Letter of Authorization Application – Addendum to G&G Permit Application

Long Form – Assumes proprietary materials of BOEM G&G application are not provided to NMFS

Requested Period of Effectiveness:
Start date : December 1st, 2025
End date : May 31st, 2026

BOEM permit# : L25-022 (Engagement-9)

A. Type of Survey:

Please indicate which type of survey will be used in the proposed activity

_X_ Deep Penetration Seismic (greater than 1,500 in^3 total airgun array volume)
- 2D Seismic-towed Streamer
- 2D Seismic-Seafloor Cable or Nodes
- 3D Seismic-towed Streamer
- 3D Seismic-Seafloor Cable or Nodes
- NAZ
- WAZ
- 4D (Time Lapse)
- Vertical Cable
- Borehole Seismic (VSP)

___ Shallow Penetration Seismic (less than 1,500 in^3 total airgun array volume)
- Surface Vessel
- Surface Vessel and AUV/ROV
- Borehole Seismic (VSP)

___ HRG Surveys (no airguns used)
- Surface vessel
- AUV/ROV
- Both

___ Other
Describe (if Other):

Proxy used : Coil

WesternGeco is applying for an LOA to acquire a long offset sparse OBN survey.

The Coil proxy option has been used in the Exposure Estimation Tool because it most closely resembles sparse OBN. Both Coil and sparse OBN use efficient acquisition methodology to

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acquire Full Azimuth (FAZ) and long offset data to enable better imaging of the sub-surface geological structures in both production/development and exploration settings. Both acquisition methods use multiple sources, towed from different vessels to achieve the Full Azimuth and Long Offset data set. Long offsets being 30 Km for sparse OBN and 18-20 Km for Coil. Full Azimuth (FAZ) means each receiver collects data from a full range of azimuths, i.e. 0° - 360°, thereby "illuminating" the sub-surface geological structures from different directions and therefore providing a clearer image of potential drilling prospects.
In contrast, 3D NAZ is narrow azimuth and short offset, typically 8-10 Km, with a source towed by a single vessel, the same vessel that tows the receiver array. Narrow Azimuth means each receiver collects data from a limited range of azimuths, i.e. 150° - 210° relative to the source and therefore there is a limitation on this technology's ability to image the deep geological structures.

#Note: The survey area, as permitted, is very large. It is not the intention of WesternGeco to acquire data in all the permitted area. However, at this time, we cannot be more specific as to the exact location as we are seeking underwriting from various Clients. The intention is to acquire a subset of the permitted area to produce a data set of approximately 200 OCS blocks .

B. Survey Area and Operational Plan:

Question:	Response
Location: (Lease Block(s), Facility or Prospect Name, Lat/Lon, etc.)	**Green Canyon and Walker Ridge** Engagement-9
Overall Duration of the Activity (days):	100 days for both node and source activity
Areal extent of the survey area: (in OCS lease blocks or km^2) (Attach GIS file(s) of survey lines and/or survey area perimeter)	~478 OCS blocks for the node area ~1,132 OCS blocks for the source area Source and node perimeter shape files attached (see #note above)
G&G ITR/PEIS Modeling Zone(s) in which the activity will occur (1-7):	Zones 5 & 7 The proposed survey area is split between zones 5 and 7 with ~32% of the survey in zone 5 and ~68% in zone 7
Number of days during the overall activity period on which the sound source(s) listed in Section C will operate: (If the activity will occur in more than one Modeling Zone, provide the number of operating days within each modeling zone.)	80 days overall with ~30 in zone 5 and ~50 days in zone 7 The survey is planned to be acquired between December, 2025 and mid-May 2026.
Water depth range	1,400 m to 3,200 m

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C. Sound Sources:

- List all survey-related instruments that emit acoustic energy into the water column, including but not limited to airgun or airgun arrays, sub-bottom profilers, bubble pulsers, sparkers, side scan sonars, multi-beam sonars, single-beam echosounders, ultra-short baseline (USBL) position systems, pressure inverted echosounder (PIES), etc.
- For airgun arrays, please attach a diagram showing the layout (geometry) of the array and list of airgun sizes. See attached source description file: PX5000_GGII_2str_s12m_d10m_MantaHyd.pdf and PX5000_GGII_2str_s12m_d10m_MantaGeo.pdf
- Also under consideration is the TPS (Tuned Pulse Source) low frequency source.

Energy Source	**Manu-facturer**	**Model**	**Total Array Volume & Number of Elements** (cubic inches or Liters.)	**Source Level (SL) in dB re 1µPa@1m in water** (RMS)	**Source Level (SL) in dB re 1µPa@1m in water** (Peak to Peak)	**Operating Frequency** (Hz, kHz, range)	**Pulse Duration** (seconds, milli-seconds)	**Pulse Rate (or Cycle)** (Pulses per second or minute)	**Towing Depth of the Source** (ft or m)	**Towing Depth of the Receiver(s)** (ft or m)	**Duration of Use** (Number of Days or Percent of Active Sound Source Days)
Air gun array	G-Gun		5000 cu. in.	233 dB	263 dB	0-128 Hz	100 msecs	8 seconds	10 m	OBN receivers on Seabed	100%
Pressure Inverted Echo Sounder	Sonardyne	8036	NA	188-200 dB	190-200 dB	14-19 KHz	NA	1 pulse every 15 seconds	Placed on seabed	Placed on seabed	100%
Single beam echosounder One per vessel	Simrad	EA600	NA			38 Khz					100%
USBL system	Kongsberg	HiPAP 501	NA			21-31 Khz					100%
TPS	Sercel	TPS	28,000 cu. in. via a single element	222 dB	241 dB	0.5-128 Hz	~340 msecs	20-60 seconds	6-15m	Placed on seabed	100%

Note: the source to be utilized on each vessel will be one of the following-

- G-Gun airgun array only
- G-Gun air gun array in conjunction with a single TPS

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D. Take Estimate:

[*Insert the "Summary for NOAA" table here after completing all required inputs on the "Applicant Data Entry" spreadsheet in the Take Calculator Excel file or alternative tool developed with/by NMFS*]

Zone 5

User Selections

Parameters	
Survey Type	*COIL*
Zone Number	*5*
Array	*5110cuin*

# of Days per Month					
jan	10	may	0	sep	0
feb	10	jun	0	oct	0
mar	5	jul	0	nov	0
apr	0	aug	0	dec	5

Exposures by Metric

F.H.G	Species	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total (No Level B Scaling)	Level A Colour Legend
Level A															Level A SEL > Level A Peak
LF	Rice's whale	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	**< 0.01**	Level A Peak > Level A SEL
HF	Kogia spp.[a]	1.33	1.33	0.67	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.67	**3.99**	**Total (Including Level B Scaling)**
Level B															
LF	Rice's whale	0.27	0.27	0.10	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.14	**0.79**	**0.15**
MF	Atlantic spotted dolphin	62.19	66.49	33.09	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	29.98	**191.75**	**55.03**
	Bottlenose dolphin	191.37	223.80	116.37	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	80.22	**611.76**	**175.58**
	Clymene dolphin	142.56	147.18	54.72	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	73.15	**417.61**	**119.85**
	Beaked whales[b]	293.63	248.59	107.17	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	160.94	**810.33**	**81.84**
	Fraser's dolphin[d]	84.85	84.85	42.43	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	42.43	**254.56**	**73.06**
	Blackfish[c]	457.12	386.99	166.84	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	250.54	**1,261.50**	**372.14**
	Pantropical spotted dolphin	1,048.06	1,241.44	465.05	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	614.45	**3,369.00**	**966.90**
	Risso's dolphin	36.25	37.94	16.85	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	17.31	**108.35**	**31.96**
	Rough-toothed dolphin[d]	233.09	233.09	116.54	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	116.54	**699.26**	**200.69**
	Short-finned pilot whale	36.76	40.11	24.19	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	18.42	**119.47**	**35.24**
	Sperm whale	36.20	36.78	20.62	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	21.20	**114.81**	**48.56**
	Spinner dolphin	27.53	29.11	14.47	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	13.09	**84.18**	**24.16**
	Striped dolphin	426.51	375.10	148.03	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	193.62	**1,143.26**	**328.12**
HF	Kogia spp.[a]	25.65	25.65	12.82	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	12.82	**76.95**	**24.70**

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Zone 7

User Selections

Parameters	
Survey Type	*COIL*
Zone Number	*7*
Array	*5110cuin*

# of Days per Month					
jan	15	may	0	sep	0
feb	15	jun	0	oct	0
mar	12	jul	0	nov	0
apr	0	aug	0	dec	8

Exposures by Metric

F.H.G	Species	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total (No Level B Scaling)	Level A Colour Legend
Level A															Level A SEL > Level A Peak
LF	Rice's whale	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	**< 0.01**	Level A Peak > Level A SEL
HF	Kogia spp.[a]	4.78	4.78	3.82	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	2.55	**15.92**	**Total (Including Level B Scaling)**
Level B															
LF	Rice's whale	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	**< 0.01**	**< 0.01**
MF	Atlantic spotted dolphin	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	**0.02**	**< 0.01**
	Bottlenose dolphin	0.92	1.33	1.18	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.73	**4.15**	**1.19**
	Clymene dolphin	459.62	385.90	177.63	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	196.93	**1,220.09**	**350.17**
	Beaked whales[b]	18.74	17.91	14.77	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	11.40	**62.82**	**6.34**
	Fraser's dolphin[d]	94.79	94.79	75.83	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	50.55	**315.96**	**90.68**
	Blackfish[c]	764.02	779.34	482.16	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	329.21	**2,354.73**	**694.64**
	Pantropical spotted dolphin	3,088.39	3,315.87	1,840.08	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	1,874.48	**10,118.82**	**2,904.10**
	Risso's dolphin	14.43	12.60	10.56	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	8.22	**45.82**	**13.52**
	Rough-toothed dolphin[d]	204.88	204.88	163.91	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	109.27	**682.95**	**196.01**
	Short-finned pilot whale	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	**< 0.01**	**< 0.01**
	Sperm whale	46.43	46.05	38.72	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	28.15	**159.36**	**67.41**
	Spinner dolphin	22.65	22.83	18.66	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	12.08	**76.21**	**21.87**
	Striped dolphin	1,342.65	1,032.33	483.55	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	504.38	**3,362.91**	**965.16**
HF	Kogia spp.[a]	64.85	64.85	51.88	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	34.58	**216.15**	**69.38**

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E. Mitigation and Monitoring Efforts:

Question:	Response:
Please indicate which set of monitoring and mitigation measures from the ITR's apply to the planned activity:	All monitoring and mitigation measures in the ITRs applicable to Airgun Surveys with a total volume >1500 cu in will be followed. See attached file "Mitigation Measures.pdf" for a list of applicable monitoring and mitigation measures. Additionally, to avoid potential taking of killer whales, the airgun array will be shut down if killer whales are observed at any distance from the array while in operation.
Confirm that you will apply this set of monitoring and mitigation measures during the activity:	Yes, we will apply these measures during the 3D OBN survey.

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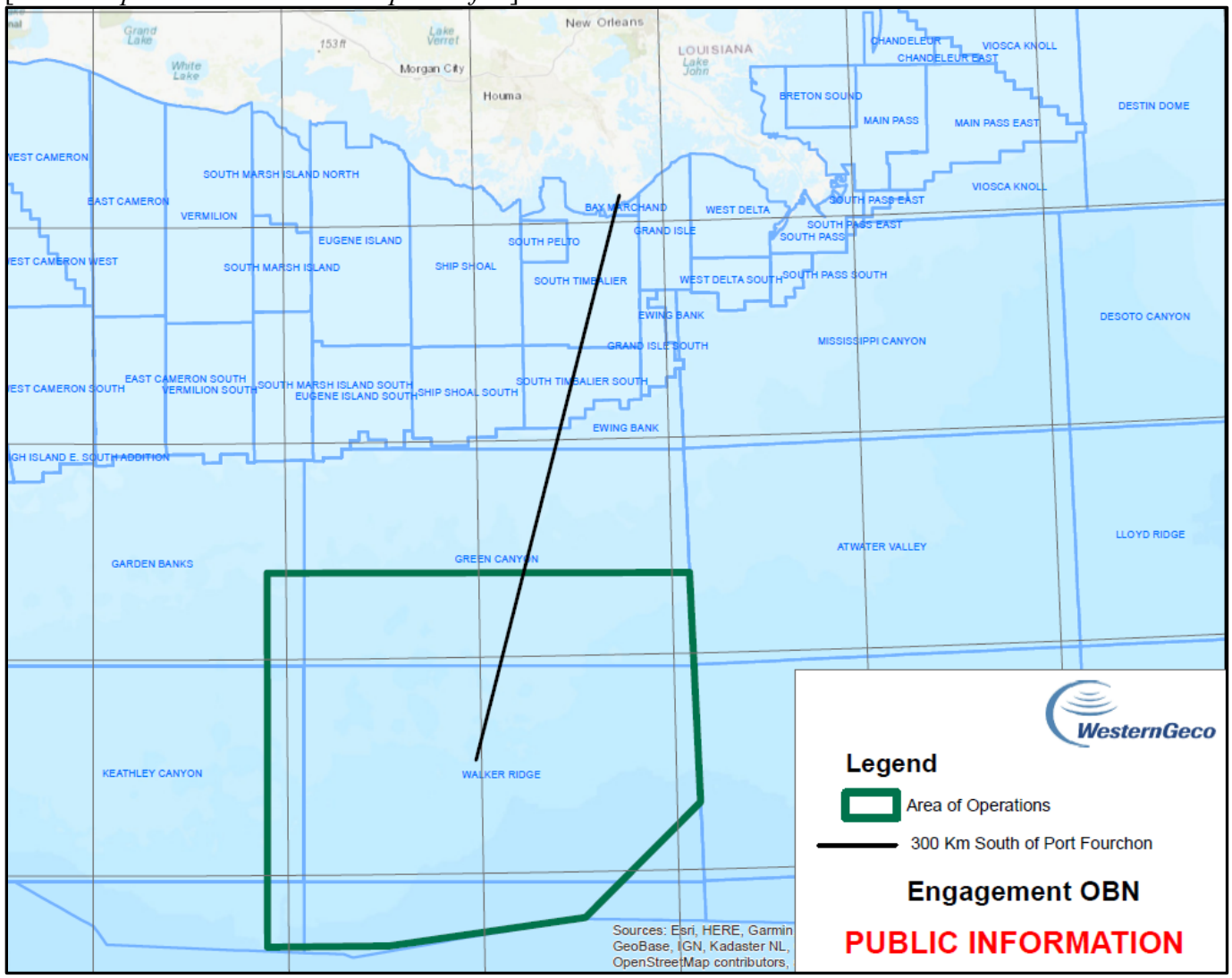
F. Map of Survey Area and Transit Route

[*Insert map here or attach as a separate file*]



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