hydro support.

## 2.2. FOD/ARO – GULF COAST & CARIBBEAN ISLANDS STATIONS

### 8726384 Port Manatee, FL (PORTS)

L27203

Part 20

*PBM:* 872 6384 E TIDAL (AG7341)

*PBM above SD:* 2.666 m

*GPS Bench Mark:* 872 6384 E TIDAL (AG7341)

*MSL above SD:* 0.419 m

*GPS Observation Frequency:* Every five years (Required in 2009)

*Dive Inspection Frequency:* Annually

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

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
2. Replace the wind sensor nose cone.

### 8726413 C-Cut, FL (PORTS)

Met Only Station

1. Replace the wind sensor nose cone.
2. Provide sensor heights and digital photos of all installed sensors as specified in the section 2.9 of the Standing Project Instructions, Updated November 2008.

### 8726520 St. Petersburg, FL (PORTS)

L27203

Part 11

*PBM:* 872 6520 F (No PID)

*PBM above SD:* 4.023 m

*GPS Bench Mark:* 872 6520 K (No PID)

*MSL above SD:* 1.394 m

*GPS Observation Frequency:* Every five years (Required in 2009)

*Dive Inspection Frequency:* Annually

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

1. **Unresolved from 2008 Project Instructions.** Provide digital photos of all installed sensors as specified in the section 2.9 of the Standing Project Instructions, Updated November 2008.
2. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
3. Replace the wind sensor nose cone.



**8726607 Old Port Tampa, FL (PORTS)****L27203****Part 21****PBM:** 872 6607 A (No PID)**PBM above SD:** 10.000 m**GPS Bench Mark:** 872 6607 A (No PID)**MSL above SD:** 9.018 m**GPS Observation Frequency:** Every five years (Required in 2009)**Dive Inspection Frequency:** Annually

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

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
2. Replace the wind sensor nose cone.

**8726667 CSX Rockport Terminal, FL (PORTS)****L27203****Part 22****PBM:** 872 6667 J (No PID)**PBM above SD:** 3.120 m**GPS Bench Mark:** 872 6667 J (No PID)**MSL above SD:** 0.542 m**GPS Observation Frequency:** Every five years (Required in 2009)**Dive Inspection Frequency:** Annually

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.

**8726669 Berth 223, FL (PORTS)****Met Only Station**

1. Replace wind sensor nose cone.
2. Provide sensor heights and digital photos of all installed sensors as specified in the section 2.9 of the Standing Project Instructions, Updated November 2008.

**8726673 SEABULK, FL (PORTS)****Met Only Station**

1. Replace wind sensor nose cone.
2. Provide sensor heights and digital photos of all installed sensors as specified in the section 2.9 of the Standing Project Instructions, Updated November 2008.

**8726694 TPA Cruise Terminal 2, FL (PORTS)****Met Only Station**

1. Replace wind sensor nose cone.
2. Provide sensor heights and digital photos of all installed sensors as specified in the section 2.9 of the Standing Project Instructions, Updated November 2008.

**8735181 Dauphin Island, AL (Hydro)****L27204****Part 2****PBM:** 873 5180 TIDAL 1 (BH1756)**PBM above SD:** 6.288 m**GPS Bench Mark:** 873 5180 TIDAL 1 (BH1756)**MSL above SD:** 1.058 m**GPS Observation Frequency:** NA**Dive Inspection Frequency:** Annually

1. Perform closing levels, if not done in FY 2008, and then remove the hydro gauge.

**8732828 Weeks Bay, AL (NERRS)****L27204****Part 11*****PBM:*** 873 2828 A (No PID)***PBM above SD:*** 10.000 m***GPS Bench Mark:*** Select most stable mark observable***MSL above SD:*** 9.452m***GPS Observation Frequency:*** Annually***Dive Inspection Frequency:*** Annually

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
2. Coordinate requirements with COASTAL Program manager and Weeks Bay Project Manager.

**8743281 Ocean Springs, MS****L27205****Part 4*****PBM:*** 874 3281 A (No PID)***PBM above SD:*** 10.000m***GPS Bench Mark:*** Select most stable mark observable***MSL above SD:*** 9.458m***GPS Observation Frequency:*** Annually***Dive Inspection Frequency:*** Annually

This station may be installed under a new contract; installation during FY09 is uncertain.

1. Reinstallation of this NWLON station is uncertain. USGS single pile stations have been installed in the Mississippi Sound area, possibly leading to deleting the requirement for this station. The station, if still needed, may be reinstalled at Cadet Point or another nearby location, depending on information obtained from a recon.

**8745557 Gulfport Harbor, MS****L27205****Part 5*****PBM:*** 874 5557 C (No PID)***PBM above SD:*** 2.934 m***GPS Bench Mark:*** 874 5557 TIDAL 2 (BH0865)***MSL above SD:*** 0.996 m***GPS Observation Frequency:*** Annually***Dive Inspection Frequency:*** Annually

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
2. Remove the water level station if HPT no longer needs the station.

**8765251 Cypremort Point, LA**  
**PBM:** 876 5251 CYPR (DJ9345)  
**GPS Bench Mark:** CYPR (DJ9345)  
**GPS Observation Frequency:** Annually  
**Dive Inspection Frequency:** Annually

**L27206**

**Part 7**  
**PBM above SD:** 8.495 m  
**MSL above SD:** 7.556 m

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
2. **Unresolved from 2007 Project Instructions.** Take digital photos of the setting (waist or chest high view) and general location of all existing bench marks. Take face, setting, and location photos for any newly established marks.

**9751364 Christiansted Harbor, St. Croix, VI**

**L27209**

**Part 3**  
**PBM above SD:** 10.000 m  
**MSL above SD:** 8.362 m

**PBM:** 975 1364 A (No PID)  
**GPS Bench Mark:** 975 1364 A (No PID)  
**GPS Observation Frequency:** Every five years (Not required this year)  
**Dive Inspection Frequency:** Annually

1. No further requirements.

**9751381 Lameshur Bay, St Johns, VI**

**L27209**

**PART 4**  
**PBM above SD:** 10.000 m  
**MSL above SD:** 8.924 m

**PBM:** 975 1391 A (No PID)  
**GPS Bench Mark:** 975 1391 A (No PID)  
**GPS Observation Frequency:** Every five years (Not required this year)  
**Dive Inspection Frequency:** Annually

1. Verify and update barometer sensor height.
2. Update bench mark sketch to a digitized version. Hand drawn sketches will not be accepted anymore. Acceptable bench mark sketch formats include: Google Earth images, AutoCAD drawings, and electronic street maps.

**9751401 Limetree Bay, St. Croix, VI**

**L27209**

**Part 1**  
**PBM above SD:** 13.612 m  
**MSL above SD:** 10.501 m

**PBM:** 975 1401 M (No PID)  
**GPS Bench Mark:** 975 1401 M (No PID)  
**GPS Observation Frequency:** Every five years (Not required this year)  
**Dive Inspection Frequency:** Annually

1. **Unresolved from 2008 Project Instructions:** Establish, describe, and connect via levels a surface mark on rock outcrop, designation/stamping: 975 1401 S/1401 S 2009.
2. Include Bench Marks 975 1401 B, 975 1401 C, and 975 1401 H in the level run; these marks have not been leveled since 2002.
3. Update bench mark sketch to a digitized version. Hand drawn sketches will not be accepted anymore. Acceptable bench mark sketch formats include: Google Earth images, AutoCAD drawings, and electronic street maps.

**9751639 Charlotte Amalie, St. Thomas, VI****L27209****Part 2****PBM:** 975 1639 F (No PID)**PBM above SD:** 3.267 m**GPS Bench Mark:** Select most stable mark observable**MSL above SD:** 1.715 m**GPS Observation Frequency:** Every five years (Required in 2009)**Dive Inspection Frequency:** Annually

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
2. **Unresolved from 2008 Project Instructions:** Include Bench Marks 975 1693 TIDAL 3, 975 1639 TIDAL 5, and 975 1639 L in the level run; these marks have not been leveled since 2004.
3. Update bench mark sketch to a digitized version. Hand drawn sketches will not be accepted anymore. Acceptable bench mark sketch formats include: Google Earth images, AutoCAD drawings, and electronic street maps.

**9752235 Culebra, PR****L27208****Part 6****PBM:** 975 2235 A TIDAL (No PID)**PBM above SD:** 10.000 m**GPS Bench Mark:** 975 2235 A TIDAL (No PID)**MSL above SD:** 8.523 m**GPS Observation Frequency:** Every five years (Not required this year)**Dive Inspection Frequency:** Annually

1. Install a met tower and met sensors during FY09 (including dual winds, barometer and air temperature sensors – all equipment GFE). Notes shall be provided on the site report if the wind sensors are not feasible due to obstructions. Provide sensor heights and digital photos as specified in the section 2.9 of the Standing Project Instructions, Updated November 2008.
2. Establish, describe, and connect via levels two surface marks or marks on rock outcrop, designation/stamping: 975 2235 J/2235 J 2009, and 975 2235 K/2235 K 2009.
3. Update bench mark sketch to a digitized version. Hand drawn sketches will not be accepted anymore. Acceptable bench mark sketch formats include: Google Earth images, AutoCAD drawings, and electronic street maps.
4. Coordinate through COASTAL program manager to notify local partner (Puerto Rico Seismic Network) after the met upgrade is completed.
5. Install the digital display as designed for the inside of the ferry terminal as per the request of the local authorities.

**9752695 Vieques Island, PR**

**L27208**

**Part 7**

**PBM:** 975 2295 A TIDAL (No PID)

**PBM above SD:** 10.000 m

**GPS Bench Mark:** 975 2295 A TIDAL (No PID)

**MSL above SD:** 8.035 m

**GPS Observation Frequency:** Every five years (Not required this year)

**Dive Inspection Frequency:** Annually

1. Install a met tower and met sensors during FY09 (including dual winds, barometer and air temperature sensors – all equipment GFE). Notes shall be provided on the site report if the wind sensors are not feasible due to obstructions. Provide sensor heights and digital photos as specified in the section 2.9 of the Standing Project Instructions, Updated November 2008.
2. Include Bench Marks 975 2695 E and 975 2695 F in the level run; these marks have not been leveled since 2006.
3. Update bench mark sketch to a digitized version. Hand drawn sketches will not be accepted anymore. Acceptable bench mark sketch formats include: Google Earth images, AutoCAD drawings, and electronic street maps.
4. Coordinate through COASTAL program manager to notify local partner (Puerto Rico Seismic Network) after the met upgrade is completed.

**9755371 San Juan, PR**

**L27208**

**Part 3**

**PBM:** 975 5371 A TIDAL (TV1513)

**PBM above SD:** 2.600 m

**GPS Bench Mark:** 975 5371 M (No PID)

**MSL above SD:** 1.266 m

**GPS Observation Frequency:** Every five years (Not required this year)

**Dive Inspection Frequency:** Annually

1. **Unresolved from 2008 Project Instructions.** Perform an evaluation for a total station rebuild during a separate visit. Determine requirements, obtain all necessary permissions, and prepare a report for the return crew.
2. **Unresolved from 2008 Project Instructions.** Provide sensor heights of all installed sensors as specified in the section 2.9 of the Standing Project Instructions.

**9759110 Magueyes Island, PR**

**L27208**

**Part 4**

**PBM:** 975 9110 BM 1 (No PID)

**PBM above SD:** 4.755 m

**GPS Bench Mark:** 975 9110 G (No PID)

**MSL above SD:** 1.191 m

**GPS Observation Frequency:** Every five years (Not required this year)

**Dive Inspection Frequency:** Annually

1. Update bench mark sketch to a digitized version. Hand drawn sketches will not be accepted anymore. Acceptable bench mark sketch formats include: Google Earth images, AutoCAD drawings, and electronic street maps.

**9759412 Aguadilla, PR****L27208****Part 8****PBM:** 975 9938 A (No PID)**PBM above SD:** 10.000 m**GPS Bench Mark:** 975 9412 E (No PID)**MSL above SD:** 7.100 m**GPS Observation Frequency:** Every five years (Not required this year)**Dive Inspection Frequency:** Annually

1. Install a met tower and met sensors during FY09 (barometer and air temperature sensors only – all equipment GFE). Notes shall be provided on the site report if the wind sensors are not feasible due to obstructions. Provide sensor heights and digital photos as specified in the section 2.9 of the Standing Project Instructions, Updated November 2008.
2. Update bench mark sketch to a digitized version. Hand drawn sketches will not be accepted anymore. Acceptable bench mark sketch formats include: Google Earth images, AutoCAD drawings, and electronic street maps.

**9759938 Mona Island, PR****L27208****Part 9****PBM:** 975 9938 A (No PID)**PBM above SD:** 10.000 m**GPS Bench Mark:** 975 9938 F (No PID)**MSL above SD:** 8.869 m**GPS Observation Frequency:** Every five years (Not required this year)**Dive Inspection Frequency:** Annually

1. Reinstall a dual orifice Paroscientific pressure sensor as N1 and T1 on DCP 1 (Xpert) and install a single orifice Paroscientific sensor N1 on DCP 2 (Xpert Dark). Document the measured distance between the dual orifice Paros orifices on DCP 1, and steel tape measure (with millimeter graduations) the distance between the staff stop and the 3 orifices. Take digital pictures of the orifices and staff stop and of the measurements.
2. Install met sensors during FY09 (barometer and air temperature sensors only – all equipment GFE). Notes shall be provided on the site report if the wind sensors are not feasible due to obstructions. Provide sensor heights and digital photos as specified in the section 2.9 of the Standing Project Instructions, Updated November 2008.
3. **Unresolved from 2008 Project Instructions.** Establish, describe, and connect via levels three surface marks, designation/stamping: 975 9938 H/9938 H 2009, 975 9938 J/9938 J 2009, and 975 9938 K/9938 K 2009.
4. Update bench mark sketch to a digitized version. Hand drawn sketches will not be accepted anymore. Acceptable bench mark sketch formats include: Google Earth images, AutoCAD drawings, and electronic street maps.

**2695540 Bermuda Esso Pier****L27213****Part 1****PBM:** 269 5540 A (No PID)**PBM above SD:** 14.298 m**GPS Bench Mark:** 269 5540 A (No PID)**MSL above SD:** 1.410 m

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

1. No further requirements.

### 2.3. AIR-SEA SYSTEMS - TASK XVI - FLORIDA THROUGH LOUISIANA STATIONS

Brad Wynn, Task Manager/Technical Representative (TR)

**8720030 Fernandina Beach, FL** **L27078** **Part 1**  
**PBM:** 872 0030 TIDAL 34 (BC0166) **PBM above SD:** 4.770 m  
**GPS Bench Mark:** CONTAINER (BC2488) **MSL above SD:** 1.522 m  
**GPS Observation Frequency:** Every five years (Not required this year)  
**Dive Inspection Frequency:** Annually

1. Advise OET of the recommended status of Bench Marks 872 0030 TIDAL 22 and 872 0030 TIDAL 38; these marks were reported as destroyed in the past and we need confirmation. Should they be removed from the level file and sketch?

**8720218 Mayport Bar Pilots Dock, FL** **L27078** **Part 2**  
**PBM:** 870 0218 A TIDAL (DI9221) **PBM above SD:** 5.000 m  
**GPS Bench Mark:** 872 0220 A TIDAL (BC2486) **MSL above SD:** 3.509 m  
**GPS Observation Frequency:** Every five years (Not required this year)  
**Dive Inspection Frequency:** Annually

1. Reinstall the NWLON station on a GFE elevated frame on the Pilots Dock, and remove the temporary water level station after the NWLON station is installed and leveled. This will be covered under the contract EM funding.

**8721604 Trident Pier, FL** **L27203** **Part 19**  
**PBM:** 872 1604 A (No PID) **PBM above SD:** 9.303 m  
**GPS Bench Mark:** 872 1604 C TIDAL (AJ2449) **MSL above SD:** 6.006 m  
**GPS Observation Frequency:** Every five years (Not required this year)  
**Dive Inspection Frequency:** Annually

1. No further requirements.

**8722670 Lake Worth Pier, FL** **L27203** **Part 6**  
**PBM:** P 317 (AD2724) **PBM above SD:** 15.111m  
**GPS Bench Mark:** Select most stable mark observable **MSL above SD:** 9.601m  
**GPS Observation Frequency:** Every five years (Required in 2009)  
**Dive Inspection Frequency:** Annually

1. Contact the City of Lake Worth to determine the possibility of installing a NWLON station on the new pier. Coordinate with the construction company and the City to develop installation plans and schedule. Install a NWLON station including met sensors if the City is agreeable. Prepare and sign a standard lease agreement.
2. If the station is re-installed, GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.

**8723962 Key Colony Beach, FL** **L27203** **Part 6**  
**PBM:** 872 3962 A TIDAL (AA0883) **PBM above SD:** 2.758 m  
**GPS Bench Mark:** Select most stable mark observable **MSL above SD:** 1.371 m  
**GPS Observation Frequency:** Every five years (Not required this year)  
**Dive Inspection Frequency:** Annually

1. Prepare recon information for two alternative installation options: new site inside the channel entrance northeast of the historical site, and a dual Paros option for the historical site. Submit plans and cost estimates for an engineering review and consideration of the Contracting Officer's Representative (COR).

**8723214 Virginia Key, FL** **L27203** **Part 5**  
**PBM:** 872 3214 B (AH5251) **PBM above SD:** 5.000 m  
**GPS Bench Mark:** 872 3214 E (No PID) **MSL above SD:** 3.431 m  
**GPS Observation Frequency:** Every five years (Not required this year)  
**Dive Inspection Frequency:** Annually

1. Reinstall the elevated frame station on the school dock when repairs have been completed and the work has been designated by the COR using EM funding.
2. Level to the PBM and Bench Marks U 313, MI 6 RESET, and two additional marks.
3. Upgrade tsunami software.

**8723970 Vaca Key, FL** **L27203** **Part 7**  
**PBM:** 872 3970 TIDAL 1 (AA0896) **PBM above SD:** 2.073 m  
**GPS Bench Mark:** R 273 (AA0302) **MSL above SD:** 0.931 m  
**GPS Observation Frequency:** Every five years (Not required this year)  
**Dive Inspection Frequency:** Annually

1. **Unresolved from 2008 Project Instructions.** If confirmed as destroyed, remove bench mark 872 3970 TIDAL 2 from the level file and bench mark sketch.

**8724580 Key West, FL** **L27203** **Part 8**  
**PBM:** 872 4580 E TIDAL (AJ2450) **PBM above SD:** 3.116 m  
**GPS Bench Mark:** 872 4580 E TIDAL (AJ2450) **MSL above SD:** 1.662 m  
**GPS Observation Frequency:** Every five years (Not required this year)  
**Dive Inspection Frequency:** Annually

The City now owns the property where the tide station is located and City has plans to develop the area in the near future; crew has been in touch with the city and no need to move station anytime soon.

1. Bench Marks 872 4580 TIDAL 26 and KEY WEST GSL must be added to the bench mark sketch; both marks indicated as recovered in 2008. Correction: two marks are noted as KH 8, so one must be another mark – correct on the sketch.



**8725110 Naples Pier, FL** **L27203** **Part 9**  
*PBM:* 872 5110 TIDAL 7 (AD5731) *PBM above SD:* 4.225 m  
*GPS Bench Mark:* 872 5110 C TIDAL (AD6337) *MSL above SD:* 1.155 m  
*GPS Observation Frequency:* Every five years (Not required this year)  
*Dive Inspection Frequency:* Annually

1. No additional requirements.

**8725520 Ft. Myers, FL** **L27203** **Part 10**  
*PBM:* 872 5520 A TIDAL (AD7888) *PBM above SD:* 2.746 m  
*GPS Bench Mark:* 872 5520 A TIDAL (AD7888) *MSL above SD:* 1.522 m  
*GPS Observation Frequency:* Every five years (Not required this year)  
*Dive Inspection Frequency:* Annually

1. Replace the existing station with an elevated frame and enclosure using EM funding. Provide the COR with a cost estimate for removal of the old station and installation of the new station.

**8726724 Clearwater Beach, FL** **L27203** **Part 12**  
*PBM:* LP 10 1 FLHD (AG7197) *PBM above SD:* 2.234 m  
*GPS Bench Mark:* 872 6724 N TIDAL (AG9359) *MSL above SD:* 0.970 m  
*GPS Observation Frequency:* Every five years (Not required this year)  
*Dive Inspection Frequency:* Annually

1. Ensure that the data display is in good working order and that the owner has a contact number to notify if it fails in the future.

**8727520 Cedar Key, FL** **L27203** **Part 13**  
*PBM:* TIDAL STATION 3-60 TIDAL 8 (AR1204) *PBM above SD:* 2.347 m  
*GPS Bench Mark:* PARK (AR1851) *MSL above SD:* 1.171 m  
*GPS Observation Frequency:* Every five years (Not required this year)  
*Dive Inspection Frequency:* Annually

1. Install the NWLON station equipment on the elevated platform when all GFE have been provided, using EM funding. Provide the COR with a cost estimate for installation of the new station. Notify the task manager if a license agreement is required by the City.
2. Fully document the new station with general and specific detail photos.

**8728690 Apalachicola, FL****L27203****Part 15****PBM:** TIDAL STA 3-66 TIDAL 1 (AS0240)**PBM above SD:** 5.669 m**GPS Bench Mark:** APALACHICOLA (AS0246)**MSL above SD:** 1.584 m**GPS Observation Frequency:** Every five years (Not required this year)**Dive Inspection Frequency:** Annually

1. Finalize plans for construction of a four pile platform and relocation of the equipment to the new site. Provide the COR with a cost estimate for installation of the new station and removal of the old station. Notify the task manager if a license agreement is required by the City.
2. Ensure that the HA file has handheld GPS positions for each mark at the end of the descriptive text.

**8729108 Panama City, FL****L27203****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 five years (Not required this year)**Dive Inspection Frequency:** Annually

1. No further requirements.

**8729210 Panama City Beach, FL****L27203****Part 17****PBM:** 872 9210 A (No PID)**PBM above SD:** 13.725 m**GPS Bench Mark:** 872 9210 M (No PID)**MSL above SD:** 8.440 m**GPS Observation Frequency:** Every five years (Not required this year)**Dive Inspection Frequency:** Annually

1. The pier is undergoing reconstruction in 2008/2009.
2. Coordinate with the city on plans for a new station once the pier is rebuilt. The cost will be covered by the EM funding. Provide the COR with a cost estimate for installation of the new station and removal of the old station. Notify the task manager if a license agreement is required by the City.

**8729840 Pensacola, FL****L27203****Part 18****PBM:** 872 9840 M TIDAL (BG4867)**PBM above SD:** 4.368 m**GPS Bench Mark:** 872 9840 M TIDAL (BG4867)**MSL above SD:** 2.757 m**GPS Observation Frequency:** Every five years (Not required this year)**Dive Inspection Frequency:** Annually

1. No additional requirements.

**8747437 Bay Waveland YC, MS****L27205****Part 3*****PBM:*** 874 7437 TIDAL 1 (BH0937)***PBM above SD:*** 2.473 m***GPS Bench Mark:*** 874 7437 TIDAL 1 (BH0937)***MSL above SD:*** 0.990 m***GPS Observation Frequency:*** Annually***Dive Inspection Frequency:*** Annually

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
2. Establish and level three marks (minimum two rod marks), designations and stampings as follows: 874 7437 K/7437 K 2009; 874 7437 L/7437 L 2009; 874 7437 M/7437 M 2009.
3. Update bench mark sketch with new marks.
4. Inspect entire structure and components for corrosion. Photograph and report findings for future maintenance.
5. Inspect nuts on adjustable clamps and brackets to determine if jam nuts are still being used or if standard nuts have been installed

**8760922 Pilots Station East, SW Pass, LA****L27206****Part 2*****PBM:*** 876 0922 C (No PID)***PBM above SD:*** 10.000 m***GPS Bench Mark:*** 876 0922 C (No PID)***MSL above SD:*** 9.313 m***GPS Observation Frequency:*** Annually***Dive Inspection Frequency:*** Annually

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
2. Install a new Redundant Water Level Sensor system.
3. Install new Dry Air Pump system because of its portability.

**8761305 Shell Beach, LA****L27206****Part 35*****PBM:*** 876 1305 E (No PID)***PBM above SD:*** 10.000m***GPS Bench Mark:*** 876 1305 D (No PID)***MSL above SD:*** 5.525m***GPS Observation Frequency:*** Annually***Dive Inspection Frequency:*** Annually

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
2. Establish and level three 3D rod marks, designations and stampings as follows: 876 1305 H/1305 H 2009; 876 1305 J/1305 J 2009; 876 1305 K/1305 K 2009.
3. Update bench mark sketch with new marks.
4. Inspect entire structure and components for corrosion. Photograph and report findings for future maintenance.
5. Inspect nuts on adjustable clamps and brackets to determine if jam nuts are still being used or if standard nuts have been installed.

**8761724 Grand Isle, LA****L27206****Part 1****PBM:** 10 (AT0687)**PBM above SD:** 2.810 m**GPS Bench Mark:** 876 1724 C TIDAL (AT0681)**MSL above SD:** 1.947 m**GPS Observation Frequency:** Annually**Dive Inspection Frequency:** Annually

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.

**8761927 USCG New Canal Station, LA****L27206****Part 10****PBM:** ALCO (BJ1342)**PBM above SD:** 3.149 m**GPS Bench Mark:** ALCO (BJ1342)**MSL above SD:** 1.350 m**GPS Observation Frequency:** Annually**Dive Inspection Frequency:** Annually

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
2. Lower plate was buried in the mud last year; determine need to raise the well and proceed if the situation has deteriorated.

**8762075 Port Fourchon, LA****L27206****Part 33****PBM:** 876 2075 A (No PID)**PBM above SD:** 10.000 m**GPS Bench Mark:** 876 2075 A (No PID)**MSL above SD:** 9.163 m**GPS Observation Frequency:** Annually**Dive Inspection Frequency:** Annually

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.

**8762372 East Bank 1, LA****L27206****Part 3****PBM:** 876 2372 E (No PID)**PBM above SD:** 10.000 m**GPS Bench Mark:** 876 2372 F (DH3787)**MSL above SD:** 9.847 m**GPS Observation Frequency:** Annually**Dive Inspection Frequency:** Annually

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
2. Rerun the conduit from the wells to the DCP to prevent high water from reaching the cable joints and causing false temperature readings.

**8762482 West Bank 1, LA**  
**PBM:** 876 2482 A (No PID)  
**GPS Bench Mark:** 876 2482 E (DJ9385)  
**GPS Observation Frequency:** Annually  
**Dive Inspection Frequency:** Annually

**L27206**

**Part 4**  
**PBM above SD:** 10.000 m  
**MSL above SD:** 9.662 m

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.

**8764044 Tesoro Marine Terminal, LA**  
**PBM:** 876 4044 E (No PID)  
**GPS Bench Mark:** 876 4044 E (No PID)  
**GPS Observation Frequency:** Annually  
**Dive Inspection Frequency:** Annually

**L27206**

**Part 34**  
**PBM above SD:** 5.000 m  
**MSL above SD:** 5.781 m

Upgrade of the station with hurricane funding has been postponed.

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
2. Perform closing levels for hydro and continue operation of the station as a future NWLON station.
3. Add additional supports to the DCP stand, or replace it with a more substantial stand capable of supporting the enclosure assembly. May need EM funding or GFE stand.

**8764227 LAWMA, Amerada Pass, LA**  
**PBM:** 876 4227 A (No PID)  
**GPS Bench Mark:** GPS GAGE 36 (DJ9384)  
**GPS Observation Frequency:** Annually  
**Dive Inspection Frequency:** Annually

**L27206**

**Part 11**  
**PBM above SD:** 8.759 m  
**MSL above SD:** 7.347 m

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
2. Inspect entire structure and components for corrosion. Photograph and report findings for future maintenance.
3. Inspect nuts on adjustable clamps and brackets to determine if jam nuts are still being used or if standard nuts have been installed.

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

**L27206**

**Part 8**

**PBM above SD:** 8.887m  
**MSL above SD:** 6.760m

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
2. Upgrade to NWLON elevated platform.

**8767816 Lake Charles, LA (PORTS)**  
**PBM:** A 269 (BK1489)  
**GPS Bench Mark:** CIVIC (BK3291)  
**GPS Observation Frequency:** Annually  
**Dive Inspection Frequency:** Annually

**L27206**

**Part 9**

**PBM above SD:** 10.000 m  
**MSL above SD:** 8.323m

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.

**8768094 Calcasieu Pass, East Jetty LA (PORTS)**  
**PBM:** 876 8094 A (No PID)  
**GPS Bench Mark:** 876 8094 E TIDAL (DJ9387)  
**GPS Observation Frequency:** Annually  
**Dive Inspection Frequency:** Annually

**L27206**

**Part 5**

**PBM above SD:** 10.000 m  
**MSL above SD:** 8.549 m

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
2. Inspect entire structure and components for corrosion. Photograph and report findings for future maintenance.
3. Inspect nuts on adjustable clamps and brackets to determine if jam nuts are still being used or if standard nuts have been installed.

## 2.4. AIR-SEA SYSTEMS - TASK XXVIII - LOWER MISSISSIPPI RIVER PORTS®

John Stepnowski, Task Manager/Technical Representative (TR)

### 8761955 Carrollton, LA (PORTS)

L27206

Part 36

*PBM:* DISTRICT 1 A (AU2196)

*PBM above SD:* 10.000 m

*GPS Bench Mark:* DISTRICT 1 A (AU2196)

*MSL above SD:* Undetermined

*GPS Observation Frequency:* Annually

*Dive Inspection Frequency:* Annually

1. Install 9210 DCP for the water level station as per the contract. The well for this site is already installed.
2. Station needs a local network of 5 bench marks. The preliminary information indicates currently four marks may exist as follows: DISTRICT 1 A, DISTRICT 1, TBM FIRST AID, TBM NOD B. Install one additional 3-D mark with logo cap stamping/designation as follows: 1955 A 2009/876 1955 A.
3. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.

### 8761847 Crescent City Bridge, LA (PORTS)

Air Gap Only Station

1. Install Air Gap Sensor- Crescent City Bridge had a previous Air Gap installation and ladder, man cage and sensor bracket are already in place.
2. Provide sensor heights and digital photos of all installed sensors as specified in the section 2.9 of the Standing Project Instructions, Updated November 2008.

### 8762002 Huey Long Bridge, LA (PORTS)

Air Gap Only Station

1. Install Air Gap Sensor. Provide sensor heights and digital photos of all installed sensors as specified in the section 2.9 of the Standing Project Instructions, Updated November 2008.

**2.5. TEXAS A&M DNR - TASK XX - MOBILE PORTS®**

Brad Wynn, Task Manager/Technical Representative (TR)

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

**Met Only Station**

1. Provide heights of met sensors above SD according to standing project instructions.
2. Replace wind sensor nose cone.

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

**L27204**

**Part 1**

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

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

***GPS Bench Mark:*** 873 5180 TIDAL 1 (BH1756)

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

***GPS Observation Frequency:*** Annually

***Dive Inspection Frequency:*** Annually

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
2. Install an access pier and ladder to upper platform.

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

**L27204**

**Part 7**

***PBM:*** 873 6897 A (No PID)

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

***GPS Bench Mark:*** 873 6897 A (No PID)

***MSL above SD:*** 8.953m

***GPS Observation Frequency:*** Annually

***Dive Inspection Frequency:*** Annually

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.



**8737048 Mobile, AL (PORTS)**

**L27204**

**Part 10**

***PBM:*** 7048 A 1980 (No PID)

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

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

***MSL above SD:*** 0.721m

***GPS Observation Frequency:*** Annually

***Dive Inspection Frequency:*** Annually

1. **Unresolved from 2007 Project Instructions.** Perform a reconnaissance of the site to find an appropriate location for installing a meteorological sensor package (air temperature and barometer only) in FY09, using CO-OPS Water Level and Meteorological Site Reconnaissance Procedures (Updated November 2008) as a guideline, and provide a report with digital photos, measurements, and notes along with the required documentation from the Annual Inspection. Provide a cost estimate to the COR for installation of the two sensors.
2. **Unresolved from 2007 Project Instructions.** Perform GPS observations on one mark near the water level station and on the commemorative mark in the city park; simultaneous observations on the two marks is desirable but not required if only one set of GPS equipment is available.
3. Establish and level one surface mark on the same level of the pier as the station, designation and stamping as follows: 874 7048 E/7048 E 2009.
4. Update bench mark sketch with new marks.

**2.6. TEXAS A&M DNR - TASK XXIV - GULFPORT AND PASCAGOULA PORTS®**  
John Stepnowski, Task Manager/Technical Representative (TR)

**8741003 Petit Bois Island, MS (PORTS) Met Only Station**

1. Provide sensor heights and digital photos of all installed sensors as specified in the section 2.9 of the Standing Project Instructions, Updated November 2008.
2. Replace wind sensor nose cone.

**8741041 Pascagoula Dock E, MS (PORTS) L27205 Part 7**  
*PBM:* USACE RM 1 TIDAL (No PID) *PBM above SD:* 10.000m  
*GPS Bench Mark:* 874 1041 E (No PID) *MSL above SD:* 6.758m  
*GPS Observation Frequency:* Annually  
*Dive Inspection Frequency:* Annually

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
2. Provide sensor heights and digital photos of all installed sensors as specified in the section 2.9 of the Standing Project Instructions, Updated November 2008.

**8741094 Range A Rear, MS (PORTS) Met Only Station**

1. Replace wind sensor nose cone.

**8741501 Dock C, MS (PORTS) Met Only Station**

1. Replace wind sensor nose cone.

**8741533 Pascagoula NOAA Lab, MS (PORTS) L27205 Part 6**  
*PBM:* 874 1533 B (No PID) *PBM above SD:* 9.145m  
*GPS Bench Mark:* 874 1533 B (No PID) *MSL above SD:* 6.898m  
*GPS Observation Frequency:* Annually  
*Dive Inspection Frequency:* Annually

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.

**8744707 Ship Island, MS (PORTS) Met Only Station**

1. Provide sensor heights and digital photos of all installed sensors as specified in the section 2.9 of the Standing Project Instructions, Updated November 2008.
2. Replace wind sensor nose cone.

**8745651 West Pier, MS (PORTS) Met Only Station**

1. Provide sensor heights and digital photos of all installed sensors as specified in the section 2.9 of the Standing Project Instructions, Updated November 2008.
2. Replace wind sensor nose cone.

## 2.7. TEXAS A&M DNR - TASK XIII - HOUSTON/GALVESTON PORTS®

Mark Bailey, Task Manager/Technical Representative (TR)

### 8770613 Morgans Point, TX (PORTS)

L27207

Part 8

**PBM:** 877 0613 A TIDAL (AW4858)

**PBM above SD:** 7.0048 m

**GPS Bench Mark:** 877 0613 A TIDAL (AW4858)

**MSL above SD:** 1.813 m

**GPS Observation Frequency:** Annually

**Dive Inspection Frequency:** Annually

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
2. Arrange for transfer of all station and bench mark photos in the DNR database to CO-OPS to ensure CO-OPS has the full set of photos with photo files named according to NOS standards.

### 8771013 Eagle Point, TX (PORTS)

L27207

Part 13

**PBM:** 877 1013 B (No PID)

**PBM above SD:** 3.913 m

**GPS Bench Mark:** 877 1013 A (AJ4424)

**MSL above SD:** 1.446 m

**GPS Observation Frequency:** Annually

**Dive Inspection Frequency:** Annually

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
2. **Unresolved from 2007 Project Instructions.** Determine status and report on Bench Marks EAGLE POINT 1932, EAGLE POINT NO 1 and NO 2 1932, 4 1973, and 5 1973 at the old site north of the present site.
3. Arrange for transfer of all station and bench mark photos in the DNR database to CO OPS to ensure CO-OPS has the full set of photos with photo files named according to NOS standards.

### 8771341 Galveston North Jetty, TX (PORTS)

L27207

Part 41

**PBM:** 877 1314 A (No PID)

**PBM above SD:** 4.180 m

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

**MSL above SD:** 3.082 m

**GPS Observation Frequency:** Annually

**Dive Inspection Frequency:** Annually

1. The station was completely destroyed by Hurricane Ike in 2008; awaiting possible funding support for rebuilding the platform or installing a Sentinel.

**8771450 Galveston Pier 21, TX (PORTS)****L27207****Part 2****PBM:** 7.151 (AW0433)**PBM above SD:** 2.856 m**GPS Bench Mark:** 877 1450 TIDAL 40 RESET (AW0569)**MSL above SD:** 1.588 m**GPS Observation Frequency:** Annually**Dive Inspection Frequency:** Annually

1. The station was heavily damaged by Hurricane Ike in 2008. Arrange to install a temporary station nearby while the pier is under reconstruction, then reinstall the permanent station when ready and remove the temporary station.
2. Level to the PBM and Bench Marks 877 1450 D, 877 1450 E, 877 1450 F, TIDAL 40 RESET, and TIDAL 41 RESET when the temporary gage is installed (these marks have not been hit since 2005).
3. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
4. **Unresolved from 2007 Project Instructions.** Calculate the barometer coefficient using GFE barometer standard.
5. Arrange for transfer of all station and bench mark photos in the DNR database to CO-OPS to ensure CO-OPS has the full set of photos with photo files named according to NOS standards.

**8771510 Galveston Pleasure Pier, TX (PORTS)****L27207****Part 3****PBM:** 877 1510 TIDAL 43 (AW0592)**PBM above SD:** 8.605 m**GPS Bench Mark:** 877 1510 TIDAL 46 (AW1703)**MSL above SD:** 1.404 m**GPS Observation Frequency:** Annually**Dive Inspection Frequency:** Annually

1. The station was heavily damaged by Hurricane Ike in 2008. Keep CO-OPS informed on the status of pier access in 2009, and the possible closing of the pier and need for relocation of the station.
2. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
3. Level to the PBM, 877 1510 A, and the most distant marks not hit in 2008.
4. **Unresolved from 2007 Project Instructions.** Calculate the barometer coefficient using GFE barometer standard.
5. Arrange for transfer of all station and bench mark photos in the DNR database to CO-OPS to ensure CO-OPS has the full set of photos with photo files named according to NOS standards.

**2.8. TEXAS A&M DNR - SABINE-NECHES PORTS®**

Mark Bailey, Task Manager/Technical Representative (TR)

**8770570 Sabine Pass North, TX (PORTS)**

**L27207**

**Part 1**

***PBM:*** 877 0570 A TIDAL (AV1014)

***PBM above SD:*** 3.264 m

***GPS Bench Mark:*** 877 0570 K (No PID)

***MSL above SD:*** 1.343 m

***GPS Observation Frequency:*** Annually

***Dive Inspection Frequency:*** Annually

1. Provide cost estimate to COR for repairs to the platform which was damaged by Hurricane Ike. Make necessary repairs under EM funding.
2. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
3. Calculate the barometer coefficient using GFE barometer standard.
4. Arrange for transfer of all station and bench mark photos in the DNR database to CO-OPS to ensure CO-OPS has the full set of photos with photo files named according to NOS standards.

**8770520 Rainbow Bridge, TX (PORTS)**

**L27207**

**Part 10**

***PBM:*** 877 0520 B (No PID)

***PBM above SD:*** 2.526 m

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

***MSL above SD:*** 1.393 m

***GPS Observation Frequency:*** Annually

***Dive Inspection Frequency:*** Annually

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements. Identify above in header the mark used in the COE survey.
2. Arrange for transfer of all station and bench mark photos in the DNR database to CO-OPS to ensure CO-OPS has the full set of photos with photo files named according to NOS standards.

## 2.9. TEXAS A&M DNR - TASK XXVII - TEXAS STATIONS

Mark Bailey, Task Manager/Technical Representative (TR)

### **8772447 USCG Freeport, TX**

**L27207**

**Part 47**

***PBM:*** 877 2447 A (No PID)

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

***GPS Bench Mark:*** 877 2447 E (No PID)

***MSL above SD:*** 1.525 m

***GPS Observation Frequency:*** Annually

***Dive Inspection Frequency:*** Annually

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
2. Install an IP modem provided by FOD.
3. Arrange for transfer of all station and bench mark photos in the DNR database to CO-OPS to ensure CO-OPS has the full set of photos with photo files named according to NOS standards.

### **8774770 Rockport, TX**

**L27207**

**Part 5**

***PBM:*** 877 4770 TIDAL 8 (AN1877)

***PBM above SD:*** 3.385 m

***GPS Bench Mark:*** 877 4770 TIDAL 8 (AN1877)

***MSL above SD:*** 1.914 m

***GPS Observation Frequency:*** Annually

***Dive Inspection Frequency:*** Annually

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
2. Arrange for transfer of all station and bench mark photos in the DNR database to CO-OPS to ensure CO-OPS has the full set of photos with photo files named according to NOS standards.
3. The station is being considered for relocation to an elevated platform outside the harbor breakwater, pending identification of funding.

### **8775870 Corpus Christi, TX**

**L27207**

**Part 6**

***PBM:*** 877 5870 A TIDAL (AC8459)

***PBM above SD:*** 9.098 m

***GPS Bench Mark:*** 877 5870 H TIDAL (AH1762)

***MSL above SD:*** 6.635 m

***GPS Observation Frequency:*** Every five years (Not required this year)

***Dive Inspection Frequency:*** Annually

1. Arrange for transfer of all station and bench mark photos in the DNR database to CO-OPS to ensure CO-OPS has the full set of photos with photo files named according to NOS standards.

**8779770 Port Isabel, TX**

**L27207**

**Part 7**

***PBM:*** 877 9770 TIDAL 10 (AB1227)

***PBM above SD:*** 4.276 m

***GPS Bench Mark:*** X 1406 (AB1225)

***MSL above SD:*** 1.423 m

***GPS Observation Frequency:*** Every five years (Not required this year)

***Dive Inspection Frequency:*** Annually

1. Perform a reconnaissance of the harbor and prepare a plan with cost estimate for relocation of the station. The pilings have deteriorated and need replacement or station relocation.
2. Include bench mark BM 9 USE in the leveling run; not hit in 2008 as required in the two year rotation. The recovery note says it is leaning 20 degrees – is it still useful?
3. Arrange for transfer of all station and bench mark photos in the DNR database to CO-OPS to ensure CO-OPS has the full set of photos with photo files named according to NOS standards.

## 2.10. FOD/ARO - GREAT LAKES

### 2.10.1. St. Lawrence River

**8311030 Ogdensburg, NY**

**L27214**

**Part 1**

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

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

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

**Hydraulic Corrector:** +0.000 m

**GPS Observation Frequency:** Every five years (Not required this year)

**Dive Inspection Frequency:** As found necessary or required

1. This station was to be included in the CELRE Infrastructure Upgrade but is now not funded. If funds are provided in the future a temporary gauge will need to be installed during demolition and restoration. Reconnaissance and a meeting with the city engineer will be needed for approval of engineering design and construction.
2. Provide a full compliment of photographs of station to include exterior, interior, sump, DCPs, equipment configurations, mounting, meteorological and any other ancillary sensors as applicable.
3. Minor repairs of roof leaks and door threshold made by Pat Reagan. Pat plans to replace roof and make other miscellaneous repairs in the spring. Inspect all work, verify that all needed caulking etc has been done, and make additional repairs as needed. Indicate all findings, actions, contact, and other information on the station report.

**8311062 Alexandria Bay, NY**

**L27214**

**Part 2**

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

**PBM Elevation (Dynamic):** 86.1710 m

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

**Hydraulic Corrector:** +0.000 m

**GPS Observation Frequency:** Every five years (Not required this year)

**Dive Inspection Frequency:** Annually

1. Remove the intake inserts for both primary and backup well, flush and clear of any obstructions. Check structural integrity of brackets for possible ice or other damage. Indicate all findings, actions, contact, and other information on the station report.
2. Create an additional page for both benchmark sketch and chart section to include Bench Marks JAMISON, DEE, TIB, and. LEDGE (Note – Chart section may not cover the area for plotting BM Ledge as it is inland). These marks were used in the level line to obtain geodetic connection to the National Spatial Reference System (NSRS) and are not to be included as part of the normal station benchmark network.
3. Provide a full compliment of photographs of station to include exterior, interior, sump, DCPs, equipment configurations, mounting, meteorological and any other ancillary sensors as applicable.



**2.10.2. Lake Ontario**

**9052000 Cape Vincent, NY**

**L27215**

**Part 1**

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

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

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

**Hydraulic Corrector:** +0.008 m

**GPS Observation Frequency:** Every five years (Not required this year)

**Dive Inspection Frequency:** Annually

1. This station was to be included in the CELRE Infrastructure Upgrade but is now not funded. If funds are provided in the future CELRE will contract the required soil boring analysis needed to determine if construction is feasible at this location due to rock.
2. Provide a full compliment of photographs of station to include exterior, interior, sump, DCPs, equipment configurations, mounting, meteorological and any other ancillary sensors as applicable.
3. Maintain and repair old station until approval given for closure and removal.

**9052030 Oswego, NY (MASTER)**

**L27215**

**Part 2**

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

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

**GPS Bench Mark:** 905 2030 J (AH9231)

**Hydraulic Corrector:** +0.000 m

**GPS Observation Frequency:** Every five years (Not required this year)

**Dive Inspection Frequency:** As found necessary or required

1. Inspect and determine if general repairs on leaks around the valve and sump walls are feasible. Determine if new ladder section can be welded to sump walls or will need a sump bottom base, replace the bottom nine feet of the sump ladder as necessary. Indicate all findings, actions, contact, and other information on the station report.
2. 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.
3. Provide a full compliment of photographs of station to include exterior, interior, sump, DCPs, equipment configurations, mounting, meteorological and any other ancillary sensors as applicable.

**9052058 Rochester, NY****L27215****Part 3****PBM:** 905 2058 SUB (OF1082)**PBM Elevation (Dynamic):** 76.8041**GPS Bench Mark:** 905 2058 K (AH9232)**Hydraulic Corrector:** +0.006 m**GPS Observation Frequency:** Every five years (Not required this year)**Dive Inspection Frequency:** Mandatory this year

1. Contract divers to inspect and clean the intake, blow intake out, install buoy and verify the elevation of both inside and outside inverts. Update intake GPS coordinates. This diving is mandatory unless requirements are relaxed due to lack of funding. Indicate all findings, actions, contact, and other information on the station report.
2. Pump down sump enough times (minimum 4 to 6) to ensure entire length of intake line has been cleared of any debris. Indicate all findings, actions, contact, and other information on the station report.
3. Provide a full compliment of photographs of station to include exterior, interior, sump, DCPs, equipment configurations, mounting, meteorological and any other ancillary sensors as applicable.

**9052076 Olcott, NY****L27215****Part 4****PBM:** 905 2076 WEST (OG0098)**PBM Elevation (Dynamic):** 77.4920 m**GPS Bench Mark:** 905 2076 H (AH9233)**Hydraulic Corrector:** +0.008 m**GPS Observation Frequency:** Every five years (Not required this year)**Dive Inspection Frequency:** As found necessary or required

1. Inspect tree removal contract work which was completed in 2008 after the maintenance cycle in area was completed. Indicate all findings, actions, contact, and other information on the station report.
2. Dive inspection during 2009 maintenance cycle is mandatory. Offshore intake is to be located, inspected, outside intake invert elevation determined. Work with GL Eastern contractor to use work boat to establish GPS coordinates on offshore intake. Indicate all findings, actions, contact, and other information on the station report.
3. Provide a full compliment of photographs of station to include exterior, interior, sump, DCPs, equipment configurations, mounting, meteorological and any other ancillary sensors as applicable.

**2.10.3. Niagara River**

**9063007 Ashland Avenue, NY**

**L27216**

**Part 1**

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

**PBM Elevation (Dynamic):** 111.4279

**GPS Bench Mark:** N/A

**Hydraulic Corrector:** +0.000 m

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

**Dive Inspection Frequency:** Annually (Contracted)

1. NYPA to contract for the necessary dive services to be performed at this station. All contracting, dates and times need to be coordinated with NYPA engineers and the Niagara City Waste Water Treatment facility managers. See the station report for contacts. Note – Dive contractor must meet and provide all of NYPA’s insurance requirements for working on site. Indicate all findings, actions, contact, and other information on the station report.
2. Provide a full compliment of photographs of station to include exterior, interior, sump, DCPs, equipment configurations, mounting, meteorological and any other ancillary sensors as applicable.

**9063009 American Falls, NY**

**L27216**

**Part 2**

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

**PBM Elevation (Dynamic):** 171.8554

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

**Hydraulic Corrector:** +0.000 m

**GPS Observation Frequency:** Every five years (Not required this year)

**Dive Inspection Frequency:** N/A (Above Falls)

1. This station’s bypass pipe is equipped with a Chicago air fitting connection for blowing out the intake. Rent a compressor large enough to blow the entire length of the intake out. Indicate all findings, actions, contact, and other information on the station report.
2. Provide a full compliment of photographs of station to include exterior, interior, sump, DCPs, equipment configurations, mounting, meteorological and any other ancillary sensors as applicable.

**9063012 Niagara Intake, NY**

**L27216**

**Part 3**

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

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

**GPS Bench Mark:** 906 3012 INTAKE (OG0215)

**Hydraulic Corrector:** +0.000 m

**GPS Observation Frequency:** Every five years (Not required this year)

**Dive Inspection Frequency:** N/A (Power Intakes)

1. Check to see if NYPA has performed the needed roof repairs to keep the rain water from leaking down on the gauge equipment. Indicate all findings, actions, contact, and other information on the station report.
2. Provide a full compliment of photographs of station to include exterior, interior, sump, DCPs, equipment configurations, mounting, meteorological and any other ancillary sensors as applicable.

**2.10.4. Lake Erie**

**9063020 Buffalo, NY**

**L27217**

**Part 1**

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

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

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

**Hydraulic Corrector:** -0.026 m

**GPS Observation Frequency:** Every five years (Not required this year)

**Dive Inspection Frequency:** As found necessary or required

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. Replace water temperature sensor if discrepancies in temperatures still occurring. Indicate all findings, actions, contact, and other information on the station report.
3. Provide a full compliment of photographs of station to include exterior, interior, sump, DCPs, equipment configurations, mounting, meteorological and any other ancillary sensors as applicable.

**9063028 Sturgeon Point, NY**

**L27217**

**Part 2**

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

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

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

**Hydraulic Corrector:** -0.023 m

**GPS Observation Frequency:** Every five years (Not required this year)

**Dive Inspection Frequency:** As found necessary or required

1. Contract divers to inspect and clean the intake, blow intake out, and verify the elevation of both inside and outside inverts. Establish intake GPS coordinates. Indicate all findings, actions, contacts, and other information on the station report.
2. Inspect sump ladder rungs for corrosion; if necessary, contract for replacement. Indicate all findings, actions, contacts, and other information on the station report.
3. Last year's levels indicate movement in the ETG. Review this years ETG elevation and report the results to the Great Lakes Team. Don't leave the station until consulting with the team as you may need to change the retained ZETG in the DCP'S.
4. Provide a full compliment of photographs of station to include exterior, interior, sump, DCPs, equipment configurations, mounting, meteorological and any other ancillary sensors as applicable.

**9063038 Erie, PA****L27217****Part 3****PBM:** D 362 (ND0163)**PBM Elevation (Dynamic):** 175.4628 m**GPS Bench Mark:** D 362 (ND0163)**Hydraulic Corrector:** -0.025 m**GPS Observation Frequency:** Every five years (Not required this year)**Dive Inspection Frequency:** As found necessary or required

1. The meteorological reconnaissance was completed last year but the lighthouse needs further reconnaissance to ensure that a tower can be mounted on the roof. Contact the GL operations team for more details. Obtain all necessary permits from SHPO, and/or USCG as this is still an active lighthouse; also maybe from COE as the pier may be owned by them).
2. Provide a full compliment of photographs of station to include exterior, interior, sump, DCPs, equipment configurations, mounting, meteorological and any other ancillary sensors as applicable.

**9063053 Fairport, OH (MASTER)****L27217****Part 4****PBM:** K 321 (MB1625)**PBM Elevation (Dynamic):** 175.9180 m**GPS Bench Mark:** Under Evaluation**Hydraulic Corrector:** +0.000 m**GPS Observation Frequency:** Every five years (Not required this year)**Dive Inspection Frequency:** As found necessary or required

1. Subsidence of all benchmarks 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. Benchmark heights need to be re-evaluated by CO-OPS. Coordinate with NGS to connect again in 2009 to NSRS to monitor movement. Indicate all findings, actions, contact, and other information on the station report.
2. Meteorological equipment to be provided and installed by Cleveland NWS field office. If completed, inspect the installation and carry out any necessary field maintenance as directed by CO-OPS. Indicate all findings, actions, contact, and other information on the station report.
3. Provide a full compliment of photographs of station to include exterior, interior, sump, DCPs, equipment configurations, mounting, meteorological and any other ancillary sensors as applicable.
4. Include marks X323 & 3053 F in the survey this year. These marks were not surveyed to last year because of inclement weather and lack of personnel.

**9063063 Cleveland, OH****L27217****Part 5****PBM:** G 321 (MB1563)**PBM Elevation (Dynamic):** 177.7308 m**GPS Bench Mark:** G 321 (MB1563)**Hydraulic Corrector:** +0.010 m**GPS Observation Frequency:** Every five years (Not required this year)**Dive Inspection Frequency:** As found necessary or required

1. Meteorological equipment was provided and installed by Cleveland NWS field office. Inspect the installation and carry out any necessary field maintenance as directed by CO-OPS. Indicate all findings, actions, contact, and other information on the station report.
2. 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.
3. Provide a full compliment of photographs of station to include exterior, interior, sump, DCPs, equipment configurations, mounting, meteorological and any other ancillary sensors as applicable.

**9063079 Marblehead, OH****L27217****Part 6****PBM:** Z 317 (MC0984)**PBM Elevation (Dynamic):** 177.2379 m**GPS Bench Mark:** 906 3079 L (AH9236)**Hydraulic Corrector:** -0.006 m**GPS Observation Frequency:** Every five years (Not required this year)**Dive Inspection Frequency:** Annually

1. During the dive inspection remove and clean both the intake cap opening and the pass through pipe on the redundant 12" well and ream out the intake pass through on the primary 18" well. Indicate all findings, actions, contact, and other information on the station report.
2. 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.
3. Provide a full compliment of photographs of station to include exterior, interior, sump, DCPs, equipment configurations, mounting, meteorological and any other ancillary sensors as applicable.

**9063085 Toledo, OH**

**L27217**

**Part 7**

**PBM:** 906 3085 NAVAL (MC0269)

**PBM Elevation (Dynamic):** 175.4592 m

**GPS Bench Mark:** 906 3085 G (AH9237)

**Hydraulic Corrector:** -0.005 m

**GPS Observation Frequency:** Every five years (Not required this year)

**Dive Inspection Frequency:** Mandatory this year

1. Contract divers to locate, inspect, and clean the intake; blow the intake out; verify or install intake screen; and verify the elevation of both inside and outside inverts. Update the intake GPS coordinates. If the intake buoy is missing contact FOD. This diving is mandatory unless requirements are relaxed due to lack of funding. Indicate all findings, actions, contact, and other information on the station report.
2. Inspect the valve, valve stem, and sump ladder. Pump and pressure wash the sump. Indicate all findings, actions, contact, and other information on the station report.
3. Contact Cooley Communications, GL maintenance contractor to replace the RM Young wind bird nose cones on the Coast Guard tower. Indicate all findings, actions, contact, and other information on the station report.
4. Provide a full compliment of photographs of station to include exterior, interior, sump, DCPs, equipment configurations, mounting, meteorological and any other ancillary sensors as applicable.
5. Inspect and verify that the direct readout displays at both the Corps of Engineers and Coast Guard offices are reading properly. Displays should readout the water level in inches above or below Low Water Datum (LWD) and Local Standard Time (LST). Indicate all findings, actions, contact, and other information on the station report.

**9063090 Fermi Power Plant, MI**

**L27217**

**Part 8**

**PBM:** 906 3090 POWER (MC0873)

**PBM Elevation (Dynamic):** 177.5893 m

**GPS Bench Mark:** 906 3090 G (AH9238)

**Hydraulic Corrector:** +0.023 m

**GPS Observation Frequency:** Every five years (Not required this year)

**Dive Inspection Frequency:** Mandatory this year

1. Contract divers to locate, inspect, and clean the intake, blow intake out, verify or install intake screen, and verify the elevation of both inside and outside inverts. Update intake GPS coordinates. This diving is mandatory unless requirements are relaxed due to lack of funding. Indicate all findings, actions, contact, and other information on the station report.
2. Obtain permission to establish, describe, and connect via levels one rod mark, designation/stamping: 906 3090 H/3090 H 2009. Recommend this mark be set between 906 3090 G and F 234. Update the bench mark sketch. Indicate all findings, actions, contact, and other information on the station report.
3. Leveling to F 234 is mandatory for 2009 Annual Inspection.
4. Inspect the valve, valve stem, and sump ladder. Pump and pressure wash the sump. Indicate all findings, actions, contact, and other information on the station report.
5. Provide a full compliment of photographs of station to include exterior, interior, sump, DCPs, equipment configurations, mounting, meteorological and any other ancillary sensors as applicable.
6. Contract a locksmith to repair lock and doorknob if not completed prior to Annual Inspection. Indicate all findings, actions, contact, and other information on the station report.



**2.10.5. Detroit River**

**9044020 Gibraltar**

**L27218**

**Part 13**

**PBM:** M 234 (NE0857)

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

**GPS Bench Mark:** H 115 X (No PID)

**Hydraulic Corrector:** 0.000 m

**GPS Observation Frequency:** Every five years (Not required this year)

**Dive Inspection Frequency:** As found necessary or required

1. Ensure that readout display at the Gibraltar Police station is working properly. Displays should readout the water level in inches above or below Low Water Datum (LWD) and Local Standard Time (LST). Indicate all findings, actions, contact, and other information on the station report.
2. Contact Gibraltar City officials, starting with the police chief, to obtain written permission to install winds on the City's tower at the police station. If permission is granted then FOD crew will perform a reconnaissance to investigate radio feasibility back to the gage house. If feasible data will be radioed back to the gauge station, otherwise a stand alone 9210 DCP with GOES will be required. Install dual wind sensors, barometer, and air temperature sensor. Meteorological reconnaissance report was completed last year. Indicate any and all findings, actions, contact, and other information on the station report. The installation of meteorological sensors will be completed by the GL maintenance contractor providing sensor heights and digital photos as specified in the section 2.9 of the Standing Project Instructions, Updated March 2007.
3. Provide a full compliment of photographs of station to include exterior, interior, sump, DCPs, equipment configurations, mounting, meteorological and any other ancillary sensors as applicable.

**9044030 Wyandotte, MI****L27218****Part 2****PBM:** 904 4030 CHIEF (NE0577)**PBM Elevation (Dynamic):** 176.1190 m**GPS Bench Mark:** Select most stable mark observable**Hydraulic Corrector:** 0.000 m**GPS Observation Frequency:** Every five years (Not required this year)**Dive Inspection Frequency:** As found necessary or required

1. Update information on the reconnaissance of the site for installation of a meteorological sensor package to include tower with dual wind birds, air temperature sensor, and barometer in FY09, using CO-OPS Water Level and Meteorological Site Reconnaissance Procedures (updated March 2007) as a guideline, and provide a report with digital photos, measurements, and notes along with the required documentation from the Annual Inspection. The tower needs to be installed somewhere in the area at the mouth of the Rouge River between Wyandotte and Ft. Wayne stations. It will most likely need to be a stand alone 9210 DCP with GOES. Indicate all findings, actions, contact, and other information on the station report.
2. Establish, describe, and connect via geodetic leveling one rod mark, designation/stamping: 904 4030 K/4030 K 2009. Recommend this mark be set between 904 4030 J and 904 4030 G along the river front and open to the sky for GPS observations. Indicate all findings, actions, contact, and other information on the station report.
3. A two meter level rod is required for proper placement on the PBM. Indicate this in the station report.
4. Provide a full compliment of photographs of station to include exterior, interior, sump, DCPs, equipment configurations, mounting, meteorological and any other ancillary sensors as applicable.

**9044036 Fort Wayne, MI****L27218****Part 3****PBM:** 904 4036 RAMP (NE0622)**PBM Elevation (Dynamic):** 175.2317 m**GPS Bench Mark:** FORT WAYNE A (AA8055)**Hydraulic Corrector:** 0.000 m**GPS Observation Frequency:** Every five years (Not required this year)**Dive Inspection Frequency:** As found necessary or required

1. Contact the COE office at the boatyard prior to arrival to gain permission to access the property. See the station report for contacts, and update as necessary.
2. Provide a full compliment of photographs of station to include exterior, interior, sump, DCPs, equipment configurations, mounting, meteorological and any other ancillary sensors as applicable.

**9044049 Windmill Point, MI**

**L27218**

**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 five years (Not required this year)

**Dive Inspection Frequency:** As found necessary or required

1. Obtain permission, establish, describe, and connect via levels one rod mark, designation/stamping: 904 4049 M/4049 M 2009. This mark should be open to the sky for GPS observations.
2. Update the bench mark sketch. Indicate all findings, actions, contact, and other information on the station report.
3. Provide a full compliment of photographs of station to include exterior, interior, sump, DCPs, equipment configurations, mounting, meteorological and any other ancillary sensors as applicable.

**2.10.6. Lake St Clair**

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

**L27219**

**Part 1**

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

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

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

***Hydraulic Corrector:*** 0.000 m

***GPS Observation Frequency:*** Every five years

***Dive Inspection Frequency:*** As found necessary or required

1. US Coast Guard is planning to install a new radio tower in the general location of the water level station gauge house. FOD crew should inquire with the commanding officer of the base as to the status of a new USCG tower. Like at Toledo, the USCG would like CO-OPS to install and operate a full suite of meteorological sensors (dual wind, air temperature, and barometer) on their tower. Obtain the necessary US Coast Guard permit. Investigate also the data types and availability of NWS sensors installed at the meteorological station next door at the yacht club. A decision will be made soon and if necessary the full meteorological sensor installation may occur in FY09. Indicate all findings, actions, contact, and other information in a meteorological reconnaissance report.

**2.10.7. St. Clair River**

**9014070 Algonac, MI**

**L27220**

**Part 1**

**PBM:** 901 4070 TREAT (NE0255)

**PBM Elevation (Dynamic):** 176.8682m

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

**Hydraulic Corrector:** 0.000 m

**GPS Observation Frequency:** Every five years (Not required this year)

**Dive Inspection Frequency:** Annually

1. This station was to be included in the CELRE Infrastructure Upgrade but is now not funded. The engineering design and all permits have been finalized. If funds are provided in the future a temporary gauge will need to be installed during demolition and restoration. The Department of Homeland Security is now actively pursuing the installation of 110-ft tower again for security of international boundary.
2. Continue to include both spikes, SPSN 0105 & 0106 to track movement and/or stability at both ends of bulkhead on property to prepare for potential future gauge house construction. Indicate all findings, actions, contact, and other information on the station report.
3. Provide a full compliment of photographs of station to include exterior, interior, sump, DCPs, equipment configurations, mounting, meteorological and any other ancillary sensors as applicable.

**9014080 St. Clair State Police, MI**

**L27220**

**Part 2**

**PBM:** A 237 (NE0943)

**PBM Elevation (Dynamic):** 176.5906m

**GPS Bench Mark:** 901 4080 F (AC9129)

**Hydraulic Corrector:** 0.000 m

**GPS Observation Frequency:** Every five years (Not required this year)

**Dive Inspection Frequency:** As found necessary or required

1. Contact the property owner at least two weeks in advance of annual inspection to schedule an access time to survey to the PBM, A 237. The backyard where the mark is located has two German Shepherds who have access to the yard 24/7. Do not enter without the landowners' permission.
2. Provide a full compliment of photographs of station to include exterior, interior, sump, DCPs, equipment configurations, mounting, meteorological and any other ancillary sensors as applicable.

**9014087 Dry Dock, MI**

**L27220**

**Part 3**

**PBM:** Z 236 (NE0953)

**PBM Elevation (Dynamic):** 180.7617 m

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

**Hydraulic Corrector:** 0.000 m

**GPS Observation Frequency:** Every five years (Not required this year)

**Dive Inspection Frequency:** As found necessary or required

1. Provide a full compliment of photographs of station to include exterior, interior, sump, DCPs, equipment configurations, mounting, meteorological and any other ancillary sensors as applicable.

**9014090 Mouth of the Black River, MI**

**L27220**

**Part 4**

**PBM:** Z 43 (NE0088)

**PBM Elevation (Dynamic):** 178.9323m

**GPS Bench Mark:** 901 4090 D (NE0955)

**Hydraulic Corrector:** 0.000 m

**GPS Observation Frequency:** Every five years (Not required this year)

**Dive Inspection Frequency:** Annually

1. NOTE - The new station established will require operation of the old station for a minimum of one year for comparisons between stations, including at least one complete summer month period, June through September, for computing the Low Water Datum (LWD). Continue to maintain old MBR station as usual until directed otherwise.
2. Perform dive to inspect and clean the old station intakes. Remove intakes for both primary and backup well, flush and clear of any obstructions. Indicate all findings, actions, contact, and other information on the station report.
3. Test the heat rods. If replacement is required, contract with Tim Cooley, Great Lakes maintenance contractor. Indicate all findings, actions, contact, and other information on the station report.
4. Provide a full compliment of photographs of station to include exterior, interior, sump, DCPs, equipment configurations, mounting, meteorological and any other ancillary sensors as applicable.

**9014091 Mouth of the Black River, MI**

**L27220**

**Part 4**

**PBM:** Z 43 (NE0088)

**PBM Elevation (Dynamic):** 178.9323m

**GPS Bench Mark:** 901 4090 D (NE0955)

**Hydraulic Corrector:** 0.000 m

**GPS Observation Frequency:** Every five years (Not required this year)

**Dive Inspection Frequency:** Annually

1. Determine and document outside and inside invert elevations.
2. Replace ground wires for both DCP'S and surge protectors with standard green ground wire.
3. Provide a full compliment of photographs of station to include exterior, interior, sump, DCPs, equipment configurations, mounting, meteorological and any other ancillary sensors as applicable.

**9014096 Dunn Paper, MI****L27220****Part 5****PBM:** 3060 (NE0081)**PBM Elevation (Dynamic):** 179.1206m**GPS Bench Mark:** Select most stable mark observable**Hydraulic Corrector:** 0.000 m**GPS Observation Frequency:** Every five years (Not required this year)**Dive Inspection Frequency:** Annually

1. Perform dive to inspect and clean the old station intakes. Remove intakes for both primary and backup well, flush and clear of any obstructions. Indicate all findings, actions, contact, and other information on the station report.
2. Test the heat rods. If replacement is required, contract with Tim Cooley, Great Lakes maintenance contractor. Indicate all findings, actions, contact, and other information on the station report.
3. Provide a full compliment of photographs of station to include exterior, interior, sump, DCPs, equipment configurations, mounting, meteorological and any other ancillary sensors as applicable.

**9014098 Fort Gratiot, MI****L27220****Part 6****PBM:** 901 4098 RETAINING WALL (OJ0009)**PBM Elevation (Dynamic):** 179.5533 m**GPS Bench Mark:** 901 4098 RETAINING WALL (OJ0009)**Hydraulic Corrector:** 0.000 m**GPS Observation Frequency:** Every five years (Not required this year)**Dive Inspection Frequency:** As found necessary or required

1. Inspect the display in the ground level entry way of the lighthouse to ensure that readout display is working properly. This display provides wind speed in MPH and direction in North, South, East or West and Local Standard Time (LST).
2. If the crew is unable to change out the RM Young wind bird nose cone atop the lighthouse then contact Cooley Communications, GL maintenance for this requirement. Indicate all findings, actions, contact, and other information on the station report.
3. A new spike (SPSN 606) is required to be set every year at this station in order to perform the Water Transfer (inside/outside) check.
4. Provide a full compliment of photographs of station to include exterior, interior, sump, DCPs, equipment configurations, mounting, meteorological and any other ancillary sensors as applicable.

**2.10.8. Lake Huron**

**9075002 Lakeport, MI**

**L27221**

**Part 1**

**PBM:** 907 5002 BURTCH (OJ0036)

**PBM Elevation (Dynamic):** 178.7965m

**GPS Bench Mark:** LAKEPORT RM 2 (OJ0599)

**Hydraulic Corrector:** +0.013 m

**GPS Observation Frequency:** Every five years (Not required this year)

**Dive Inspection Frequency:** As found necessary or required.

1. Contract dive was completed this 2008 maintenance year, and gooseneck intake was re-built.
2. Provide a full compliment of photographs of station to include exterior, interior, sump, DCPs, equipment configurations, mounting, meteorological and any other ancillary sensors as applicable.

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

**L27221**

**Part 2**

**PBM:** GRIST (OJ0219)

**PBM Elevation (Dynamic):** 180.2752 m

**GPS Bench Mark:** LSC 5C93 (OJ0517)

**Hydraulic Corrector:** 0.000 m

**GPS Observation Frequency:** Every five years (Not required this year)

**Dive Inspection Frequency:** As found necessary or required

1. The old PBM E 237 has been made available for use again. Geodetic leveling to E237 as PBM and all bench marks on property required.
2. Bench mark elevations need to be reviewed by GL Operations team before and after 2009 maintenance.
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. Inspect the sump ladder for structural integrity. If replacement is necessary, obtain estimate for replacement and contact FOD. Indicate all findings, actions, contact, and other information on the station report.
5. Provide a full compliment of photographs of station to include exterior, interior, sump, DCPs, equipment configurations, mounting, meteorological and any other ancillary sensors as applicable.
6. No how to reach statement exists for this station. Create a statement and incorporate into the E-Site. Ensure that all bench mark descriptions for this station meet the proper standards and formatting.



**9075035 Essexville, MI****PBM:** 907 5035 CON (OJ0526)**GPS Bench Mark:** ESSEX A (AA8053)**GPS Observation Frequency:** Every five years (Not required this year)**Dive Inspection Frequency:** As found necessary or required**L27221****PBM Elevation (Dynamic):** 179.1734 m**Hydraulic Corrector:** -0.002 m**Part 3**

1. At a minimum of one week prior to arrival on site, call and notify plant security of field party's anticipated date of arrival. Pre-arrange access through the rear entrance gate so that a Water Transfer (inside/outside) check can be obtained. Water Transfer was not done in 2007, but is required every year. See the station report for contacts.
2. Perform a reconnaissance of the site eastward towards the point to find an appropriate location for installing a meteorological sensor package (tower with dual wind birds, air temperature sensor, and barometer) in FY09, using CO-OPS Water Level and Meteorological Site Reconnaissance Procedures (updated March 2007) as a guideline. Provide a Meteorological Reconnaissance report with digital photos, measurements, and notes along with the required documentation from the Annual Inspection. If line of sight radio transmissions are not possible, then installation of a meteorological package may require additional DCP with transmitter. CO-OPS will write letters to appropriate authorities for permissions, as necessary, based on field crew's report.
3. NOTE: PBM elevation subject to change. NGS geodetically connected the network of station bench marks to the National Spatial Reference Network (NSRN) in 2006. Contact FOD for elevation update prior to abstracting precise levels. Bench mark elevations need to be reviewed by CO-OPS.
4. Provide a full compliment of photographs of station to include exterior, interior, sump, DCPs, equipment configurations, mounting, meteorological and any other ancillary sensors as applicable.

**9075059 Harrisville, MI****PBM:** K 306 (PK0230)**GPS Bench Mark:** LAUNCH SITE (AH9229)**GPS Observation Frequency:** Every five years (Not required this year)**Dive Inspection Frequency:** Annually**L27221****PBM Elevation (Dynamic):** 184.7660 m**Hydraulic Corrector:** -0.003 m**Part 4**

1. Station has been discontinued, and equipment and wells removed. Contact CO-OPS for more information.

**9075065 Alpena, MI****L27221****Part 7****PBM:** 907 5065 POST OFFICE (GJ0009)**PBM Elevation (Dynamic):** 180.1536 m**GPS Bench Mark:** 907 5065 G (No PID)**Hydraulic Corrector:** +0.031 m**GPS Observation Frequency:** Every five years (Not required this year)**Dive Inspection Frequency:** As found necessary or required

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 a full compliment of photographs of station to include exterior, interior, sump, DCPs, equipment configurations, mounting, meteorological and any other ancillary sensors as applicable.

**9075079 Mackinaw City, MI****L27221****Part 5****PBM:** J 299 (QK0428)**PBM Elevation (Dynamic):** 179.6082 m**GPS Bench Mark:** J 299 (QK0428)**Hydraulic Corrector:** +0.043 m**GPS Observation Frequency:** Every five years (Not required this year)**Dive Inspection Frequency:** As found necessary or required

1. Determine and document inside and outside invert elevations at new station.
2. Replace ground wires for both DCP'S and surge protectors with standard green ground wire.
3. Install and/or 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. Inspect meteorological sensors installed by GL contractor last January and report findings on the site report.

**9075080 Mackinaw City, MI****L27221****Part 5****PBM:** J 299 (QK0428)**PBM Elevation (Dynamic):** 179.6082 m**GPS Bench Mark:** J 299 (QK0428)**Hydraulic Corrector:** +0.043 m**GPS Observation Frequency:** Every five years (Not required this year)**Dive Inspection Frequency:** As found necessary or required

1. NOTE - The new station established will require operation of the old station for a minimum of one year for comparisons between stations, including at least one complete summer month period, June through September, for computing the Low Water Datum (LWD). Continue to maintain old Mackinaw City station as usual until directed otherwise.

**9075099 Detour Village, MI (PORTS)**

**L27221**

**Part 6**

***PBM:*** L 293 (QJ0086)

***PBM Elevation (Dynamic):*** 179.7044m

***GPS Bench Mark:*** DETOUR MARINA (AH9228)

***Hydraulic Corrector:*** +0.005 m

***GPS Observation Frequency:*** Every five years (Not required this year)

***Dive Inspection Frequency:*** As found necessary or required

1. Update chart section.
2. Provide a full compliment of photographs of station to include exterior, interior, sump, DCPs, equipment configurations, mounting, meteorological and any other ancillary sensors as applicable.

**2.10.9. Lake Michigan**

**9087023 Ludington, MI**

**L27222**

**Part 1**

**PBM:** J 318 (OL0303)

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

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

**Hydraulic Corrector:** +0.087 m

**GPS Observation Frequency:** Every five years (Not required this year)

**Dive Inspection Frequency:** As found necessary or required

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. NWS would like CO-OPS to move our wind sensors out to the entrance channel, providing true marine winds. Have GL maintenance contractor perform meteorological reconnaissance including report. When permits are in place, install a new tower with dual winds. Recon will determine line of site radio will work or if a 9210 DCP with GOES will be required.
3. Provide a full compliment of photographs of station to include exterior, interior, sump, DCPs, equipment configurations, mounting, meteorological and any other ancillary sensors as applicable.

**9087031 Holland, MI**

**L27222**

**Part 2**

**PBM:** W 319 (NG0413)

**PBM Elevation (Dynamic):** 177.5769 m

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

**Hydraulic Corrector:** +0.090 m

**GPS Observation Frequency:** Every five years (Not required this year)

**Dive Inspection Frequency:** Annually

1. Contract for construction under CELRC Infrastructure Upgrade awarded and work will commence in Spring, 2009 including installation of full suite of meteorological sensors (Rohn tower with dual wind birds, air temperature sensor, and barometer). Provide a report with digital photos, measurements, and notes along with the required documentation from the Annual Inspection.  
NOTE – When completed the new station will require operation of the old station for a minimum of one year for comparisons between stations, including at least one complete summer month period, June through September, for computing the Low Water Datum (LWD). Continue to maintain the old Holland station as usual until directed otherwise.
2. Perform dive to inspect and clean the old station intakes. Remove intakes for both primary and backup well, flush and clear of any obstructions and ream out the intake pass through on the ETG well. Indicate all findings, actions, contact, and other information on the station report.
3. Test the heat rods at old station. If replacement is required, contract with Tim Cooley. Indicate all findings, actions, contact, and other information on the station report.
4. Provide a full compliment of photographs of station to include exterior, interior, sump, DCPs, equipment configurations, mounting, meteorological and any other ancillary sensors as applicable.

**9087044 Calumet Harbor, IL****L27222****Part 3****PBM:** 908 7044 COM (ME2189)

PBM Dynamic Height: 178.0648 m

**GPS Bench Mark:** 908 7044 H (AE9231)**Hydraulic Corrector:** +0.104 m**GPS Observation Frequency:** Every five years (Not required this year)**Dive Inspection Frequency:** As found necessary or required

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 a full compliment of photographs of station to include exterior, interior, sump, DCPs, equipment configurations, mounting, meteorological and any other ancillary sensors as applicable.

**9087057 Milwaukee, WI****L27222****Part 4****PBM:** NAVY (OL0278)

PBM Dynamic Height: 182.9494 m

**GPS Bench Mark:** MILWAUKEE A (AA8061)**Hydraulic Corrector:** +0.106 m**GPS Observation Frequency:** Every five years (Not required this year)**Dive Inspection Frequency:** As found necessary or required

1. Site reconnaissance for the installation of meteorological sensor package was performed by RDD/FOD in July 2007. Two sites were chosen. The preferred location is owned by Lake Express, LLC. The owner has been contacted and supports this installation. The existing tower needs to have further reconnaissance performed. This will be done by our GL contractor. At the preferred location dual wind birds, air temperature sensor, and barometer need to be installed by the GL contractor in FY09. Provide a report with digital photos, measurements, and notes along with the required documentation from the Annual Inspection. (Still waiting on final plan and confirmation with property owner, contact Jeff Oyler & Seth Baldelli for more information).
2. Provide a full compliment of photographs of station to include exterior, interior, sump, DCPs, equipment configurations, mounting, meteorological and any other ancillary sensors as applicable.

**9087068 Kewaunee, WI****L27222****Part 5****PBM:** 908 7068 ROD (PM0373)

PBM Dynamic Height: 177.9684 m

**GPS Bench Mark:** 908 7068 H (AH5304)**Hydraulic Corrector:** +0.114 m**GPS Observation Frequency:** Every five years (Not required this year)**Dive Inspection Frequency:** Annually

1. This station was to be included in the CELRE Infrastructure Upgrade but is now not funded.
2. Provide a full compliment of photographs of station to include exterior, interior, sump, DCPs, equipment configurations, mounting, meteorological and any other ancillary sensors as applicable.

**9087069 Kewaunee Met, WI****Met Only Station**

1. Standard DCP maintenance is required.
2. Provide a full compliment of photographs of station to include exterior, interior, sump, DCPs, equipment configurations, mounting, meteorological and any other ancillary sensors as applicable.

**9087072 Sturgeon Bay Canal, WI****L27222****Part 6****PBM:** 908 7072 GARAGE (PM0361)

PBM Dynamic Height: 181.8608 m

**GPS Bench Mark:** STURGEON A (AA8057)**Hydraulic Corrector:** +0.106 m**GPS Observation Frequency:** Every five years (Not required this year)**Dive Inspection Frequency:** As found necessary or required

1. OET never received Met recon notes in FY 08. Update the met recon information and coordinate the installation of a full suite of meteorological sensors. NWS currently has two wind sensors in operation.
2. Provide a full compliment of photographs of station to include exterior, interior, sump, DCPs, equipment configurations, mounting, meteorological and any other ancillary sensors as applicable.

**9087079 Green Bay, WI****L27222****Part 7****PBM:** 908 7078 WIS (PN0090)

PBM Dynamic Height: 179.6563 m

**GPS Bench Mark:** 908 7079 H (AH5305)**Hydraulic Corrector:** +0.114 m**GPS Observation Frequency:** Every five years (Not required this year)**Dive Inspection Frequency:** As found necessary or required (contracted)

1. Note: This station was to be included in the CELRE Infrastructure Upgrade but is now not funded. If funding becomes available in the future a temporary “hydro” type station will be required for a four month summer data collection series at the proposed site of new station, the City owned property across the Fox River from the current site at the Pulliam Plant. This will determine if this site is up-slope from the existing station due to its river location.
2. Provide a full compliment of photographs of station to include exterior, interior, sump, DCPs, equipment configurations, mounting, meteorological and any other ancillary sensors as applicable.
3. A buoy marking the intake location is required to be installed in the spring and removed in late Fall each year. The contact for the dive contractor to place the buoy in this area is: Seaview Diving Contractors Inc, N8867 County Road Y, Seymour, WI 54165, Contact Name: Mike Holdridge, phone: 902-833-7601, fax: 920-833-7701

**9087088 Menominee, WI**

**L27222**

**Part 9**

**PBM: MARATHON (QL0345)**

**PBM Dynamic Height: 179.5330 m**

**GPS Bench Mark: 35 A (D 17590)**

**Hydraulic Corrector: +0.184 m**

**GPS Observation Frequency: Every five years (Not required this year)**

**Dive Inspection Frequency: Annually**

1. Note: The new water level station for this location is currently under construction under the CELRC Infrastructure Upgrade contract. When construction is complete CO-OPS install all gauging equipment including installation of full suite of meteorological sensors (Rohn tower with dual wind birds, air temperature sensor, and barometer). Provide a report with digital photos, measurements, and notes along with the required documentation from the Annual Inspection.  
NOTE – When completed the new station will require operation of the old station for a minimum of one year for comparisons between stations, including at least one complete summer month period, June through September, for computing the Low Water Datum (LWD). Continue to maintain the old Menominee station as usual until directed otherwise.
2. NOTE: PBM elevation subject to change. NGS geodetically connected the network of station bench marks to the National Spatial Reference Network (NSRN) in 2006. Contact FOD for elevation update prior to abstracting precise levels. Bench mark elevations need to be reviewed by CO-OPS.
3. Perform dive to inspect and clean the orifices and replace the temperature sensor as necessary. Indicate all findings, actions, contact, and other information on the station report.
4. The temperature sensor is connected to the primary Xpert. The analog board is bad causing a -10 degree error in the water level temperatures. Replace this board and perform the required test procedures to ensure the WL temperatures are correct. Note, continue repairs as necessary.

**9087096 Port Inland, MI**

**L27222**

**Part 8**

***PBM:*** 908 7096 G (AC8317)

PBM Dynamic Height: 181.3705m

***GPS Bench Mark:*** 908 7096 J (No PID)

***Hydraulic Corrector:*** +0.046m

***GPS Observation Frequency:*** Every five years (Not required this year)

***Dive Inspection Frequency:*** Annually

1. Perform dive inspection, clean the intakes, and obtain the intake elevations. Dive inspection is mandatory in 2009 due to new installation of wells changing the originally determined intake elevations. Indicate all findings, actions, contact, and other information on the station report.
2. If the GL maintenance contractor has not already done so, install a redundant Teledesign 5 watt radio in the redundant DCP. Indicate all findings, actions, contact, and other information on the station report.
3. Inspect the stand alone meteorological station and perform standard maintenance for meteorological station. Indicate all findings, actions, contact, and other information on the station report.
4. Provide a full compliment of photographs of station to include exterior, interior, sump, DCPs, equipment configurations, mounting, meteorological and any other ancillary sensors as applicable.



**2.10.10. St. Marys River**

**9076024 Rock Cut, MI (PORTS)**

**L27223**

**Part 3**

**PBM:** 907 6024 B (No PID)

**PBM Elevation (Dynamic):** 178.0183m

**GPS Bench Mark:** 907 6024 B (No PID)

**Hydraulic Corrector:** 0.000 m

**GPS Observation Frequency:** Every five years (Not required this year)

**Dive Inspection Frequency:** Annually

1. Seal the air gap around the wells where they come through the fiberglass flooring. Rodents are chewing through expanding foam insulation. Movement of well against cut station floor continues also. Field crew is to come up with a permanent solution, possibly plywood and/or rubber gasket or other. This is mandatory for 2009 maintenance cycle. Indicate all findings, actions, contact, and other information on the station report.
2. Provide a full compliment of photographs of station to include exterior, interior, sump, DCPs, equipment configurations, mounting, meteorological and any other ancillary sensors as applicable.

**9076027 West Neebish Island, MI (PORTS)**

**L27223**

**Part 6**

**PBM:** E 297 (RJ0670)

**PBM Elevation (Dynamic):** 178.7844 m

**GPS Bench Mark:** 907 6027 DOCK (RJ0186)

**Hydraulic Corrector:** 0.000 m

**GPS Observation Frequency:** Every five years (Not required this year)

**Dive Inspection Frequency:** As found necessary or required

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 a full compliment of photographs of station to include exterior, interior, sump, DCPs, equipment configurations, mounting, meteorological and any other ancillary sensors as applicable.

**9076032 Little Rapids, MI (PORTS)**

**L27223**

**Part 5**

**PBM:** D 293 (RJ0616)

**PBM Dynamic Height:** 178.3058 m

**GPS Bench Mark:** FERRY DOCK (RJ0617)

**Hydraulic Corrector:** 0.000 m

**GPS Observation Frequency:** Every five years (Not required this year)

**Dive Inspection Frequency:** Annually

1. NOTE: When completed the new station will require operation of the old station for a minimum of one year for comparisons between stations, including at least one complete summer month period, June through September, for computing the Low Water Datum (LWD). Continue to maintain the old Little Rapids station as usual until directed otherwise.
2. Provide a full compliment of photographs of station to include exterior, interior, sump, DCPs, equipment configurations, mounting, meteorological and any other ancillary sensors as applicable.

**9076033 Little Rapids, MI (PORTS)****L27223****Part 5****PBM:** D 293 (RJ0616)

PBM Dynamic Height: 178.3058 m

**GPS Bench Mark:** FERRY DOCK (RJ0617)**Hydraulic Corrector:** 0.000 m**GPS Observation Frequency:** Every five years (Not required this year)**Dive Inspection Frequency:** Annually

1. Note: Continue standard maintenance at old station until new station is accepted.
2. Perform dive inspection, clean the intake, and obtain the intake invert elevations. Indicate all findings, actions, contact, and other information on the station report.
3. Provide one general location photo showing the new water level station in relationship to its supporting structure and the local body of water.
4. Install and/or 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. Inspect meteorological sensors installed by GL contractor last January and report findings on the site report.
6. Provide a full compliment of photographs of station to include exterior, interior, sump, DCPs, equipment configurations, mounting, meteorological and any other ancillary sensors as applicable.

**9076060 U.S. Slip, MI (PORTS)****L27223****Part 1****PBM:** C 293 (RJ0613)**PBM Elevation (Dynamic):** 184.3007 m**GPS Bench Mark:** UNIT 10 106 (AE8008)**Hydraulic Corrector:** 0.000 m**GPS Observation Frequency:** Every five years (Not required this year)**Dive Inspection Frequency:** As found necessary or required

1. 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 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. If a dive operation becomes necessary it requires a written plan to be submitted to the lead of dive operations, in the Detroit District office, and the Soo Locks operations engineer. This must be done at least one full week in advance of the dive.
3. 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.
4. Please add Bench Marks 10 and IBM 36 to the sketch.
5. Provide a full compliment of photographs of station to include exterior, interior, sump, DCPs, equipment configurations, mounting, meteorological and any other ancillary sensors as applicable.

**9076070 S.W. Pier, MI (PORTS)**

**L27223**

**Part 2**

***PBM:*** V 295 (RJ0608)

***PBM Elevation (Dynamic):*** 186.0904 m

***GPS Bench Mark:*** UNIT 10 106 (AE8008)

***Hydraulic Corrector:*** 0.000 m

***GPS Observation Frequency:*** Every five years (Not required this year)

***Dive Inspection Frequency:*** As found necessary or required

1. 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 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. If a dive operation becomes necessary it requires a written plan to be submitted to the lead of dive operations, in the Detroit District office, and the Soo Locks operations engineer. This must be done at least one full week in advance of the dive.
3. Provide a full compliment of photographs of station to include exterior, interior, sump, DCPs, equipment configurations, mounting, meteorological and any other ancillary sensors as applicable.

**2.10.11. Lake Superior**

**9099004 Point Iroquois, MI (PORTS)**

**L27224**

**Part 1**

**PBM:** A 293 (RJ0586)

**PBM Elevation (Dynamic):** 187.7989 m

**GPS Bench Mark:** A 293 (RJ0586)

**Hydraulic Corrector:** -0.100 m

**GPS Observation Frequency:** Every five years (Not required this year)

**Dive Inspection Frequency:** As found necessary or required

1. Perform dive inspection, clean the intake, and obtain the intake invert elevations. Obtain the GPS coordinates for the offshore end of the intake. Indicate all findings, actions, contact, and other information on the station report. Dive operation is mandatory in 2009, rent or contract a boat.
2. 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.
3. Provide a full compliment of photographs of station to include exterior, interior, sump, DCPs, equipment configurations, mounting, meteorological and any other ancillary sensors as applicable.

**9099018 Marquette, MI (MASTER)**

**L27224**

**Part 2**

**PBM:** U 329 (RK0448)

**PBM Elevation (Dynamic):** 189.9332 m

**GPS Bench Mark:** 909 9018 K (AH7272)

**Hydraulic Corrector:** 0.000 m

**GPS Observation Frequency:** Every five years (Not required this year)

**Dive Inspection Frequency:** As found necessary or required.

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. Field crew to obtain updated status of USCG base construction. Note: NWS and the local mariners would like us to move our wind sensors over atop the Marquette Harbor Lighthouse, providing true marine winds for the area. The GL maintenance contractor has performed reconnaissance of the lighthouse and contacted the leaser, President, Board of Directors, Marquette Maritime Museum, Frederick Stonehouse and obtained permission (letter in hand) for the installation. Because this lighthouse is historic, permits will also have to be obtained from both MI SHPO and the CG. 9<sup>th</sup> District office. Once these permits are in place dual winds will be installed and radioed to the gauge station. Great Lakes contractor will perform the installation.
3. Provide a full compliment of photographs of station to include exterior, interior, sump, DCPs, equipment configurations, mounting, meteorological and any other ancillary sensors as applicable.

**9099044 Ontonagon, MI****L27224****Part 3****PBM:** 909 9044 VFW (AE8284)**PBM Elevation (Dynamic):** 186.0416 m**GPS Bench Mark:** 909 9044 L (DJ 5175)**Hydraulic Corrector:** +0.049 m**GPS Observation Frequency:** Every five years (Not required this year)**Dive Inspection Frequency:** As found necessary or required.

1. New PBM established. Use PBM 909 9044 VFW at elevation 186.0416 meters.
2. Contact the Great Lakes maintenance contractor for status on upgrading the electrical system and installing a new heater assembly. Indicate all findings, actions, contact, and other information on the station report.
3. Provide a full compliment of photographs of station to include exterior, interior, sump, DCPs, equipment configurations, mounting, meteorological and any other ancillary sensors as applicable.

**9099064 Duluth, MN****L27224****Part 4****PBM:** 909 9064 BAR (RN1077)**PBM Elevation (Dynamic):** 184.4324 m**GPS Bench Mark:** 602 (AE8289)**Hydraulic Corrector:** +0.079 m**GPS Observation Frequency:** Every five years (Not required this year)**Dive Inspection Frequency:** As found necessary or required

1. Determine if the water temperature sensor can be placed through one of the intake pipes and attached to the off shore end of the intake pipe. If a longer WT sensor is needed, contact ED CIL to obtain. Do not install water temperature probe if it prevents the intake/valve openings from being closed. Indicate all findings, actions, contact, and other information on the station report.
2. Provide a full compliment of photographs of station to include exterior, interior, sump, DCPs, equipment configurations, mounting, meteorological and any other ancillary sensors as applicable.

**9099090 Grand Marais, MN****L27224****Part 5****PBM:** 909 9090 SCOTT (SH0674)**PBM Elevation (Dynamic):** 184.9850 m**GPS Bench Mark:** MARAIS RESET (AA2869)**Hydraulic Corrector:** +0.046 m**GPS Observation Frequency:** Every five years (Not required this year)**Dive Inspection Frequency:** As found necessary or required

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. If PBM SCOTT ever becomes inaccessible then use BM Z 176 as the new PBM with elevation above IGLD as 188.5940 m.
3. Provide a full compliment of photographs of station to include exterior, interior, sump, DCPs, equipment configurations, mounting, meteorological and any other ancillary sensors as applicable.
4. Intake was damaged fall of 2008 from dredging. Dive operation is required to inspect the contracted repairs and to re-determine outside intake invert elevation.

## 2.11. FOD/PRO - HAWAII, PACIFIC ISLANDS, AND WEST COAST STATIONS

### 1611400 Nawiliwili, HI

**PBM:** 161 1400 TIDAL 14 (No PID)

**PBM above SD:** 3.155 m

**GPS Bench Mark:** 161 1400 WALL

**MSL above SD:** 0.949 m

**GPS Observation Frequency:** Every five years (Not required this year)

**Dive Inspection Frequency:** Every two years (Not required this year)

1. Install a met tower and met sensors during FY09 (including dual winds, barometer and air temperature sensors - all equipment GFE). Notes shall be provided on the site report if the wind sensors are not feasible due to obstructions. Provide sensor heights and digital photos as specified in the Standing Project Instructions, Updated November 2008.
2. Take one general location photo showing the water level station in relationship to its supporting structure and the local body of water. Take digital photos of the setting (waist or chest high view) and a general location for Bench Marks 161 1400 A, 161 1400 B, 161 1400 C, 161 1400 TIDAL 14, 161 1600 F, 161 1400 G, 161 1400 H, 161 1400 J, and 161 1400 TIDAL 8.

### 1612340 Honolulu, HI

**PBM:** 161 2340 BM 8 (TU0286)

**PBM above SD:** 3.734 m

**GPS Bench Mark:** GSL 2340 1987 (No PID)

**MSL above SD:** 1.412 m

**GPS Observation Frequency:** Every five years (not required year)

**Dive Inspection Frequency:** Every two years (Required in 2009)

1. **Unresolved from 2008 Project Instructions.** Record the serial numbers for the Xpert Dark RTU, power supply (Xpert and Xpert Dark), and pump.
2. **Unresolved from 2008 Project Instructions.** Take digital photos of the setting (waist or chest high view) and general location of all existing bench marks. Take face, setting, and location photos for all marks.

### 1612480 Mokuoloe, HI

**PBM:** 161 2480 NO 1 (No PID)

**PBM above SD:** 1.969 m

**GPS Bench Mark:** NO 2 1987 (No PID)

**MSL above SD:** 1.210 m

**GPS Observation Frequency:** Every five years (Not required this year)

**Dive Inspection Frequency:** Every two years (Required in 2009)

1. **Unresolved from 2008 Project Instructions.** Replace machete.
2. Update Aquatrak controller chip to the newest version 4.01.

**1615680 Kahului, HI****PBM:** 161 5680 A (No PID)**PBM above SD:** 3.007 m**GPS Bench Mark:** 161 5680 C (No PID)**MSL above SD:** 1.075 m**GPS Observation Frequency:** Every five years (Not required this year)**Dive Inspection Frequency:** Annually

1. No additional requirements are needed.

**1617433 Kawaihae, HI****PBM:** 161 7433 B (No PID)**PBM above SD:** 3.094 m**GPS Bench Mark:** 161 7433 B (No PID)**MSL above SD:** 1.049 m**GPS Observation Frequency:** Every five years (Not required this year)**Dive Inspection Frequency:** Annually

1. No additional requirements are needed.

**1617760 Hilo, HI****PBM:** 161 7760 TIDAL 4 (TU0020)**PBM above SD:** 4.663 m**GPS Bench Mark:** 161 7760 A (No PID)**MSL above SD:** 1.545 m**GPS Observation Frequency:** Every five years (Not required this year)**Dive Inspection Frequency:** Every two years (Required in 2009)

1. Install a met tower and met sensors during FY09 (including dual winds, barometer and air temperature sensors - all equipment GFE). Notes shall be provided on the site report if the wind sensors are not feasible due to obstructions. Provide sensor heights and digital photos as specified in the Standing Project Instructions, Updated November 2008.
2. **Unresolved from 2008 Project Instructions.** Run rigid conduit from the tide house to the roof.
3. **Unresolved from 2008 Project Instructions.** Replace all solar cable and GOES cable.
4. **Unresolved from 2008 Project Instructions.** Record serial number for the Xpert and Xpert Dark DCP power supply.

**1619910 Sand Island, Midway Islands****PBM:** 161 9910 TIDAL 21 (No PID)**PBM above SD:** 3.243 m**GPS Bench Mark:** 161 9910 A (No PID)**MSL above SD:** 1.020 m**GPS Observation Frequency:** Every five years (Required in 2009)**Dive Inspection Frequency:** Annually

1. Verify the elevation difference between the digibub staff stop and the digibub orifices zero on an annual basis for OGP funded redundant DCP 3.
2. Replace Druck with Paros sensor on primary station backup DCP.
3. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements. Ed Carlson of NGS has been requested to perform this task with the OGP funding for FY09.

**1630000 Guam****PBM:** 163 0000 TIDAL 4 (TW0041)**PBM above SD:** 2.996 m**GPS Bench Mark:** 163 0000 TIDAL 11 (AA4394)**MSL above SD:** 0.826 m**GPS Observation Frequency:** Every five years (Not required this year)**Dive Inspection Frequency:** Annually

1. Verify the elevation difference between the digibub staff stop and the digibub orifices zero on an annual basis for NWLON DCP 1 and OGP funded redundant DCP 3.
2. Replace water temperature sensor.
3. Ground galvanized pole at the top of the Shakespeare mast to the nearby ground rod.
4. Maintain access to the cement junction boxes during each inspection to prevent over growth on the lids.
5. Bench mark 163 0000 TIDAL 13 must be included in the 2009 level run. Bench mark is inside of a security fence and permission may be needed to access the mark.
6. Take one general location photo showing the water level station in relationship to its supporting structure and the local body of water. Take digital photos of the setting (waist or chest high view) and general location of all existing bench marks. Take face, setting, and location photos for any newly established marks.

**1631428 Pago Bay, Guam****PBM:** 163 1428 B (No PID)**PBM above SD:** 10.000 m**GPS Bench Mark:** Undetermined**MSL above SD:** 7.731 m**GPS Observation Frequency:** Every five years (Required in 2009)**Dive Inspection Frequency:** Annually

1. Verify the elevation difference between the digibub staff stop and the digibub orifices zero on an annual basis.
2. Paint PVC baffle around orifice with anti-fouling paint.

**1770000 Pago Pago****PBM:** 177 0000 S (DE8786)**PBM above SD:** 2.557 m**GPS Bench Mark:** 177 0000 S (DE8786)**MSL above SD:** 1.194 m**GPS Observation Frequency:** Every five years (Not required this year)**Dive Inspection Frequency:** Annually

1. Replace Druck with Paros sensor on primary station backup DCP.
2. Replace orifice and rerun bubbler tubing.
3. Bring additional aluminum anodes for the orifices.
4. Bring desiccant packs for all gauges and desiccators.
5. Take one general location photo showing the water level station in relationship to its supporting structure and the local body of water.



**1820000 Kwajalein****PBM:** 182 0000 TIDAL 8 (No PID)**PBM above SD:** 2.853 m**GPS Bench Mark:** 182 0000 TIDAL 12 (No PID)**MSL above SD:** 1.457 m**GPS Observation Frequency:** Every five years (Not required this year)**Dive Inspection Frequency:** Annually

1. Verify the elevation difference between the digibub staff stop and the digibub orifices zero on an annual basis for OGP funded redundant DCP 3.
2. Re-calibrate the barometer.
3. Take digital photos of the setting (waist or chest high view) and general location of bench mark 182 0000 S.

**1890000 Wake Island****PBM:** 189 0000 TIDAL 12 (TW0169)**PBM above SD:** 4.353 m**GPS Bench Mark:** 161 0000 L (No PID)**MSL above SD:** 1.608 m**GPS Observation Frequency:** Every five years (Not required this year)**Dive Inspection Frequency:** Annually

1. Verify the elevation difference between the digibub staff stop and the digibub orifices zero on an annual basis for OGP funded redundant DCP 3.
2. Replace Druck with Paros sensor on primary station backup DCP.
3. Upgrade the Iridium modems on both the primary and redundant stations.
4. Replace all DCP batteries.
5. Patch hole in the deck and repair wood timber fender.
6. Install equipment barriers around ROHN tower.
7. Record the pump serial number.

**9410689 Gerald Desmond Bridge, CA (PORTS)****Air Gap Only Station**

1. Provide sensor heights and digital photos of all installed sensors as specified in the section 2.9 of the Standing Project Instructions, Updated March 2007.

**9411406 TOPEX, CA****PBM:** 941 1406 NO STAMPING (+20 LEG 1992) (No PID)**GPS Bench Mark:** Undetermined**PBM above SD:** 20.150 m**GPS Observation Frequency:** Every five years (Not required this year)**MSL above SD:** 14.467 m**Dive Inspection Frequency:** Annually

1. Request the oil company to perform the dive inspection and measure the orifices elevations.
2. Install a DAA pump on DCP 1, procured with OGP funding.
3. Replace the stainless steel LP bolt on the riser to a longer size to allow leveling without removing the flange. The new bolt length should be 2 ¾"-3" full thread.
4. Provide a "To Reach" statement for this station.

**9414523 Redwood City, CA (PORTS)** **L27210** **Part 8**  
*PBM:* 941 4523 TIDAL 13 (HT2319) *PBM above SD:* 5.993 m  
*GPS Bench Mark:* 941 4523 TIDAL 13 (HT2319) *MSL above SD:* 3.378 m  
*GPS Observation Frequency:* Every five years (Not required this year)  
*Dive Inspection Frequency:* Annually

1. No additional requirements.

**9414863 Richmond, CA (PORTS)** **L27210** **Part 10**  
*PBM:* TIDAL 1 STA III 23 (HT0934) *PBM above SD:* 7.330 m  
*GPS Bench Mark:* Undetermined *MSL above SD:* 4.520 m  
*GPS Observation Frequency:* Every five years (Required in 2009)  
*Dive Inspection Frequency:* Annually

1. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
2. Add ground equipment to the station.
3. Check parallel plates for a secure fit on the end cone; if not secure, add a tap.

**9414769 Oakland Middle Harbor, CA (PORTS)** **Met Only Station**  
1. Provide sensor heights and digital photos of all installed sensors as specified in the section 2.9 of the Standing Project Instructions, Updated March 2007.

**9439099 Wauna, OR** **L27211** **Part 6**  
*PBM:* 943 9909 F (SC1084) *PBM above SD:* 5.290 m  
*GPS Bench Mark:* Undetermined *MSL above SD:* 1.332 m  
*GPS Observation Frequency:* Every five years (Required in 2009)  
*Dive Inspection Frequency:* Annually

1. Verify the elevation difference between the digibub staff stop and the digibub orifices zero on an annual basis for DCP 1 and DCP 2.
2. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.

**9439201 St. Helens, OR**

**L27211**

**Part 7**

***PBM:*** TIDAL 3 (RD0587)

***PBM above SD:*** 12.571 m

***GPS Bench Mark:*** Undetermined

***MSL above SD:*** 1.047 m

***GPS Observation Frequency:*** Every five years (Required in 2009)

***Dive Inspection Frequency:*** Annually

1. Verify the elevation difference between the digibub staff stop and the digibub orifices zero on an annual basis for DCP 1 and DCP 2.
2. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
3. Repair and replace the inside door handle.

**9440083 Vancouver, WA**

**L27212**

**Part 11**

***PBM:*** 944 0083 D

***PBM above SD:*** 9.470 m

***GPS Bench Mark:*** Undetermined

***MSL above SD:*** 0.940 m

***GPS Observation Frequency:*** Every five years (Required in 2009)

***Dive Inspection Frequency:*** Annually

1. Verify the elevation difference between the digibub staff stop and the digibub orifices zero on an annual basis for DCP 1 and DCP 2.
2. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.

**9440422 Longview, WA**

**L27212**

**Part 12**

***PBM:*** 944 0422 TIDAL 5 (SC1112)

***PBM above SD:*** 8.360 m

***GPS Bench Mark:*** Undetermined

***MSL above SD:*** 1.382 m

***GPS Observation Frequency:*** Every five years (Required in 2009)

***Dive Inspection Frequency:*** Annually

1. Verify the elevation difference between the digibub staff stop and the digibub orifices zero on an annual basis for DCP 1 and DCP 2.
2. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.

**9440569 Skamokawa, WA****L27212****Part 13****PBM:** 944 0569 TIDAL 5 (SC0340)**PBM above SD:** 5.504 m**GPS Bench Mark:** Undetermined**MSL above SD:** 1.270 m**GPS Observation Frequency:** Every five years (Required in 2009)**Dive Inspection Frequency:** Annually

1. Verify the elevation difference between the digibub staff stop and the digibub orifices zero on an annual basis for DCP 1 and DCP 2.
2. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
3. Raise the tide house 3 feet with plastic timbers, placing the tide house above the water-line.
4. Take digital photos of the setting (waist or chest high view) and general location of all existing bench marks.

**9440910 Toke Point, WA****L27212****Part 1****PBM:** 944 0910 H (No PID)**PBM above SD:** 6.669 m**GPS Bench Mark:** FLAG (SC0916)**MSL above SD:** 2.836 m**GPS Observation Frequency:** Every five years (Not required this year)**Dive Inspection Frequency:** Annually

1. Remove silt accumulation from under the acoustic well. Water jet and suction mud from below the well to create a larger/deeper hole.
2. Replace tide house door handle.

**9441102 Westport, WA****L27212****Part 2****PBM:** 944 1102 A (No PID)**PBM above SD:** 5.592 m**GPS Bench Mark:** 944 1102 H (No PID)**MSL above SD:** 2.244 m**GPS Observation Frequency:** Every five years (Not required this year)**Dive Inspection Frequency:** Annually

1. Take one general location photo showing the water level station in relationship to its supporting structure and local body of water.

**9442396 La Push, WA****L27212****Part 3****PBM:** 944 2396 TIDAL 7 (No PID)**PBM above SD:** 10.40 m**GPS Bench Mark:** 944 2396 G (No PID)**MSL above SD:** 2.943 m**GPS Observation Frequency:** Every five years (Not required this year)**Dive Inspection Frequency:** Annually

1. Verify the elevation difference between the digibub staff stop and the digibub orifices zero on an annual basis.
2. Install a telephone conditioner.
3. Move equipment down below to office area on south wall left of the stairway to upper hatch (per MSTR Chief Johnson's permission).

**9443090 Neah Bay, WA****L27212****Part 4****PBM:** 9444 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 five years (Not required this year)**Dive Inspection Frequency:** Annually

1. Fix wind bird conduit near well area as time permits.
2. Provide logistical and station information support to NGS and the Spatial Reference Center of Washington (SRCW) for the installation of a CORS site. The web link for SRCW is <http://www.washington3d.org/15.asp>.

**9444090 Port Angeles, WA****L27212****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 five years (Not required this year)**Dive Inspection Frequency:** Every two years (Not required this year)

1. Replace 12v / 40AH battery in Dark enclosure and power box.
2. Replace sounding tube, if needed.
3. Consider building a barricade such as a knee high cinderblock wall with tall corner posts around tide house. May be needed to prevent damage from forklifts and other maintenance vehicles.

**9444900 Port Townsend, WA****L27212****Part 6****PBM:** 944 4900 BM 18 (No PID)**PBM above SD:** 6.559 m**GPS Bench Mark:** 944 4900 D TIDAL (AI2202)**MSL above SD:** 2.547 m**GPS Observation Frequency:** Every five years (Not required this year)**Dive Inspection Frequency:** Every two years (Not required this year)

1. Keep an eye on the stove pipe; be prepared to replace.
2. Take digital photos of the setting (waist or chest high view) and general location of all existing bench marks. Take face, setting, and location photos for any newly established marks.

**9446482 Tacoma, WA (PORTS)**

**Met Only Station**

1. No additional requirements.

**9446484 Tacoma, WA (PORTS)**

**L27212**

**Part 7**

**PBM:** 944 6484 A (No PID)

**PBM above SD:** 5.326 m

**GPS Bench Mark:** Undetermined

**MSL above SD:** 2.268 m

**GPS Observation Frequency:** Every five years (Not required this year)

**Dive Inspection Frequency:** Annually

1. **Unresolved from 2008 Project Instructions.** Establish one to two new bench marks, designation/stamping as follows: 944 6484 F/6484 F 2009, and 944 6484 G/6484 G 2009.
2. Update the bench mark sketch.
3. Take digital photos of the setting (waist or chest high view) and general location of all existing bench marks. Take face, setting, and location photos for any newly established marks.

**9447130 Seattle, WA**

**L27212**

**Part 8**

**PBM:** 944 7130 TIDAL 23 (No PID)

**PBM above SD:** 8.851 m

**GPS Bench Mark:** DAVE (No PID)

**MSL above SD:** 4.443 m

**GPS Observation Frequency:** Every five years (Not required this year)

**Dive Inspection Frequency:** Every two years (Required this year if item 1 requires a dive)

1. Replace the steel clamps as needed; showing significant corrosion.

**9449419 Cherry Point at South Dock, WA (PORTS)**

**Met Only Station**

1. Replace the IP modem.

**9449424 Cherry Point, WA (PORTS)**

**L27212**

**Part 9**

**PBM:** 944 9424 TIDAL 1 (No PID)

**PBM above SD:** 11.226 m

**GPS Bench Mark:** 941 9424 J TIDAL (AI2204)

**MSL above SD:** 3.543 m

**GPS Observation Frequency:** Every five years (Not required this year)

**Dive Inspection Frequency:** Annually

1. A dive **MUST** be completed during the FY09 annual inspection.
2. Install a current meter.

**9449880 Friday Harbor, WA**

**L27212**

**Part 10**

**PBM:** 944 9880 TIDAL 10 (No PID)

**PBM above SD:** 4.892 m

**GPS Bench Mark:** 944 9880 C TIDAL (AI2205)

**MSL above SD:** 2.561 m

**GPS Observation Frequency:** Every five years (Not required this year)

**Dive Inspection Frequency:** Annually

1. Replace water temperature interconnect cable.

## 2.12. EHI - TASK XXI - CALIFORNIA AND OREGON STATIONS

Steve Hudziak, Task Manager/Technical Representative (TR)

### 9410170 San Diego, CA

L27210

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 five years (Not required this year)

**Dive Inspection Frequency:** Every two years (Required in 2009)

1. Establish and level one new bench marks, designation/stamping as follows: 941 0170 X/0170 X 2009.
2. Update the bench mark sketch with the new marks.
3. Take digital photos of the setting (waist or chest high view) and general location of the new bench mark.
4. Update the bench mark descriptions for 941 0170 TIDAL 12, 941 0170 TIDAL 9, and M57 so that they meet NOS standards which can be found in the User's Guide for Writing Bench Mark Descriptions, Updated 2002.

### 9410230 La Jolla, CA

L27210

Part 2

**PBM:** 941 0230 TIDAL 7 (DC0986)

**PBM above SD:** 12.299 m

**GPS Bench Mark:** 941 0320 M TIDAL (DC1313)

**MSL above SD:** 2.163 m

**GPS Observation Frequency:** Every five years (Not required this year)

**Dive Inspection Frequency:** Annually

1. Install a met tower and met sensors at tide station location during FY09 (including dual winds, barometer and air temperature sensors – all equipment GFE). Provide sensor heights and digital photos as specified in the section 2.9 of the Standing Project Instructions, Updated November 2008.
2. Replace the stove pipe.
3. Replace delaminating steel clamp which is 3<sup>rd</sup> down from pier deck with SS unit.
4. Inspect and evaluate the 1<sup>st</sup> and 2<sup>nd</sup> steel clamps down from the pier deck Annually for replacement.

### 9410660 Los Angeles (PORTS), CA

L27210

Part 3

Primary Benchmark: 8 - 14 FT ABOVE MLW (DY1083)

**PBM above SD:** 5.361 m

**GPS Bench Mark:** 8 - 14 FT ABOVE MLW (DY1083)

**MSL above SD:** 2.028 m

**GPS Observation Frequency:** Every five years (Not required this year)

**Dive Inspection Frequency:** Annually

1. Monitor the condition of the underwater uni-strut brackets holding the bubbler tubing conduit annually.

**9410840 Santa Monica, CA****L27210****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 five years (Not required this year)**Dive Inspection Frequency:** Annually

1. Install a met tower and met sensors at tide station location during FY09 (including dual winds, barometer and air temperature sensors – all equipment GFE). Provide sensor heights and digital photos as specified in the section 2.9 of the Standing Project Instructions, Updated November 2008.
2. Replace the water temperature sensor (GFE).
3. Monitor the galvanized clamp at M.H.H.W. level on well annually and evaluate for future replacement.
4. Update the bench mark descriptions for 941 0840 TIDAL 3 and 941 0840 R so that it meets NOS standards which can be found in the User's Guide for Writing Bench Mark Descriptions, Updated 2002.
5. Re-level bench mark 941 0840 TIDAL 3 to verify the 9.9 mm movement calculated during the FY08 annual inspection.

**9411340 Santa Barbara, CA****L27210****Part 16****PBM:** 941 1340 L**PBM above SD:** 4.746 m**GPS Bench Mark:** 941 1340 L**MSL above SD:** 1.824 m**GPS Observation Frequency:** Every five years (Not required this year)**Dive Inspection Frequency:** Annually

1. Verify the elevation difference between the digibub staff stop and the digibub orifices zero on an annual basis.
2. Record the serial number of the Paros 2 pump and the redundant sensor pump.
3. Replace water temperature sensor.

**9412110 Port San Luis, CA****L27210****Part 5****PBM:** 941 2110 TIDAL 16 (FV1078)**PBM above SD:** 5.691 m**GPS Bench Mark:** 941 2110 TIDAL 6 (FV0898)**MSL above SD:** 2.149 m**GPS Observation Frequency:** Every five years (Not required this year)**Dive Inspection Frequency:** Annually

1. Install a met tower and met sensors at tide station location during FY09 (including dual winds, barometer and air temperature sensors – all equipment GFE). Provide sensor heights and digital photos as specified in the section 2.9 of the Standing Project Instructions, Updated November 2008.
2. Replace stove pipe inside Aquatrak well.
3. Re-case and install a bench mark lid to bench mark 941 2110 A and 941 2110 B.



**9413450 Monterey, CA****L27210****Part 6****PBM:** 941 3450 TIDAL 2 (GU2090)**PBM above SD:** 5.669 m**GPS Bench Mark:** 941 3450 M TIDAL (GU4116)**MSL above SD:** 1.893 m**GPS Observation Frequency:** Every five years (Not required this year)**Dive Inspection Frequency:** Annually

1. Replace the bottom well clamp with a stainless steel unit.
2. Remove remaining fiberglass coated wood beam at waterline.
3. Install plastic beams to support a Dixon board style bubbler system which is attached to 1" all-thread extending from plastic beam piling supports.
4. Initiate conversation with the pier owner concerning the replacement of the ladder from tide house down to catwalk.
5. Initiate conversation with the pier owner concerning the repair 4"x12"x10' wood timber on north end of catwalk, one is failing.
6. Update the bench mark descriptions for B 21, and 941 3450 K so that they meet NOS standards which can be found in the User's Guide for Writing Bench Mark Descriptions, Updated 2002.

**9414290 San Francisco, CA (PORTS)****L27210****Part 7****PBM:** 941 4290 TIDAL 180 (HT0702)**PBM above SD:** 5.794 m**GPS Bench Mark:** 941 4290 TIDAL 180 (HT0702)**MSL above SD:** 2.773 m**GPS Observation Frequency:** Every five years (Not required this year)**Dive Inspection Frequency:** Annually

1. Verify the elevation difference between the digibub staff stop and the digibub orifices zero on an annual basis.
2. Check water temperature conduit attachment on piling every year.
3. Add a third measurement and reference point to the bench mark description for Bench Marks 941 4290 TIDAL 176, CLARK RM 2, and 941 4290 K TIDAL.
4. Monitor Swage-lock nut on the PAROS 2 orifice; may need to replace nut and fitting.

**9414750 Alameda, CA (PORTS)****L27210****Part 9****PBM:** 941 4750 TIDAL 8 (HT0890)**PBM above SD:** 4.795 m**GPS Bench Mark:** 941 4750 TIDAL 7 (HT0882)**MSL above SD:** 2.067 m**GPS Observation Frequency:** Every five years (Not required this year)**Dive Inspection Frequency:** Annually

1. Monitor fiberglass coated timbers and steel piling attachments annually and evaluate for future replacement with plastic timbers.
2. Replace missing spare solar regulator in Xpert DCP.

**9415020 Point Reyes, CA** **L27210** **Part 11**  
*PBM: B 243 (HT1839)* *PBM above SD: 4.977 m*  
*GPS Bench Mark: 941 5020 Q TIDAL (HT3505)* *MSL above SD: 2.152 m*  
*GPS Observation Frequency: Every five years (Not required this year)*  
*Dive Inspection Frequency: Annually*

1. If station is not relocated prior to the annual inspection, make temporary repairs to the portion of the roof covering the tide house.
2. Add a third measurement and reference point to the bench mark description for B 243.

**9415144 Port Chicago, CA (PORTS)** **L27210** **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 five years (Not required this year)*  
*Dive Inspection Frequency: Annually*

1. Continue discussion with the new property owner regarding moving the tide house and well farther out pier to deeper water to eliminate the need to dredge below well annually, PRO talk to US Army Station Authorities. PRO and EHI will collectively develop the engineering plans, if relocation is approved.
2. During station relocation (may not be in FY-09), relocate the wind sensor adjacent to the new tide house by installing a 25ft. tilt base wind tower (GFE) and removing the existing wind and air temperature sensor from the existing power/light pole.

**9416841 Arena Cove, CA** **L27210** **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 five years (Not required this year)*  
*Dive Inspection Frequency: Annually*

1. Replace top of wind tower with new galvanized parts: 2" pipe coupler, 2" to 1-1/4" reducer and 6ft. section of 1-1/4" pipe
2. Add a third measurement and reference point to the bench mark description for 941 6841 TIDAL 5.

**9418767 North Spit, CA** **L27210** **Part 14**  
*PBM: 941 8767 TIDAL 9 (LV0361)* *PBM above SD: 9.205 m*  
*GPS Bench Mark: 941 8767 TIDAL 11 (LV0359)* *MSL above SD: 5.562 m*  
*GPS Observation Frequency: Every five years (Not required this year)*  
*Dive Inspection Frequency: Annually*

1. Replace unistrut pipe clamps for solar panels and GOES antenna with stainless steel pipe clamps or U-bolts. (The pipe is 2" in diameter.)

**9419750 Crescent City, CA****L27210****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 five years (Not required this year)**Dive Inspection Frequency:** Every two years, (Not required this year)

1. Inspect middle well clamp closely for future replacement.
2. Replace bubbler board, orifice, and tubing.

**9431647 Port Orford, OR****L27211****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 five years (Not required this year)**Dive Inspection Frequency:** Annually

1. Verify the elevation difference between the digibub staff stop and the digibub orifices zero on an annual basis.
2. Re-build and bolt down to the concrete deck, the treated wooden step in front of the door to the tide house over electrical connection to avoid a tripping hazard going into tide house.
3. Double the number of the tide house hold-down brackets and anchors.

**9432780 Charleston, OR****L27211****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 five years (Not required this year)**Dive Inspection Frequency:** Annually

1. Replace copper tube.

**9435380 South Beach, OR****L27211****Part 3****PBM:** C 590 (QE1114)**PBM above SD:** 6.194 m**GPS Bench Mark:** C 590 (QE1114)**MSL above SD:** 2.806 m**GPS Observation Frequency:** Every five years (Not required this year)**Dive Inspection Frequency:** Annually

1. Add 4" PVC pipe extension onto benchmark OSU NO3 to bring casing up to ground level.
2. Install a 25-ft. fiberglass tilt tower to raise wind sensor height and upgrade to dual wind sensors (all equipment GFE-if funding is available), and eliminate safety concern due to necessity of laddering on tide house roof to service sensor.
3. Replace copper tube.
4. Inspect derelict well clamps for future replacement.
5. Update the bench mark description for 943 5380 B TIDAL, adding the hand-held GPS receiver position of the mark.

**9437540 Garibaldi, OR**

**L27211**

**Part 5**

***PBM:*** 943 7540 A (No PID)

***PBM above SD:*** 5.827 m

***GPS Bench Mark:*** 943 7540 H (No PID)

***MSL above SD:*** 2.511 m

***GPS Observation Frequency:*** Every five years (Not required this year)

***Dive Inspection Frequency:*** Annually

1. No additional requirements.

**9439040 Astoria, OR**

**L27211**

**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 five years (Not required this year)

***Dive Inspection Frequency:*** Every two years (Not required this year)

1. Replace the tide house roof with a metal roof (contingent on available funding). This task will be performed by PRO.

## 2.13. DEA - GSA CONTRACT – ALASKA STATIONS

Andrew Moss, Task Manager/Technical Representative (TR)

### 9450460 Ketchikan, AK

**PBM:** 945 0460 TIDAL 24 (No PID)

**PBM above SD:** 8.946 m

**GPS Bench Mark:** 945 0460 TIDAL 37 (No PID)

**MSL above SD:** 4.345 m

**GPS Observation Frequency:** Every five years (Not required this year)

**Dive Inspection Frequency:** Annually

1. Install a met tower and met sensors during FY09 (including dual winds, barometer and air temperature sensors- all equipment GFE). Notes shall be provided on the site report if the wind sensors are not feasible due to obstructions. Provide sensor heights and digital photos as specified in the Standing Project Instructions, Updated November 2008.
2. Investigate the GOES mast attachment; if necessary replace the ¼” plywood with metal plate.
3. Run a new ground line to the metallic conduit on the concrete curb or the base of the light pole nearby.

### 9451054 Port Alexander, AK

**PBM:** 945 1054 TIDAL 1 (No PID)

**PBM above SD:** 6.148 m

**GPS Bench Mark:** Undetermined

**MSL above SD:** N/A

**GPS Observation Frequency:** Every five years

**Dive Inspection Frequency:** Annually

1. Install a met tower and met sensors during FY09 (including dual winds, barometer and air temperature sensors - all equipment GFE). Notes shall be provided on the site report if the wind sensors are not feasible due to obstructions. Provide sensor heights and digital photos as specified in the Standing Project Instructions, Updated November 2008.
2. Upgrade the redundant water level system by swapping the Xpert Dark DCP and the Druck sensor with a new Xpert Dark DCP with SatLink and Paros sensor, GOES and GPS antenna – all major equipment GFE. Provide sensor heights and digital photos as specified in the Standing Project Instructions, Updated November 2008.
3. **Unresolved from 2008 Project Instructions.** For the primary orifice Dixon board, add one 1" stainless steel bolt to the lower support.
4. Measure to multiple points on the orifice plate to ensure the orifice is straight. Verify orifice is straight with a hand level.
5. If a phone line is installed then the house will need a phone switch.
6. Retighten bolts/nuts/all-thread on the entire orifice assembly to prevent future movement. When measuring from staff stop to orifice plates, take care not to allow tape to get caught on an obstruction.

**9451600 Sitka, AK****PBM:** 945 1600 L (No PID)**PBM above SD:** 13.669 m**GPS Bench Mark:** 945 1600 N (No PID)**MSL above SD:** 2.989 m**GPS Observation Frequency:** Every five years (Not required this year)**Dive Inspection Frequency:** Every two years (Not required this year)

1. Install a met tower and met sensors during FY09 (including barometer and air temperature sensors - all equipment GFE). Provide sensor heights and digital photos as specified in the Standing Project Instructions, Updated November 2008.

**9452210 Juneau, AK****PBM:** 945 2210 TIDAL 8 (No PID)**PBM above SD:** 13.036 m**GPS Bench Mark:** 945 2210 JNU TIDAL GPS 1999 (AI 4908)**MSL above SD:** 3.782 m**GPS Observation Frequency:** Annually (Required in 2009)**Dive Inspection Frequency:** Annually

1. Install a met tower and met sensors during FY09 (including dual winds, barometer and air temperature sensors - all equipment GFE). Notes shall be provided on the site report if the wind sensors are not feasible due to obstructions. Provide sensor heights and digital photos as specified in the Standing Project Instructions, Updated November 2008.
2. Verify the elevation difference between the digibub staff stop and the digibub orifices zero on an annual basis.
3. GPS observations are required this year. Refer to the User's Guide for GPS Observations at Tide and Water Level Station Bench Marks, updated November 2008 for guidelines and requirements.
4. Replace zip ties securing backup conduit to piling underwater with SS banding.
5. Secure conduit for Paros orifice lines to piling with SS banding.
6. Replace GOES antenna and/or cable.

**9452400 Skagway, AK****PBM:** 945 2400 TIDAL 11 (No PID)**PBM above SD:** 11.646 m**GPS Bench Mark:** 945 2400 C (No PID)**MSL above SD:** 3.617 m**GPS Observation Frequency:** Annually (Required in 2009)**Dive Inspection Frequency:** Annually

1. Install a met tower and met sensors during FY09 (including barometer and air temperature sensors - all equipment GFE). Provide sensor heights and digital photos as specified in the Standing Project Instructions, Updated November 2008.
2. Verify the elevation difference between the digibub staff stop and the digibub orifices zero on an annual basis.

**9452634 Elfin Cove, AK**

**PBM:** 945 2634 TIDAL 4 (No PID)

**PBM above SD:** 9.365 m

**GPS Bench Mark:** 945 2634 F (No PID)

**MSL above SD:** 4.683 m

**GPS Observation Frequency:** Annually (Required in 2009)

**Dive Inspection Frequency:** Annually

1. Upgrade the redundant water level system by swapping the Xpert Dark DCP and the Druck sensor with a new Xpert Dark DCP with SatLink and Paros sensor, GOES and GPS antennae – all major equipment GFE. Provide sensor heights and digital photos as specified in the Standing Project Instructions, Updated November 2008.
2. Verify the elevation difference between the digibub staff stop and the digibub orifices zero on an annual basis.
3. Install ground bulkhead and ground wire on Paros box.
4. Install a new bench mark in the same concrete pad were destroyed bench mark 945 2634 C was located or in the bedrock along the beach near the tide station. The new bench mark designation/stamping: 945 2634 H/2634 H 2009.
5. Update the bench mark sketch with any new marks.
6. Take digital photos of the setting (waist or chest high view) and general location of the new bench mark.

**9453220 Yakutat, AK**

**PBM:** 945 3220 Z (No PID)

**PBM above SD:** 8.745 m

**GPS Bench Mark:**945 3220 M (No PID)

**MSL above SD:** 2.238 m

**GPS Observation Frequency:** Annually (Required in 2009)

**Dive Inspection Frequency:** Annually

1. AC Power has been shut off the past tree years in the winter. Resolve this problem with Cannery and see if we can receive a separate feed from the city power that will never be turned off so that continuous power is available to the tide station.
2. Level to bench mark 945 3220 W; verify the 2 cm movement shown in the 2008 levels.

**9454050 Cordova, AK**

**PBM:** 945 4050 Q (No PID)

**PBM above SD:** 16.456 m

**GPS Bench Mark:** 945 4050 TIDAL 13 (No PID)

**MSL above SD:** 3.972 m

**GPS Observation Frequency:** Every five years (Not required this year)

**Dive Inspection Frequency:** Annually

1. Install covers on the serial ports of the Xpert and Xpert Dark DCPs.

**9454240 Valdez, AK**

**PBM:** 945 4240 TIDAL 21 (No PID)

**PBM above SD:** 8.327 m

**GPS Bench Mark:** 945 4240 T (No PID)

**MSL above SD:** 4.035 m

**GPS Observation Frequency:** Every five years (Not required this year)

**Dive Inspection Frequency:** Every two years (Not required this year)

1. Install a met tower and met sensors during FY09 (including dual winds, barometer and air temperature sensors - all equipment GFE). Notes shall be provided on the site report if the wind sensors are not feasible due to obstructions. Provide sensor heights and digital photos as specified in the Standing Project Instructions, Updated November 2008.
2. Replace I/O boards - ribbons will be provided as GFE.
3. Replace GOES antenna polyphaser as GFE.

**9455090 Seward, AK**

**PBM:** 945 5090 B (No PID)

**PBM above SD:** 8.314 m

**GPS Bench Mark:** 945 5090 TIDAL 19 (No PID)

**MSL above SD:** 3.566 m

**GPS Observation Frequency:** Every five years (Not required this year)

**Dive Inspection Frequency:** Every two years (Not required this year)

1. Recover bench mark 945 5090 G or establish a new mark with designation/stamping 945 5090 P/5090 P 2009.
2. Update the bench mark sketch with any new marks.
3. Take digital photos of the setting (waist or chest high view) and general location of the new bench mark and/or 945 5090 G, 945 5090 M, and 945 5090 N.
4. Record the serial number of the Xpert Dark DCP.

**9455500 Seldovia, AK**

**PBM:** 945 5500 TIDAL 19 (No PID)

**PBM above SD:** 11.272 m

**GPS Bench Mark:** 945 5500 TIDAL 19 (No PID)

**MSL above SD:** 5.114 m

**GPS Observation Frequency:** Annually (Required in 2009)

**Dive Inspection Frequency:** Annually

1. No additional requirements.

**9455760 Nikiski, AK (PORTS)**

**PBM:** 945 5760 L (No PID)

**PBM above SD:** 14.850 m

**GPS Bench Mark:** 945 5760 L (No PID)

**MSL above SD:** 5.591 m

**GPS Observation Frequency:** Annually (Required in 2009)

**Dive Inspection Frequency:** No dive requirement

1. Add a second desiccant dryer inline on Paros 1 (GFE).



**9455920 Anchorage, AK (PORTS)**

**PBM:** 945 5920 TIDAL 15 1966 (TT0711)

**GPS Bench Mark:** 945 5920 C (No PID)

**GPS Observation Frequency:** Annually (Required in 2009)

**Dive Inspection Frequency:** N/A

**PBM above SD:** 13.231 m

**MSL above SD:** 6.931 m

1. Replace the four stainless steel bolts securing wind bird pole to the concrete.

**9457292 Kodiak, AK**

**PBM:** 945 7292 B (No PID)

**GPS Bench Mark:** KODIAK MON 7278 (TT4632)

**GPS Observation Frequency:** Annually (Required in 2009)

**Dive Inspection Frequency:** Every two years (Not required this year)

**PBM above SD:** 14.124 m

**MSL above SD:** 9.203 m

1. Install a met tower and met sensors during FY09 (including dual winds, barometer and air temperature sensors - all equipment GFE). Notes shall be provided on the site report if the wind sensors are not feasible due to obstructions. Provide sensor heights and digital photos as specified in the Standing Project Instructions, Updated November 2008.
2. Include Bench Marks 945 7292 TIDAL 24 and 945 7292 MON 7282 RM 2 in the level run; this mark was not leveled last year.
3. Update the bench mark description for 945 7292 TIDAL 24 by adding one more taped distance and reference point.

**9457804 Alitak, AK**

**PBM:** 945 7804 TIDAL 6 (No PID)

**GPS Bench Mark:** 945 7804 B (No PID)

**GPS Observation Frequency:** Every five years (Not required this year)

**Dive Inspection Frequency:** Annually

**PBM above SD:** 7.521 m

**MSL above SD:** 3.613 m

1. Upgrade the redundant water level system by swapping the Xpert Dark DCP and the Druck sensor with a new Xpert Dark DCP with SatLink and Paros sensor, GOES and GPS antennae – all major equipment GFE. Provide sensor heights and digital photos as specified in the Standing Project Instructions, Updated November 2008.
2. Verify the elevation difference between the digibub staff stop and the digibub orifices zero on an annual basis.
3. Install covers on the serial ports of the Xpert and Xpert Dark DCP.

**9459450 Sand Point, AK**

**PBM:** 945 9450 R (No PID)

**PBM above SD:** 13.894 m

**GPS Bench Mark:** 945 9450 TIDAL 1293-1 (NO PID ASS.)

**MSL above SD:** 10.482 m

**GPS Observation Frequency:** Every five years (Not required this year)

**Dive Inspection Frequency:** Every two years (Not required this year)

1. **Unresolved from 2007 Project Instructions.** Take one general location photo showing the water level station in relationship to its supporting structure and the local body of water. Take face, setting, and location photos for any newly established marks.
2. Install a new PCMCIA flash card.
3. Monitor the fiberglass covered boards supporting the Aquatrak well as some are rotting.
4. Replace the 180AH (or higher AH) D-4 battery (GFE).

**9459881 King Cove, AK**

**PBM:** 945 9881 D (No PID)

**PBM above SD:** 6.888 m

**GPS Bench Mark:** KCH-1 1998 (No PID)

**MSL above SD:** 2.362 m

**GPS Observation Frequency:** Every five years (Not required this year)

**Dive Inspection Frequency:** Annually

1. No additional requirements.

**9461380 Adak, AK**

**PBM:** 946 1380 TIDAL 18 (UW7919)

**PBM above SD:** 6.700 m

**GPS Bench Mark:** 946 1380 TIDAL 18 (UW7919)

**MSL above SD:** 1.553 m

**GPS Observation Frequency:** Every five years (Not required this year)

**Dive Inspection Frequency:** Annually

1. Relocate the backup orifice (if funding is available) north (inland) to the next row of pilings; approximately 12" wood piles  $\pm$  10' away. (Skiff and diver(s), climbing gear, Dixon board, 12" belly bands, 50'+ of conduit and new tubing, extra Delron clamp and orifice in tide house, but no parallel plates.)
2. Replace XPERT battery.
3. Replace GOES antenna cable.
4. Repair tide house lights as necessary. Not GFE.

**9461710 Atka, Nazan Bay, AK**

**PBM:** 946 1710 B (No PID)

**GPS Bench Mark:** 946 1710 G (No PID)

**GPS Observation Frequency:** Every five years (Not required this year)

**Dive Inspection Frequency:** Annually

**PBM above SD:** 15.000 m

**MSL above SD:** Undetermined

1. Upgrade the redundant water level system by swapping the Xpert Dark DCP and the Druck sensor with a new Xpert Dark DCP with SatLink and Paros sensor, GOES and GPS antennae – all major equipment GFE. Provide sensor heights and digital photos as specified in the Standing Project Instructions, Updated November 2008.
2. Install a met tower and met sensors at tide station location during FY09 (including dual winds, barometer and air temperature sensors – all equipment GFE). Provide sensor heights and digital photos as specified in the section 2.9 of the Standing Project Instructions, Updated November 2008.
3. Verify the elevation difference between the digibub staff stop and the digibub orifices zero on an annual basis.
4. Install a bolt-type clamp (Paros 2) for the upper right side that fits under the Xpert Dark DCP.
5. Reinforce the mounting for the upper air dryer and install longer hoses.
6. Replace the Air X wind generator (GFE) and test the power system.

**9462450 Nikolski, Mueller Cove, AK**

**PBM:** 945 2450 F (No PID)

**GPS Bench Mark:** 945 2450 F (No PID)

**GPS Observation Frequency:** Every five years (Not required this year)

**Dive Inspection Frequency:** Annually

**PBM above SD:** 7.782 m

**MSL above SD:** 1.910 m

1. Upgrade the redundant water level system by swapping the Xpert Dark DCP and the Druck sensor with a new Xpert Dark DCP with SatLink and Paros sensor, GOES and GPS antennae – all major equipment GFE. Provide sensor heights and digital photos as specified in the Standing Project Instructions, Updated November 2008.
2. Verify the elevation difference between the digibub staff stop and the digibub orifices zero on an annual basis.
3. Replace the Air X wind generator (GFE) and test the power system.
4. Install a power box and a battery for the Xpert DARK DCP pump.

**9462620 Unalaska, AK**

**PBM:** 946 2620 TIDAL 7 (No PID)

**PBM above SD:** 3.597 m

**GPS Bench Mark:** 946 2620 TIDAL 19 (No PID)

**MSL above SD:** 1.427 m

**GPS Observation Frequency:** Every five years (Not required this year)

**Dive Inspection Frequency:** Annually

1. Install a met tower and met sensors during FY09 (including dual winds, barometer and air temperature sensors - all equipment GFE). Notes shall be provided on the site report if the wind sensors are not feasible due to obstructions. Provide sensor heights and digital photos as specified in the Standing Project Instructions, Updated November 2008.
2. Dredge beneath Aquatrak well.
3. Replace the copper tube.

**9463502 Port Moller, AK**

**PBM:** 946 3502 B (No PID)

**PBM above SD:** 15.42 m

**GPS Bench Mark:** 946 3502 H (No PID)

**MSL above SD:** 10.684 m

**GPS Observation Frequency:** Every five years (Not required this year)

**Dive Inspection Frequency:** Annually

1. Install a met tower and met sensors during FY09 (including dual winds, barometer and air temperature sensors - all equipment GFE). Notes shall be provided on the site report if the wind sensors are not feasible due to obstructions. Provide sensor heights and digital photos as specified in the Standing Project Instructions, Updated November 2008.
2. Investigate the possibility of installing a phone line.
3. Install tide house as GFE (contingent upon funding and limited transportation).

**9464212 Village Cove, AK**

**PBM:** 946 4212 RBD 1

**GPS Bench Mark:** Undetermined

**GPS Observation Frequency:** Every five years (Not required this year)

**Dive Inspection Frequency:** Annually

**PBM above SD:** 9.074 m

**MSL above SD:** 0.981 m

1. **Unresolved from 2008 Project Instructions.** Replace U-bolts that attach the 3/4" pipe to the ladder rungs.
2. **Unresolved from 2008 Project Instructions.** Replace orifice (if funding is available) with larger (standard) diameter orifice.
3. **Unresolved from 2008 Project Instructions.** Determine and document a suitable benchmark for GPS observations.
4. Install a met tower and met sensors at tide station location during FY09 (including dual winds, barometer and air temperature sensors – all equipment GFE). Provide sensor heights and digital photos as specified in the section 2.9 of the Standing Project Instructions, Updated November 2008.
5. Verify the elevation difference between the digibub staff stop and the digibub orifices zero on an annual basis.
6. Inspect both orifice pipes for corrosion.
7. Replace zinc on each orifice pipe.
8. Replace lifting cable for orifice pipes with stainless steel cable and cable clamps.
9. Replace GOES antenna.

**9468756 Nome, AK**

**PBM:** 946 8756 SHEET PILE C (No PID)

**GPS Bench Mark:** 946 8756 G (No PID)

**GPS Observation Frequency:** Every five years (Not required this year)

**Dive Inspection Frequency:** Annually

**PBM above SD:** 5.611 m

**MSL above SD:** 1.345 m

1. Verify the elevation difference between the digibub staff stop and the digibub orifices zero on an annual basis.
2. Replace (3-4) 12" x 6" x 1/2" zinc plates and 3/8" x 1.5" inspection plate bolts annually. Remember to bring extra 3/8" bolts, washer and nuts for zincs which now mount directly to access covers.
3. Install a new 40W solar panel for the second power box for pump 2.
4. Replace wind bird propeller for a propeller that has tabs to fit into the notches in the nose cone.
5. Move Druck sensor from being T'd into orifice line connected to the Outlet Port on the H355 pump to T'd into H350 port with the Paros 2 sensor.
6. Re-drill the lower right hole on the upper orifice access cover larger to make rethreading bolt into channel easier. (if funding is available)
7. Check the Druck slope value stored in DCP 2; verify it is set to 152.4, change value if necessary.

**9491094 Red Dog, AK****PBM:** 949 1094 A TIDAL (No PID)**PBM above SD:** 4.696 m**GPS Bench Mark:** 949 1094 B (No PID)**MSL above SD:** 1.682 m**GPS Observation Frequency:** Every five years (Not required this year)**Dive Inspection Frequency:** Annually

1. Upgrade the redundant water level system by swapping the Xpert Dark DCP and the Druck sensor with a new Xpert Dark DCP with SatLink and Paros sensor, GOES and GPS antennae – all major equipment GFE. Provide sensor heights and digital photos as specified in the Standing Project Instructions, Updated November 2008.
2. Verify the elevation difference between the digibub staff stop and the digibub orifices zero on an annual basis.
3. Install slow burn 5A fuses or larger fuses for pump power boxes.
4. Inspect and replace (if necessary) the wire running from the wind bird to the Xpert.
5. Install a new phone switch and loop conditioner.
6. Continue to level each separate clip for the Paros 2 for the measure down to the orifices.

**9497645 Prudhoe Bay, AK****PBM:** 949 7645 CELL 4B (No PID)**PBM above SD:** 16.389 m**GPS Bench Mark:** 949 7645 WINDSOCK (No PID)**MSL above SD:** 11.018 m**GPS Observation Frequency:** Every five years (Not required this year)**Dive Inspection Frequency:** Annually**Due to a mutual agreement between NOS and DEA, the annual maintenance at Prudhoe Bay in FY09 may be completed by PRO.**

1. Verify the elevation difference between the digibub staff stop and the digibub orifice zero on an annual basis, for primary Paros only.
2. Install a new battery for the air pump.
3. Re-attach the 3” sleeve for the Aquatrak well mount using 3” conduit clamps.