May2012

Southern Company
Interim Policy Lease Application
Addendum A

Data Collection Project
Offshore of Tybee Island, Georgia

prepared for:

Bureau of Ocean Energy Management,
Outer Continental Shelf Alternative Energy Program
Interim Policy Lease

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Southern Company IP Lease Application – Addendum A

Bureau of Ocean Energy Management,

Outer Continental Shelf (OCS) Alternative Energy Program

Interim Policy Lease

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LIST OF ACRONYMS AND ABBREVIATIONS

BDCC	Buoy Data Collection Configuration
BMP	Best Management Practice
BOEM	Bureau of Ocean Energy Management
BSH	Biologically Sensitive Habitat
CFR	Code of Federal Regulations
CO	Carbon Monoxide
CO_2	Carbon Dioxide
DCC	Data Collection Configuration
EFH	Essential Fish Habitat
EPA	Environmental Protection Agency
FAA	Federal Aviation Administration
ft	Foot (Feet)
G&G	Geological and Geophysical
gal	Gallon(s)
GHG	Greenhouse Gas
GPS	Global Positioning System
kHz	Kilohertz
kW	Kilowatt(s)
LIDAR	Light Detection and Ranging
m	Meter(s)
MBTA	Migratory Bird Treaty Act
MMPA	Marine Mammal Protection Act
MMS	Minerals Management Service
met	Meteorological
NAD	North American Datum
NDBC	National Data Buoy Center
NEPA	National Environmental Policy Act
NM	Nautical Mile(s)
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NOMAD	Navy Oceanographic Meteorological Automatic Device
NO_x	Nitrogen Oxides
NTL	Notice to Lessee and Operator
OCS	Outer Continental Shelf
PM	Particulate Matter
PV	Photovoltaic
SO_x	Sulfur Oxides
t	Ton(s)
U.S.	United States
USACE	United States Army Corps of Engineers
USCG	United States Coast Guard
USFWS	United States Fish and Wildlife Service
VHF	Very High Frequency
W	Watt(s)
VOC	Volatile Organic Compound

1.0A INTRODUCTION

In April 2011, Southern Company submitted an Interim Policy Lease Application (2011 Lease Application) to potentially place a single traditional fixed meteorological (met) tower Data Collection Configuration (DCC) on the Outer Continental Shelf (OCS) off the coast of Georgia to collect site-specific wind and environmental data. The 2011 Lease Application fully characterized the potential placement of the DCC on the OCS. In the 2011 Lease Application Southern Company initially identified three OCS blocks of potential lease interest, Brunswick NH 17-02 OCS blocks numbered 6074, 6174 and 6126, ultimately identifying block 6126 as the preferred block to lease for potentially placing a single fixed met tower DCC.

The purpose of this Addendum is to fully characterize another data collection technology, the AXYS WindSentinel^{TM}, hereafter referred to as Buoy Data Collection Configuration (BDCC), a mobile or moveable single unit alternative technology to potentially be deployed. Because the BDCC is a mobile technology configuration, a single BDCC unit could be deployed and moved around into any of the three previously identified lease blocks (Brunswick NH 17-02 OCS blocks numbered 6074, 6174 and 6126).

At this time Southern Company has not decided which data collection technology to deploy (the met tower DCC, the BDCC buoy or possibly both); therefore, to aid in this decision making process, Southern Company requests a Bureau of Ocean Energy Management (BOEM) National Environmental Policy Act (NEPA) review of 1) the deployment and fixed installation of a DCC met tower technology at Brunswick NH 17-02 OCS block 6126, as considered in the 2011 Application; and/or 2) the deployment of a single mobile BDCC buoy to potentially collect data at all three Brunswick NH 17-02 OCS blocks numbered 6074, 6174 and 6126, as considered here in this Addendum. Any technology deployment will be designed with the necessary instrumentation to measure wind speed, direction and shear and to potentially collect other environmental data types during the lease term. Additionally, Southern Company may enter into a collaborative partnership with other interested parties for data collection technology deployment, validation and comparison. If such partnerships evolve, Southern Company will consult with BOEM as required and as necessary.

1.1A Identifying Information

This section identifies the lessee/operator and current contractors/consultants (**Table 1-0A**). Any additional contractors, consultants and collaborators will be reported to BOEM. If the operator changes, Form MMS-1123 will be completed and submitted to designate the new operator.

1.2A The Site Assessment Concept

This section presents the purpose of this Project and describes the site assessment, location of the onshore support base and Project schedule.

Southern Company proposes to collect site-specific wind and environmental data in federal waters at locations approximately 3 to 9 nautical miles (NM) off the coast of Tybee Island, Georgia (**Figure 2-1A: location plat map**). This Addendum A considers the deployment of a single BDCC as identified above. The three OCS blocks of interest are Brunswick NH 17-02

OCS blocks numbered 6074, 6174 and 6126. The latitudes and longitudes for the approximate center points of the Sub Blocks of interest within each of these OCS blocks are listed in **Table 1-1A**. With BOEM concurrence, Southern Company would like to reserve the right to shift the single BDCC anchor location from the approximate center points within the OCS blocks as necessary in response to site assessment information developed through potential geophysical/ geotechnical investigations, archaeological and biological surveys and other efforts that might affect placement of the BDCC.

The lessee and operator is Southern Company.

Table 1-0A. Lessee and contractors/consultants.

Lessee	Primary Point-of-Contact	Email
Southern Company Executive Sponsor	Chris M. Hobson Senior Vice President Chief Environmental Officer Southern Company Services	cmhobson@southernco.com
Southern Company Research Research Engineer, Renewable Energy Technology	William B. Hobbs Research Engineer Southern Company Services 600 North 18th Street/ 14N-8195 PO Box 2641 Birmingham, AL 35291-8195 Work: (205) 257-6309 Cell: (678) 575- 0185	whobbs@southernco.com
Southern Company Lease Application Project Manager & Primary Point-of-Contact	George A. Martin Environmental Specialist Georgia Power Company 241 Ralph McGill Boulevard, NE Bin 10221 Atlanta, GA 30308-3374 Work:(404) 506-1357 Cell: (404) 717-2844	gamartin@southernco.com
Contractors/Consultants		
AXYS Technologies, Inc	Graham Howe AXYS Technologies Inc. 2045 Mills Road Sidney, BC V8L5X2, Canada	ghowe@axys.com
Geo-Marine, Inc.	Greg Rosier Renewable Energy Project Manager Geo-Marine, Inc. 2201 K Avenue, Suite A2 Plano, TX 75074	grosier@geo-marine.com

Southern Company is considering all three **Table 1-1A** lease blocks for potential site assessment utilizing the mobile placement of a single BDCC. The 2011 Lease Application Figure 2-1 has been modified in this Addendum as **Figure 2-1A** and simply refers to those three blocks as Sites 1, 2 and 3.

Table 1-1A. OCS Block locations & sub block North American Datum (NAD) 83 points.

OCS Block (Figure 2-1 Reference)	NAD 83 Latitude (Decimal)	NAD 83 Longitude (Decimal)
Block 6074 (Figure 2-1A Site 1)	31ºN 54' 14.828712" (31.904108)	80ºW 49' 41.2632093" (-80.828162)
Block 6174 (Figure 2-1A Site 2)	31ºN 50' 12.9181804" (31.8368884)	80ºW 49' 40.5334877" (-80.8278815)
Block 6126 (Figure 2-1A Site 3)	31ºN 52' 13.87276" (31.870498)	80ºW 43' 12.4549983" (-80.7201042)

Several alternative DCC technologies have been considered for this Project including recently developed BDCC options. AXYS Technologies has developed and deployed a met buoy that provides technical capabilities similar to those of a traditional fixed met tower. This BDCC utilizes Light Detection and Ranging (LIDAR) as its key component to obtain wind resource measurements from 30 meters (m) to 150 m. It is easily deployed and capable of surviving harsh, extreme marine conditions due to its Navy Oceanographic Meteorological Automatic Device (NOMAD) hull that was originally designed for the U.S. Navy's offshore data collection program. The data collection instrumentation has also been marine-hardened to withstand offshore conditions. An illustration of the BDCC is provided in **Appendix A**.

Examples of the possible instrumentation and equipment to be installed on the proposed BDCC are listed in **Table 1-2A**. This instrumentation and equipment will be used to measure, at a minimum, site-specific wind resource characteristics such as speed, shear, direction, time period and velocity. Other data such as air and water temperature, humidity, rainfall, barometric pressure, lightning occurrence, current and tidal characteristics, wave heights and periods and avian, marine mammal and substrate resource data may also be collected.

The BDCC would be marked with appropriate visual and audible navigational warning devices in accordance with United States (U.S.) Coast Guard (USCG) and Federal Aviation Administration (FAA) requirements. Navigational warning devices may include a yellow day-marker paint color scheme, an amber navigational lighting configuration and flashing patterns (visual aid lights as necessary), a fog detector and foghorn and appropriate warning signage.

The BDCC will be constructed at the AXYS facility in British Colombia, Canada, and then transported to Southern Company's Georgia Power Plant Kraft in Port Wentworth, Georgia, for OCS deployment via barge or tug. The probable location for the onshore support base and Project deployment staging area will be Plant Kraft. Plant Kraft is located at latitude 32.1510367°N and longitude -81.1340012°W. Plant Kraft is located on the Savannah River which discharges downstream directly into the Atlantic Ocean adjacent to Tybee Island northeast of the OCS Project area.

The long-term operation and maintenance staging base during the life of the Project will most likely be at Plant Kraft or at another Georgia Power facility located in close proximity. Alternate onshore base locations are available within the Port of Savannah near Plant Kraft. Georgia Power also owns an inland substation on Tybee Island located off the beach shoreward from the Project area as an alternative land based work location.

The final Project schedule will depend on the lease application and negotiation process, lease conditions, project permitting, site assessment activities, assessment data analysis and data results-driven decisions, onshore buoy delivery staging activities, budgeting and other factors. Taking these factors into account, deployment of the BDCC is anticipated to occur in 2013 or later.

The schedule for redeployment or decommissioning of the BDCC will depend on business decisions made after site-specific wind resource data are collected and analyzed. For example, if the wind resource data reveal adequate wind resources, Southern Company may decide to conduct wind power generating technology testing and deployment. Southern Company at that time may apply to BOEM to engage in those activities with continuing BDCC placement, maintenance and operation.

Table 1-2A. Potential BDCC instrumentation and equipment (or equivalents).

Sensor	Model
Air Volume Instrument*	Catch The Wind, Inc. Vindicator Laser Wind Sensor (Doppler Velocimeter)
Wave Measurements	TRIAXYS Directional Wave Sensor
Wind Speed	Vector Instruments Cup Anemometer and Wind Vane
Temperature/Relative Humidity	Rotronic Instrument Corp. Hygrometer (PT 100RD)
Barometric Pressure Sensor	Vaisala Barocap
Water Temperature	YSI
Current Measurements	Nortek Aquadopp Accoustic Doppler Profiler
Solar Radiation	Licor I-200SA
Water Quality	WET Labs Multi-Sonde
pH	Sea-Bird Electronics
Bat and Bird Detection	Wildlife Acoustics SM2 Platform
Global Positioning System	Immarsat Skywave DRM800D
Compass	KVH Industries Fluxgate
Navigation Lamp	Carmanah Technologies M702-1
Position Verification	Inmarsat WatchCircle

*Designed to measure a volume of air simultaneously at various measurement ranges up to 150 meters.

If site-specific wind resource data do not support wind power generation technology testing and deployment, in addition to BDCC removal and decommissioning similar to installation/ deployment activities, Southern Company would like to retain the option of transferring the Lease to a qualified federal, state, local or other private or educational institution for continuing offshore data collection and/or research. If transfer of the Lease with BDCC ownership and

operational responsibilities to a third party is desired, it will be conducted in compliance with all applicable laws and regulations and with BOEM's approval.

Additional discussion on the decommissioning of the BDCC is presented in Section 2.13A.

1.3A A Listing of All Federal, State and Local Authorizations, Approvals and Permits

See Section 1.3 of the 2011 Lease Application for an initial listing of federal, state and local authorizations, approvals and permits that may be required for Project site assessment and BDCC installation activities.

1.4A Non-profit and Public Agency Coordination

See Section 1.4 of the 2011 Lease Application for a list of private, non-profit and public groups, individuals and agencies Southern Company has coordinated, consulted or otherwise communicated with thus far regarding the wind resource evaluation off the coast of Georgia. Such efforts will continue when and if the Project advances.

1.5A Other Information

This section provides a place holder for additional information required by BOEM to accept this Project application.

2.0A INSTALLATION OF STRUCTURES

The following sections discuss the potential impact producing factors of the BDCC on the physical, biological and other environmental resources of the three potential OCS lease blocks.

2.1A Location Plat (Map)

Due to the low profile and mobility of the BDCC and minimal impact of the anchoring system, all three of the OCS blocks being considered for lease are viable areas for the mobile deployment of a single BDCC (see **Figure 2-1A)**.

2.2A Geotechnical Survey and Shallow Hazards Survey

Geotechnical and shallow hazard surveys have not been conducted for the purposes of this Addendum A. If and when the lease application is approved, it may be necessary to conduct all or a portion of the geotechnical surveys described in Section 2.2 of the 2011 Lease Application to insure safe and stable placement of the BDCC anchor.

2.3A Biological Survey

A field biological survey has not been conducted for the purposes of this Addendum A but Section 2.8.2 of the 2011 Lease Application provides a detailed discussion of all known animal occurrences and environments within and adjacent to the three OCS blocks of interest, compiled during extensive desktop studies.

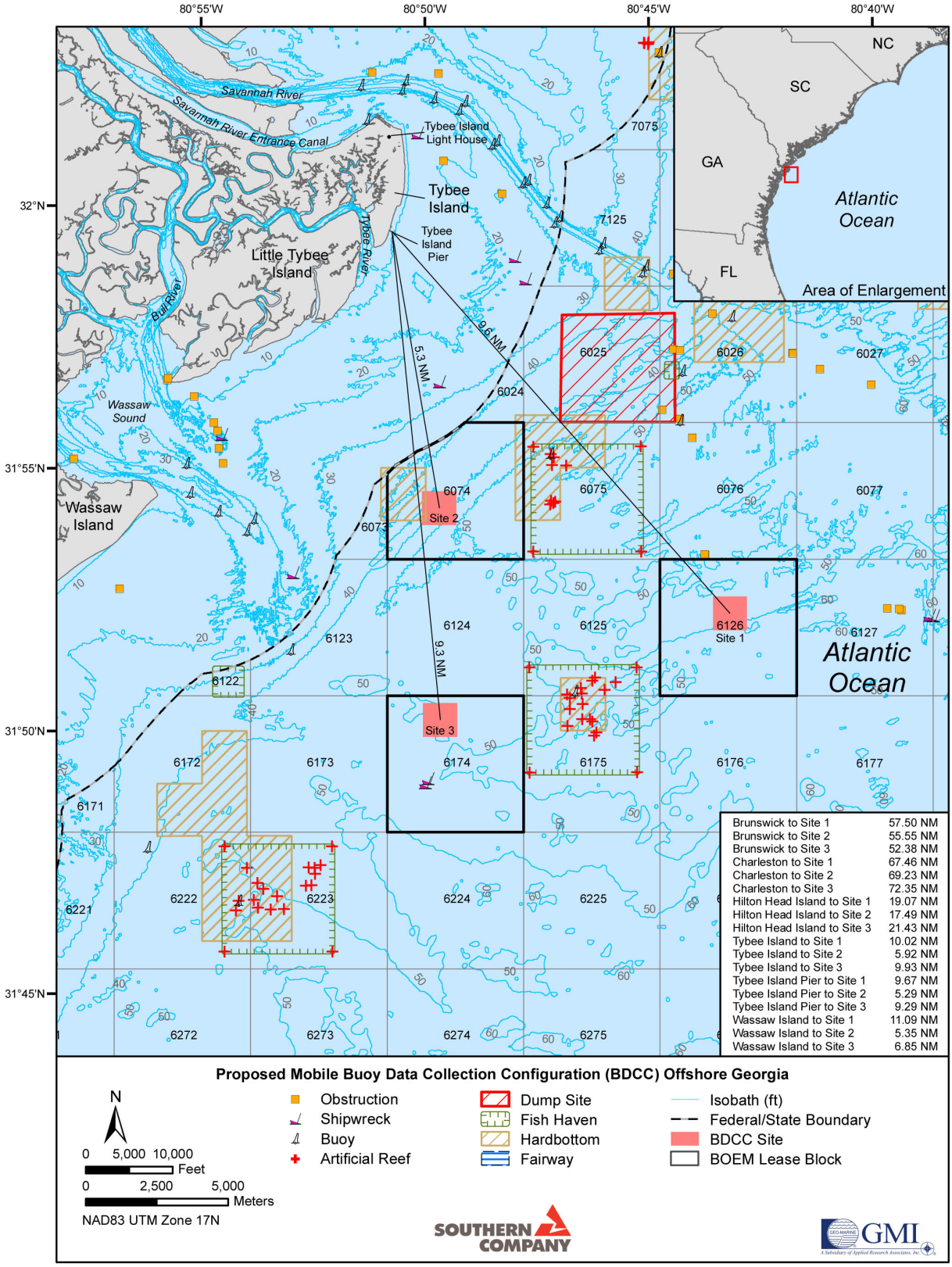


Figure 2-1A. Proposed BDCC location plat map.

Consultations with BOEM, U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS) and perhaps others will determine if additional biological surveys are necessary at the proposed BDCC deployment block locations. Survey design plans will meet the requirements and follow the protocols as set forth by Minerals Management Service (MMS) Notices to Lessee and Operator (NTLs) (2009a) and any subsequent BOEM guidance.

2.4A General Structure and Project Design, Fabrication and Installation Information

This section provides information about the components of the BDCC including a description of the BDCC deployment and commissioning process. Emergency BDCC repair contingencies are also presented.

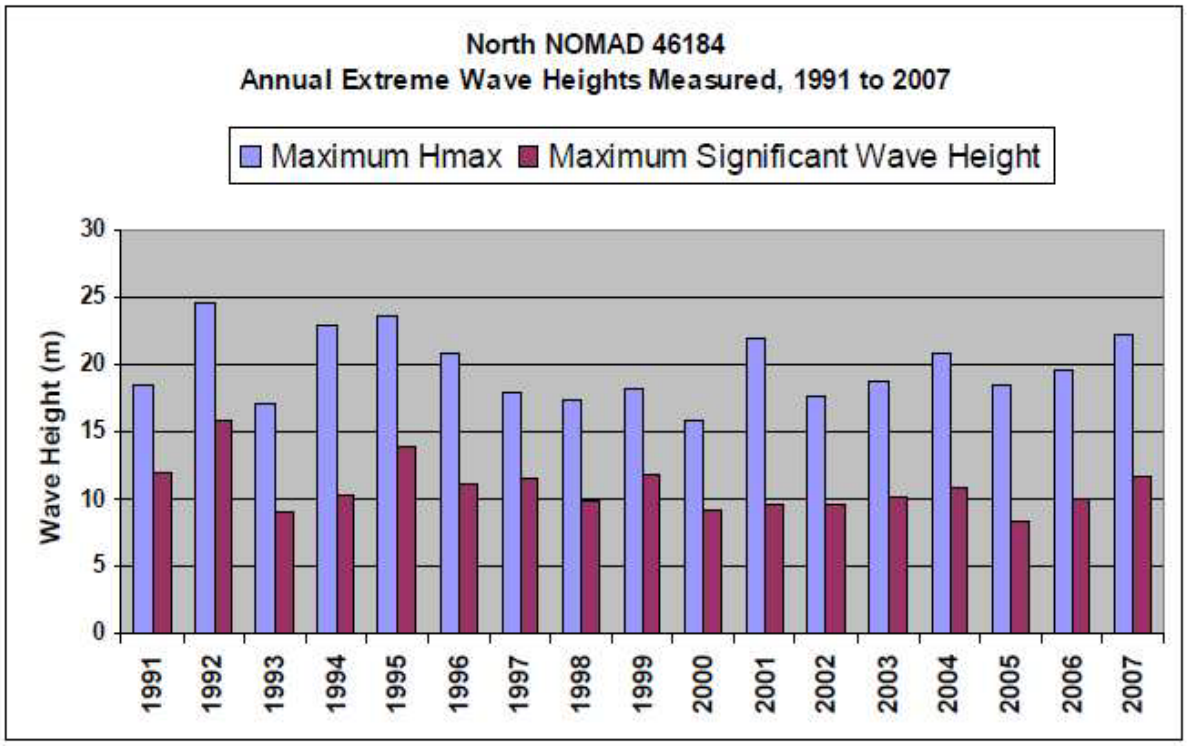
The WindSentinel™ BDCC was designed around the NOMAD buoy platform (**Appendix A**). This 6x3.1-m aluminum-hulled platform has successfully been deployed in marine environments for over 50 years and was originally designed for the U.S. Navy's offshore met data collection program. The NOMAD design has been used as part of the U.S. National Data Buoy Center (NDBC) permanent buoy station network. The NOMAD design was adopted by the Canadian Atmospheric Environmental Service for deep ocean stations off the east and west coasts of Canada and has been well proven to withstand the harsh marine environment (**Figure 2-2A**).

To mitigate any low probability buoy mooring failures, the BDCC features the intelligent WatchCircle™ location warning system. The WatchCircle™ uses buoy coordinates from the onboard global positioning system (GPS) receiver to determine whether the buoy is within a predefined area. Should the buoy drift out of its WatchCircle™, an Inmarsat D+ satellite transmitter is activated and location messages are transmitted, enabling the buoy to be tracked to aid in its recovery. Use of the Inmarsat D+ satellite transmitter enables a redundant positioning message to be received even if the buoy drifts out of very high frequency (VHF) or cellular range.

Primary electrical power for all equipment on the BDCC is provided by sealed lead acid rechargeable batteries. These batteries are charged by wind generators and a 3x20-watt (W) solar panel array mounted on the buoy. These systems are backed up by a high efficiency 10.8-kilowatt (kW), 2-cylinder, 4-cycle diesel generator which will only cycle on and off as required. The backup generator will cycle into use only if all renewable sources of electric power generation are unsupported or otherwise out of service. Once renewable source electrical power generation can resume, the generator will automatically shut down. This generator's engine complies with Tier 4 of the Environmental Protection Agency's (EPA's) emission standards for nonroad diesel engines. A regulator protects the batteries from damage by possible overcharging. If all charging systems were to become disabled, the BDCC would operate at full capacity for 3 days after which it would enter a low power mode. The BDCC will operate in low power mode for 80 days to allow adequate time to perform onsite system repairs.

The BDCC will either be transported and deployed offshore by a derrick barge or towed by a tug to the various Project blocks. If deployed by derrick barge, the BDCC will be lifted into place via crane followed by the placement of the 5-ton (t) mooring anchor. Deployment of a BDCC typically requires 1 day under acceptable weather conditions. A full day allows for testing of the system while at the deployment location. For an illustration of the BDCC and mooring anchor, see **Appendix A**.

North NOMAD Station 46184 Maximum Waves and Winds
1991 to 2007



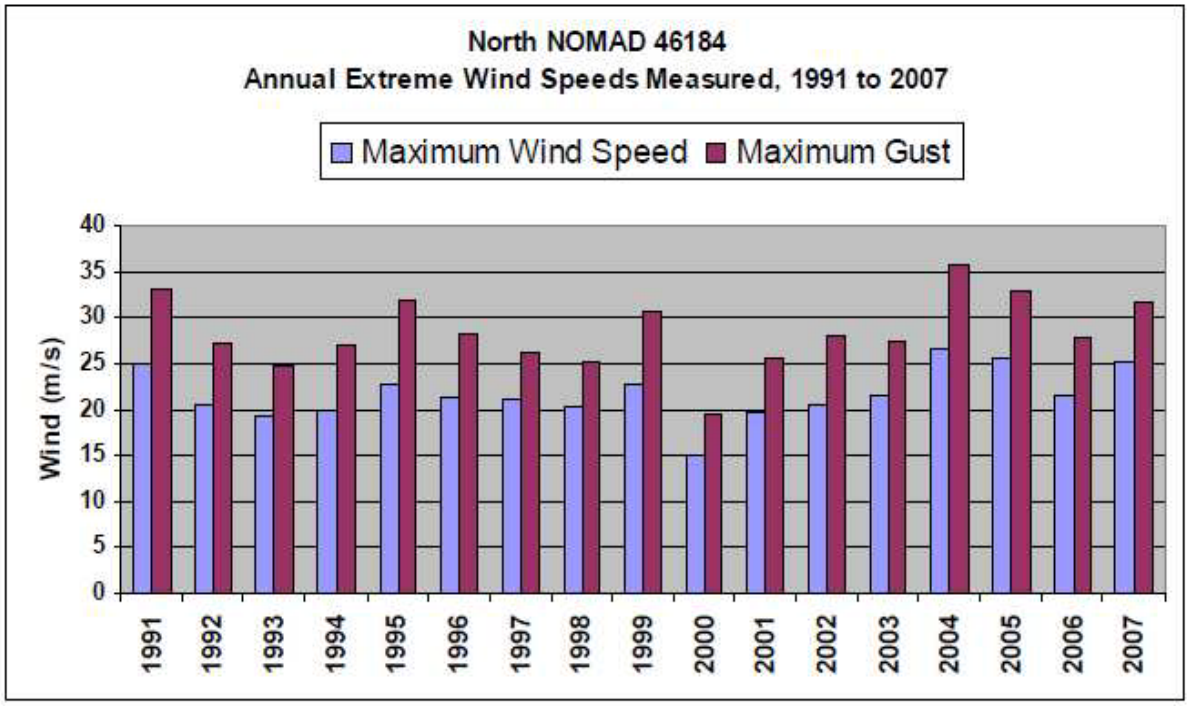


Figure 2-2A. Maximum waves and winds experienced by NOMAD 46184 (1991 to 2007).

In the event of any unforeseen emergency situation involving the BDCC, such as accidental vessel collisions, force majeure, vandalism and other unplanned events, Southern Company will respond immediately depending on the nature of the emergency to: take the BDCC out of service; dispatch the necessary personnel to the BDCC site; contain the emergency situation; and dispatch additional support to fully control the emergency, each as appropriate. Once the emergency situation is contained, a BDCC damage assessment will be conducted to determine the extent of repair necessary. Depending on the event and the outcome of the damage assessment, Southern Company will decide whether to repair or decommission the BDCC. If BDCC repair is selected, a Root Cause Analysis may be performed and corrective actions will be implemented. Corrective actions may include BDCC re-engineering, safety practice and instrumentation modifications, and/or the implementation of new operational procedures. Throughout any BDCC emergency event, Southern Company actions will be undertaken with appropriate BOEM consultation.

2.5A Description of the Deployment Activities

This section describes the safety, prevention and environmental protection features of the Project. See Section 2.5 of the 2011 Lease Application for a discussion of the deployment activities as they are the same for any DCC deployment.

2.6A Support Vessels, Offshore Vehicles

This section describes any vessels, offshore vehicles or aircraft used to support Project activities including vehicle deployment frequency.

Southern Company anticipates the following vessels will be used to facilitate the deployment of the BDCC. Two options are available for BDCC deployment: (1) A barge and tug to transport and deploy the BDCC; or (2) A tugboat to tow the BDCC to the site for deployment. Details regarding the vessel type, approximate hours on site, length, displacement, engine horse power and fuel capacity are included in **Table 2-1A**. Georgia Power's Plant Kraft will be used to support (birth) vessels during the BDCC installation, operation and decommissioning.

Table 2-1A. Projected vessel usage and specifications for deployment of a BDCC.

Vessel Type	Hours on Site	Length (feet)	Displacement (tons)	Engines (horsepower)	Fuel capacity (gallons)
Barge w/Diesel Crane	8	215		Crane – 300	200
Support Tug	8	65	300	1500	14,000
High Speed Vessel	8	50	100	600	1,800

- **Barge:** The barge may be used to transport/deploy the BDCC.
- **Support Tug:** The tug may be used to support the barge in BDCC deployment or to tow and deploy the BDCC from Plant Kraft to the lease block location.
- **High Speed Vessel:** The high speed vessel will be used to shuttle personnel to and from the deployment location and the support docks at Plant Kraft in Port Wentworth, Georgia.
- **Aircraft:** Any aircraft that may be utilized for various Project activities will be fully described on a case-by-case use basis prior to use.

2.7A Archaeological Resources

This section describes potential archaeological resources. See Section 2.7 of the 2011 Lease Application for a discussion of archaeological resources as they are the same for any DCC deployment.

2.8A NEPA and Other Federal Compliance

This section provides compliance information for NEPA and other relevant federal laws.

As a component of the 2011 Lease Application, a desktop analysis was conducted to determine the existing physical, biological, socioeconomic and cultural resources in the proposed OCS blocks. The results from this analysis are presented in Section 2.8 of the 2011 Lease Application. The following sections examine the factors, determined from the site assessment concept (see Section 1.2A), that potentially impact these resources.

2.8.1A Impact-Producing Factors

The identification and description of activities, equipment, materials and processes that potentially impact natural and human resources in areas proposed for BDCC deployment are presented in this section.

2.8.1.1A Site Assessment, Construction, Routine Operations and Decommissioning

Under routine conditions, the expected lifecycle of a BDCC Project is divided into four distinct phases: (1) site assessment surveys, (2) deployment, (3) routine operation/maintenance and (4) decommissioning. The potential impacts resulting from these four phases are addressed in the following sections.

- **Emissions**

Primary greenhouse gas (GHG) emissions (e.g., carbon dioxide [CO_2]) associated with the BDCC Project life cycle occur from engine exhaust of ocean vessel traffic (e.g., survey or deployment vessels) and heavy equipment (e.g., a crane or generator). Most emissions result from internal combustion engines burning diesel fuel. Emissions of lesser extent may include nitrogen oxides (NO_x) and carbon monoxide (CO), lesser amounts of volatile organic compounds (VOCs) and particulate matter ($PM_{2.5}$ and PM_{10}), mostly in the form of $PM_{2.5}$, and negligible amounts of sulfur oxides (SO_x). These emissions may occur during all phases of the BDCC Project, with amounts varying with different levels of activities associated with each phase (MMS, 2007, 2009b).

Air emissions during the site assessment surveys will result from the geological and geophysical (G&G) surveying/sampling and natural resource monitoring activities. Impacts will be limited to emission sources from internal combustion engines from vessels, generators or other equipment used for such investigations. Overall, air emissions during these activities are expected to be very low, intermittent and temporary. Total impacts on the ambient air quality during site assessment surveys are anticipated to be insignificant.

The emissions from existing activities in the vicinity of the proposed BDCC deployment sites (e.g., commercial shipping and recreational boating) haven't been directly quantified for this addendum. It is highly likely that the air emissions resulting from the estimated 1-day offshore deployment phase will be minor compared to the emissions from these activities. Estimated emission levels of criteria pollutants and CO_2 during deployment are presented in **Table 2-2A**.

Routine operation/maintenance of the BDCC is expected to have negligible impacts on air quality. For the initial year after deployment, the anticipated service interval is 3 months (4 trips). In a typical year, after operating parameters have been established, one in-water service and one out-of-water service are anticipated (2 trips). The in-water service will require only a high speed vessel, and the out-of-water service will require a vessel capable of lifting the BDCC from the water (e.g., derrick barge with a crane). The BDCC onboard backup generator will cycle into use only if all renewable sources of electric power generation are unsupported or otherwise out of service. Insignificant emissions from routine operation/maintenance of the BDCC's via minimal vessel usage and generator operation are anticipated. Estimated emission levels of criteria pollutants and CO_2 during deployment are presented in **Table 2-2A**.

GHG emissions during decommissioning are expected to be insignificant and comparable to those emitted during deployment.

Mitigation measures to reduce engine emissions will include the proper maintenance of equipment and offshore vessels to minimize air emissions from diesel-powered engines and the use of ultra low-sulfur diesel fuel to reduce SO_2 emissions. The BDCC backup diesel generator also complies with the EPA's Tier 4 emission standards for nonroad diesel engines.

Section 2.12A provides a summary of all measures that may be utilized to avoid, minimize and mitigate impacts to marine and coastal environments.

- **Sea Bottom Disturbances**

The BDCC mooring footprint will cover a very small area (up to a few square meters) of the seafloor; therefore, disturbances to the sea bottom are anticipated to be insignificant.

Minor disturbances that may occur on the seafloor during each phase of the BDCC Project are predicated on site-specific conditions. Disturbances may result from vessel anchoring, BDCC mooring deployment, coring and scour. Potential physical impacts may include the slight acceleration of geologic processes (e.g., minor erosion or mass movement on the seafloor) and slight alteration of seafloor topography. In addition, any disturbances may affect benthic biology by altering the availability of various habitat types through minor disturbance of sediments, impacting benthic organisms and increasing turbidity. The amount and duration of increased turbidity is dependent on the level of activity, sediment grain size, current velocity and water depth (MMS, 2009c). Water quality should not be significantly impacted to a degree that interferes with normal benthic biology and ecology. The BDCC Project is anticipated to produce minor temporary impacts to the seafloor during all four phases.

Table 2-2A. Estimated emissions in tons for BDCC site during deployment, decommissioning, and maintenance for 5-year period.

Deployment and Decommissioning								
			Emissions (tons)					
Deployment Equipment	**HP**	**Hours of Operation**	**NO_X**	**CO**	**SO_X**	**PM**	**TOC**	**CO_2**
Vessel/Crane Power Generator	300	16	0.074	0.01603	0.004920	0.00528	0.0060	2.76
Support Tug	1500	16	0.288	0.06600	0.000146	0.00840	0.0085	13.92
High Speed Vessel	600	16	0.149	0.03206	0.009840	0.01056	0.0121	5.52
Total		**48**	0.511	0.11410	0.014906	0.02424	0.0266	22.20

Maintenance									
				Emissions (tons)					
Maintenance Equipment	**HP**	**Hours of operation in first year**	**Hours of operation per year after first year**	**NO_X**	**CO**	**SO_X**	**PM**	**TOC**	**CO_2**
Backup Generator[5]	14.5	2133.3	1066.7	1.438	0.30995	0.095120	0.10208	0.1167	53.36
Support Tug	1500	10	10	0.900	0.20625	0.000455	0.02625	0.0264	43.50
High Speed Vessel	600	24	8	0.521	0.11222	0.034440	0.03696	0.0422	19.32
Total		**2167.3**	**1084.7**	**2.859**	**0.62843**	**0.130015**	**0.16529**	**0.1853**	**116.18**

	Emission Factors (lb/hp-hr)[1]					
	NO_X	**CO**	**SO_X[2]**	**PM[3]**	**TOC[4]**	**CO_2**
Diesel Engines ≤600 HP	0.031	6.68E-03	2.05E-03	2.20E-03	2.51E-03	1.15
Diesel Engines >600 HP	0.024	5.5E-03	8.09 E-03S_1	0.0007	7.05E-04	1.16

[1] All emission factors are from EPA's AP-42 Chapter 3: Stationary Internal Combustion Sources.
[2] Ultra low sulfur diesel will be used in the deployment equipment which has a maximum sulfur content of 0.0015%: therefore, S1 = 0.0015
[3] According to AP-42, Chapter 3.3 (Gasoline and Diesel Industrial Engines) Table 3.3-1, all particulate emissions from diesel industrial engines are assumed to be <1 µm in size; therefore, all PM 10 and PM 2.5 emissions are captured by the calculated PM emissions.
[4] TOC (Total Organic Compounds) emissions from diesel industrial engines <600 hp are attributed to exhaust and crankcase operation (AP-42 Table 3.3-1).
[5] The capacity of the diesel tank for the backup generator is 240 gallons and the engine consumes fuel at a rate of approximately 0.45 gallons/hour. The maximum operation for backup generator is calculated assuming that the engine operates for 533.3 hours between maintenance visits, which would consume the entire contents of the diesel tank. The tank can be filled up at each maintenance visit (four times in the first year and twice in each subsequent year); therefore, the maximum hours of operation are 2,133.3 hours in the first year and 1,066.7 hours each subsequent year.

- **Wastes and Overboard Discharges**

Refer to Section 2.8.1.1 of the 2011 Lease Application for a discussion on wastes and overboard discharges expected from the Project. It is anticipated that the BDCC Project will produce no wastes and overboard discharges. Section 2.8.1.2A below discusses potential impacts.

- **Noise**

Noise caused by diesel-powered equipment and acoustic devices utilized during site assessment surveys is expected to be temporary and minor compared to noise generated from existing on-going coastal activities in the vicinity of the potential BDCC sites. Minor noise associated with mooring anchor placement and mooring chain deployment may affect the proposed BDCC location during deployment of the BDCC. The noise resulting from anchor and chain deployment is anticipated to be short-term and insignificant. No significant above or below water noise is anticipated to result from the operation of the BDCC. Noise generated during decommissioning would be similar to that during deployment and is expected to be negligible.

Appropriate Best Management Practices (BMPs) will be employed during site assessment surveys and BDCC deployment to minimize and mitigate noise generated from acoustic site assessment devices, vessel operations and deployment activities. Examples of these BMPs include the development of safety exclusion zones within which the potential presence of sensitive marine animal species is to be visually monitored. Site assessment surveys will be discontinued when such species are detected within the exclusion zone and will continue only when the species migrate out of the zone. In addition, site assessment and deployment activities may be scheduled during periods of relatively low probability of species occurrence within the exclusion zone.

Section 2.12A provides a summary of all measures that may be utilized to avoid, minimize and mitigate impacts to marine and coastal environments.

- **Onshore Facility Construction or Modification**

No onshore facilities will be constructed or modified for this Project. The fabrication of the buoy will be conducted at the AXYS Canada facility. Georgia Power's Plant Kraft will be used to support/birth vessels during BDCC deployment, maintenance/operation and decommissioning. No significant impact on land use or coastal infrastructure is expected.

- **Vessel Traffic**

Vessel activity during site assessment surveys will be short and intermittent. Several vessels will be utilized during deployment, operation/maintenance and decommissioning of the BDCC. **Table 2-3A** provides a description of the vessels and estimated usage.

During routine operation and maintenance, data will be monitored and processed remotely. The BDCC will be accessed by boat for routine maintenance. Approximately 20 routine maintenance trips may occur over a 5-year lease. These vessel trips are not expected to require any addition to, or expansion of, onshore facilities.

Vessel activity during decommissioning is anticipated to be similar to vessel activity during deployment. Due to the short duration of vessel activity during each phase of the BDCC Project and the lack of shipping lanes within the proposed OCS blocks, impacts to vessel traffic or conflicts with shipping lanes are not expected.

Table 2-3A. Projected vessel usage for BDCC deployment, operation and decommissioning.

Vessel Type	Trips by Project Phase (round trips)			Time On Site by Phase (hours)		
	Deployment	Operation	Decommissioning	Deployment	Operation	Decommissioning
Barge w/ Diesel Crane	1	4	1	8	40	8
Tug	1	4	1	8	40	8
High Speed Vessel	1	8	1	8	64	8

- **Lights and Electromagnetic Forces**

Marine navigation safety lighting will be installed and maintained in accordance with USCG regulations. Southern Company anticipates that the navigation warning light will consist of one amber-colored flashing light which is required and regulated by the USCG under 33 Code of Federal Regulations (CFR) 66 (Private Aids to Navigation). Southern Company will consult with the USCG to confirm this configuration prior to BDCC deployment. As allowed by the USCG, lighting will be used that minimizes visibility from shore.

There are no electromagnetic force impacts expected as a result of BDCC deployment, operation/maintenance and decommissioning.

2.8.1.2A Environmental Hazards and Accidental Events

The following sections discuss environmental hazards and accidental events that may occur during the BDCC Project.

- **Environmental Hazards**

Environmental hazards anticipated during the lifecycle of a BDCC Project include natural weather events such as severe storms (e.g., hurricanes).

Depending on the severity of the natural event, the BDCC may be damaged or destroyed, resulting in economic, safety, and/or environmental consequences; moreover, marine vessels used in deploying, servicing and maintaining the BDCC could also be impacted, potentially resulting in loss of life and the release of diesel fuel to the environment (MMS, 2007).

AXYS (the BDCC manufacturer) is a registered ISO 9001:2008 company. The company's extensive quality assurance program ensures that its products are manufactured to the highest standards using a rigorous and documented design, manufacturing and testing process. The

BDCC's NOMAD hull was originally designed for the U.S. Navy's offshore data collection program and is a well proven design with more than 30 years of deployment at Canada's deep ocean stations. NOMADs moored off the Canadian coast commonly experience storms with wave heights approaching 20 m. The National Oceanic and Atmospheric Administration's (NOAA's) NDBC reports no known capsizes of the 6-m NOMAD hull.

- **Accidental Events**

Accidental events potentially encountered during the lifecycle of a BDCC Project include vessel collisions and fluid spills.

Vessel Collisions

A single BDCC located in any of the proposed OCS blocks may pose a navigational risk to irresponsible marine vessels and area marine life, resulting in economic, safety and environmental consequences. Though unlikely, a collision between a vessel and the BDCC may result in damage to or loss of the BDCC, as well as vessel damage, personal injury and the spill of petroleum products.

Vessel traffic in the vicinity of the proposed OCS blocks is discussed in the above section entitled Vessel Traffic. In addition to vessel traffic directly associated with BDCC deployment, operation/maintenance and decommissioning (e.g., barge, tugboat, high-speed vessel), other types of vessel traffic may be expected in the vicinity of the BDCC, including commercial and recreational fishing vessels and commercial transport vessels. Any vessel traffic outside defined shipping lanes may pose limited risk of collision with the BDCC.

In addition to vessel collisions with the BDCC, vessels associated with site assessment surveys, deployment, maintenance or decommissioning of the BDCC may also potentially collide with marine mammals, sea turtles and other marine life species during transit. To limit or prevent such collisions, NOAA Fisheries Service provides all boat operators with *Whale Watching Guidelines* derived from the Marine Mammal Protection Act (MMPA). These NMFS guidelines suggest safe navigational practices based on speed and distance limitations when encountering marine mammals and will be followed throughout the BDCC Project. The frequency of vessel collisions with these marine organisms varies as a function of their spatial and temporal distribution patterns, the pathway of maritime traffic, vessel speed, number of vessel trips, navigational visibility (MMS, 2009b) and implementation of on-board detection and evasive strategies (e.g., presence of marine animal observers, communication with vessel captains and crew).

Fluid Spills

All deployment, operation and decommissioning vessels utilized will comply with USCG requirements relating to prevention and control of oil spills. In order to mitigate potential spills from liquid wastes during BDCC deployment, spill kits will be available onboard the vessels. Fluid spills related to the BDCC generator are not anticipated to be an issue due to a BDCC double-walled fuel tank design. Southern Company will prepare and implement a spill response plan to further mitigate potential impacts caused by a fuel spill from the onboard generator. In

the unlikely event that the fuel tank is damaged resulting in a diesel spill, the small amount (approximately 240 gallons [gal]) of diesel is not anticipated to cause a significant impact. Diesel fuel is a refined petroleum product that is lighter than water. It may float on the water's surface or be dispersed into the water column by waves. Diesel is a distillate of crude oil and does not contain the heavier components that contribute to crude oil's longer persistence in the environment. If a diesel spill were to occur, it would be expected to dissipate very rapidly and would then evaporate and biodegrade within a few days (USDOI, MMS, 2007b).

Section 2.12A summarizes all measures that may be utilized to avoid, minimize and mitigate impact to marine and coastal environments.

2.8.2A Affected Environment

The following sections discuss the impacts on physical and biological resources resulting from the deployment, operation/maintenance and decommissioning of the BDCC in the OCS blocks and the immediate vicinity. When applicable, a general discussion of the potential impacts from relevant impact producing factors is provided.

2.8.2.1A Physical Resources

This section provides a discussion of the possible impacts of the BDCC on surficial sediments, shallow hazards and water, air, noise and visual quality. See Section 2.8.2.1 of the 2011 Lease Application for a discussion on the Physical Oceanography and Climate of the region at and surrounding the proposed lease blocks.

- **Surficial Sediments**

Potential Impacts and Discussion

Due to its potential value as a habitat for marine benthic organisms, hard-bottom substrates may be considered to be a Biologically Sensitive Habitat (BSH). Approximately 10-15% of the bottom substrate composition of OCS Block 6074 is hard-bottom; hence, there is a potential for areas within this OCS block to be considered BSHs. If a BSH is discovered during site characterization surveys, Southern Company will notify the U.S. Army Corps of Engineers (USACE), BOEM and other appropriate agency personnel to discuss possible impacts, Project development plans and BDCC anchor placement.

- **Shallow Hazards**

Potential Impacts and Discussion

Shipwrecks, because of their historical and ecological value as an artificial reef habitat for commercial and recreational fish species, may also be considered to be a BSH. Two shipwrecks are known to exist within OCS Block 6174; hence, areas within this OCS block may be considered BSHs. Based on existing literature, there are no known shallow hazards within OCS Block 6126 or 6074. If a shallow hazard is discovered during site characterization surveys,

Southern Company will notify the USACE, BOEM and other appropriate agency personnel to discuss possible impacts, Project development plans and BDCC anchor placement.

- **Water Quality**

Potential Impacts and Discussion

There are no anticipated impacts to water quality during the site assessment surveys. Survey vessels will dispose of all bilge water and other associated wastes in appropriate facilities when at dock. Spill kits will be available for emergency use aboard all survey vessels utilized during the site assessment phase as well as at any land-based staging areas. BMPs for deployment and support practices will be followed at all times and during all phases of the Project.

The BDCC deployment activities may impact water quality, but any impacts are expected to be minor, localized and short-lived. Increased activity from maritime support vessels as well as crane vessel activities such as anchor deployment may disrupt sediments for short periods of time but such sediment disruption is not expected to significantly increase ambient background turbidity typical of coastal Georgia for significant periods of time. There are no expected impacts to water quality during operational activity. While there is a small chance of a diesel fuel spill from unforeseen events such as a BDCC collision by a boat or ship, it is unlikely that the small volume of diesel fuel used for the onboard generator would pose a threat to the surrounding waters; furthermore, AXYS designed the Wind Sentinel diesel fuel tank to be double walled to prevent spills. Southern Company will prepare and implement a spill control plan to further mitigate this concern. See Section 2.8.1.2A above for supporting discussion on the potential impacts of a diesel spill. Potential impacts to coastal waters, in the form of sediment resuspension and diesel fuel spills, resulting from the combined events of site assessment surveys, BDCC deployment and operational activities are expected to be insignificant.

- **Air Quality**

Potential Impacts and Discussion

Air quality may be impacted during any pre-deployment activities due to site assessment survey activities which may require the use of exhaust producing machines and/or vehicles, including but not limited to land-based equipment and maritime support vessels. Such activities would be temporary; hence, long-term impacts are not anticipated.

Deployment activities may impact air quality through the use of maritime support vessels, cranes and other heavy equipment. These activities are temporary; hence, long-term impacts to ambient air quality are not anticipated.

Impacts to air quality from BDCC operations are expected to be insignificant. The BDCC will be powered by a combination of non-emitting sources, including a solar photovoltaic (PV) array and battery bank, small wind turbines and a small diesel generator for backup power. Exhaust emissions from the diesel generator are not expected to be significant in volume and should not impact air quality. Maintenance of the BDCC may impact ambient air quality due to exhaust emissions from vessels and equipment use, though impacts will be minimal and temporary.

- **Noise Quality**

Potential Impacts and Discussion

Noise quality may be impacted during pre-deployment by increased boat activity during site assessment surveys. Such surveys would examine and identify: bathymetry, seafloor morphology, topography, sub-seafloor geology/stratigraphy and obstructions on or below the seafloor. Noise may emanate from site assessment survey equipment. Site assessment surveys may include multi-beam and side scan sonar, magnetometer and sub-benthic profiling. Noise generated during acoustic surveys may affect marine mammals, sea turtles, fish and other wildlife. Possible effects include: temporary or permanent hearing loss, discomfort and injury and masking of marine animal communications (Richardson et al., 1995; Davis et al., 1998; Gordon et al., 1998). Potential impacts to marine life will be addressed by using observers to monitor for marine life activity during surveys and the use of exclusion zones.

Offshore activities involved with BDCC deployment may potentially create noise both in air and in water, which may affect both humans and wildlife. Above-water noise generated during the phases of the BDCC Project is anticipated to be insignificant compared to that generated by background activities that may be occurring in the vicinity of the proposed OCS blocks (e.g., shipping-lane vessel traffic, commercial and recreational fishing vessels). It is anticipated that above-water noise generation during BDCC deployment will not be at a level that will disturb normal human or terrestrial wildlife activities.

Noise sources during BDCC deployment include ship and barge noise, crane operation, boat operations (Scholik and Yan, 2002) and the use of hand tools and small machinery (Medwin et al., 1973; Wahlberg and Westerberg, 2005). Deployment of the anchor and associated chain and cable may produce small, transient noises as the anchor system is lowered to the seafloor. Noise associated with anchor deployment is unlikely to exceed ambient levels and/or levels that would harm and/or harass marine mammals.

As previously stated (on page 13), noise is not expected to be significant during BDCC operation, but noise generation may occur during rough seas as currents and waves move the buoy and anchoring chain, during periods when the generator is operating and during routine maintenance. This noise would be similar to or likely less than that generated during deployment activities from ship and barge operations (Scholik and Yan, 2002) as well as from any tools or machinery (Medwin et al., 1973; Wahlberg and Westerberg, 2005).

- **Visual Quality**

Potential Impacts and Discussion

The quality of ocean views by onshore observers may be impacted during the deployment phase due to nearshore vessel traffic needed to conduct the required site assessment surveys. Such deployment activities would be temporary; long-term impacts are not expected. In addition, visual quality impacts generated by Project-related vessel traffic are not expected to be

significantly greater than those generated by local background vessel traffic (i.e., unrelated to the BDCC Project activities).

On-site deployment of the BDCC is anticipated to require approximately 8 hours, but this time frame depends on weather conditions and material or human resource issues. Deployment vehicles, platforms and support vessels may possibly be visible from shore areas during transportation of the BDCC when nearshore. Considering the short duration of deployment and decommissioning activities, no long-term visual impacts are expected. Given the dimensions of the BDCC (6 m [L] x 3.1 m [W] x 9 m [H]), no visual impacts from shore are expected during operation.

2.8.2.2A Biological Resources

This section presents potential impacts resulting from the proposed BDCC Project activities on biological resources occurring within or in the vicinity of the proposed OCS blocks. See Section 2.8.2.2 of the 2011 Lease Application for a detailed discussion of each biological resource that may be found within the lease blocks.

- **Benthic Communities**

Potential Impacts and Discussion

Due to the relatively small footprint of the proposed BDCC and temporary nature of its installation, deployment activities will result in a small amount of habitat loss for benthic communities and minor temporary increased turbidity from the installation of the BDCC anchor. Sediment resuspension and any turbidity plume generated during mooring installation is likely to be of far less magnitude than that caused by any local storm event and should have a temporary minor effect on the non-vegetative benthic organisms (i.e., polychaetes and small crustaceans). In addition, any loss of soft-bottom habitat will be negligible relative to the benthic habitat available to species in the surrounding area. There are no expected impacts during the operation of the BDCC.

Any impacts associated with decommissioning processes would be short-lived and would not significantly alter the benthic habitat in the proposed OCS blocks.

- **Marine and Coastal Birds**

Potential Impacts and Discussion

Deployment, operation and decommissioning phases of the BDCC Project may result in minor disturbance to some bird species. Sources of potential impacts and disturbances include site assessment activities, deployment crane operations and small boat and barge movements and activities. There may be species that fall under the Migratory Bird Treaty Act (MBTA) and are permanent residents on the coastlines in the vicinity of the three OCS blocks. The OCS blocks and possible BDCC locations have been carefully selected to maximize available wind energy while minimizing impacts to bird and other animal species.

Bird collisions with boats and the BDCC are not likely and should be at or below other known collision rates with other marine structures such as lighthouses. Navigation lights on Project support vessels and the BDCC may create collision issues for nighttime migrating species but the impact is not expected to result in serious mortality; furthermore, experience with other similar structures and projects have not resulted in major mortality events. Navigation lights have been located in nearshore coastal waters for decades and have not resulted in large numbers of bird mortalities. BDCC lighting will comply with FAA guidelines and will be minimized to the extent possible while maintaining safety and operational requirements.

While every effort has been made to site the BDCC to avoid and minimize impacts to birds, offshore platforms may encourage perching and roosting by migrating and/or foraging birds. Appropriate deterrent devices, such as anti-perching mesh netting, may be utilized to discourage perching and nesting activity and will help prevent impacts to bird species that might become acclimatized to the BDCC.

- **Fish and Essential Fish Habitat**

Potential Impacts and Discussion

During the deployment and maintenance of the BDCC, impacts to finfish/shellfish populations, any essential fish habitat (EFH) and protected species could result from the following threats: (1) noise generated by increased vessel traffic and anchor deployment and removal, (2) minor loss or alteration of habitat, (3) degradation of water quality resulting from temporary sediment resuspension and turbidity plume, (4) exposure to fuel spills and (5) lighting. In general, all of the above impacts should be short-term and negligible. Overall, since most fish and shellfish species are highly motile and exhibit seasonal changes in distribution, impacts from the deployment, operation and removal or movement of the BDCC should be insignificant (Tetra Tech EC Inc., 2008, 2009).

A small area of bottom substrate equivalent to the footprint of the anchor would change from soft, sandy sediments to a hard surface. This habitat alteration would render the area temporarily unavailable to species with a preference for soft substrate and may result in attracting species that prefer hard surfaces during the time it is in place. Sediment resuspension and a turbidity plume generated during the anchor deployment placement is unlikely to be of greater local magnitude than that caused by any local storm event and should have a temporary minor effect on all species (Tetra Tech EC Inc., 2008, 2009).

The potential that deployment/operation/decommissioning vessels will have an accidental spill, most likely a fuel spill, exists, but is generally low. Lights on the BDCC may attract fish depending on brightness and orientation of the lights. Consultation with the USCG will help minimize potential adverse impacts of the required lighting on marine navigation.

- **Sea Turtles**

Potential Impacts and Discussion

The siting of the BDCC in any of the three proposed OCS blocks has little potential to impact sea turtle species found in the surrounding waters. Potential impacts may include minor behavioral disturbance and injury or mortality in extreme and highly unusual circumstances, which could have local population-level effects such as very minor reduction in survival and reproductive rates. These impacts could occur from activities associated with assessment of the site, deployment activities, operation and maintenance of the BDCC and decommissioning of the BDCC. Nonetheless, these BDCC activities are generally very similar to normal local maritime activities. The following is a brief discussion of potential impacts and the mitigation measures that may be employed to minimize such impacts.

Various species of sea turtles may reside in, breed in and/or migrate through the vicinity of the proposed OCS blocks throughout the year. These species may be impacted by the siting and placement of the BDCC within the proposed OCS blocks. These impacts may be either direct or indirect in nature. Direct impacts may occur as a result of a Project vessel striking a turtle on or near the surface and may also be associated with a turtle's ingestion of materials that are lost overboard during the course of BDCC placement. A possible indirect impact may be temporary displacement from habitat as turtles move out of the way of deployment activities. The introduction of acoustic sources into the marine environment may potentially cause individuals to react if they detect the noise; however, because sea turtles hear in low frequency (<1 kilohertz [kHz]), they are not likely to be impacted by noise (Ketten and Bartol, 2006; Viada et al., 2008).

Potential impacts to sea turtles may be reduced by employing mitigation measures that include using trained protected species observers to watch for sea turtles. These observers may help reduce and/or minimize turtle and vessel strikes. Observers will also identify and document sea turtles present in the OCS block and record any behavioral changes that may be associated with site assessment, deployment or decommissioning activities.

Section 2.12A summarizes measures that may be utilized to avoid, minimize and mitigate impacts to marine and coastal environments.

- **Marine Mammals**

Potential Impacts and Discussion

The siting of a BDCC in any of the proposed OCS blocks may potentially impact marine mammal species in the vicinity of the site. These potential impacts may include minor behavioral disturbance, harassment and injury or mortality in extreme and unusual circumstances, which could have local population-level effects such as very low reduction in reproductive capacity or survival. These impacts could occur from activities associated with assessment of the site, BDCC deployment, operation/maintenance of the BDCC and decommissioning upon termination of data collection.

Typical marine vessel use is part of all phases of the Project. Any vessels traveling to, from and within the OCS blocks may impact marine mammals directly via vessel strike or indirectly via behavioral disturbance. Many species of cetaceans are known to move out of the way of oncoming vessels and are not expected to be impacted directly by vessel movements. Injury and mortality from vessel strikes will be mitigated by adhering to vessel speed restrictions in the vicinity of major ports which includes the proposed OCS blocks.

Section 2.12A summarizes measures that may be utilized to avoid, minimize and mitigate impacts to marine and coastal environments.

Field Site Assessment

The topography and sub-surface stratigraphy of the proposed location for the placement of the BDCC within the OCS blocks being considered may be characterized using high-resolution sonic imagers and sub-bottom profiling. These G&G surveys generally employ directional, low energy and high-frequency signals. Some of the equipment used, such as a Geopulse "boomer," may result in non-directional acoustic input to the marine environment. The frequency range used by G&G survey equipment is within the hearing range of marine mammals, particularly odontocetes or toothed whales; however, the acoustic energy emitted by the equipment is localized and attenuates quickly to levels which do not cause harm or harassment. In previous site-characterization studies for the placement of DCCs on the Atlantic OCS, NMFS anticipated no harm or harassment to marine mammals outside of a 500-m (1,640-foot [ft]) exclusion zone around the acoustic source (MMS, 2010a).

The species that may be exposed to acoustic energy during G&G surveys for a BDCC placement vary depending on the exact location of survey activities and the time of year during which the survey activities take place; however, acoustic impacts will be mitigated through the establishment of an exclusion zone. This exclusion zone represents a discrete area that is monitored visually from the survey vessel by trained marine mammal observers who can spot, identify, track and document the presence of marine mammals near or within the zone. Because the exclusion zone is monitored visually, survey activities will only occur during daylight hours and under favorable weather conditions when the entire zone is visible. The size of the exclusion zone will be determined in consultation with NMFS and will depend upon the species most likely to be encountered and the survey equipment used. If a marine mammal enters the exclusion zone, the acoustic surveys will be temporarily shut down and will resume when the mammal clears the zone or when 30 minutes have passed without further sightings.

Deployment

BDCC deployment activities may impact marine mammals. Noise associated with deployment is unlikely to exceed ambient levels and/or levels that would harm and/or harass marine mammals. As previously stated, vessel strikes with marine mammals will be mitigated by adhering to vessel speed restrictions.

Operation/Maintenance

Noise associated with operation/maintenance of the BDCC will be generated by maintenance vessels and the onboard generator when in use. This noise is anticipated to be similar to that of ongoing vessel activity in the vicinity of the lease blocks. Maintenance vessels will adhere to speed restrictions to mitigate strikes with marine mammals.

Decommissioning

Noise associated with decommissioning, like that associated with deployment of the BDCC, is expected to be minimal and, hence poses an insignificant impact on marine mammals.

- **Bats**

Potential Impacts and Discussion

The deployment, operation/maintenance and decommissioning phases of this Project have little potential to disturb or impact bat species. Bat collision rates with Project boats, cranes and the BDCC should be comparable to or lower than those with other local marine structures such as lighthouses. Because of their use of sonar for navigation, bats are capable of avoiding stationary objects; hence, it is unlikely that the BDCC poses a significant collision risk to foraging or migrating bats. BDCC Project activities that occur during daylight hours (e.g., deployment, decommissioning, daytime BDCC operations) are not expected to significantly impact bat dusk/ crepuscular foraging flights. In addition, the 24/7/365 operation of the BDCC is not expected to significantly impact bat flights, since bats do not take to flight during daylight hours and bats can use sonar to locate (and maneuver around) the BDCC during nocturnal hours; thus, increased vessel traffic from deployment/decommissioning or operational maintenance is not expected to significantly impact bats foraging or moving through the OCS blocks.

2.8.2.3A Socioeconomic and Human Resources

This section discusses potential impacts of the proposed BDCC activities on socioeconomic and human resources within and in the vicinity of the proposed OCS blocks.

See Section 2.8.2.3 of the 2011 Lease Application for a discussion of each socioeconomic and human resource that may be found within the lease blocks for any BDCC project.

- **Commercial Fisheries**

There are no anticipated impacts resulting from BDCC activities to commercial fisheries.

- **OCS and Coastal Infrastructure**

There are no anticipated impacts to the OCS and Coastal Infrastructure as a result of BDCC Project activities.

- **Land Use Patterns**

Georgia Power's Plant Kraft will be used as a staging area for the deployment, operation/ maintenance and decommissioning of the BDCC. Operation of the BDCC will not result in any changes to current land use patterns or nearshore activities.

- **Archaeological Resources**

There is no evidence of any significant archaeological resources within the proposed OCS blocks; therefore, no mitigation should be necessary. Section 2.7 of the 2011 Lease Application provides more information on the cultural resources evaluation conducted.

- **Competing Use of State Waters and OCS**

The activities associated with the BDCC Project are not expected to impact ongoing commercial or recreational activities within and in the vicinity of the proposed lease blocks.

- **Demographic Patterns and Employment**

Potential Impacts and Discussion

The three proposed OCS blocks are approximately 3 to 9 NM offshore of Chatham and Bryan Counties. It is not anticipated that anything other than minor, temporary disruptions of boating and/or recreational fishing will occur due to BDCC activities. Section 2.8.2.3 of the 2011 Lease Application provides a comprehensive summary regarding the demographic patterns and employment within Georgia's six coastal counties.

2.8.3A Consultations

Section 1.4 of the 2011 Lease Application lists private, non-profit and public groups, individuals and agencies Southern Company has consulted thus far regarding this Project.

2.9A Expected Air and Greenhouse Gas Emissions

Air and greenhouse gas emissions during site assessment surveys and BDCC deployment, operation/maintenance and decommissioning are anticipated to be minor and insignificant compared to non-BDCC-Project related background activities that may be occurring in the vicinity of the proposed OCS blocks (e.g., shipping-lane vessel traffic, commercial and recreational fishing vessel use, etc.). The maximum expected air and greenhouse gas emissions during deployment are provided in a tabular format in Section 2.8.1.1A.

2.10A Expected Noise and In-water Acoustic Levels

Impacts from site assessment surveys, BDCC deployment, operation/maintenance and decommissioning to in-water acoustic levels are anticipated to be insignificant.

2.11A List of Solid and Liquid Wastes

Section 2.8.2 of the 2011 Lease Application discusses potential solid and liquid waste generation resulting from any and all DCC phases. As previously stated (see Section 2.8.2.1A, Physical Resources – Water Quality), all waste will be held on vessels and disposed of at an appropriately permitted facility onshore.

2.12A Measures for Avoiding, Minimizing, Reducing and Eliminating Environmental Impacts

It is anticipated that impacts on environmental resources resulting from the site assessment surveys, BDCC deployment, operation/maintenance and decommissioning of the proposed BDCC will be minor to negligible; however, to ensure potential impacts are minimized to the maximum extent practicable, Southern Company may employ the following mitigation measures:

- Proper maintenance of equipment and offshore vessels to minimize air emissions of diesel-powered engines and use of ultra low-sulfur diesel fuel to reduce potential SO_2 emissions. The BDCC backup diesel generator complies with the EPA Tier 4 emission standards.
- BMPs will be employed during site assessment surveys and BDCC deployment, operation/maintenance and decommissioning to minimize and mitigate noise generated from acoustic site assessment devices, vessel operations and various other activities. Examples of such BMPs include the development of safety exclusion zones within which the potential presence of sensitive marine animal species is to be visually monitored. Site assessment surveys will be discontinued when such species are detected within the exclusion zone, and will continue only when the species migrate out of the zone. In addition, site assessment and deployment activities may be scheduled during periods of relatively low probability of species occurrence within the exclusion zone.
- Anti-perching devices may be utilized to discourage perching and nesting activity which will help prevent impacts to birds.
- All vessel operators will follow the NOAA Fisheries Service *Whale Watching Guidelines* derived from the MMPA.
- Navigational lights required for mariner safety will be placed on the BDCC. These lights will be installed as directed by the USCG and in compliance with FAA regulations.
- Proper and safe waste management practices will be implemented, including collection, storage, handling and disposal. All waste will be stored on the vessel for proper disposal at an appropriately permitted onshore facility.
- A BDCC double-walled fuel tank design will be implemented to minimize or prevent fluid leakage/spills. Southern Company will prepare and implement a spill response plan.
- The intelligent WatchCircle™ location warning system, with the aid of an onboard GPS receiver, will be used to continuously track and monitor the location of the BDCC buoy. If the buoy drifts out of its predefined area (e.g., due to a failed mooring), the Inmarsat D+ satellite transmitter will be activated to track the buoy's location and aid in its recovery.

2.13A Decommissioning and Site Clearance Procedures

Decommissioning of the BDCC is contingent upon the determination and nature of site-specific wind resource data and many related business decisions that may lead to next steps such as wind power generation technology testing and deployment. If site-specific wind resource data support technology testing, Southern Company may apply to BOEM to engage in those activities with continuing BDCC maintenance and operation.

If site specific wind resource data do not support further wind power generation technology testing and deployment, Southern Company would like to retain the option of transferring the Lease to a qualified state, federal or local entity for continuing offshore data collection and/or research. Any effort to keep the BDCC in long-term service, under such conditions or transferring the Lease with BDCC ownership and operational responsibilities to a third party would be in compliance with all applicable laws and regulations and with BOEM approval. In addition, depending on site characteristics and the environmental impacts of full decommissioning, some measure of decommissioning-in-place may be proposed.

Should the BDCC be decommissioned prior to lease expiration, Southern Company will submit a decommissioning plan to BOEM for approval before any decommissioning operations are anticipated to commence.

2.14A Other Information

This section serves as a place holder for any addition information as required by BOEM to accept this application.

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Appendix A

AXYS WindSentinel (BDCC) and Mooring Anchor

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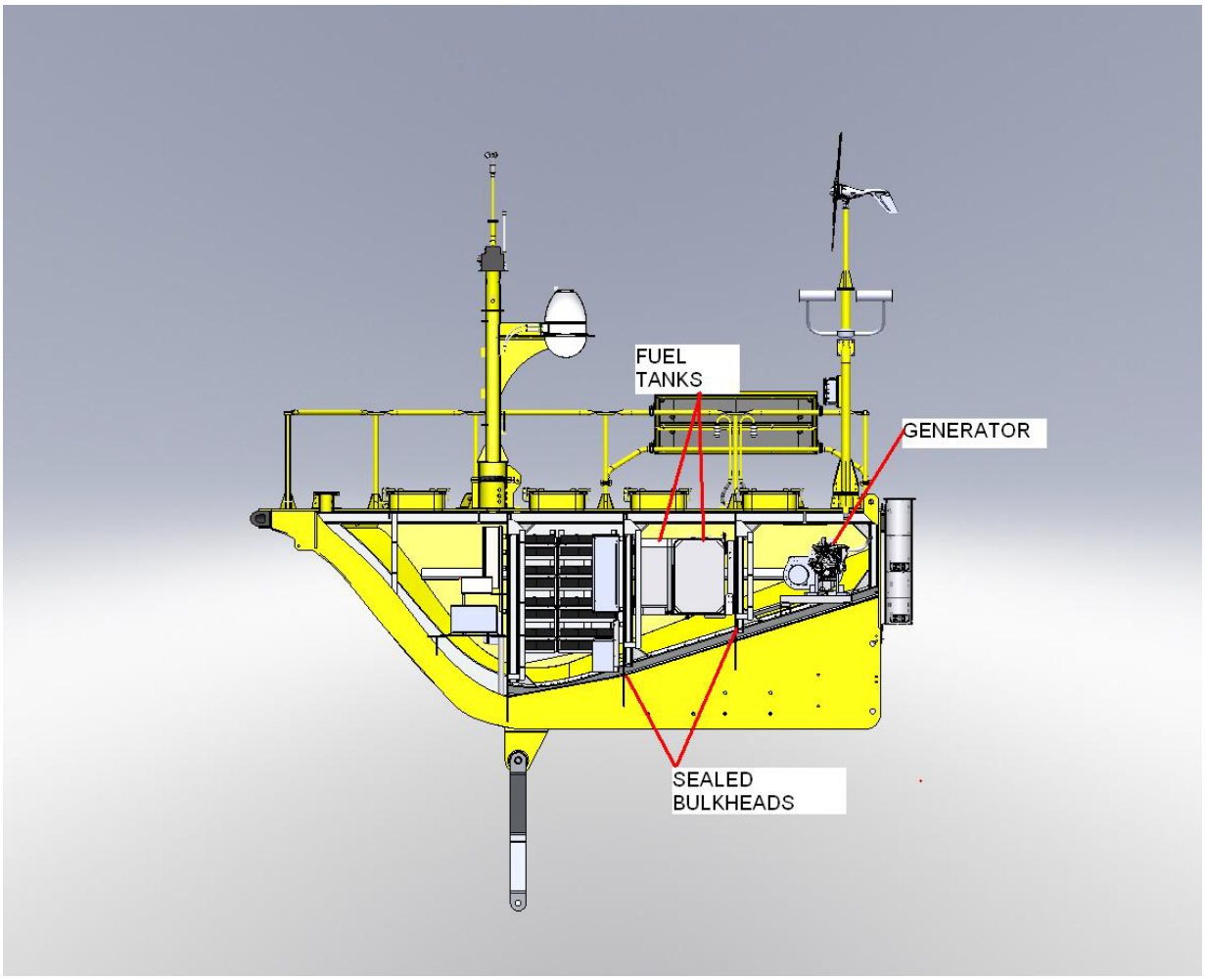
FUEL
TANKS
GENERATOR
SEALED
BULKHEADS


AXYS
6NB00080

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Appendix B

Proposed Supporting Vessels

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Derrick Barge with Crane

Supporting Tug