

# BGES, INC.

ENVIRONMENTAL CONSULTANTS

**BOEM-134 Application for Permit or Authorization  
to Conduct Geological or Geophysical Prospecting or Exploration  
for Mineral Resources or Notice of Scientific Research on the  
Outer Continental Shelf  
Related to Minerals Other than Oil, Gas, and Sulphur**

**Supplemental Application Information:  
Prospecting Plan of Operations**

**for**

**Palmerosa Mining  
Norton Sound, Alaska**

**February 2026**

**Submitted to:**

**Regional Supervisor for Resource Evaluation  
Bureau of Ocean Energy Management  
Alaska OCS Region  
3801 Centerpoint Dr., Suite #500  
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**ACRONYMS**

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ADEC	-	Alaska Department of Environmental Conservation
ARIS	-	Aris Explorer 3000
BGES	-	Braunstein Geological and Environmental Services, Inc.
BOEM	-	Bureau of Ocean Energy Management
CFR	-	Code of Federal Regulations
kHz	-	kilohertz
LED	-	Light Emitting Diode
NEPA	-	National Environmental Policy Act
OCS	-	Outer Continental Shelf
ROV	-	Remote Operating Vehicle
U.S.	-	United States
USACE	-	United States Army Corps of Engineers
USFWS	-	United States Fish and Wildlife Service

## 1.0 INTRODUCTION

The following information is being provided by BGES, INC (BGES) on behalf of Palmerosa-IDS dba. Palmerosa Mining, LLC (Palmerosa Mining) for the United States (U.S.) Department of the Interior Bureau of Ocean Energy Management (BOEM) Form-0134 (BOEM-0134) Application for Permit or Authorization to Conduct Geological or Geophysical Prospecting or Exploration For Mineral Resources or Notice Of Scientific Research on the Outer Continental Shelf Related To Minerals Other Than Oil, Gas, and Sulphur.

The BOEM-0134 application is being submitted for authorization of geological prospecting and exploration for gold and silver resources in federal waters on the Alaska Outer Continental Shelf (OCS) in Norton Sound, northeastern Bering Sea, near Nome, Alaska (Figure 1). BOEM authorization of the proposed gold and silver prospecting and exploration activities would be under Section 11, Outer Continental Shelf Lands Act of August 7, 1953, as amended on September 18, 1978, by Public Law 95-372, 92 Statute 629, 43 U.S.C. 1340; and 30 Code of Federal Regulations (CFR) Parts 580 and 280, as applicable, and other applicable Federal statutes and regulations, as amended. Proposed activities would be conducted in compliance with all applicable permits and mitigation measures.

Proposed activities include prospecting and exploration for gold and silver deposits on the ocean floor using a tracked remotely operated vehicle (ROV), secured to a 77-foot vessel (Figure 2). The proposed exploration area is located in the BOEM Alaska OCS Norton Basin Planning Area, within the BOEM Offshore Boundary Line in the Nome OCS Protraction Polygons - 1st Division, Official Protraction Diagram Number NQ03-07, OCS Block Polygons - 2<sup>nd</sup> Division, Block Numbers 6625 and 6675. The exploration area is approximately 5,166 acres (8 square miles) in size, located approximately 5.15 miles (4.48 nautical miles) southwest of the Port of Nome, and approximately 1,000 feet (0.19 miles) southwest of the Alaska State Submerged Lands Act Boundary (Figures 1 and 3). Prospecting activities are planned to occur during the open water season from August through October. The open water season typically ends when ice begins to form in the rivers and Bering Sea in late September or early October.

## **1.1 PROJECT INFORMATION**

*This Plan of Operations provides responses to all applicable questions in Sections A, B, and D of the Form BOEM-0134 application:*

*Section A. General Information, Questions 1 - 6*

*Section B. Geological Prospecting or Exploration for Mineral Resources or Geological Scientific Research, Questions 1 – 4*

*Section D. Proprietary Information Attachment, Questions 1 – 8*

### **Section A. General Information, Questions 1. - 2.**

#### ***1. The activity will be conducted by:***

Palmerosa Mining is a mining company with locations in Nome, Alaska and a corporate office in Shelbyville, Kentucky. Palmerosa Mining is a Deep-Water Ocean Mining Company with over 14 years of experience prospecting and mining precious metals offshore in northwest Alaska state waters.

#### ***2. The purpose of the activity is:***

The purpose of the proposed activity is for exploration and mineral prospecting for gold and silver in the Alaska OCS in Norton Sound, an inlet of the Bering Sea, near Nome, Alaska (Figure 1). If results from the proposed exploration and prospecting project indicate mining in the exploration area is economically viable, the company plans to apply for an “Unsolicited Lease sale Approval” and purchase of the prospecting area for future mining operations.

### **Section A. General Information, Question 3.**

#### ***3. Describe your proposed survey activities (i.e., vessel use, acoustic sources, benthic impacts, etc.)***

##### **Proposed Surveying/Prospecting Activities**

The proposed prospecting exploration area consists of a total of 31 prospecting track lines oriented in a north to south direction from the shoreline and approximately 500 feet apart (Figure 3). The total number of planned prospecting track lines surveyed is dependent on ocean and weather conditions, operational and mechanical equipment, and length of the open water season. Prospecting activities would occur in water depths estimated at 60 to 90 feet (18 to 27 meters) along the ocean seafloor down to depths of 1 to 3 feet below the seabed.

##### **Vessels and Vessel Uses**

Prospecting activities would be conducted from a mining ‘barge’ or vessel and a tracked ROV. The name of the mining vessel is the JAG of Nome, Alaska. The JAG is a 77-foot twin Catamaran, twin screw, work

boat designed for deep sea offshore mining and remote operation of a ROV mining machine. The vessel is equipped with double steel pontoons and an open center area for deployment of the ROV mining machine. The ROV is controlled by the mining operator in the control room on JAG (Figure 2). The JAG is held fast during mining by four 1,500 pound anchors. Each anchor is controlled by a hydraulic hoist (Figure 2 and Figure 4).

The ROV is a tracked 'mining machine' attached to the JAG via four ¾-inch diameter wire rope lifting cables and two 175-foot dual hose umbilical's. The ROV is deployed and retrieved from the JAG using the hydraulic ROV hoist. The umbilical's are deployed and retrieved from the JAG using the hydraulic umbilical hoist. One umbilical consists of a 6-inch diameter hose powered by two pumps that transports the classified (sifted) bottom material (typically 1-inch and smaller) up to the sluice and tester (a specialized, removable matting system designed to capture fine gold) on the vessel. The second umbilical is an 8-inch diameter hose housing the hydraulic, electric, telemetry, and camera wires (Figure 2 and Figure 4).

The ROV mining machine consists of a modified, 360 degree rotating, excavator platform equipped with a 19-inch suction dredge, 20-foot long intake pipe, excavator arm with a 5-pronged rake attachment, and vibrating classifier (sifter). The vibrating classifier exhausts oversize and unwanted material out a large 4-foot by 4-foot opening at the rear of the classifier. The ROV is tracked and weighs approximately 42,000 pounds and has a ground pressure of 9 pounds per square inch (Figure 2).

### **Vessel and ROV Lighting**

The JAG has a total of 15 exterior lights that are only in use when working in darkness (late summer and fall). Lights consist of 13 single, 24-volt light-emitting diode (LED) lights and two 24-volt LED light bars: one above the vessel cabin and one above the wheel house. The ROV is equipped with two LED lights in the front of the ROV.

### **Mining Power and Fuel/Oil Storage**

The vessel is powered by four diesel engines located on JAG. The diesel engines power hydraulic pumps and electrical generators which power all of the equipment on the ROV and JAG. A total of 3,700 gallons of diesel fuel are stored in the following tanks: two double-walled 500-gallon tanks; two 1,000-gallon single-walled tanks; and two single-walled 350-gallon tanks. The hydraulic oil for the hydraulic systems is supplied by three single-walled tanks: two 450-gallon tanks and one 50-gallon tank.

## **Navigation System and Acoustic Sources**

The vessel navigation system consists of two Garmin chartplotters. The mining operator utilizes sonars, two cameras with lights, and telemetry information to direct the movements and actions on the ROV. The mining barge is also equipped with a custom-designed, proprietary, passive hydrophone used by the ROV mining machine operator as a listening device to assess material movement (i.e., rocks and gravel striking the metal pipes) via a headset or a speaker in the control room of the barge (Figure 2 and Figure 4).

Two types of sonar systems are also used to guide the exploration and prospecting: two multi-beam sonar systems: Garmin Panoptix™ and an Aris Explorer 3000 (ARIS). The Garmin Panoptix™ system is mounted to the hull of the barge and the Aris Explorer is mounted to the ROV (Figure 2 and Appendix B).

The Garmin Panoptix™ is a forward-facing or live sonar system that provides up to 1,000 feet of visual distance and is used to monitor the umbilical cables and orientation of the ROV mining machine. The Garmin Panoptix™ transducer uses phased arrays to emit multiple, steerable beams in a single ping. This allows the transducer to provide live images of marine mammals, fish, and structures beneath the boat. The Garmin Panoptix sonar is used to view the direction of the ROV and manage the two 6-inch umbilical cables (Figure 2).

The second sonar system is an imaging sonar, the ARIS system is an active acoustic, high-frequency, dual-frequency, imaging detection sonar that functions as an "acoustic camera". The ARIS system uses 128 beams operating at 3 megahertz, to create a high-resolution, near-video-like image of the underwater environment by converting sound echoes into a digital image. The sonar's operating depth limit is 984 feet (300 meters) and provides up to 50 feet (15 meters) for object identification and is used by the mining operator to detect subsurface hazards like large boulders or rocks that may need to be removed to access the prospecting area. It can operate in both clear and turbid water and zero-visibility conditions.

Refer to Appendix A for Figures 1 – 4; Appendix B for navigation and sonar system specification sheets; and Appendix C for the proprietary version of Figure 2. Mining Vessel Configuration that depicts the JAG vessel and associated mining equipment (sluice, shaker screen, tester [proprietary] and sonar systems), ROV and associated equipment, and the proprietary hydrophone design document. The hydrophone design document is proprietary and is provided in Appendix C.

## Prospecting Operations

Once the mining operator determines that the vessel is at the planned testing location, the mining operator initiates the prospecting operation with deployment of the ROV from the vessel to the ocean floor. The operator uses the ROV hoist control and the umbilical hoist control to deploy the ROV and umbilicals. The mining operator utilizes sonar images, camera images, hydrophone audio, and telemetry information to direct the movements and actions of the ROV. Prospecting occurs once the operator verifies that the area does not have any hazardous objects in the ROV path. During the prospecting operation, the ROV performs several functions in the following order:

- 1) The mining operator uses the ROV excavator arm to rake and move large rocks/boulders from the prospecting area. The ROV is tracked, can be driven in any direction, and the excavator arm and suction dredge are installed on a modified excavator platform designed to rotate 360 degrees. The excavator arm is equipped with a rake with five prongs or ‘tines’ that are approximately 8 inches apart. The arm moves boulders and large rocks during prospecting work.
- 2) The mining operator directs the ROV suction head along the seafloor and suctions the material from the prospecting area down to approximately 1 to 3 feet below the seafloor.
- 3) The material proceeds up the suction head and intake pipe through a vibrating screen (shaker screen) in the rearward area of the ROV. The shaker screen is a single level, 4-feet by 8-feet screen deck that can be equipped with either 1-inch or 0.75-inch diameter holes. All materials 1-inch and smaller are directed to a sump on the ROV and pumped up the 6-inch diameter umbilical to the tester. All larger material is ejected out of the back of the vibrating screen and deposited on the ocean floor.
- 4) Prior to the classified material entering the sluice, its speed is slowed via a diffuser to maximize its entrapment in the 28-foot tester and sluice. During prospecting mode, all of the material is directed through the tester followed by the sluice. When the test cycle is complete, the tester is removed from the material flow path and all material is directed through the sluice. The mining operator then evaluates, grades, and logs the results including location, water depth, subfloor cutting depth, and the type of material observed. The material caught in the tester is released from the tester and it proceeds into the sluice.
- 5) The material that is not captured in the matting of the sluice is ejected out of the end of the sluice and down a 10-inch diameter and 10-foot long discharge hose or ‘curtain drain’ that extends a

minimum of 5 feet below the water surface (Figure 2). The curtain drain minimizes the surface discharge of the excess bottom sediment material.

- 6) When the sluice on the vessel is full, the prospecting operation stops until the sluiced material is removed for further cleaning and assaying at the Palmerosa shop facility. Sluice cleanup occurs after approximately 80 to 100 hours of prospecting/mining.

The entire prospecting operation (steps 1-5) takes approximately 10 minutes. Once the prospecting operation is completed, the ROV is lifted approximately 10 to 20 feet off the ocean floor and the vessel and ROV can be moved via hydraulic hoists. Each anchor has about 1,000 feet of anchor line. If the next point to be prospected is further than what can be reached with the current anchor set, the anchors are pulled and the vessel moves to a new location identified by the operator and the anchors are set at the new location.

### **Benthic Impacts**

Benthic impacts from prospecting operations would include the following:

- Temporary physical disturbance and destruction of benthic habitat within the tracked ROV path and at prospecting areas down to depths of between 1 and 3 feet below the seafloor sediment. Benthic marine organisms and fish may be crushed and habitat destroyed by ROV tracks or the excavation arm while moving large rocks and boulders;
- Temporary disruption of benthic habitat and marine organisms due to acoustic and visual impacts from the ROV sonar, cameras, and lights; and
- Sediment plumes from ROV operations would temporarily impact marine organisms and fish populations. Sediment plumes from the ROV could smother marine invertebrates and bottom fish and newly disturbed areas could promote opportunistic species to invade habitat and increase predation on members of the local benthic community.

Impacts to the benthic community would be temporary and the benthic habitat would eventually be restored. A previous study on the impact of placer mining in Norton Sound estimated a minimum of four years required for benthos to recover from mining activities and stated that impacts from mining were minor in comparison to the natural environmental disturbances that typically occur in the Norton Sound such as seabed gouging from ice keels, sand waves, and extreme currents (Jewett, S.C., 1997).

## 1.2 ENVIRONMENTAL IMPACTS

### Section A. General Information, Question 3. (cont.)

*Describe the environmental effects of the proposed activity, including potential adverse effects on marine life. Describe what steps are planned to minimize these adverse effects (mitigation measures).*

#### **Environmental Effects of the Proposed Activity**

Environmental effects of the proposed activity of geological exploration and prospecting for gold and silver on ocean seafloor using the mining ROV and JAG vessel are detailed in the following section. Environmental effects would be mostly temporary, occur during the open water season only, and may include the following:

- Habitat disturbance from vessel presence (pelagic marine environment) and ROV presence in the benthic marine environment;
- Potential oil/fuel spills from vessel, ROV, and hydraulic equipment;
- Anthropogenic noise from the vessel and ROV causing behavioral changes in marine mammals and fish (pelagic and benthic);
- Habitat loss and reduction of local benthic community populations due to tracked ROV travel and prospecting operations (e.g. suction dredging, digging, removal of boulders and cobble substrate, and seafloor bottom smoothing); and
- Increased turbidity in pelagic and benthic zones due to surface sediment plumes from bottom material discharged from curtain drain pipe and bottom sediment plumes due to resuspension of fine sediments from ROV operation on the seafloor

#### **Potential Adverse Effects On Marine Life**

##### **Benthic Zone**

Key marine organisms that may be present in the benthic zone of the exploration area include marine invertebrates (polychaete worms, crustaceans, and bivalves), epifauna (sea stars, red king crabs, and shrimp), and benthic (bottom) fish (Pacific cod, sculpins, and flatfish) [U.S. Fish & Wildlife Service (USFWS), 2025; U.S. Army Corps of Engineers (USACE), 2023; National Oceanic and Atmospheric Administration, 2025].

##### **Potential Adverse Effects**

Potential adverse effects on marine life in the benthic zone from the proposed operation of the mining vessel and ROV would include the following:

- Loss of habitat;
- Increased predation on injured organisms;
- Loss of prey species and habitat;
- Light pollution from ROV;
- Damage to marine organisms respiratory and feeding structures from sediment;
- Disrupted visual communication within and amongst marine species due to turbidity and anthropogenic noise;
- Changes in the oxygen content, pH, temperature and turbidity due to surface and bottom sediment plumes produced by prospecting operations and equipment.
- Oil/fuel spills from Vessel and ROV

### **Pelagic Zone**

Key marine species that may be present in the pelagic zone of the exploration area include marine mammals: polar bears, seals, sea lions, walrus, and whales (beluga, grays, orca, and humpback, etc.); seabirds (albatross and eider species, etc.); and fish: herring, salmon, cod, and pollock, etc.

The following marine mammals are highly unlikely to be present during project activities because they are typically located on land, barrier islands, or nearshore during the open water season: polar bears, sea lions, walrus, albatross, and eider species (USFWS, 2025; USACE, 2023; NOAA, 2025).

### **Potential Adverse Effects**

Potential adverse effects on marine life in the pelagic zones from the proposed operation of the mining vessel and ROV would include:

- Psychological/behavioral disturbances from operation of vessel and deployment and retrieval of ROV (e.g. avoidance, flight response, masking of natural sounds, alteration of feeding, and extended haul out);
- The sediment plume could attract fish, sea birds, and marine mammals;
- Anthropogenic noise (sonars, vessel, and ROV mining equipment) from the prospecting operation;
- Entanglement of marine mammal and fish species in umbilical's of the ROV; and
- Vessel lighting attracting seabirds and causing light pollution (only during late fall).

## 1.3 MITIGATION MEASURES

### Section A. General Information, Question 3. (cont.)

*Describe what steps are planned to minimize these adverse effects (mitigation measures). For example:*

*1) Potential Effect: Excessive sound level; Mitigation: Marine Mammal Observers, mammal exclusion zone or 2) Potential Effect: Bottom disturbance; Mitigation: ROV deployment/retrieval vibracoring rigs.*

#### **Potential Effects and Minimization Measures**

##### **Potential Effect**

Increased anthropogenic noise from sonars, vessel travel, operations of ROV and mining equipment and ROV deployment and retrieval have the potential to affect marine mammals and local fish species and causing physiological and behavioral changes.

##### **Mitigation Measures to be Utilized**

- Use of Marine Mammal Observers and establishment of marine mammal exclusion/shut down zones to reduce anthropogenic noise from vessel and prospecting operations.
- The vessel to be utilized for this project uses a passive hydrophone and two high frequency sonar systems that operate above the frequency (265 kilohertz [kHz] and up to 1,100 kHz) of hearing for any marine mammal species that may be in the vicinity of the proposed project.
- Reduction of vessel speed, shut down of vessel and ROV; and changing course to avoid marine mammals if observed.

##### **Potential Effect**

Increased turbidity in the water column due to surface and bottom sediment discharges; oil/fuel spills from vessel and equipment; physical impact to seafloor and substrate; increased turbidity; changes in the oxygen content, pH, and temperature changes in the immediate area of prospecting from heat produced from ROV and mining equipment.

##### **Mitigation Measures to be Utilized**

- The barge is equipped with an 8-inch diameter and 10-foot long curtain drain pipe that extends 5 feet below the water surface. As a standard operating practice, the downspout would be oriented, as necessary, to prevent any scouring and minimize resuspension of sediment in the area.

- Use of Marine Mammal Observers and establishment of marine mammal exclusion/shut down zones to reduce impact from discharges of bottom material sediment from the vessel curtain drain.
- Use of the vessel hydrophone and sonars, and the ROV equipped with lighting, cameras, sonars, and excavator arms is a more precise and controllable prospecting method in environmentally sensitive and hazardous areas in comparison to other seafloor prospecting and survey methods (e.g. bucket-line, air-lift, hopper dredges, use of 2D and 3D seismic surveys, explosives, and vibracoring).
- Releases of petroleum products and other hazard substances would be prevented or mitigated as follows: regular inspection and maintenance of the JAG, ROV, and associated equipment and systems to avoid situations that result in leaks, spills, and other releases of pollutants. Spill prevention and containment equipment would be stored on the vessel. Bulk fuel/oils are stored in double-walled tanks.
- Large rocks and material too large to pass through the suction pump are deposited back onto the ocean floor allowing for new habitat to form instead of leaving the area barren.
- Use of the ROV and suction dredge produces less sediment plumes from the ocean bottom in comparison to other seafloor prospecting and survey methods.
- Proposed prospecting activities would not occur during Norton Sound Red King Crab (*Paralithodes camtschaticus*) spawning (March 1 through May 31) or when salmon are out-migrating from anadromous streams (June 1 through July 15) (Alaska Department of Environmental Conservation [ADEC, 2024]).
- If red king crab mating pairs or clusters are observed, prospecting operations would move to an alternate location where no crabs are observed or cease operation until the crabs have moved away.

**Potential Effect:** ROV prospecting operations have the potential to affect historic properties including archaeological sites such as shipwrecks.

### **Mitigation Measures to be Utilized**

- Review of archaeological field surveys conducted in the project area or conducting a magnetic bottom survey prior to exploration (if required) would provide information on areas to avoid during prospecting operations.
- Use of the vessel hydrophone and sonars, and the ROV equipped with lighting, cameras, sonars,

allows for clearer visual assessment of the prospecting area allowing for early detection and avoidance of shipwrecks, culturally sensitive areas, and historic areas in comparison to other seafloor prospecting and survey methods.

## 1.4 PROJECT OPERATIONS

### **Section A. General Information, Questions 4. - 6.**

#### ***4. The expected commencement date and completion date:***

The proposed commencement date would be August 1<sup>st</sup> and is dependent on approval of all required federal permits and a National Environmental Policy ACT (NEPA) environmental review. The proposed completion date of the prospecting operation would be dependent on the length of the open water season, mineable weather days, and delays due to equipment breakdowns. In Norton Sound, the mining season typically ends by mid-October. Prospecting operations would occur 24 hours per day, seven days per week, with two operators each working 12-hour shifts. It may be necessary to extend our prospecting to include June and July of 2027 mining season.

#### ***Question 5. Name of individual in charge of the field operation is:***

Thomas Palmer III, Chief Operating Officer of Palmerosa Mining will be the Field Operations Manager for the proposed project. Contact information is provided in the attached application.

#### ***Question 6. The vessel(s) to be used in the operation is (are):***

Vessels to be used include: JAG of Nome Alaska, Registry Number 10786919, Registered Owner: Thomas Palmer II (Figure 2), 17-foot Lowe Boat Skiff, and 16 foot Lund safety boat.

### **Section B. Complete for Geological Prospecting or Exploration for Mineral Resources or Geological Scientific Research**

#### ***Question 1. The type of operation(s) to be used is:***

Geological prospecting sampling, collection, and screening of sub-seafloor sediments for presence of gold and silver placer deposits in marine water depths estimated at 60 to 90 feet (18 to 27 meters) using a tracked ROV equipped with a 19-inch suction head secured to a 77-foot vessel.

## 2.0 REFERENCES

Alaska Department of Environmental Conservation (ADEC). 2024. Alaska Pollutant Discharge Elimination System for Norton Sound Large Dredge Placer Miners General Permit Number AKG374000. Anchorage, Alaska. July 2024.

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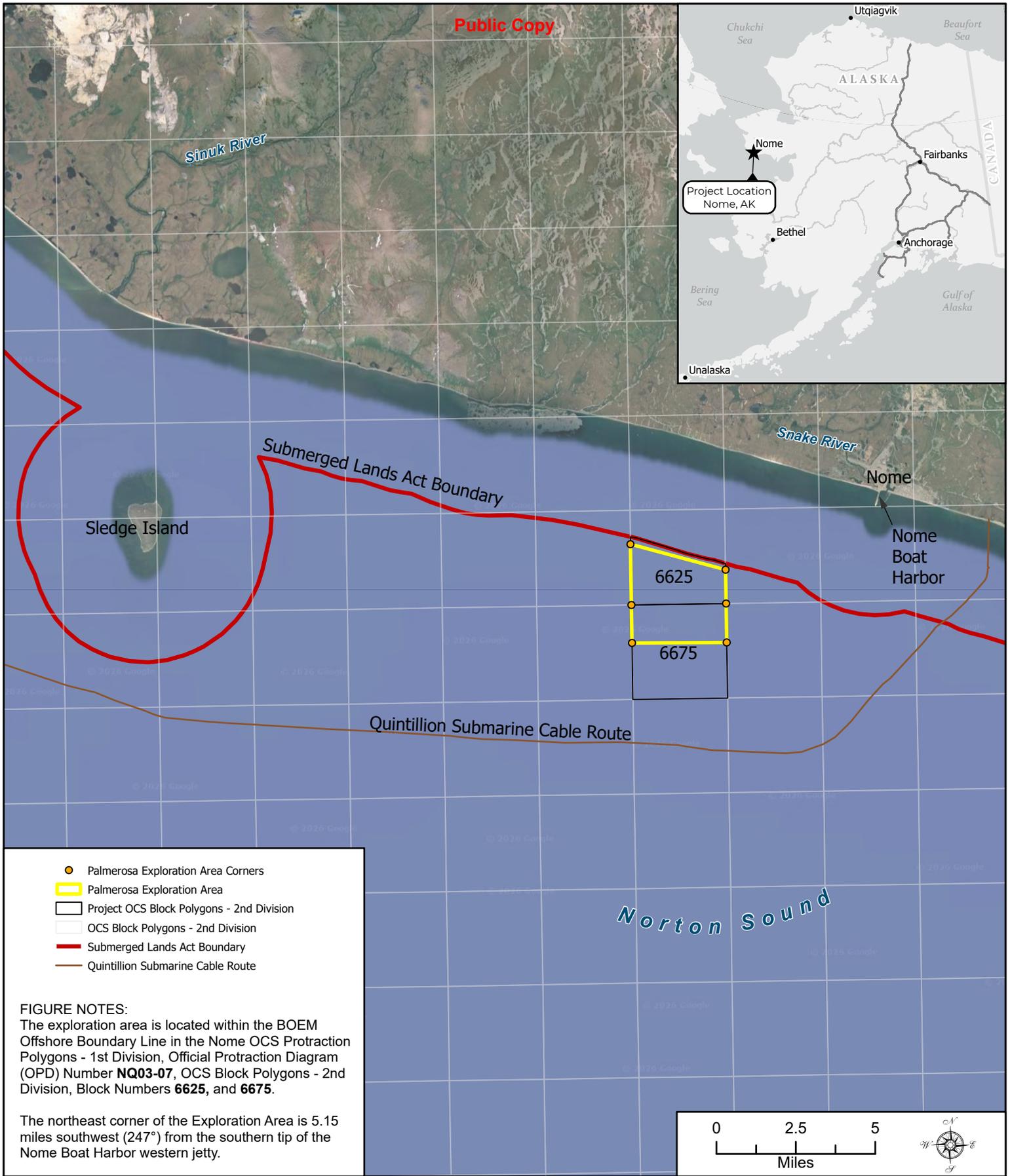
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## **APPENDIX A. FIGURES**

Public Copy

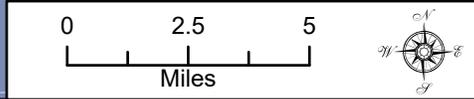


- Palmerosa Exploration Area Corners
- ▭ Palmerosa Exploration Area
- ▭ Project OCS Block Polygons - 2nd Division
- ▭ OCS Block Polygons - 2nd Division
- Submerged Lands Act Boundary
- Quintillion Submarine Cable Route

**FIGURE NOTES:**

The exploration area is located within the BOEM Offshore Boundary Line in the Nome OCS Protraction Polygons - 1st Division, Official Protraction Diagram (OPD) Number **NQ03-07**, OCS Block Polygons - 2nd Division, Block Numbers **6625**, and **6675**.

The northeast corner of the Exploration Area is 5.15 miles southwest (247°) from the southern tip of the Nome Boat Harbor western jetty.



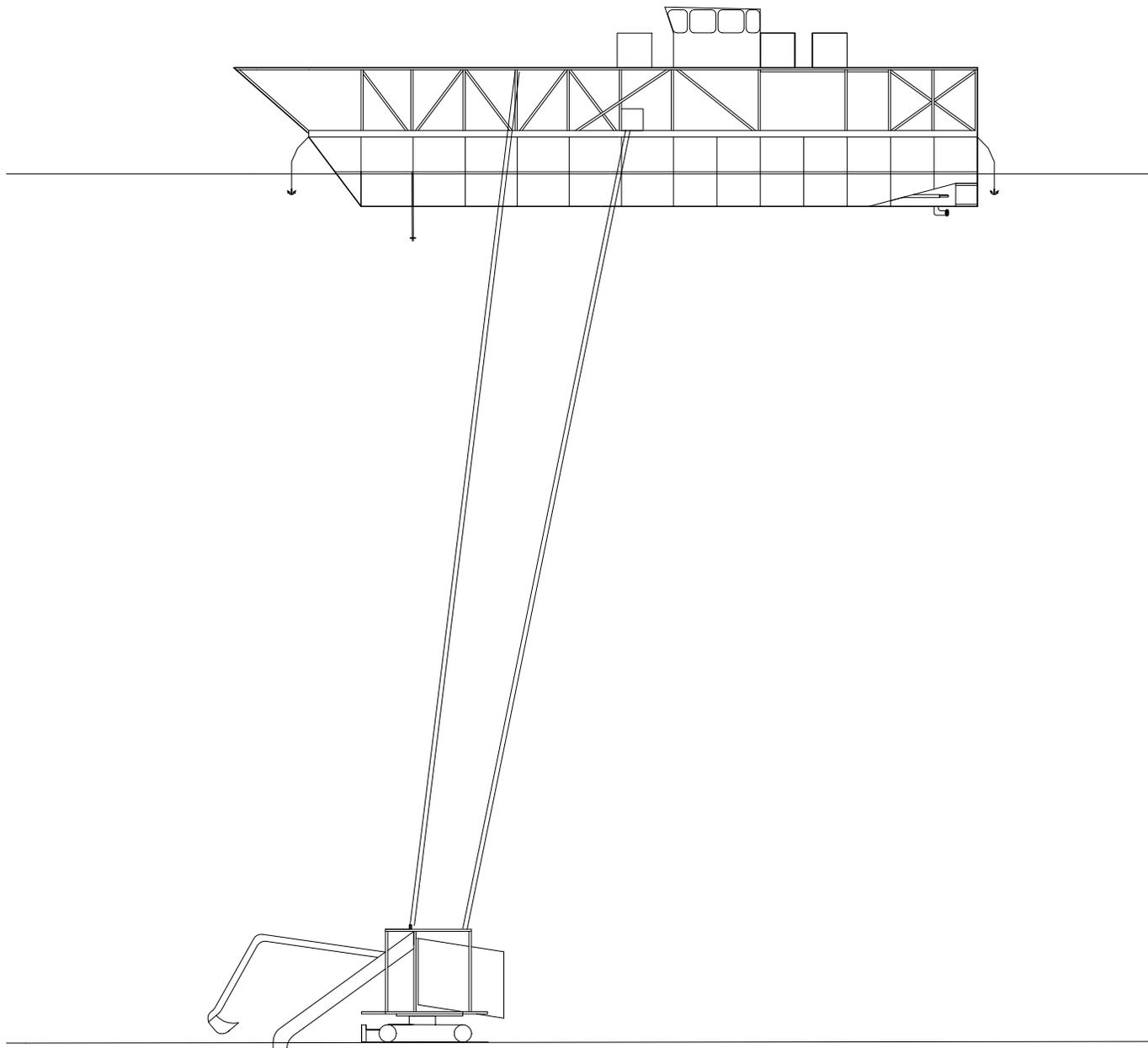
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 KENAI 907.283.2051  
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[www.HDLAlaska.com](http://www.HDLAlaska.com)

**Figure 1: Vicinity Map (Public Information)**

Palmerosa Mining, LLC - Nome Geophysical Mapping  
Prepared for: Bureau of Ocean Energy Management

DATE:	JANUARY 2026	DRAWN BY:	GH	SHEET:	1 OF 3
SCALE:	1:250,000	CHECKED BY:	OM	JOB NO.:	26-601



**Figure 2 - Mining Vessel Configuration**  
(PUBLIC INFORMATION)  
**Palmerosa Mining, LLC - Nome Geophysical Mapping**  
Prepared for: Bureau of Ocean Energy Management

DATE:	JAN 2026	DRAWN BY:	AHPA	SHEET:	2 OF 3
SCALE:	NTS	CHECKED BY:	GH	JOB NO.:	26-601



The JAG of Nome Vessel - Port and Stern Side



The JAG of Nome Vessel - Bow and Port Side



The JAG of Nome Vessel - Helm and Hydraulic Tanks



The JAG of Nome Vessel - Bow, Deck, and Hydraulic Tank



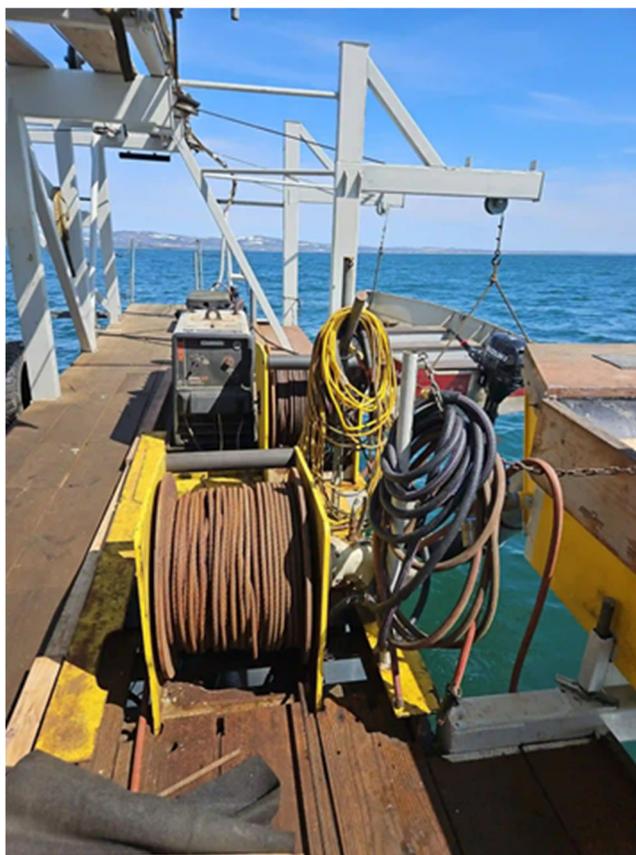
The JAG of Nome Vessel - Removing from harbor on Air Bags



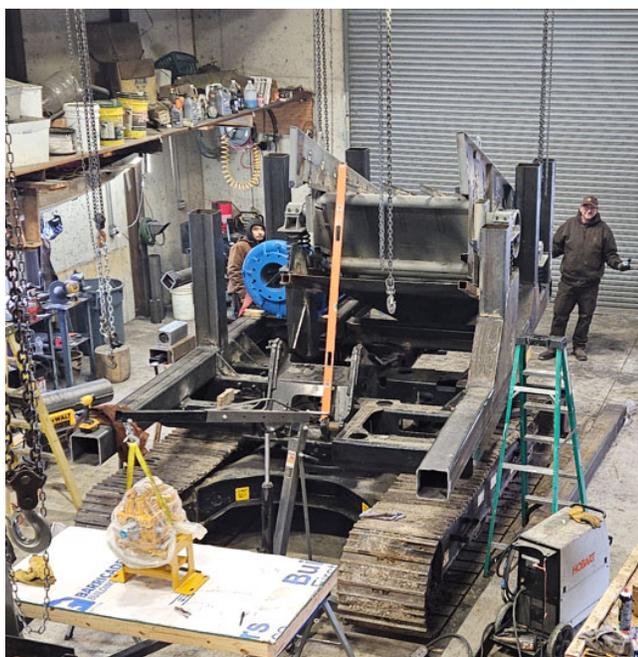
The JAG of Nome Vessel - Bow with Umbilical Deployment System.



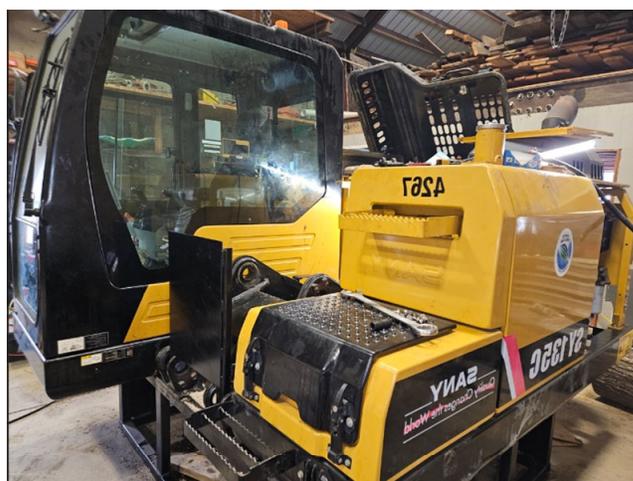
The JAG of Nome Vessel – Interior Controls and PLC



The JAG of Nome Vessel – Star Side: 2 Anchor Winches, Safety Boat, and Front edge of Sluice



The ROV under construction. The vibrating screen (top) is mounted and one water pump (blue). In the foreground is the main hydraulic valve (yellow).



The mining operator drives the ROV from the control station (under construction) located on the deck of the JAG.

## APPENDIX B. EQUIPMENT SPECIFICATIONS



## ARIS Explorer 3000 Specifications

### *Detection Mode*

Operating Frequency	1.8 MHz
Beamwidth (two-way)	0.3° H by 15° V
Source Level (average)	195 dB re 1 $\mu$ Pa at 1 m
Nominal Effective Range	15m @ 15°C water temperature

### *Identification Mode*

Operating Frequency	3.0 MHz
Beamwidth (two-way)	0.2° H by 15° V
Source Level (average)	< 195 dB re 1 $\mu$ Pa at 1 m
Nominal Effective Range	5m @ 15°C water temperature

### *Both Modes*

Number of beams	128 or 64	
Beam Spacing	0.25° nominal	
Field-of-View	30° horizontal x 15° vertical	
Max frame rate (128 beams)	4-15 frames/sec (8-15 frames/sec using 64 beams)	
Minimum Range Start	0.7m	
Downrange Resolution	3mm to 19mm	
Transmit Pulse Length	4 $\mu$ s to 24 $\mu$ s	
Remote Focus	0.7m to infinity	
Power Consumption	18 Watts typical	
Weight in Air	5.12 kg (11.0 lb)	
Weight in Water	1.55 kg (3.0 lb)	
Dimensions	26cm x 16cm x 14cm	
Depth rating	300m	
Data Comm Link	HomePlug	100BaseT Ethernet
Maximum cable length	150m (500 ft)	30m (100 ft)

Minimum PC Requirements:	Windows 7 SP1 or Higher
	100BaseT Wired Ethernet (USB Adapter OK)

Recommended PC Configuration:	DirectX 11 compatible graphics
	Multi-Core CPU
	8 Gb RAM
	512 Mb Video RAM
	64 Gb Available Hard Disk Space



RENTAL

# Sound Metrics ARIS Explorer 3000

Category | ROV Peripherals | Bathymetric, Depth Sensors, Altimeters, Imaging and Profiling

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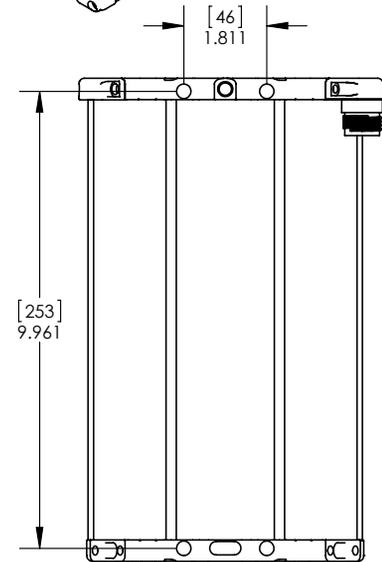
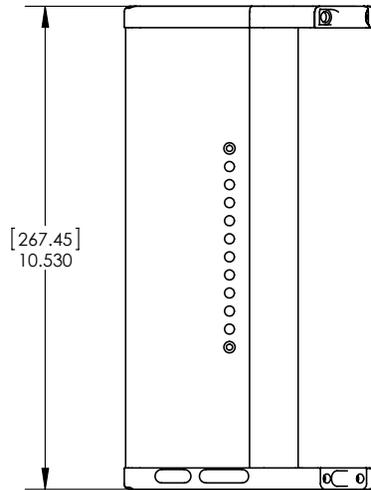
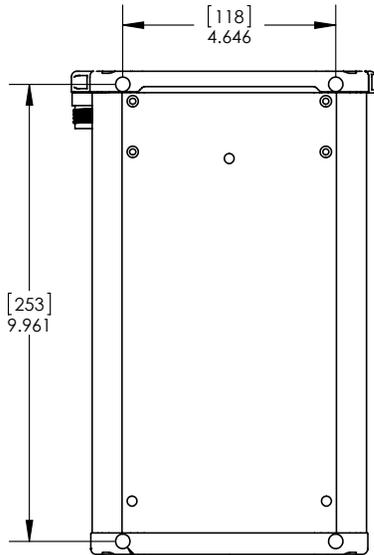
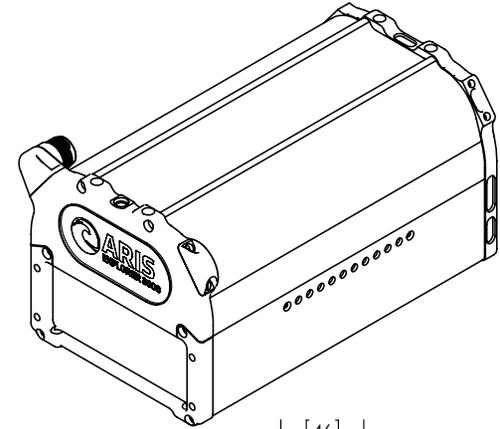
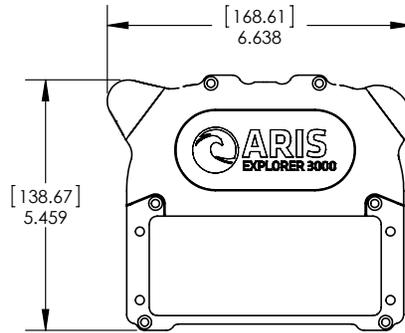
Sound Metrics ARIS Explorer 3000

THE NEXT GENERATION IN CLARITY.

# MOUNTING DIMENSIONS

## ARIS EXPLORER 3000

[mm]  
inch



ALL MOUNTING HOLES  
M5 x .8  $\nabla$  8MM  
8 PLACES

With 128 distinct physical beams operating at 3MHz, the ARIS Explorer 3000 can provide higher resolution than any other imaging sonar in its class, with unprecedented image clarity even in dark or turbid waters.

For longer range applications, Sound Metrics offers the Explorer 1800 and Explorer 1200 models. All models offer dual frequencies, dynamic focusing, multiple recording and output options, background subtraction and innovative soft-ware.

Teamed with the ARIS Rotator AR2 on a tripod, pole-mount or ROV, the ARIS Explorer line opens up exciting new possibilities of underwater discovery.

---

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#### DATASHEETS

Screen version



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GPSMAP

GPS Speed  
**0.00**<sup>k</sup>/<sub>h</sub>

Dist. to Next  
**1.50**<sup>k</sup>

Arrival  
---

Off Course  
**R0.06**<sub>m</sub>

Bearing  
**025**<sub>M</sub>

GPS Hdg (COG)  
**025**<sup>o</sup><sub>M</sub>

HOME



MENU

FOCUS

BACK

SELECT

NAV  
INFO

MARK  
SOB

1

2

3

4

Depth  
**17.8**<sub>m</sub>

GPS Position  
**N 43°53.691'**  
**W069°17.359'**

Follow Route

N

015

030

045

0

**000**<sub>M</sub>

for Standby

GARMIN