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USACE / NAVFAC / AFCEC / NASA **UFGS-35 20 23.23 (February 2022)**

Preparing Activity: USACE **New**

UNIFIED FACILITIES GUIDE SPECIFICATIONS

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SECTION 35 20 23.23

NATIONAL DREDGING QUALITY MANAGEMENT PROGRAM - HOPPER DREDGE
02/22

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NOTE: This guide specification covers the requirements for the National Dredging Quality Management Program for hopper dredging.

Adhere to UFC 1-300-02 Unified Facilities Guide Specifications (UFGS) Format Standard when editing this guide specification or preparing new project specification sections. Edit this guide specification for project specific requirements by adding, deleting, or revising text. For bracketed items, choose applicable item(s) or insert appropriate information.

Remove information and requirements not required in respective project, whether or not brackets are present.

Comments, suggestions and recommended changes for this guide specification are welcome and should be submitted as a Criteria Change Request (CCR).

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PART 1 GENERAL

1.1 DESCRIPTION

The work under this contract requires use of the National Dredging Quality Management Program (DQM)to monitor the dredge's status at all times during the contract and to manage data history.

This performance-based specification section identifies the minimum required output and the precision and instrumentation requirements. The requirements may be satisfied using equipment and technical procedures selected by the Contractor.

1.2 SUBMITTALS

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NOTE: Review Submittal Description (SD) definitions

in Section 01 33 00 SUBMITTAL PROCEDURES and edit the following list, and corresponding submittal items in the text, to reflect only the submittals required for the project. The Guide Specification technical editors have classified those items that require Government approval, due to their complexity or criticality, with a "G". Generally, other submittal items can be reviewed by the Contractor's Quality Control System. Only add a "G" to an item, if the submittal is sufficiently important or complex in context of the project.

For Army projects, fill in the empty brackets following the "G" classification, with a code of up to three characters to indicate the approving authority. Codes for Army projects using the Resident Management System (RMS) are: "AE" for Architect-Engineer; "DO" for District Office (Engineering Division or other organization in the District Office); "AO" for Area Office; "RO" for Resident Office; and "PO" for Project Office. Codes following the "G" typically are not used for Navy, Air Force, and NASA projects.

The "S" classification indicates submittals required as proof of compliance for sustainability Guiding Principles Validation or Third Party Certification and as described in Section 01 33 00 SUBMITTAL PROCEDURES.

Choose the first bracketed item for Navy, Air Force and NASA projects, or choose the second bracketed item for Army projects.

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Government approval is required for submittals with a "G" or "S" classification. Submittals not having a "G" or "S" classification are [for Contractor Quality Control approval.][for information only. When used, a code following the "G" classification identifies the office that will review the submittal for the Government.] Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-07 Certificates

National Dredging Quality Management Program Certification, [_____] District; G[, [_____]]

1.3 PAYMENT

Separate payment for installation, operation, and maintenance of the DQM-certified system as specified herein for the duration of the dredging operations is not allowed; all costs in connection therewith are considered a subsidiary obligation of the Contractor and are covered under the contract unit price for dredging in the bidding schedule.

1.4 NATIONAL DREDGING QUALITY MANAGEMENT PROGRAM CERTIFICATION

1.4.1 Certification

The Contractor is required to have a current certification from DQM for the hopper dredge instrumentation system to be used under this contract. Criteria for certification is based on the most recent specification posted on the DQM website: http://dqm.usace.army.mil/Specifications/Index.aspx. Verify compliance with these criteria by annual onsite quality assurance (QA) checks conducted by the DQM Support Center Data Acquisition and Analysis Team and by periodic review of the transmitted data. DQM Certification is valid for one year from the date of the annual QA checks. Certification is contingent upon the system's ability to continuously meet the performance requirements as outlined in paragraph PERFORMANCE REQUIREMENTS. If issues with data quality are not corrected within 48 hours, the system certification will be revoked and additional QA checks by the Data Acquisition and Analysis Team may be necessary.

Annual DQM Certification must be based on the following:

a. A series of quality assurance checks as outlined on the DQM website: https://dqm.usace.army.mil/Certifications/Index.aspx.

b. Verification of data acquisition and transfer as described in paragraph Performance Requirements.

c. Review of the Dredge Plant Instrumentation Plan (DPIP) as described in paragraph DREDGE PLANT INSTRUMENTATION PLAN (DPIP).

1.4.2 Recertification

The owner or operator of the dredge must contact DQM at DQM-AnnualQA@rpsgroup.com on an annual basis, or at least three weeks prior to certification expiration, to schedule QA checks for renewal. This notification is meant to make the Data Acquisition and Analysis Team aware of a target date for the annual QA checks for the dredge. At least one week prior to the target date, the Contractor must contact the Data Acquisition and Analysis Team and verbally coordinate a specific date and location. The Contractor must then follow up this conversation with a written email confirmation. The owner/operator must coordinate the QA checks with all local authorities, including but not limited to, the local USACE Contracting Officer's Representative (COR).

Recertification is required for any yard work which produces modification to displacement (change in dredge lines, or repositioning or repainting hull marks), modification to bin volume (change in bin dimensions, or addition or subtraction of structure), or changes in sensor type or location; report these changes in the sensor log section of the DPIP. A system does not have to be transmitting data between jobs; however, in order to retain its certification during this period, the system sensors or hardware should not be disconnected or removed from the dredge. If the system is powered down, retain calibration coefficients.

1.5 DREDGE PLANT INSTRUMENTATION PLAN (DPIP)

The Contractor must have a digital copy of the DPIP on file with the DQM Support Center. While working on site, the Contractor must also maintain on the dredge a copy of the DPIP which is easily accessible to Government

personnel at all times. This document must describe the sensors used, configuration of the system, how sensor data will be collected, how quality control on the data will be performed, and how sensors/data reporting equipment will be calibrated and repaired if they fail. A description of the computed dredge-specific data and how the sensor data will be transmitted to the DQM database will also be included. A complete list of the required DPIP contents is provided on the DQM website https://dqm.usace.army.mil/Certifications/Index.aspx

Submit to the DQM Support Center any addendum or modifications made to the plan, subsequent to its original submission, prior to the start of work. Any changes to the computation methods must be approved by the DQM Support Center prior to their implementation.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 REQUIREMENTS FOR REPORTED DATA

Provide, operate, and maintain all hardware and software to meet these specifications. The Contractor is responsible for replacement, repair, and calibration of sensors and other necessary data acquisition equipment needed to supply the required data. Complete repairs within 48 hours of any sensor failure. Notify the COR upon completion of a repair, replacement, installation, modification, or calibration. The COR may request recalibration of sensors or other hardware components at any time during the contract as deemed necessary.

Keep a log of sensor repair, replacement, installation, modification, and calibration in the dredge's onboard copy of the DPIP. The log must contain a three-year history of sensor maintenance, including the time of the sensor failures (and subsequent repairs), the time and results of sensor calibrations, the time of sensor replacements, and the time that backup sensor systems were initiated to provide required data. It must also contain the name of the person responsible for the sensor work. Install sensors that are capable of collecting parameters within specified accuracies and resolutions indicated in the following subparagraphs. Reported sensor values for ullage, draft, and draghead depth should represent a weighted average with the highest and lowest values not included in the calculated average for the given interval. This information should be documented in the DPIP sections that say "Calculations done external to the instrumentation."

3.1.1 Date and Time

Report the date and time to the nearest second and referenced to UTC time based on a 24-hour format: mm/dd/yyyy hh:mm:ss. The reported time must be the time reported by the GPS in the NMEA string.

3.1.2 Load Number

A load number must document the end of a disposal event. Load numbering will begin at number 1 at the start of the contract and will be incremented by 1 at the completion of each disposal event or emptying of the hopper. Whenever possible, calculate the load number off of the sensors aboard the dredge, which must be a mathematically repeatable

routine. Make efforts to include logic that avoids false load number increments. Do not allow the routine to miss any disposal event. If manual incrementing of the load number is in place, pay extra attention to this value in the quality control process.

3.1.3 Horizontal Positioning

Obtain all locations using a positioning system operating with a minimum accuracy level of 1 to 3 meters 3 to 10 feet horizontal Circular Error Probable (CEP). Report positions as Latitude/Longitude WGS 84 in decimal degrees. West Longitude and South Latitude values are reported as negative.

3.1.3.1 Vessel Horizontal Positioning

Record vessel horizontal positioning as geographic coordinates of the vessel as indicated by the location of the GPS antenna.

3.1.3.2 Draghead Horizontal Positioning

Record draghead horizontal positioning as geographic coordinates of the heel on the centerline of the draghead(s). Describe any offset calculations from the GPS antenna in the DPIP.

3.1.4 Hull Status

Monitor open/closed status of the hopper dredge, corresponding to the split/non-split condition of a split-hull hopper dredge. For dredges with hopper doors, the status of a single door that is the first opened during normal disposal operations may be monitored. An "open" value indicates that the hopper door is open or, in the case of split-hull dredges, that the hull is split. A "closed" value indicates that the hopper doors are closed or, in the case of split-hull dredges, that the hull is not split.

For this contract, hull status must register closed prior to leaving the disposal area.

3.1.5 Dredge Course

Provide dredge course-over-ground (COG) using industry-standard equipment. Provide dredge course-over-ground to the nearest whole degree with values from 000 (true north) to 359 degrees referenced to a clockwise positive direction convention.

3.1.6 Dredge Speed

Provide dredge speed-over-ground in knots using industry-standard equipment with a minimum accuracy of 1 knot and resolution to the nearest 0.1 knot.

3.1.7 Dredge Heading

Provide dredge heading using industry-standard equipment. The dredge heading must be accurate to within 5 degrees and reported to the nearest whole degree with values from 000 (true north) to 359 degrees referenced to a clockwise positive direction convention.

3.1.8 Tide

Obtain tide data using appropriate equipment to give the water level with an accuracy of plus or minus 0.03 meter 0.1 foot and a resolution of 0.003 meter 0.01 foot. Enter tide values above project datum described in the dredging specification with a positive sign and those below with a negative sign.

3.1.9 Draft

Report all draft measurements in meters feet, tenths, and hundredths with an accuracy of plus or minus 0.03 meter 0.1 foot relative to observed physical draft readings. Report the measurements at a resolution of two decimal places (hundredths of a meter foot). The reported forward draft value is equal to the sum of the visual forward port and starboard draft mark readings divided by two. The reported aft draft value is equal to the sum of the visual aft port and starboard draft mark readings divided by two. Forward draft, aft draft, and average draft will be reported. Place sensors at an optimum location on the vessel to be reflective of observed physical draft mark readings at any trim or list. Minimum accuracies are conditional to relatively calm water. The sensor value reported must be an average of at least ten samples per event, with at least one maximum value and one minimum value removed, and the minimum eight remaining values averaged. When the average draft is calculated for the purpose of determining displacement, maintain significant digits for average draft such that if forward draft was 0.15 and aft draft was 0.1, the average draft would be 0.125.

3.1.10 Hopper Ullage Sounding

Report all reported ullage soundings in meters feet, tenths, and hundredths with an accuracy of plus or minus 0.03 meter 0.1 foot with respect to the combing and be representative of the forward and aft extents of the hopper as close to the centerline as is possible. Report the measurements at a resolution of two decimal places (hundredths of a foot). Report forward ullage and aft ullage soundings. Mount sensors to avoid discharge flume turbulence, foam, and any structure that could produce sidelobe errors. If sensors must be offset from the centerline of the hopper, they should be offset to opposite sides of the vessel. If more than one fore or one aft sensor are used, place the sensors near the corners of the hopper, and report the average value of the fore sensors and the average value of the aft sensors. The sensor value reported must be an average of at least ten samples per event, with at least one maximum value and one minimum value removed, and the minimum eight remaining values averaged. When the average ullage is calculated for the purpose of determining hopper volume, maintain significant digits for average ullage such that if forward ullage was 0.15 and aft ullage was 0.1, then the average ullage would be 0.125.

3.1.11 Hopper Volume

Report hopper volume in cubic meters yards, based on the most accurate method available for the dredge. The minimum standard of accuracy for hopper volume is interpolation from the certified hopper volume table, based on the average fore and aft ullage soundings.

3.1.12 Displacement

Report dredge displacement in long tons, based on the most accurate method

available for the dredge. The minimum standard of accuracy for displacement is interpolation from the displacement table, based on the average draft. For this contract the density of water used to calculate displacement is [_____]* kg/cubic meter lbs/cubic foot, and it will be used for an additional interpolation between the fresh and salt water tables.

*The water density used is project-/location-specific. Enter the appropriate water density in the blank:

Fresh Water: 1000 kg/m3 (1 g/cm3)62.43 lbs/cubic foot
Salt Water: 1027-1030 kg/m3 (1.027-1.03 g/cm3)64.11 - 64.30 lbs/cubic foot

3.1.13 Empty Displacement

Report empty displacement in long tons, which is the lightship value of the dredge, or the weight of the dredge with no material in the hopper, adjusted for fuel and water consumption.

3.1.14 Draghead Depths

Report draghead depths with an accuracy of plus or minus 0.15 meter 0.5 foot and a resolution to the nearest 0.03 0.1 foot as measured from the surface of the water with no tidal adjustments. Minimum accuracies are conditional to relatively calm water. The sensor value reported must be an average of at least ten samples per event, with at least one maximum value and one minimum value removed, and the minimum eight remaining values averaged.

3.1.15 Slurry Densities

Use a density metering device, calibrated according to the manufacturer's specifications, to record the slurry density of each dragarm to the nearest 0.001 g/cc with an accuracy of plus or minus 0.01 g/cc. If the manufacturer does not specify a frequency of recalibration, conduct calibration prior to commencement of work.

3.1.16 Slurry Velocities

Use a flow metering device, calibrated according to the manufacturer's specifications, to record the slurry velocity of each dragarm to the nearest 0.003 mps 0.01 fps with an accuracy of plus or minus 0.15 mps 0.5 fps. If the manufacturer does not specify a frequency of recalibration, conduct calibration prior to commencement of work. Measure the slurry velocity in the same pipeline inside diameter as that used for the slurry density measurement.

3.1.17 Pump RPM

Measure the RPM of any pump being used to move material with the highest level of accuracy that is standard on the vessel operational displays, either at the bridge, at the drag tender's controls, or in the engine room. Dredges with multiple pumps per side must report RPM for the pump that best describes the dredging process (typically the outboard pump).

3.1.18 Sea Suction Valve for Dragarm

If sea suction can be taken to bypass suction through the draghead, the sea suction location and valve status will be reported. The status of the

valve will change from "closed" to "open" when the valve starts to open and will register "closed" when the valve is fully closed. When applicable, the state of the latch will be reported as "true" or "false." Report the sea suction location in a standard non-changing name string of no more than 20 characters. These field values will always occur in the XML string as a set. The DQM system can accommodate only up to four unique sea suction locations. Suggested options for the naming convention can be found in the example dataset in paragraph DATA FORMAT.

3.1.19 Pumpout

When the hopper dredge is being pumped out, report a "true" value; when it is not, report a "false" value. The only permissible values are "true" and "false."

3.2 NATIONAL DREDGING QUALITY MANAGEMENT PROGRAM SYSTEM REQUIREMENTS

The Contractor's DQM system must be capable of collecting, displaying, and transmitting information to the DQM database. Record the applicable parameters from paragraph REQUIREMENTS FOR REPORTED DATA as events locally and continually transmitted to the DQM database anytime an Internet connection is available. Equip the Dredge with a DQM computer system, consisting of a computer, monitor, keyboard, mouse, data modem, UPS, and network hub. Provide a standalone computer system, exclusive to the DQM monitoring system, and with USACE DQM software installed on it. If a hardware problem occurs, or if a part of the system is physically damaged, the Contractor is responsible for repairing it within 48 hours of determination of the condition.

3.2.1 Computer Requirements

Provide a dedicated onboard computer for use by the DQM system. This computer must run USACE software and receive data from the Contractor's data-reporting interface. This computer must meet or exceed the following performance specifications:

CPU:	Intel or AMD processor with a (non-overclocked) clock speed of at least 1.6 gigahertz (GHz)
Hard drive:	250 gigabytes (GB); internal
RAM:	4 gigabytes (GB)
Ethernet adapter:	Internal network card with an RJ-45 connector
Ports:	1 free serial port with standard 9-pin connectors; 1 free USB port
Other hardware:	Keyboard, mouse, monitor

Install a fully licensed copy of Windows 7 Professional Operating System or later on the computer specified above. Also install any necessary manufacturer-provided drivers for the installed hardware. Locate and orient the computer to allow data entry and data viewing, as well as to provide access to data ports for the connection of external hardware.

3.2.2 Software

The DQM computer's primary function is to transmit data to the DQM

shoreside database. Do not install software which conflicts with this function on this computer. The DQM computer must have the USACE-provided Dredging Quality Management Onboard Software (DQMOBS) installed on it by DQM personnel along with USACE-selected software for remote support and management.

3.2.3 UPS

Supply an Uninterruptible Power Supply (UPS) for the computer and networking equipment. The UPS must provide backup power at 1 kVA for a minimum of ten minutes. The UPS must interface with the DQM computer to communicate UPS status. Ensure that sufficient power outlets are available to run all specified equipment.

3.2.4 Internet Access

Maintain an Internet connection capable of transmitting real-time data to the DQM server and supporting remote access, as well as enough additional bandwidth to clear historically queued data when a connection is re-obtained. If connectivity is lost, que and transmit unsent data upon restoration of connectivity. Delays in pushing real-time data to the DQM database should not exceed four hours. Exceptions to these requirements may be granted by the DQM Support Center on a case-by-case basis with consideration for contract-specific requirements, site-specific conditions, and extreme weather events.

Acquire and install all necessary hardware and software to make the Internet connection available for data transmission to the DQM web service. Configure the hardware and software to allow the DQM Support Center remote access to this computer. Coordination between the dredging company's IT and the DQM Support Center may be required in order to configure remote access though any security, firewall, router, and telemetry systems. Telemetry systems must be capable of meeting these minimum reporting requirements in all operating conditions.

3.2.5 Data Routing Requirements

Onboard sensors must continually monitor dredge conditions, operations and efficiency and route this information into the shipboard dredge-specific system (DSS) computer to assist in guiding dredge operations. Portions of this Contractor-collected information must be routed to the DQM computer on a real-time basis. Use an RS-232 9600- or 19200-baud serial interface to send standard sensor data to the DQM computer. Configure the serial interface as 8 bits, no parity, and no flow control.

3.2.6 Data Reporting Frequency

Log data as a series of events. Each event will consist of a dataset containing dredge information in accordance with paragraph REQUIREMENTS FOR REPORTED DATA. Each set of measurements (time, position, etc.) will be considered an event. Collect any required information in paragraph REQUIREMENTS FOR REPORTED DATA that is not an averaged variable (draft and ullage) within 1 second of the reported time. Send a data string for an event to the DQM computer every 6 to 12 seconds. This interval must remain constant throughout the contract; do not transmit data strings more than once per every 5 seconds. Collect and compute any averaged variable within this sampling interval.

3.2.7 Data Format

Report data as an extensible Markup Language (W3C standard XML 1.0) document as indicated below. Line breaks and spaces are added for readability, but the carriage return, line feed character combination is added only to delineate records (HOPPER_DREDGING_DATA tag) for actual data transmission.

```
      {?xml version="1.0"?}
      {HOPPER_DREDGING_DATA version = "2.0"}
         {DREDGE_NAME} string32 {/DREDGE_NAME}
            {HOPPER_DATA_RECORD}
                {DATE_TIME} time date string {/DATE_TIME}
                {CONTRACT_NUMBER} string32 {/CONTRACT_NUMBER}
                {LOAD_NUMBER} integer string {/LOAD_NUMBER}
                {VESSEL_X coord_type="LL"} floating point string
    {/VESSEL_X}
                {VESSEL_Y coord_type="LL"} floating point string
    {/VESSEL_Y}
            {PORT_DRAG_X coord_type="LL"} floating point string
    {/PORT_DRAG_X}
            {PORT_DRAG_Y coord_type="LL"} floating point string
    {/PORT_DRAG_Y}
            {STBD_DRAG_X coord_type="LL"} floating point string
    {/STBD_DRAG_X}
                {STBD_DRAG_Y coord_type="LL"} floating point string
    {/STBD_DRAG_Y}
                {HULL_STATUS} OPEN/CLOSED string {/HULL_STATUS}
                {VESSEL_COURSE} floating point string {VESSEL_COURSE}
                {VESSEL_SPEED} floating point string {/VESSEL_SPEED}
                {VESSEL_HEADING} floating point string {/VESSEL_HEADING}
                {TIDE} floating point string {/TIDE}
                {DRAFT_FORE} floating point string {/DRAFT_FORE}
                {DRAFT_AFT} floating point string {/DRAFT_AFT}
                {ULLAGE_FORE} floating point string {/ULLAGE_FORE}
                {ULLAGE_AFT} floating point string {/ULLAGE_AFT}
                {HOPPER_VOLUME} floating point string {/HOPPER_VOLUME}
                {DISPLACEMENT} floating point string {/DISPLACEMENT}
               {EMPTY_DISPLACEMENT} floating point string
    {/EMPTY_DISPLACEMENT}
                {DRAGHEAD_DEPTH_PORT} floating point string
    {/DRAGHEAD_DEPTH_PORT}
                {DRAGHEAD_DEPTH_STBD} floating point string
    {/DRAGHEAD_DEPTH_STBD}
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                {PORT_VELOCITY} floating point string {/PORT_VELOCITY}
                {STBD_VELOCITY} floating point string {/STBD_VELOCITY}
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                {PUMP_RPM_STBD} floating point string {/PUMP_RPM_STBD}
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                {VALVE_1_STATUS} open/closed {/VALVE_1_STATUS}
                {VALVE_1_LATCHED} true/false {/VALVE_1_LATCHED}
                {VALVE_2_LOCATION} string32 {/VALVE_2_LOCATION}
                {VALVE_2_STATUS} open/closed {/VALVE_2_STATUS}
                {VALVE_2_LATCHED} true/false {/VALVE_2_LATCHED}
                {VALVE_3_LOCATION} string32 {/VALVE_3_LOCATION}
                {VALVE_3_STATUS} open/closed {/VALVE_3_STATUS}
                {VALVE_3_LATCHED} true/false {/VALVE_3_LATCHED}
```

{VALVE_4_LOCATION} string32 {/VALVE_4_LOCATION}
{VALVE_4_STATUS} open/closed {/VALVE_4_STATUS}
{VALVE_4_LATCHED} true/false {/VALVE_4_LATCHED}
{PUMP_OUT_ON} **true/false/unknown string** {/PUMP_OUT_ON}
{/HOPPER_DATA_RECORD}

{/HOPPER_DREDGING_DATA}
Carriage Return - ASCII value 13
Line Feed - ASCII value 10

Example

```
{?xml version="1.0"?}
{HOPPER_DREDGING_DATA version = "2.0"}
  {DREDGE_NAME}Essayons{/DREDGE_NAME}
     {HOPPER_DATA_RECORD}
            {DATE_TIME}04/11/2002 13:12:05{/DATE_TIME}
            {CONTRACT_NUMBER}GDSNWP-11-G-0001{/CONTRACT_NUMBER}
            {LOAD_NUMBER}102{/LOAD_NUMBER}
            {VESSEL_X coord_type="LL"}-80.123333{/VESSEL_X}
            {VESSEL_Y coord_type="LL"}10.123345{/VESSEL_Y}
            {PORT_DRAG_X coord_type="LL"}-80.1233371{/PORT_DRAG_X}
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            {STBD_DRAG_Y coord_type="LL"}10.123347{/STBD_DRAG_Y}
            {HULL_STATUS}CLOSED{/HULL_STATUS}
            {VESSEL_COURSE}258{/VESSEL_COURSE}
            {VESSEL_SPEED}3.4{/VESSEL_SPEED}
            {VESSEL_HEADING}302{/VESSEL_HEADING}
            {TIDE}-0.1{/TIDE}
            {DRAFT_FORE}10.05{/DRAFT_FORE}
            {DRAFT_AFT}15.13{/DRAFT_AFT}
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            {ULLAGE_AFT}10.22{/ULLAGE_AFT}
            {HOPPER_VOLUME}2555.2{/HOPPER_VOLUME}
            {DISPLACEMENT}4444.1{/DISPLACEMENT}
            {EMPTY_DISPLACEMENT}2345.0{/EMPTY_DISPLACEMENT}
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            {STBD_DENSITY}1.03{/STBD_DENSITY}
            {PORT_VELOCITY}22.1{/PORT_VELOCITY}
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            {VALVE_1_LOCATION}Starboard Dragarm{VALVE_1_LOCATION}
            {VALVE_1_STATUS}open{/VALVE_1_STATUS}
            {VALVE_1_LATCHED}true{/VALVE_1_LATCHED}
            {VALVE_2_LOCATION}Port Dragarm{/VALVE_2_LOCATION}
            {VALVE_2_STATUS}closed{/VALVE_2_STATUS}
            {VALVE_2_LATCHED}false{/VALVE_2_LATCHED}
            {VALVE_3_LOCATION}Port Sea Chest{/VALVE_3_LOCATION}
            {VALVE_3_STATUS}closed{/VALVE_3_STATUS}
            {VALVE_3_LATCHED}false{/VALVE_3_LATCHED}
            {VALVE_4_LOCATION}Starboard Sea Chest{/VALVE_4_LOCATION}
            {VALVE_4_STATUS}open{/VALVE_4_STATUS}
            {VALVE_4_LATCHED}false{/VALVE_4_LATCHED}
            {PUMP_OUT_ON}false{/PUMP_OUT_ON}
      {/HOPPER_DATA_RECORD}
```

```
{/HOPPER_DREDGING_DATA}
{cr}
{lf}
{DREDGE_NAME}Essayons{/DREDGE_NAME}
     {HOPPER_DATA_RECORD}
            {DATE_TIME}04/11/2002 13:12:10{/DATE_TIME}
            {CONTRACT_NUMBER}GDSNWP-11-G-0001{/CONTRACT_NUMBER}
            {LOAD_NUMBER}102{/LOAD_NUMBER}
            {VESSEL_X coord_type="LL"}-80.123334{/VESSEL_X}
            {VESSEL_Y coord_type="LL"}10.123346{/VESSEL_Y}
            {PORT_DRAG_X coord_type="LL"}-80.1233372{/PORT_DRAG_X}
            {PORT_DRAG_Y coord_type="LL"}10.12336{/PORT_DRAG_Y}
            {STBD_DRAG_X coord_type="LL"}-80.123340{/STBD_DRAG_X}
            {STBD_DRAG_Y coord_type="LL"}10.123348{/STBD_DRAG_Y}
            {HULL_STATUS}CLOSED{/HULL_STATUS}
            {VESSEL_COURSE}259{/VESSEL_COURSE}
            {VESSEL_SPEED}3.5{/VESSEL_SPEED}
            {VESSEL_HEADING}300{/VESSEL_HEADING}
            {TIDE}-0.1{/TIDE}
            {DRAFT_FORE}10.00{/DRAFT_FORE}
            {DRAFT_AFT}15.15{/DRAFT_AFT}
            {ULLAGE_FORE}10.15{/ULLAGE_FORE}
            {ULLAGE_AFT}10.20{/ULLAGE_AFT}
            {HOPPER_VOLUME}2555.5{/HOPPER_VOLUME}
            {DISPLACEMENT}4444.0{/DISPLACEMENT}
            {EMPTY_DISPLACEMENT}2345.0{/EMPTY_DISPLACEMENT}
            {DRAGHEAD_DEPTH_PORT}55.15{/DRAGHEAD_DEPTH_PORT}
            {DRAGHEAD_DEPTH_STBD}53.19{/DRAGHEAD_DEPTH_STBD
            {PORT_DENSITY}1.00{/PORT_DENSITY}
            {STBD_DENSITY}1.01{/STBD_DENSITY}
            {PORT_VELOCITY}22.5{/PORT_VELOCITY}
            {STBD_VELOCITY}23.3/STBD_VELOCITY}
            {PUMP_RPM_PORT}55{/PUMP_RPM_PORT}
            {PUMP_RPM_STBD}54{/PUMP_RPM_STBD}
            {VALVE_1_LOCATION}Starboard Dragarm{VALVE_1_LOCATION}
            {VALVE_1_STATUS}open{/VALVE_1_STATUS}
            {VALVE_1_LATCHED}true{/VALVE_1_LATCHED}
            {VALVE_2_LOCATION}Port Dragarm{/VALVE_2_LOCATION}
            {VALVE_2_STATUS}closed{/VALVE_2_STATUS}
            {VALVE_2_LATCHED}false{/VALVE_2_LATCHED}
            {VALVE_3_LOCATION}Port Sea Chest{/VALVE_3_LOCATION}
            {VALVE_3_STATUS}closed{/VALVE_3_STATUS}
            {VALVE_3_LATCHED}false{/VALVE_3_LATCHED}
            {VALVE_4_LOCATION}Starboard Sea Chest{/VALVE_4_LOCATION}
            {VALVE_4_STATUS}open {/VALVE_4_STATUS}
            {VALVE_4_LATCHED} false{/VALVE_4_LATCHED}
            {PUMP_OUT_ON}false{/PUMP_OUT_ON}
            {/HOPPER_DATA_RECORD}
{/HOPPER_DREDGING_DATA}
{cr}
{lf}
```

3.2.8 Data Reporting

The system must transmit correctly formatted event data XML strings to the DQM database continuously from mobilization until the last USACE post-dredging survey has been accepted. If the Internet connection (paragraph INTERNET ACCESS) is non-operable, perform manual backups from the dredge computer of the XML data string which would have been

transmitted to the DQM computer over the serial connection for each day the device is inoperable and submit to the DQM Support Center within 48 hours. This submission does not replace the requirement of correcting the issue affecting the automatic transmission of data. In the event of data transfer, transmission, or hardware failure, maintain a manually recorded disposal log consisting of a series of events. These events are start of dredging, end of dredging, pre-disposal, and post-disposal. Include time stamp (GMT), position (Latitude and Longitude WGS84), draft, ullage, volume, and displacement for each event. Submit disposal logs on a daily basis to the COR during the time when the system is not operational.

3.2.9 Contractor Data Backup

Maintain an archive of all data sent to the DQM computer during the dredging contract. The COR may require, at no increase in the contract price, that the Contractor provide a copy of these data covering specified time periods. Provide the data, transmitted to the DQM computer, in the XML format with no line breaks between the parameters and each record string on a separate line. The naming convention for the files is {dredgename}_{StartYYYYMMddhhmmss}_{EndYYYYMMddhhmmss}.txt. Submit data via storage medium acceptable to the COR.

At the end of the dredging contract, contact the DQM Support Center prior to discarding the data. The DQM Support Center will verify that all data has been received and appropriately archived before giving the Contractor discard permission. Record the following information in a separate section at the end of the dredge's onboard copy of the DPIP:

Person who made the call
Date of the call
DQM representative who gave permission to discard

3.3 PERFORMANCE REQUIREMENTS

The Contractor's DQM system must be fully operational at the start of dredging operations and fully certified prior to moving dredge material on the contract (see paragraph NATIONAL DREDGING QUALITY MANAGEMENT PROGRAM CERTIFICATION). To meet contract requirements for operability, in addition to certification, the Contractor's system must provide a data string with all values for all parameters while operating, as described in the specifications. Additionally, all hardware must be compliant with hardware requirements (paragraph COMPUTER REQUIREMENTS). Quality data strings are considered to be those providing values for all parameters reported when operating according to the specification. Make repairs necessary to restore data return compliance within 48 hours. Failure by the Contractor to report the required data within the specified time window for dredge measurements (see paragraph DATA REPORTING FREQUENCY and paragraph DATA REPORTING) will result in withholding of up to 10 percent of the contract progress payment per FAR 52.232-5 Payments under Fixed-Price Construction Contracts.

3.4 LIST OF ITEMS TO BE PROVIDED BY THE CONTRACTOR

DPIP
https://dqm.usace.army.mil/Certifications/Index.aspx

DQM System
Sensor instrumentation: paragraph REQUIREMENTS FOR REPORTED DATA
DQM computer: paragraph NATIONAL DREDGING QUALITY MANAGEMENT

PROGRAM SYSTEM REQUIREMENTS

Dredge Data
Event documentation: paragraph DATA REPORTING
Dredge data backups: paragraph CONTRACTOR DATA BACKUP

QA Equipment on the Dredge
Dragarm depth chain
Ullage tape
Refractometer
Water sampling device

-- End of Section --