UNITED STATES GOVERNMENT
MEMORANDUM

September 9, 2016

To: Public Information (MS 5030)

From: Plan Coordinator, FO, Plans Section (MS 5231)

Subject: Public Information copy of plan

Control #	-	N-09958
Type	-	Initial Development Operations Coordinations Document
Lease(s)	-	OCS-G12802 Block - 543 West Cameron Area OCS-G14342 Block - 544 West Cameron Area OCS-G34033 Block - 522 West Cameron Area
Operator	-	Arena Offshore, LP
Description	-	Sidetrack and produce wells A002, A003, and A004, drill and produce Wells I, J, K, and revise air emissions for Plat A
Rig Type	-	Not Found

Attached is a copy of the subject plan.

It has been deemed submitted as of this date and is under review for approval.

Madonna Montz
Plan Coordinator

Site Type/Name	Botm Lse/Area/Blk	Surface Location	Surf Lse/Area/Blk
FIXED/A		919 FNL, 597 FEL	G14342/WC/544
WELL/A002	G14342/WC/544	913 FNL, 597 FEL	G14342/WC/544
WELL/A003	G34033/WC/522	907 FNL, 598 FEL	G14342/WC/544
WELL/A004	G14342/WC/544	919 FNL, 605 FEL	G14342/WC/544
WELL/I	G12802/WC/543	919 FNL, 611 FEL	G14342/WC/544
WELL/J	G14342/WC/544	913 FNL, 511 FEL	G14342/WC/544
WELL/K	G14342/WC/544	919 FNL, 618 FEL	G14342/WC/544

June 15, 2016

U.S. Department of the Interior
Bureau of Ocean Energy Management
Gulf of Mexico OCS Region
1201 Elmwood Park Boulevard
New Orleans, Louisiana 70123-2394

Arena Offshore, LP
4200 Research Forest Dr.
Suite 230
The Woodlands, TX 77381
281-681-9501
281-681-9502 Fax

Attention: Plans Unit

RE: Joint Initial Supplemental Development Operations Coordination Document for Leases OCS-G 14342/12802/34033, West Cameron Blocks 544/543/522, OCS Federal Waters, Gulf of Mexico, Offshore, Louisiana

Gentlemen:

In accordance with the provisions of Title 30 CFR 550, Subpart B and those certain Notice to Lessees (NTL) 2008-G04 and 2009-G27, Arena Offshore, LP (Arena) hereby submits for your review and approval a Joint Initial Supplemental Development Operations Coordination Document (Plan) for Leases OCS-G 14342/12802/34033, West Cameron Blocks 544/543/522, Offshore, Louisiana.

Enclosed are two Proprietary Information copies (one hard copy and one CD) and three Public Information copies (one hard copy and two CDs) of the Plan.

Included in the original proprietary copy of this JISDOCD is a Pay.Gov receipt totaling $12,714.00 for the cost recovery fee associated with the proposed activity.

Contingent upon receiving regulatory approvals, Arena is scheduled to commence activities under this Plan as early as December 1, 2016.

Should you have any questions concerning this matter or require additional information, please contact the undersigned at aimee@arenaoffshore.com or 281-210-3180, or Connie Goers at connie@arenaoffshore.com or 281-210-3123.

Sincerely,

Arena Offshore, LP

Aimee P. Deady
Regulatory Supervisor

:APD
Enclosures

Public Information

Arena Offshore, LP
4200 Research Forest Drive, Suite 230
The Woodlands, Texas 77381

Joint Initial Supplemental Development Operations Coordination Document

West Cameron Blocks 544/543/522
(Leases OCS-G 14342/12802/34033)

Aimee Deady
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June 2016

Amendments

Dated	Section	Comments	Amended Pages
06/20/2016	9- Oil Spill Response Information	Correct OSRP latest revision approval to 10/15/2015	Pages 27-28
06/20/2016	OCS Plans Forms	Correct A003 API No. and surface x-coordinate Proprietary and Public version	Attachment A
09/06/2016	18-Coastal Zone Management Information	Provide Louisiana CZM	Page 41

Section 9 - Oil Spills Information (30 CFR Part 550.250)

A. Oil Spill Response Planning

All the proposed activities and facilities in this Plan will be covered by the Regional Oil Spill Response Plan filed by Arena Offshore, LP (BOEM Company No. 02628) in accordance with Title 30 CFR Part 254 and approved on December 9, 2013 with the latest revision approved on October 15, 2015; as the activities proposed do not supersede our existing worse case discharge addressed in the current approval.

The following locations will be used in the event and oil spill occurs as a result of the proposed activities.

Primary Response Equipment Location	Pre-Planned Staging Location(s)
Galveston, TX	Galveston, TX

Arena utilizes Clean Gulf Associates (CGA) as its primary provider for equipment, which is an industry cooperative owning an inventory of oil spill clean-up equipment. CGA is supported by the Marine Spill Response Corporation's (MSRC), which is responsible for storing, inspecting, maintaining and dispatching CGA's equipment. The MSRC STARS network provides for the closest available personnel, as well as an MSRC supervisor to operate the equipment.

Category	Regional OSRP WCD	DOCD WCD	Regional OSRP WCD	DOCD WCD
Type of Activity	Drilling > 10 miles Seaward of Coastline	Drilling	Production >10 miles Seaward of Coastline	Production
Lease Number	OCS 00463	OCS 00457	G 02118	OCS 00457
Facility Location	South Timbalier Block 151	West Cameron Blocks 544	Eugene Island Block 338	West Cameron Blocks 544
Facility Designation	Well Location B	Well Location I	Platform K	Platform A
Distance to Nearest Shoreline (miles)	30	94	65	94
Storage Tanks (total)	0	0	3000	200
Lease Pipelines	NA	NA	NA	1149
Uncontrolled Blowout (bbls)	26,156 bbls	18,585 bbls	15,514 bbls	450 bbls
Total Volume (bbls)	26,156 bbls	18,585 bbls	18,514 bbls	1,799 bbls
Type of Oil	Crude Oil	Crude Oil	Crude Oil	Crude Oil
API Gravity	27.5° F	36° F	25.1° F	41° F

Section 9 - Oil Spills Information
(30 CFR Part 550.250)

Since Arena has the capability to respond to the appropriate worst-case spill scenario included in its Regional OSRP approved December 9, 2013 with the latest revision approved on October 15, 2015; and since the worst-case scenarios determined for our DOCD does not replace the worst-case scenarios in our Regional OSRP, I hereby certify that Arena has the capability to respond, to the maximum extent practicable, to a worst-case discharge, or a substantial threat of such a discharge, resulting from the activities proposed in our DOCD.

B. Oil Spill Response Discussion

In the event of an uncontrolled spill release resulting from the activities proposed in this Plan, Arena's Person-In-Charge on the platform/rig or the Shorebase Dispatcher would most likely be the initial individuals to contact the Qualified Individual (QI) or our Spill Management Team (SMT) detailed in the Regional OSRP. The QI would immediately activate the SMT to ascertain the severity of the spill incident. Arena's SMT Incident Command Center is located at O'Brien's Response Management, Inc.'s office in Slidell, Louisiana.

Dependent upon the severity of the spill incident, a trajectory analysis would be conducted utilizing the BOEM Oil Spill Risk Analysis Model (OSRAM) as referenced in our approved Regional OSRP. This trajectory would provide the required information on percentage and timing of potential impact to the shoreline impact areas. The SMT would then identify the areas of sensitivities at potential landfall segment(s), so additional planning may be conducted for shoreline protection strategies. If surveillance indicates a potential threat to shoreline; the appropriate equipment and personnel would be deployed, as outlined in our Regional OSRP.

An overflight may be conducted to determine the extent and dissipation rate of the spill, with potential sampling of the spill release. Mechanical recovery equipment may also be dispatched to the leading edge of the spill, as outlined in our Regional OSRP. If additional offshore response is required, the SMT would initiate the Dispersant Use Plan of the Regional OSRP and utilize the services of Airborne Support Inc.'s aircraft and personnel.

Included as ***Attachment K*** is the oil spill response discussion, equipment deployment, and containment for the proposed supplemental development operations.

C. Modeling Report

According to NTL 2008-G04, this Section of the Plan is not applicable to the proposed operations.

OCS PLAN INFORMATION FORM (CONTINUED)
Include one copy of this page for each proposed well/structure

Proposed Well/Structure Location

Well or Structure Name/Number (If renaming well or structure, reference previous name): A003					Previously reviewed under an approved EP or DOCD?	X	Yes		No
Is this an existing well or structure?		Yes X		No	If this is an existing well or structure, list the Complex ID or API No.	17-702-41087-00			
Do you plan to use a subsea BOP or a surface BOP on a floating facility to conduct your proposed activities?							Yes	X	No

WCD info	For wells, volume of uncontrolled blowout (Bbls/day): 18,585 bbls	For structures, volume of all storage and pipelines (Bbls): 1349 bbls	API Gravity of fluid 36°

	Surface Location	**Bottom-Hole Location (For Wells)**	**Completion (For multiple completions, enter separate lines)**
Lease No.	OCS G14342	OCS	OCS OCS
Area Name	West Cameron		
Block No.	544		
Blockline Departures (in feet)	N/S Departure: F N ___ L 906.80'	N/S Departure: F____ L	N/S Departure: F____ L N/S Departure: F____ L N/S Departure: F____ L
	E/W Departure: F E ___ L 597.50'	E/W Departure: F____ L	E/W Departure: F____ L E/W Departure: F____ L E/W Departure: F____ L
Lambert X-Y coordinates	X: 1,302,305.93	X:	X: X: X:
	Y: -108,890.19	Y:	Y: Y: Y:
Latitude/ Longitude	Latitude 28° 20' 56.7974" N	Latitude	Latitude Latitude Latitude
	Longitude 93° 30' 06.1668" W	Longitude	Longitude Longitude Longitude
Water Depth (Feet): 182'		MD (Feet): / TVD (Feet):	MD (Feet): / TVD (Feet): MD (Feet): / TVD (Feet): MD (Feet): / TVD (Feet):
Anchor Radius (if applicable) in feet:			

Anchor Locations for Drilling Rig or Construction Barge (If anchor radius supplied above, not necessary)

Anchor Name or No.	Area	Block	X Coordinate	Y Coordinate	Length of Anchor Chain on Seafloor
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	

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Section 1 - Plan Contents
(30 CFR Part 550.241)

Lease OCS-G 12802, West Cameron Block 543 was acquired by Petsec Energy Inc. at the Central Gulf of Mexico Lease Sale No. 131 held on March 27, 1991. This lease was issued an effective date of May 1, 1991 and a primary term ending date of April 30, 1996.

Lease OCS-G 14342, West Cameron Block 544 was acquired by Petsec Energy Inc. at the Central Gulf of Mexico Lease Sale No. 147 held on March 30, 1994. This lease was issued an effective date of June 1, 1994 and a primary term ending date of May 31, 1999.

West Cameron Blocks 543/544 leases are being maintained by a cessation of production for 180 days, which expires on August 26, 2016.

Lease OCS-G 34033, West Cameron Block 522 was acquired by Arena Energy, LP. at the Central Gulf of Mexico Lease Sale No. 218 held on December 14, 2011. This lease was issued an effective date of February 1, 2012 and a primary term ending date of January 31, 2017.

The West Cameron 544 A Platform was installed in 1995 and Wells A001 through A009 drilled, completed and produced. The following Development Operations Coordination Documents (DOCD's) were submitted to cover these proposed operations for Leases OCS-G 12802 and 14342.

- Initial DOCD (Control No. N-5015) covering the installation of Platform A and drilling, completion, and production of A001, A002 and Well Locations C-H.
- Supplemental DOCD (Control No. S-4244) covering the drilling, completion and production of A009 and A010.

This Initial/Supplemental DOCD is proposing to utilize a typical jack-up rig using surface BOP's to sidetrack drill, complete and produce Wells A002, A003 and A004 and drill, complete and produce Well Locations I-K; all from the common surface location in Lease OCS-G 14342, West Cameron Block 544 A Platform (Complex ID. 29032-1).

The current lease operator and ownership are as follows:

Area/Block Lease No.	Operator	Ownership
West Cameron Blocks 544/543/522 Leases OCS-G 14342/12802/34033	Arena Offshore, LP	Arena Energy, LP Arena Offshore, LP

Section 1 - Plan Contents
(30 CFR Part 550.241)

A. Plan Information Form

Included as ***Attachment A*** is Form BOEM 137 "OCS Plan Information Form" which provides information concerning the activities proposed under this Plan.

B. Location

Included as ***Attachment B*** is a location plat detailing the existing surface and proposed bottomhole locations as required by NTL 2008-G04.

The activities proposed in this Plan will be conducted from the existing surface location of West Cameron Block 544 A Platform (Plan Control No. N-5015) and therefore does not require an additional bathymetry map.

C. Safety and Pollution Prevention Features

Safety of personnel and protection of the environment during the proposed operations is of primary concern with Arena, and mandates regulatory compliance with the contractors and vendors associated with the proposed operations as follows:

The offices of the Bureau of Ocean Energy Management (BOEM) and Bureau of Safety and Environmental Enforcement (BSEE) mandate the operations in this Plan comply with well control, pollution prevention, construction, welding procedures, safety and environmental related issue, et al; as described in various Subparts of Titles 30 CFR Parts 250 and 550; and as further clarified by applicable Notices to Lessees (NTL's). BSEE conducts periodic announced and unannounced onsite inspections of offshore facilities to confirm operators are complying with lease stipulations, operating regulations, approved plans, and other conditions; as well as to assure safety and pollution prevention requirements are being met. The National Potential Incident of Noncompliance (PINC) List serves as the baseline for these inspections.

U. S. Coast Guard regulations contained in Title 33 CFR mandate the appropriate life rafts, life jackets, ring buoys, etc., be maintained on the facility at all times.

U. S. Environmental Protection Agency regulations contained in the NPDES General Permit GMG290000 mandate that supervisory and certain designated personnel on-board the facility be familiar with the effluent limitations and guidelines for overboard discharges into the receiving waters.

Section 1 - Plan Contents
(30 CFR Part 550.241)

Arena's activities in this Plan will comply with the existing regulations and NTL's implemented by the above listed agencies.

D. Storage Tanks and Production Vessels

The following table details the storage tanks and/or production vessels that will store oil (capacity greater than 25 bbls. or more) and be used to support the proposed activities (MODU, barges, platform, etc.):

Type of Storage Tank	Type of Facility	Tank Capacity (bbls)	Number of Tanks	Total Capacity (bbls)	Fluid Gravity (API)
Fuel Oil	MODU	250	2	500	No. 2 Diesel
Production	Platform A	200	1	200	41°

E. Pollution Prevention Measures

Additional measures initiated by Arena beyond those measures required by Title 30 CFR Part 250 may include any and/or all of the following:

- A preliminary facility inspection by a contractor to ensure facility meets current regulatory requirements prior to commencement of operations
- Obtain historical performance history of the drill rig and/or production facility (if applicable).

F. Additional Measures

- Obtain historical performance history of the drilling and/or production contractor (if applicable).
- Safety and Environmental Briefings with offshore employee and contractor personnel to facility orientation and briefings on current operations.
- Review of Oil Spill Response Plan to ensure personnel are aware of the initial notifications and reporting requirements.
- Review of EPA NPDES General Permit with applicable personnel to ensure awareness of permit effluent limitations and reporting requirements.
- Pre-Spud and/or Pre-Production Start-Up Meetings with field personnel and contractors to discuss regulatory, environmental issues.
- SEMS Contractor Evaluations
- Safety Orientation Meetings
- Job Safety Analyses
- Management of Change Process

Section 2 - General Information
(30 CFR Part 550.243)

A. Application and Permits

The following Federal/State applications will be submitted for the activities provided for in this Plan exclusive of EPA and COE general permits.

Application/Permit	*Issuing Agency*	*Status*
Applications for Permit to Drill	BSEE District	Pending
Rig Move Reports	BSEE and USCG	Pending

B. Drilling Fluids

Arena plans to use the following drilling fluids for the operations proposed under this Plan:

Drilling Fluid Type	*Estimated Volume of Drilling Fluid to be used Per Well*
Water-based (seawater, freshwater, barite)	3125 bbls

C. Production

Arena estimates the combined life of reserves for the proposed development activity to as follows:

Hydrocarbon Type	*Average Production Rate*	*Peak Production Rate*	*Life of Reservoir*
Oil	450 BOPD	1500 BOPD	9 Years
Gas	1.6 MMCFPD	5 MMCFPD	9 Years

D. Oils Characteristics

According to NTL 2008-G04, oil characteristics information is not required for the proposed activities addressed in this Plan.

Section 2 - General Information
(30 CFR Part 550.243)

E. New or Unusual Technology

Arena does not plan or anticipate using any new or unusual technology as defined in Title 30 CFR 250.200 during the proposed activities addressed in this Plan. However, the best available and safest technologies (BAST), as currently referenced in Title 30 CFR Part 250 will be incorporated as a standard operational procedure.

F. Bonding Statement

The bond requirements for the activities and facilities proposed in this Plan are satisfied by a $3,000,000 Areawide Development Bond, furnished and maintained according to Title 30 CFR Part 556, Subpart I; NTL No. 2015-N04, "General Financial Assurance;" and a current BOEM-approved deferment from providing additional security under Title 30 CFR 556.53(d) and National NTL No. 2008-N07 "Supplemental Bonding Procedures." Should Arena no longer qualify for exempt status of supplemental bonding deferment; measures will be initiated to obtain the required additional security or a third party guarantee within 60 days after such disqualification.

G. Oil Spill Financial Responsibility (OSFR)

According to Title 30 CFR Part 553, and NTL 2008-N05, "Guidelines for Oil Spill Financial Responsibility for Covered Facilities."; Arena Offshore, LP (Company No. 02628) has demonstrated oil spill financial responsibility for the operations associated with Leases OCS-G 14342/12802, West Cameron Blocks 544/543. Prior to commencing operations associated with Lease OCS-G 34033, West Cameron Block 522; Arena will obtain oil spill financial responsibility coverage.

H. Deepwater Well Control Statement

According to NTL 2008-G04, a deepwater well control statement is not required for the activities proposed in this Plan.

I. Suspensions of Production

In the event production is not restored prior to August 2016, Arena anticipates submittal of a Joint Suspension of Production for Leases OCS-G 14342/12802, West Cameron Blocks 544/543 to maintain the subject leases until such time as this Plan is approved and the proposed activities commenced.

Section 2 - General Information
(30 CFR Part 550.243)

J. Blowout Scenario

Arena will drill to the objective sands outlined in Geological and Geophysical Section of this Plan utilizing a typical structural, conductor, surface and production casing program. If mandated by wellbore conditions, an intermediate casing string will be set prior to drilling through the objective sand. In the event of a blowout during the course of drilling open hole in the objective sands, Arena anticipates a rate of 18,585 BCP/D with an anticipated gravity of 36°. The wellbore would most likely bridge over in approximately 2 days. Arena would immediately activate its Regional Oil Spill Response Plan and Spill Management Team to initiate potential recovery of liquid hydrocarbons on the receiving water and review potential well intervention options. In the event a relief well is initiated, Arena does not anticipate any delays in acquiring a jack-up type rig to conduct the proposed operations. Dependent upon the interval the well was drilled to, and potential interval for bridging over and surface intervention; if required, it could take at least 14-26 days to mobilize equipment and/or a rig to the field and perform a surface intervention or drill the relief well. Based on well intervention outlined in the potential worse-case discharge scenarios, the potential for drilling a relief well and a rig not being immediately available would be a total of 36 days and a potential total of 483,210 barrels during that time span.

Case I. ***Bridging Over*** - It is anticipated that a loss of well control from the surface will result in the well bridging over in less than 48 hrs as supported by the BOEM database where 49% of all blowout events during the period from 1992 through 2006 stooped flowing in less than 24 hrs. The drawdown at the sand face that would be experienced during a loss of well control event in this shallow, unconsolidated formation will result in the wellbore collapsing across multiple sand/shale interfaces. (Approximately 2 days)

Case II. ***Conventional Surface Intervention*** – It is assumed that a loss of well control from the surface will result in mobilizing 3rd party well control equipment to the rig. It is assumed that the BOP's are compromised, that the rig has not caught fire and is capable of supporting well control efforts with the assistance of a support vessel. As an example, the intervention would consist of top killing the well with kill weight mud or possibly replacing BOP's with another set to contain flow from the breached equipment. (Approximately 14 days)

Case III. ***Relief Well Intervention*** – It is assumed that a jack-up rig is immediately available to mobilize to location to commence drilling a relief well. The mobilization and estimated time to drill the relief well is based upon the actual drilling performance of offset wells drilled in this field development. (Approximately 26 days)

Case IV. ***Relief Well Intervention*** – It is assumed that a jack-up rig is not immediately available to mobilize to location to commence drilling a relief well. The estimated mobilization time of a rig to location incorporates the suspension of activities by an Operator before the rig can be released for relief well operations. The time to drill the relief well is based upon the actual drilling performance of offset wells drilled in this field development.

Assess well condition:	2 days
Suspend current operations:	10 days
Mobilize Rig:	2 days
Drill relief well:	22 days
Total:	36 days

Relief Rig Availability:

There are currently 4 independent leg jack up rigs and 6 mat supported jack up rig marketed in the GOM that are capable of drilling a relief well in this water depth.

Should the jack-up rig be damaged during the initial loss of well control, there are no platforms in the area that would be capable of utilizing a platform rig to reach the bottom hole location of the subject wellbores.

Blowout Prevention Measures

The purpose of this document is to describe measures that Arena will take, above and beyond what is detailed in BSEE Title 30 CFR Part 250, to enhance its ability to prevent a blowout, to reduce the likelihood of a blowout, and conduct effective and early intervention in the event of a blowout on the proposed well locations.

The following measures will be taken in attempt to ensure the proposed well locations are kept under control at all times:

- An Arena onsite representative will witness and review all BOP tests, casing tests and formation integrity tests.
- An Arena Superintendent in the office will review all FIT tests prior to moving forward with drilling operations
- Prior to commencing cementing operations on any casing string, a minimum of 1½ bottoms up will be circulated with drilling mud, so long as full returns are maintained, in order enhance the ability of achieving a successful cement job.
- A liner top packer, in addition to cement, will be utilized in order to ensure the pressure integrity of the liner lap of any liner run in the well.

Section 2 - General Information
(30 CFR Part 550.243)

- All production casing strings will be centralized across hydrocarbon bearing zones in order to ensure the proper isolation of individual pay sands by cementation and to prevent the transmission of hydrocarbons up the annulus behind the production casing.
- The proposed wells will be drilled on a mud weight schedule utilizing offset data from the original exploratory well drilled in West Cameron Blocks 544/543. Proposed drilling mud weights will allow for at a minimum, the known hydrostatic pressures required to drill the known hydrocarbon zones encountered in the original development of the field.
- Lost circulation material in the form of properly distributed particle sized mud additives (PSDs) will be added to the mud system in the form of sweeps while drilling both the intermediate and production hole sections. PSD additives will be utilized to prevent uncontrolled mud losses in the case that lower than anticipated pore pressures or fracture gradients are encountered.
- Wiper trips will be performed as hole conditions dictate in order to quantify the stability of the wellbore and determine if sufficient mud weights are being utilized to prevent influx of formation fluids, prevent swabbing of wellbore fluids while pulling pipe and prevent losses of wellbore fluids to the formation.
- Connections will be simulated while drilling into pressure transition areas in order to properly assess the current wellbore conditions.
- Mudloggers will be utilized during the drilling of the well in order to specifically evaluate wellbore conditions including, but not limited to weights of returning drilling fluids as compared to that of the fluid entering the hole, gas content of mud returns, formation characteristics and abnormalities of cuttings and estimated paleo aging of cuttings.
- Logging while drilling tools (LWD) will be utilized to evaluate and estimate lithology, formation pressures and fluid content from surface casing point to wellbore total depth. This will enable the real time identification of any changes in anticipated formation pressures and assist in the picking of intermediate casing points and wellbore total depth, potentially eliminating the possibility of drilling into unexpected formations that could cause dangerous well control situations. Log data will be regularly provided to the office for evaluation.
- Pressure While Drilling (PWD) data will be utilized to ensure the stability of, and to maintain constant monitoring of hydrostatic pressures applied to, the wellbore.

Blowout Intervention

In the event of an uncontrolled flow of hydrocarbons from the proposed wellbore(s), the Oil Spill Response Plan (OSRP) as described in the Plan will be activated. In addition to the activation of this Plan, two scenarios of well intervention have been described in the attached documentation and current availability of equipment to enact both well intervention scenarios identified:

- Assuming in an uncontrolled flow situation, the rig is intact and not sufficiently damaged, along with the wellbore and surface equipment, wellbore intervention would be performed from the rig itself. Master Service Agreements (MSAs) have been established with Cudd Pressure Control and Wild Well Control in order to expedite response in the case of an uncontrolled flow situation.
- As an example, flow could be controlled from either a "top kill" method or from the removal of the surface BOP stack and subsequent replacement of the stack and the wellbore shut in.
- In the event that the platform rig and/or the wellbore is irreparably damaged during a blowout scenario, wellbore intervention would be performed by contracting a MODU, mobilizing it to location and the subsequent spudding and drilling of a relief well.
- Arena currently has in place established contracts with all contractors that operate jack-up rigs in the Gulf of Mexico. Such contracts would be utilized to expedite the contracting of a rig in order to drill a relief well.

In the case of an uncontrolled flow of hydrocarbons, Arena would simultaneously pursue multiple wellbore intervention methods in an attempt to mitigate and terminate the spill, until the wellbore is brought under control.

K. Chemical Products

According to NTL 2008-G04 information regarding products is not required to accompany EP's and DOCD's in the Gulf of Mexico.

Section 3 - Geological & Geophysical Information (30 CFR Part 550.244)

A. Geological Description

Included as ***Attachment C*** are the details of the geological targets and associated trapping features for the proposed well locations.

B. Structure Contour Maps

Included as ***Attachment D*** are current structure maps depicting the proposed bottomhole locations and applicable geological cross sections for the proposed well locations.

C. Interpreted 2-D and/or Seismic Lines

Included as ***Attachment E*** are deep seismic lines depicting the proposed well locations.

D. Geological Structure Cross-Sections

Interpreted geological cross sections depicting the proposed well locations and depths are included ***Attachment F.***

E. Shallow Hazards Report

The activities proposed in this Plan will be conducted from the existing West Cameron Blocks 544 A Platform (Plan Control No. N-5015), and therefore does not require an additional shallow hazards survey and report.

F. Shallow Hazards Assessment

The activities proposed in this Plan will be conducted from the existing West Cameron Blocks 544 A Platform (Plan Control No. N-5015), and therefore does not require an additional shallow hazards assessment.

G. High Resolution Seismic Lines

The activities proposed in this Plan will be conducted from the existing West Cameron Blocks 544 A Platform (Plan Control No. N-5015), and therefore does not require additional high resolution seismic lines.

Section 3 - Geological & Geophysical Information (30 CFR Part 550.244)

H. Stratigraphic Column

Included as ***Attachment G*** are generalized biostratigraphic/lithostratigraphic column depicting the proposed well locations from the seafloor to total depth with each objective horizon labeled.

I. Time vs. Depth Tables

Arena feels there is sufficient well control data for the target sand objectives provided for in this Plan; as such seismic time vs. depth tables are not required.

J. Geochemical Information

According to NTL 2008-G04, this Section of the Plan is not applicable to the proposed operations.

K. Future G&G Activities

According to NTL 2008-G04, this Section of the Plan is not applicable to the proposed operations.

Section 4 - Hydrogen Sulfide Information (30 CFR Part 550.245)

A. Concentration

Arena does not anticipate encountering H2S above the 20 ppm atmospheric level while conducting the proposed development operations provided under this Plan as detailed on ***Attachment C.***

B. Classification

In accordance with Title 30 CFR 250.490(c), Arena requests the activities in this Plan for West Cameron Blocks 544/543/522 be classified as an area where the absence of hydrogen sulfide has been confirmed based on the following correlative wells which were drilled to the stratigraphic equivalent of the wells proposed in this Plan and detailed on ***Attachment C***.

C. H2S Contingency Plan

According to NTL 2008-G04, this Section of the Plan is not applicable to the proposed operations.

D. Modeling Report

According to NTL 2008-G04, this Section of the Plan is not applicable to the proposed operations.

Section 5 - Mineral Resource Conservation Information (30 CFR Part 550.246)

A. Technology and Reservoir Engineering Practices and Procedures

Proprietary Information

B. Technology and Recovery Practices and Procedures

Proprietary Information

C. Reservoir Development

Proprietary Information

Section 6 - Biological, Physical & Socioeconomic Information (30 CFR Part 550.247)

A. High Density Deepwater Benthic Communities Information

NTL 2009-G40 broadened the scope of a chemosynthetic communities report to cover all high density deepwater benthic communities, changed the definition of deepwater from 400 meters (1312 feet) to 300 meters (984 feet), increased the separation distance from muds and cuttings discharge locations from 1500 feet to 200 feet, and provided for an additional 1000 feet buffer area beyond the maximum anchor areas.

The activities proposed in this Plan do not disturb seafloor areas in water depths greater than 300 meters (984 feet); therefore chemosynthetic information is not required.

B. Topographic Features Map

BOEM and the National Marine Fisheries Service (NMFS) have entered into a programmatic consultation agreement for Essential Fish Habitat that requires that no bottom disturbing activities (including rig placement, and rig or construction base use of anchors, chains, cables, and wire ropes) within 305 meters (1000 feet) of a "No-Activity Zone" of a topographic feature.

If such proposed bottom disturbing activities are within 1000 feet of a no activity zone, the BOEM is required to consult with the NMFS.

The activities proposed in this Plan are not affected by a topographic feature.

C. Topographic Features Statement (Shunting)

The activities proposed in this Plan are not affected by a topographic feature; therefore, Arena is not required to shunt drill cuttings and drill fluids.

D. Live Bottoms (Pinnacle Trend) Map

Certain leases are located in areas characterized by the existence of live bottoms. Live bottom (Pinnacle trend features) are small, isolated, low to moderate relief carbonate reef features or outcrops of unknown origin or hard substrates exposed by erosion that provide surface area for the growth of sessile invertebrates and attract large number of fish. Known features occur in an area of topographic relief in the northeastern portion of the western Gulf of Mexico.

Section 6 - Biological, Physical & Socioeconomic Information (30 CFR Part 550.247)

These leases contain a Live Bottom Stipulation to ensure that impacts from nearby oil and gas activities on these live bottom areas are mitigated to the greatest extent possible.

For each affected lease, the Live Bottom Stipulation requires that you prepare a live bottom survey report containing a bathymetry map prepared by using remote sensing techniques. This report must be submitted to the BOEM Gulf of Mexico OCS Region (GOMR) before you may conduct any drilling activities or install any structure, including lease term pipelines in accordance with NTL 2009-G39.

The existing surface location in West Cameron Block 544 is not located within 200 feet of any pinnacle trend feature with vertical relief equal to or greater than 8 feet; as such live bottom information is not required.

E. Live Bottoms (Low Relief) Map

Certain leases are located in areas characterized by the existence of live bottoms. Live bottom (Low relief features) are sea grass communities; those areas that contain biological assemblages consisting of sessile invertebrates living upon and attached to naturally occurring hard or rocky formations with rough, broken, or smooth topography; and areas where a hard substrate and vertical relief may favor the accumulation of turtles, fishes or other fauna. These features occur in the Eastern Planning Area of the Gulf of Mexico.

The existing surface location in West Cameron Block 544 is not located within 200 feet of any pinnacle trend feature with vertical relief equal to or greater than 8 feet; as such live bottom (low relief) maps are not required.

F. Potentially Sensitive Biological Features Map

Oil and gas operations and transportation activities in the vicinity of potentially sensitive biological features may cause deleterious impacts to the sessile and pelagic communities associated with those habitats. Adverse impacts to the communities could be caused by mechanical damage from drilling rigs, platforms, pipelines and anchor employment.

The existing surface location in West Cameron Block 544 is not located within 61 meters (200 feet) of potentially sensitive biological features; as such the biologically sensitive maps are not required.

Section 6 - Biological, Physical & Socioeconomic Information (30 CFR Part 550.247)

G. Threatened or Endangered Species, Critical Habitat, and Marine Mammal Information

The BOEM revised Title 30 CFR Part 550, Subpart B to require lessees/operators to address the federally listed species with designated critical habitat as well as marine mammals which may be impacted by the proposed activities addressed under this Plan.

Section 7 of the Endangered Species Act (ESA) all federal agencies must ensure that any actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of a listed species, or destroy or adversely modify its designated critical habitat.

Included as ***Attachment H*** is a listing of the species under the jurisdiction of NOAA fisheries that are known to occur in the Gulf of Mexico that may be affected by the proposed action.

Arena does not anticipate that the proposed activities will occur in the presence of federally listed threatened or endangered species and critical habitat designated under the ESA and marine mammals protected under the Marine Mammal Protection Act (MMPA) based on the information is the referenced attachment.

H. Archaeological Report

In accordance with NTL's 2011-JOINT-G01 and 2005-G07, West Cameron Block 544 is located within an area requiring a 300-meter spacing survey.

This requirement provides protection of prehistoric and historic archaeological resources by requiring remote sensing surveys in areas designated to have a high probability for archaeological resources.

Copies of these reports have been previously submitted to the BOEM under separate cover for Plan Control No. N-5015 which provided for the West Cameron Block 544 A Platform.

I. Air and Water Quality Information

According to NTL 2008-G04, air and water quality information is not required as the proposed activities provided for in this Plan do not impact the State of Florida.

Section 6 - Biological, Physical & Socioeconomic Information (30 CFR Part 550.247)

J. Socioeconomic Information

According to NTL 2008-G04, socioeconomic information is not required as the proposed activities provided for in this Plan do not impact the State of Florida.

Section 7 - Wastes and Discharges Information (30 CFR Part 550.248)

A. Projected Generated Wastes

All projected solid and liquid wastes likely to be generated by our proposed activities are included in ***Attachment I.*** This attachment includes both operational wastes permitted by the appropriate NPDES General Permit GMG290269 and any other identified wastes.

Arena does not plan to treat, store or dispose of any of the above wastes down hole at our existing location.

B. Projected Ocean Discharges

All projected solid and liquid wastes likely to be generated by our proposed activities are included in ***Attachment I.*** This attachment includes both operational wastes permitted by the appropriate NPDES General Permit GMG290269 and any other identified wastes.

C. Modeling Report

According to NTL 2008-G04, a modeling report is not required for the operations proposed in this Plan.

D. NPDES Permits

According to NTL 2008-G04 information regarding NPDES permits is not required to accompany EP's or DOCD's in the Gulf of Mexico.

E. Cooling Water Intakes

According to NTL 2008-G04 information regarding cooling water intakes is not required to accompany EP's or DOCD's in the Gulf of Mexico.

Section 8 - Air Emissions Information (30 CFR Parts 550.249)

A. Emissions Worksheets and Screening Questions

The Projected Air Quality Emissions Report (Form BOEM-139) addresses the proposed drilling, construction and production operations proposed in this Plan.

As evidenced by ***Attachment J***, the worksheets were completed based on the proposed activities.

B. Emissions Reduction Measures

The projected air emissions are within the exemption level; therefore, no emission reduction measures are being proposed.

C. Verification of Non-default Emission Factors

Arena has elected to use the default emission factors as provided in ***Attachment J***.

D. Non-Exempt Activities

The proposed activities are within the exemption amount as provided in ***Attachment J***.

E. Modeling Report

According to NTL 2008-G04, this Section of the Plan is not applicable to the proposed operations.

Section 9 - Oil Spills Information
(30 CFR Part 550.250)

A. Oil Spill Response Planning

All the proposed activities and facilities in this Plan will be covered by the Regional Oil Spill Response Plan filed by Arena Offshore, LP (BOEM Company No. 02628) in accordance with Title 30 CFR Part 254 and approved on December 9, 2013 with the latest revision approved on March 22, 2016; as the activities proposed do not supersede our existing worse case discharge addressed in the current approval.

The following locations will be used in the event and oil spill occurs as a result of the proposed activities.

Primary Response Equipment Location	Pre-Planned Staging Location(s)
Galveston, TX	Galveston, TX

Arena utilizes Clean Gulf Associates (CGA) as its primary provider for equipment, which is an industry cooperative owning an inventory of oil spill clean-up equipment. CGA is supported by the Marine Spill Response Corporation's (MSRC), which is responsible for storing, inspecting, maintaining and dispatching CGA's equipment. The MSRC STARS network provides for the closest available personnel, as well as an MSRC supervisor to operate the equipment.

Category	Regional OSRP WCD	DOCD WCD	Regional OSRP WCD	DOCD WCD
Type of Activity	Drilling > 10 miles Seaward of Coastline	Drilling	Production >10 miles Seaward of Coastline	Production
Lease Number	OCS 00463	OCS 00457	G 02118	OCS 00457
Facility Location	South Timbalier Block 151	West Cameron Blocks 544	Eugene Island Block 338	West Cameron Blocks 544
Facility Designation	Well Location B	Well Location I	Platform K	Platform A
Distance to Nearest Shoreline (miles)	30	94	65	94
Storage Tanks (total)	0	0	3000	200
Lease Pipelines	NA	NA	NA	1149
Uncontrolled Blowout (bbls)	26,156 bbls	18,585 bbls	15,514 bbls	450 bbls
Total Volume (bbls)	26,156 bbls	18,585 bbls	18,514 bbls	1,799 bbls
Type of Oil	Crude Oil	Crude Oil	Crude Oil	Crude Oil
API Gravity	27.5° F	36° F	25.1° F	41° F

Section 9 - Oil Spills Information
(30 CFR Part 550.250)

Since Arena has the capability to respond to the appropriate worst-case spill scenario included in its Regional OSRP approved on March 22, 2016 and since the worst-case scenarios determined for our DOCD does not replace the worst-case scenarios in our Regional OSRP, I hereby certify that Arena has the capability to respond, to the maximum extent practicable, to a worst-case discharge, or a substantial threat of such a discharge, resulting from the activities proposed in our DOCD.

B. Oil Spill Response Discussion

In the event of an uncontrolled spill release resulting from the activities proposed in this Plan, Arena's Person-In-Charge on the platform/rig or the Shorebase Dispatcher would most likely be the initial individuals to contact the Qualified Individual (QI) or our Spill Management Team (SMT) detailed in the Regional OSRP. The QI would immediately activate the SMT to ascertain the severity of the spill incident. Arena's SMT Incident Command Center is located at O'Brien's Response Management, Inc.'s office in Slidell, Louisiana.

Dependent upon the severity of the spill incident, a trajectory analysis would be conducted utilizing the BOEM Oil Spill Risk Analysis Model (OSRAM) as referenced in our approved Regional OSRP. This trajectory would provide the required information on percentage and timing of potential impact to the shoreline impact areas. The SMT would then identify the areas of sensitivities at potential landfall segment(s), so additional planning may be conducted for shoreline protection strategies. If surveillance indicates a potential threat to shoreline; the appropriate equipment and personnel would be deployed, as outlined in our Regional OSRP.

An overflight may be conducted to determine the extent and dissipation rate of the spill, with potential sampling of the spill release. Mechanical recovery equipment may also be dispatched to the leading edge of the spill, as outlined in our Regional OSRP. If additional offshore response is required, the SMT would initiate the Dispersant Use Plan of the Regional OSRP and utilize the services of Airborne Support Inc.'s aircraft and personnel.

Included as ***Attachment K*** is the oil spill response discussion, equipment deployment, and containment for the proposed supplemental development operations.

C. Modeling Report

According to NTL 2008-G04, this Section of the Plan is not applicable to the proposed operations.

Section 9 - Oil Spills Information
(30 CFR Part 550.250)

D. NTL 2015-N01

Enclosed as ***Attachment L*** is the information required for the NTL 2015-N01 as it pertains to the potential worse-case discharge scenario, and response strategy for the activities proposed in this Plan.

Section 10 - Environmental Monitoring Information (30 CFR Part 550.252)

A. Monitoring Systems

Arena subscribes to StormGeo Inc. Weather Service which provides access to real-time weather conditions, and provides periodic updates on impending inclement weather conditions such as tropical depressions, storms and/or hurricanes entering the Gulf of Mexico.

Arena also relies on the National Weather Service to support the aforementioned subscribed service. During impending inclement weather conditions, Arena closely coordinates the activity with our contractors and field personnel to ensure the safety of people for evacuation; measures to prepare the facility for evacuation to ensure protection of the environment and the facility/equipment.

B. Incidental Takes

The BOEM revised regulations in Title 30 CFR Part 550, Subpart B to require lessees/operators to provide for monitoring systems if the activities provided for in this Plan have the potential to result in an incidental take of any federally listed species and/or marine mammals.

Arena does not anticipate the incidental taking of any species as a result of the proposed activities based on the implementation of, and adherence to the BOEM and BSEE Joint Notice to Lessees NTL 2012-G02 "Implementation of Seismic Mitigation Measures and Protected Species Observer Program", NTL 2012-G01 "Vessel Strike Avoidance and Injured/Dead Protected Species Reporting" and NTL 2012-BSEE-G01 "Marine Trash and Debris Awareness and Elimination".

Section 11 - Lease Stipulations/Special Conditions Information (30 CFR Part 550.253)

Under the Outer Continental Shelf Lands Act, both BOEM and BSEE are charged with the responsibility of managing and regulating the exploration and development on the OCS.

As part of the regulatory process, an Environmental Impact Statement (EIS) is prepared for each lease sale, at which time mitigation measures are addressed in the form of lease stipulations, which then become part of the oil and gas lease terms and are therefore enforceable as part of that lease.

As part of this process, the designated operator proposing to conduct related exploratory and development activities, must review the applicable lease stipulations, as well as other special conditions, which may be imposed by the BOEM, and other governing agencies.

West Cameron Blocks 544/543/522 are subject to the following lease stipulations and special conditions:

- **Marine Protected Species**

This lease stipulation is meant to reduce the potential taking of marine protected species. Arena will strive to perform its operations in accordance with the BOEM and BSEE issued Joint Notice to Lessees NTL 2012-G02 "Implementation of Seismic Mitigation Measures and Protected Species Observer Program", NTL 2012-G01 "Vessel Strike Avoidance and Injured/Dead Protected Species Reporting" and NTL 2012-BSEE-G01 "Marine Trash and Debris Awareness and Elimination".

Section 12 - Environmental Mitigation Measures Information (30 CFR Part 550.254)

A. Measures Taken to Avoid, Minimize, and Mitigate Impacts

The activities proposed in this Plan do not have an impact on the State of Florida; as such this section is not applicable.

B. Incidental Takes

BOEM revised regulations in Title 30 CFR Part 550, Subpart B to require lessees/operators to provide for monitoring systems if the activities provided for in this Plan have the potential to result in an incidental take of any federally listed species and/or marine mammals.

Arena does not anticipate the incidental taking of any species as a result of the proposed activities based on the implementation of, and adherence to the:

- NTL 2012-G01 "Marine Trash and Debris Awareness Training and Elimination"
- NTL 2012-JOINT-G01 "Vessel Strike Avoidance and Injured/Dead Protected Species Reporting".
- NTL 2012-JOINT-G02 "Implementation of Seismic Survey Mitigation Measures and Protected Species Observer Program".

Section 13 - Decommissioning Information (30 CFR Part 550.255)

The information at Title 30 CFR Part 250.255 regarding decommissioning is not required to accompany EP's and DOCD's submitted for the Gulf of Mexico.

Section 14 - Related Facilities & Operation Information (30 CFR Part 550.256)

A. Related OCS Facilities and Operations

The West Cameron Block 544 A Platform was installed in 1995 in a water depth of 182 feet. The existing structure is a 4-pile, 2-deck, 12-slot manned platform. The well test facilities consists of well manifolds, multiple production/test separators, scrubber, dehydrator, compressor, and condensate storage tank. The wells are individually tested on the West Cameron Block 544 A Platform, which will then be recombined prior to departing the export 10-16" gas right-of-way pipeline (ROW OCS-G 02122G/Segment No. 9526) terminating at a 3-inch subsea tie-in point in West Cameron Block 565.

The separated and measured gas and liquid hydrocarbon production will depart the West Cameron Block 544 A Platform via the above referenced right-of-way pipeline for ultimate delivery into Operation Systems No. 8.1.

The anticipated combined flow rates and shut-in times for the existing pipelines are as follows:

Origination Point	***Flow Rates***	***Shut In Time***
Platform A	1.6 MMCFPD 450 BOPD	< 2 Minutes

B. Transportation System

Arena does not anticipate installation of any new and/or modified onshore facilities to accommodate the additional production from the West Cameron Block 544 lease.

Section 14 - Related Facilities & Operation Information (30 CFR Part 550.256)

C. Produced Liquid Hydrocarbon Transportation Vessels

According to NTL 2008-G04, this Section of the Plan is not applicable to the proposed operations.

Section 15 - Support Vessels and Aircraft Information (30 CFR Part 550.257)

A. General

Personnel involved in the proposed operations will typically use their own vehicles as transportation to and from the selected onshore base; whereas the selected vendors will transport the equipment by a combination of trucks, boats and/or helicopters to the onshore base. The personnel and equipment will then be transported to the platform/rig taking the most direct route feasible as mandated by weather and traffic conditions. The table below provides for the maximum capacities, numbers and trip frequency used during the construction, drilling and production phases:

Type	Maximum Fuel Tank Storage Capacity	Maximum No. in Area at Any Time	Trip Frequency or Duration
Tug Boats	3,000 bbls	1	Mobilization on/off for drilling rig
Supply Boats	500 bbls	1	Two trips per week
Crew Boat	500 bbls	1	Four trips per week
Aircraft	330 gals.	1	As needed

B. Diesel Oil Supply Vessels

The following table details the vessels to be used for purposes other than fuel (i.e., corrosion control):

Size of Fuel Supply Vessel	Capacity of Fuel Supply Vessel	Frequency of Fuel Transfers	Route Fuel Supply Vessel Will Take
180' feet	1,500 bbls	Weekly	From the shorebase in Cameron, LA to WC 544

C. Drilling Fluids Transportation

According to NTL 2008-G04, this Section of the Plan is not applicable to the proposed operations.

Section 15 - Support Vessels and Aircraft Information (30 CFR Part 550.257)

D. Solid and Liquid Wastes Transportation

Included as ***Attachment I*** is a listing of the solid and liquid wastes associated with the proposed activities in this Plan, detailing the types of waste and approximate composition, total amount, name and location, rate and transport method.

E. Vicinity Map

A Vicinity Plat detailing the surface location in West Cameron Block 544 relative to the shoreline and onshore base is included as ***Attachment M.***

Section 16 - Onshore Support Facilities Information (30 CFR Part 550.258)

A. General

The existing surface disturbance in West Cameron Block 544 is located approximately 94 miles from the nearest Louisiana shoreline and 104 miles to the support base located in Cameron, LA.

Arena will utilize the existing Halliburton Shorebase located in Cameron, LA to accomplish the following routine operations:

- Loading/Offloading point for equipment supporting the offshore operations,
- Dispatching personnel and equipment, and does not anticipate the need for any expansion of the selected facilities as a result of the activities proposed in this Plan,
- Temporary storage for materials and equipment
- 24-Hour Dispatcher

B. Support Base Construction or Expansion

The proposed operations do not require any immediate action to acquire additional land or to expand existing base facilities.

C. Support Base Construction or Expansion Timetable

According to NTL 2008-G04, this Section of the Plan is not applicable to the proposed operations.

D. Waste Disposal

Included as ***Attachment I*** is a listing of waste disposal facilities to be utilized as part of the associated activities in this Plan; detailing the types of waste, amount, rate and disposal method to be sent to shore.

E. Air Emissions

According to NTL 2008-G04 information regarding air emissions generated by onshore support facilities is not required to accompany EP's and DOCD's for the Gulf of Mexico.

Section 16 - Onshore Support Facilities Information (30 CFR Part 550.258)

F. Unusual Solid and Liquid Wastes

According to NTL 2008-G04 information regarding unusual solid and liquid wastes generated by onshore support facilities is not required to accompany EP's and DOCD's for the Gulf of Mexico.

Section 17 - Sulphur Operations Information (30 CFR Part 550.259)

A. Bleedwater

Arena does not propose any sulphur related operations during the activities proposed in this Plan.

B. Subsidence

Arena does not propose any sulphur related operations during the activities proposed in this Plan.

Section 18 - Coastal Zone Management Information (30 CFR Part 550.260)

Under direction of the Coastal Zone Management Act (CZMA), the States of Alabama, Florida, Louisiana, Mississippi and Texas developed Coastal Zone Management Programs (CZMP) to allow for the supervision of significant land and water use activities that take place within or that could significantly impact their respective coastal zones.

A. Consistency Certification

Included in this submittal is a Coastal Zone Management Consistency Certification for the State of Louisiana.

B. Other Information

According to NTL 2008-G04, this Section of the Plan is not applicable to the proposed operations.

COASTAL ZONE MANAGEMENT CONSISTENCY CERTIFICATION

JOINT INITIAL SUPPLEMENTAL DEVELOPMENT OPERATIONS COORDINATION DOCUMENT

WEST CAMERON BLOCKS 544/543/522

LEASES OCS-G 14342/12802/34033

The proposed activities described in detail in the enclosed Plan comply with Louisiana's approved Coastal Zone Management Program and will be conducted in a manner consistent with such Program.

By: **Arena Offshore, LP**

Signed By: Mimee P. Mady

Dated: September 7, 2016

Section 19 – Environmental Impact Analysis (30 CFR Part 550.261)

A. Impact Producing Factors (IPF's) From Proposed Activities

The following matrix is utilized to identify the affected environments that could be impacted by these IPF's. An "x" has been marked for each IPF category that Arena has determined may impact a particular environment as a result of the proposed activities. For those cells which are footnoted, a statement is provided as to the applicability of the proposed activities, and where there may be an effect, an analysis of the effect is provided.

Environmental Resources	Impact Producing Factors (IPFs)					
	Emissions (air, noise, light, etc.)	**Effluents (muds, cuttings, other discharges to the water column or seafloor)**	**Physical disturbances to the seafloor (rig or anchor emplacement, etc.)**	**Wastes sent to shore for treatment or disposal**	**Accidents (e.g. oil spills, chemical spills, H_2S releases)**	**Other IPFs you identify**
Site Specific at Offshore Location						
Designated topographic features		(1)	(1)		(1)	
Pinnacle Trend area live bottoms		(2)	(2)		(2)	
Eastern Gulf live bottoms		(3)	(3)		(3)	
Chemosynthetic communities			(4)			
Water quality						
Fisheries						
Marine mammals	(8)				(8)	
Sea turtles	(8)				(8)	
Air quality	(9)					
Shipwreck sites (known or potential)			(7)			
Prehistoric archaeological sites			(7)			
Vicinity of Offshore Location						
Essential fish habitat					(6)	
Marine and pelagic birds						
Public health and safety					(5)	
Coastal & Onshore						
Beaches					(6)	
Wetlands					(6)	
Shorebirds and coastal nesting birds					(6)	
Coastal wildlife refuges						
Wilderness areas						

Section 19 – Environmental Impact Analysis (30 CFR Part 550.261)

Footnotes for Environmental Impact Analysis Matrix

J. Activities that may affect a marine sanctuary or topographic feature. Specifically, if the well or platform site or any anchors will be on the seafloor within the:

(a) 4-mile zone of the Flower Gardens Banks, or the 3-mile zone of Stetson Bank;

(b) 1000-m, 1-mile or 3-mile zone of any topographic feature (submarine bank) protected by the Topographic Features Stipulation attached to an OCS lease;

(c) Essential Fish Habitat (EFH) criteria of 500 ft from any no-activity zone; or

(d) Proximity of any submarine bank (500 ft buffer zone) with relief greater than 2 meters that is not protected by the Topographic Stipulation attached to an OCS lease.

2. Activities with any bottom disturbance within an OCS lease block protected through the Live Bottom (Pinnacle Trend) Stipulation attached to an OCS lease.
3. Activities within any Eastern Gulf OCS block where seafloor habitats are protected by the Live Bottom (Low-Relief) Stipulation attached to an OCS lease.
4. Activities on blocks designated by the BOEM as being in water depths 300 meters or greater.
5. Exploration or production activities where H_2S concentrations greater than 500 ppm might be encountered.
6. All activities that could result in an accidental spill of produced liquid hydrocarbons or diesel fuel that you determine would impact these environmental resources. If the proposed action is located a sufficient distance from a resource that no impact would occur, the EIA can note that in a sentence or two.
7. All activities that involve seafloor disturbances, including anchor emplacements, in any OCS block designated by the BOEM as having high-probability for the occurrence of shipwrecks or prehistoric sites, including such blocks that will be affected that are adjacent to the lease block in which your planned activity will occur. If the proposed activities are located a sufficient distance from a shipwreck or prehistoric site that no impact would occur, the EIA can note that in a sentence or two.
8. All activities that you determine might have an adverse effect on endangered or threatened marine mammals or sea turtles or their critical habitats.
9. Production activities that involve transportation of produced fluids to shore using shuttle tankers or barges.

Section 19 – Environmental Impact Analysis (30 CFR Part 550.261)

B. Impact Analysis

Site Specific at Offshore Location

- **Designation Topographic Features**

  There are no anticipated emissions, effluents, physical disturbances to the seafloor, wastes transported to shore, and/or accidents from the proposed activities that could cause impacts to topographic features. The surface disturbance within West Cameron Block 544 is located approximately 7 miles away from the Fathom Bank. The crests of designated topographic features in the northern Gulf are found below 10 m. In the event of an accidental oil spill from the proposed activities, the gravity of such oil (high gravity condensate and/or diesel fuel) would rise to the surface, quickly dissipate, and/or be swept clear by the currents moving around the bank; thereby avoiding the sessile biota.

- **Pinnacle Trend Area Live Bottoms**

  There are no anticipated emissions, effluents, physical disturbances to the seafloor, wastes sent to shore, and/or accidents from the proposed activities that could cause impacts to a pinnacle trend area. The proposed surface disturbance within West Cameron Block 544 is located a significant distance (> 100 miles) from the closest pinnacle trend live bottom stipulated block. The crests of the pinnacle trend area are much deeper than 20 m. In the event of an accidental oil spill from the proposed activities, the gravity of such oil (high gravity condensate and/or diesel fuel) would rise to the surface, quickly dissipate, and/or be swept clear by currents moving around the bank; and thus not impacting the pinnacles.

- **Eastern Gulf Live Bottoms**

  There are no anticipated emissions, effluents, emissions physical disturbances to the seafloor, wastes sent to shore, and/or accidents from the proposed activities that could cause impacts to Eastern Gulf live bottoms. The proposed surface disturbance within West Cameron Block 544 is located a significant distance (>100 miles) from the closest pinnacle Eastern Gulf live bottom stipulated block.

In the event of an accidental oil spill from the proposed activities, the gravity of such oil (high gravity condensate and/or diesel fuel) would rise to the surface, quickly dissipate, and/or be swept clear by currents moving around the bank; and would not be expected to cause adverse impacts to Eastern Gulf live bottoms because of the depth of the features and dilutions of spills.

- **Chemosynthetic Communities**

  Water depths at the surface location in West Cameron Block 544 is approximately 182 feet. Therefore, the proposed activities are not located within the vicinity of any known chemosynthetic communities, which typically occur in water depths greater than 300 meters. Based on the water depth, there are no anticipated emissions, effluents, emissions physical disturbances to seafloor, wastes sent to shore, and/or accidents from the proposed activities that could impact these types of communities.

- **Water Quality**

  Routine operational discharges authorized by EPA's Region VI NPDES General Permit GMG290000 are regulated based on volume discharge rate limitations, and certain testing requirements for oil and grease and toxicity limitations. As such, it is not anticipated these discharges will cause significant adverse impacts to water quality.

  Accidental oil spill releases from the proposed activities, and cumulative similar discharge activity within the vicinity could potentially cause impacts to water quality. It is unlikely that an accidental oil spill release would occur from the proposed activities. In the event of such a release, the water quality would be temporarily affected by the dissolved components and small droplets. Currents and microbial degradation would remove the oil from the water column or dilute the constituents to background levels.

  In the event of an unanticipated blowout resulting in an oil spill, it is unlikely to have an impact based on the industry wide standards for using proven equipment and technology for such responses, implementation of Arena's Regional Oil Spill Response Plan which addresses available equipment and personnel, techniques for containment and recovery, and removal of the oil spill.

Section 19 – Environmental Impact Analysis (30 CFR Part 550.261)

- **Fisheries**

  Accidental oil spill releases from the proposed activities, and cumulative similar discharge activity within the vicinity may potentially cause some detrimental effects on fisheries. It is unlikely a spill would occur; however, such a release in open waters closed to mobile adult finfish or shellfish would likely be sub-lethal and the extent of damage would be reduced to the capability of adult fish and shellfish to avoid a spill, to metabolize hydrocarbons, and to excrete both metabolites and parent compounds.

  In the event of an unanticipated blowout resulting in an oil spill, it is unlikely to have an impact based on the industry wide standards for using proven equipment and technology for such responses, implementation of Arena's Regional Oil Spill Response Plan which addresses available equipment and personnel, techniques for containment and recovery, and removal of the oil spill.

  Arena will conduct the proposed activities under EPA's Region VI NPDES General Permit GMG290000 which authorizes the discharge of certain effluents, subject to certain limitations, prohibitions and recordkeeping requirements. As such, it is not anticipated these discharges will cause significant adverse impacts to water quality.

- **Marine Mammals**

  As a result of the proposed activities, marine mammals may be adversely impacted by emissions, effluents, waste sent to shore, and/or accidents.

  Chronic and sporadic sub-lethal effects could occur that may stress and/or weaken individuals of a local group or population and make them more susceptible to infection from natural or anthropogenic sources. Few lethal effects are expected from accidental oil spill, chance collisions with service vessels and ingestion of plastic material.

  The net results of any disturbance would depend on the size and percentage of the population affected, ecological importance of the disturbed area, environmental and biological parameters that influence an animal's sensitivity to disturbance and stress, and the accommodation time in response to prolonged disturbance (Geraci and St. Aubin, 1980). Collisions between cetaceans and ship could cause serious injury or death (Laist et al., 2001).

Sperm whales are one of 11 whale species that are hit commonly by ships (Laist et al., 2001). Collisions between OCS vessels and cetaceans within the project area are expected to be unusual events.

In the event of an unanticipated blowout resulting in an oil spill, it is unlikely to have an impact based on the industry wide standards for using proven equipment and technology for such responses, implementation of Arena's Regional Oil Spill Response Plan which addresses available equipment and personnel, techniques for containment and recovery, and removal of the oil spill.

Arena will conduct the proposed activities under EPA's Region VI NPDES General Permit GMG290000 which authorizes the discharge of certain effluents, subject to certain limitations, prohibitions and recordkeeping requirements. As such, it is not anticipated these discharges will cause significant adverse impacts to water quality.

Additionally, Arena does not anticipate the incidental taking of any marine mammals as the result of the proposed activities. The proposed activities will be conducted by our company and its contractors under the additional criteria addressed by BOEM and BSEE Joint Notice to Lessees NTL 2012-G02 "Implementation of Seismic Mitigation Measures and Protected Species Observer Program", NTL 2012-G01 "Vessel Strike Avoidance and Injured/Dead Protected Species Reporting" and NTL 2012-BSEE-G01 "Marine Trash and Debris Awareness and Elimination".

- **Sea Turtles**

As a result of the proposed activities, sea turtles may be adversely impacted by emissions, effluents, waste sent to shore, and/or accidents.

Small numbers of turtles could be killed or injured by chance collision with service vessels or by eating indigestible trash, particularly plastic items accidentally lost from drilling rigs, production facilities and service vessels. Drilling rigs and project vessels (construction barges) produce noise that could disrupt normal behavior patterns and create some stress to sea turtles, making them more susceptible to disease. Accidental oil spill releases are potential threats which could have lethal effects on turtles. Contact and/or consumption of this released material could seriously affect individual sea turtles. Most OCS related impacts on sea turtles are expected to be sub-lethal. Chronic and/or avoidance of effected areas could cause declines in survival or productivity, resulting in gradual population declines.

In the event of an unanticipated blowout resulting in an oil spill, it is unlikely to have an impact based on the industry wide standards for using proven equipment and technology for such responses, implementation of Arena's Regional Oil Spill Response Plan which addresses available equipment and personnel, techniques for containment and recovery, and removal of the oil spill.

Arena will conduct the proposed activities under EPA's Region VI NPDES General Permit GMG290000 which authorizes the discharge of certain effluents, subject to certain limitations, prohibitions and recordkeeping requirements. As such, it is not anticipated these discharges will cause significant adverse impacts to water quality.

Additionally, Arena does not anticipate the incidental taking of any sea turtles as the result of the proposed activities. The proposed activities will be conducted by our company and its contractors under the additional criteria addressed by BOEM and BSEE Joint Notice to Lessees NTL 2012-G02 "Implementation of Seismic Mitigation Measures and Protected Species Observer Program", NTL 2012-G01 "Vessel Strike Avoidance and Injured/Dead Protected Species Reporting" and NTL 2012-BSEE-G01 "Marine Trash and Debris Awareness and Elimination".

- **Air Quality**

  The proposed activities are located approximately 94 miles to the nearest Louisiana shoreline. There would be a limited degree of air quality degradation in the immediate vicinity of the proposed activities. Air quality analyses of the proposed activities are below the BOEM exemption level. As such, Arena does not anticipate any IPF's as a result of the proposed activities.

- **Ship Wreck Sites (Known or Potential)**

  There are no physical disturbances to the seafloor which could impact known or potential shipwreck sites, as the review of high resolution shallow hazards data indicate there are no known or potential shipwreck sites located within the surveyed area. As such, Arena does not anticipate any IPF's as a result of the proposed activities.

- **Prehistoric Archaeological Sites**

  There are no physical disturbances to the seafloor which could cause impacts to prehistoric archaeological sites, as the review of high resolution shallow hazards data and supporting studies did not reflect the occurrence of prehistoric archaeological sites. As such, Arena does not anticipate any IPF's as a result of the proposed activities.

Vicinity of Offshore Location

- **Essential Fish Habitat**

  As a result of the proposed activities, essential fish habitat may be adversely impacted by effluents and/or accidents.

  An accidental oil spill that may occur as a result of the proposed activities has potential to cause some detrimental effects on essential fish habitat. It is unlikely that an accidental oil spill release would occur; however, if a spill were to occur in close proximity to finfish or shellfish, the effects would likely be sub-lethal and the extent of damage would be reduced to the capability of adult fish and shellfish to avoid a spill, to metabolize hydrocarbons, and to excrete both metabolites and parent compounds.

  In the event of an unanticipated blowout resulting in an oil spill, it is unlikely to have an impact based on the industry wide standards for using proven equipment and technology for such responses, implementation of Arena's Regional Oil Spill Response Plan which addresses available equipment and personnel, techniques for containment and recovery, and removal of the oil spill.

- **Marine and Pelagic Birds**

  As a result of the proposed activities, marine and pelagic birds may be adversely impacted by an accidental oil spill, by the birds coming into contact with the released oil. It is unlikely that an accidental oil spill release would occur.

In the event of an unanticipated blowout resulting in an oil spill, it is unlikely to have an impact based on the industry wide standards for using proven equipment and technology for such responses, implementation of Arena's Regional Oil Spill Response Plan which addresses available equipment and personnel, techniques for containment and recovery, and removal of the oil spill.

- **Public Health and Safety**

There are no anticipated emissions, effluents, wastes sent to shore, and/or accidents from the proposed activities that could cause impacts to the public health and safety. Arena has requested BOEM approval to classify the proposed objective area as absent of hydrogen sulfide.

Coastal and Onshore

- **Beaches**

As a result of the proposed activities, beaches may be adversely impacted by an accidental oil spill. However, due to the distance from shore (approximately 94 miles to nearest Louisiana shoreline), and the response capabilities that would be implemented, no significant adverse impacts are expected. Both historical spill data and the combined trajectory/risk calculations referenced in the publication of OCS EIA /EA BOEM 2002-052 indicate there is little risk of contact or impact to the coastline and associated environmental resources.

In the event of an unanticipated blowout resulting in an oil spill, it is unlikely to have an impact based on the industry wide standards for using proven equipment and technology for such responses, implementation of Arena's Regional Oil Spill Response Plan which addresses available equipment and personnel, techniques for containment and recovery, and removal of the oil spill.

- **Wetlands**

As a result of the proposed activities, wetlands may be adversely impacted by an accidental oil spill. However, due to the distance from shore (approximately 94 miles to the nearest Louisiana shoreline) and the response capabilities that would be implemented, no significant adverse impacts are expected. Both historical spill data and the combined trajectory/risk calculations referenced in the publication of OCS EIA /EA BOEM 2002-052 indicate there is little risk of contact or impact to the coastline and associated environmental resources.

In the event of an unanticipated blowout resulting in an oil spill, it is unlikely to have an impact based on the industry wide standards for using proven equipment and technology for such responses, implementation of Arena's Regional Oil Spill Response Plan which addresses available equipment and personnel, techniques for containment and recovery, and removal of the oil spill.

- **Shore Birds and Coastal Nesting Birds**

  As a result of the proposed activities, shore birds and coastal nesting birds may be adversely impacted by an accidental oil spill. However, due to the distance from shore (approximately 94 miles to the nearest Louisiana shoreline) and the response capabilities that would be implemented, no significant adverse impacts are expected. Both historical spill data and the combined trajectory/risk calculations referenced in the publication of OCS EIA /EA BOEM 2002-052 indicate there is little risk of contact or impact to the coastline and associated environmental resources.

  In the event of an unanticipated blowout resulting in an oil spill, it is unlikely to have an impact based on the industry wide standards for using proven equipment and technology for such responses, implementation of Arena's Regional Oil Spill Response Plan which addresses available equipment and personnel, techniques for containment and recovery, and removal of the oil spill.

- **Coastal Wildlife Refuges**

  As a result of the proposed activities, coastal wildlife refuges may be adversely impacted by an accidental oil spill. However, due to the distance from shore (approximately 94 miles to the nearest Louisiana shoreline) and the response capabilities that would be implemented, no significant adverse impacts are expected. Both historical spill data and the combined trajectory/risk calculations referenced in the publication of OCS EIA /EA BOEM 2002-052 indicate there is little risk of contact or impact to the coastline and associated environmental resources.

  In the event of an unanticipated blowout resulting in an oil spill, it is unlikely to have an impact based on the industry wide standards for using proven equipment and technology for such responses, implementation of Arena's Regional Oil Spill Response Plan which addresses available equipment and personnel, techniques for containment and recovery, and removal of the oil spill.

- **Wilderness Areas**

  As a result of the proposed activities, wilderness areas may be adversely impacted by an accidental oil spill. However, due to the distance to the nearest area (approximately 94 miles to the nearest Louisiana shoreline) and the response capabilities that would be implemented, no significant adverse impacts are expected. Both historical spill data and the combined trajectory/risk calculations referenced in the publication of OCS EIA /EA BOEM 2002-052 indicate there is little risk of contact or impact to the coastline and associated environmental resources.

  In the event of an unanticipated blowout resulting in an oil spill, it is unlikely to have an impact based on the industry wide standards for using proven equipment and technology for such responses, implementation of Arena's Regional Oil Spill Response Plan which addresses available equipment and personnel, techniques for containment and recovery, and removal of the oil spill.

Other Resources Identified

Arena has not identified any other environmental resources other than those addressed above.

C. Impacts on Proposed Activities

Arena does not anticipate any impacts on the offshore site specific locations, offshore vicinity, and/or coastal and onshore environmental conditions.

D. Environmental Hazards

West Cameron Block 544 is not located within a geographic area impacted by strong environmental phenomena, other than potential hurricanes in the Gulf of Mexico. The permanent structure has been designed to meet the current regulations and design criteria for these hurricane events. To mitigate potential impacts to the facility and/or wells during impending hurricanes, Arena will take precautionary measures to secure the facility, shutting in the wells and evacuating personnel for evacuation as further detailed in our U.S. Coast Guard Emergency Evacuation Plan.

E. Alternatives

There are no alternatives other than those required by regulation to the considered to reduce the environmental impacts of the activities proposed in this Plan.

Section 19 – Environmental Impact Analysis (30 CFR Part 550.261)

F. Mitigation Measures

No mitigation measures other than those required by regulations will be considered to avoid, lessen or eliminate potential impacts on environmental resources.

G. Consultation

Arena has not contacted any agencies or persons for consultation regarding potential impacts associated with the proposed activities. Therefore, a list of such entities is not being provided.

H. Preparer

Questions or requests for additional information should be made to Arena's authorized representative/preparer of this Plan:

Aimee Deady
Arena Offshore, LP
4200 Research Forest Drive, Suite 230
The Woodlands, Texas 77381
281-210-3180 (Phone)
aimee@arenaoffshore.com

I. References

The following documents were utilized in preparing the Environmental Impact Assessment (though not necessarily cited in the document):

Document	*Author*	*Dated*
Shallow Hazards Survey Report	John E. Chance and Associates, Inc.	1994
Environmental Impact Statement Report No. 2007-003	Bureau of Ocean Energy Management	2007
Title 30 CFR Part 550	Bureau of Ocean Energy Management	2016
Title 30 CFR Part 250	Bureau of Safety and Environmental Enforcement	2016
OCS EIA/EA BOEM 2002-052	Bureau of Ocean Energy Management	2002
NPDES General Permit GMG290000	EPA – Region VI	2012
Regional Oil Spill Response Plan	J. Connor Consulting	2016

Section 19 - Environmental Impact Analysis
(30 CFR Part 550.261)

Document	*Author*	*Dated*
NTL 2005-G07 "Archaeological Resource Surveys and Reports"	Bureau of Ocean Energy Management	2005
NTL 2009-N11 "Air Quality Jurisdiction on the OCS"	Bureau of Ocean Energy Management	2009
NTL 2009-G26 "U.S. Air Force Communication Towers"	Bureau of Ocean Energy Management	2009
NTL 2009-G27 "Submitting Exploration Plans and Development Operations Coordination Documents"	Bureau of Ocean Energy Management	2009
NTL 2009-G29 "Implementation Plan for Transition from North American Datum 27 to North American Datum 83	Bureau of Ocean Energy Management	2009
NTL 2009-G31 "Hydrogen Sulfide"	Bureau of Ocean Energy Management	2009
NTL 2009-G34 "Ancillary Activities"	Bureau of Ocean Energy Management	2009
NTL 2009-G40 "Deepwater Benthic Communities"	Bureau of Ocean Energy Management	2009
NTL 2011-G01 "Revision to the List of OCS Lease Blocks Requiring Archaeological Resource Surveys and Reports"	Bureau of Ocean Energy Management and Bureau of Safety and Environmental Enforcement	2011
NTL 2012-G01 "Vessel Strike Avoidance and Injured/Dead Protective Species"	Bureau of Ocean Energy Management and Bureau of Safety and Environmental Enforcement	2012
BSEE NTL 2012-G01 "Marine Trash & Debris Awareness & Elimination"	Bureau of Safety and Environmental Enforcement	2012
NTL 2012-G02 "Implementation of Seismic Mitigation Measures & Protected Species Observer Program"	Bureau of Ocean Energy Management and Bureau of Safety and Environmental Enforcement	2012
NTL 2012-G01 "Drilling Windows, Eastern Gulf of Mexico"	Bureau of Ocean Energy Management	2012
NTL 2015-N01 "Information Requirements for Exploration Plans, Development and Production Plans, and Development Operations Coordination Documents on the OCS for Worst Case Discharge and Blowout Scenarios"	Bureau of Ocean Energy Management	2015

Section 20 - Administrative Information (30 CFR Part 550.262)

A. Exempted Information Description (Public Information Copies Only)

Excluded from the Public Information copies are the following:

a. Proposed bottomhole location information
b. Proposed total well depths (measured and true vertical depth)
c. Production Rates and Life of Reserves
d. New and Unusual Technology
e. Mineral Resource Conservation Information
f. Geological and Geophysical Attachments
g. Correlative well information used to justify H2S classification request

B. Bibliography

The following documents were utilized in preparing the Plan:

Document	***Author***	***Dated***
BOEM Environmental Impact Statement Report No. 2007-003	BOEM	2007
Regional Oil Spill Response Plan	J. Connor Consulting	2016
Initial Development Operations Coordination Document (Control No. N-5015)	Petsec Energy Inc.	1995
Supplemental Development Operations Coordination Document (Control No. S-4244)	Petsec Energy Inc.	1997

West Cameron Blocks 544/543/522

(Leases OCS-G 14342/12802/34033)

OCS Plan Information Form

Attachment A
(Public Information)

U.S. Department of the Interior
Bureau of Ocean Energy Management

OMB Control Number: 1010-0151
OMB Approval Expires: 12/31/18

OCS PLAN INFORMATION FORM

General Information

Type of OCS Plan:		Exploration Plan (EP)	Development Operations Coordination Document (DOCD)	X

Company Name: Arena Offshore, LP	BOEM Operator Number: 02628
Address:	Contact Person: Aimee Deady
4200 Research Forest Drive, Suite 230	Phone Number: 281-210-3180
The Woodlands, Texas 77381	E-Mail Address: aimee@arenaoffshor.com

If a service fee is required under 30 CFR 550.125(a), provide the	Amount paid	$12,714.00	Receipt No.	25S5E17P

Project and Worst Case Discharge (WCD) Information

Lease(s): G14342/G12802/G34033	Area: WC 544/543/522	Block(s):	Project Name (If Applicable):

Objective(s)	X	Oil	X	Gas		Sulphur		Salt	Onshore Support Base(s): Cameron, Louisiana

Platform/Well Name: A	Total Volume of WCD: 18,585 bbls	API Gravity: 36°
Distance to Closest Land (Miles): 94 miles	Volume from uncontrolled blowout: 18,585 bbls	

Have you previously provided information to verify the calculations and assumptions for your WCD?		Yes	X	No
If so, provide the Control Number of the EP or DOCD with which this information was provided				
Do you propose to use new or unusual technology to conduct your activities?		Yes	X	No
Do you propose to use a vessel with anchors to install or modify a structure?		Yes	X	No
Do you propose any facility that will serve as a host facility for deepwater subsea development?		Yes	X	No

Description of Proposed Activities and Tentative Schedule (Mark all that apply)

Proposed Activity	Start Date	End Date	No. of Days
Exploration drilling			
Development drilling	12/01/2016	07/16/2017	228 days
Well completion	Included in above	Included in above	
Well test flaring (for more than 48 hours)			
Installation or modification of structure			
Installation of production facilities			
Installation of subsea wellheads and/or manifolds			
Installation of lease term pipelines			
Commence production	01/08/2017	01/08/2025	9 years
Other (Specify and attach description)			

Description of Drilling Rig

X	Jackup		Drillship		Caisson		Tension leg platform
	Gorilla Jackup		Platform rig		Fixed platform		Compliant tower
	Semisubmersible		Submersible		Spar		Guyed tower
	DP Semisubmersible		Other (Attach Description)		Floating production system		Other (Attach Description)

Drilling Rig Name (If Known):

Description of Structure

(See Description of Drilling Rig table above.)

Description of Lease Term Pipelines

From (Facility/Area/Block)	To (Facility/Area/Block)	Diameter (Inches)	Length (Feet)

OCS PLAN INFORMATION FORM (CONTINUED)
Include one copy of this page for each proposed well/structure

Proposed Well/Structure Location

Well or Structure Name/Number (If renaming well or structure, reference previous name): Platform A					Previously reviewed under an approved EP or DOCD?	X	Yes		No
Is this an existing well or structure?		Yes X		No	If this is an existing well or structure, list the Complex ID or API No.	29032-1			
Do you plan to use a subsea BOP or a surface BOP on a floating facility to conduct your proposed activities?							Yes	X	No

WCD info	For wells, volume of uncontrolled blowout (Bbls/day): 18,585	For structures, volume of all storage and pipelines (Bbls): 1349 bbls	API Gravity of fluid 36°

	Surface Location	**Bottom-Hole Location (For Wells)**	**Completion (For multiple completions, enter separate lines)**
Lease No.	OCS G-14342	OCS	OCS OCS
Area Name	West Cameron		
Block No.	544		
Blockline Departures (in feet)	N/S Departure: F N 919' L	N/S Departure: F____ L	N/S Departure: F____ L N/S Departure: F____ L N/S Departure: F____ L
	E/W Departure: F E 597' L	E/W Departure: F____ L	E/W Departure: F____ L E/W Departure: F____ L E/W Departure: F____ L
Lambert X-Y coordinates	X: 1,302,289.89	X:	X: X: X:
	Y: -108,896.10	Y:	Y: Y: Y:
Latitude/ Longitude	Latitude 28° 20' 56.7360" N	Latitude	Latitude Latitude Latitude
	Longitude 93° 30' 06.3449" W	Longitude	Longitude Longitude Longitude

Water Depth (Feet): 182'	MD (Feet):	TVD (Feet):	MD (Feet): MD (Feet): MD (Feet):	TVD (Feet): TVD (Feet): TVD (Feet):
Anchor Radius (if applicable) in feet:				

Anchor Locations for Drilling Rig or Construction Barge (If anchor radius supplied above, not necessary)

Anchor Name or No.	Area	Block	X Coordinate	Y Coordinate	Length of Anchor Chain on Seafloor
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	

OCS PLAN INFORMATION FORM (CONTINUED)
Include one copy of this page for each proposed well/structure

Proposed Well/Structure Location

Well or Structure Name/Number (If renaming well or structure, reference previous name): A002					Previously reviewed under an approved EP or DOCD?	X	Yes		No
Is this an existing well or structure?		Yes X		No	If this is an existing well or structure, list the Complex ID or API No.	17-702-41077-00			
Do you plan to use a subsea BOP or a surface BOP on a floating facility to conduct your proposed activities?							Yes	X	No

WCD info	For wells, volume of uncontrolled blowout (Bbls/day): 18,585 bbls				For structures, volume of all storage and pipelines (Bbls): 1349 bbls			API Gravity of fluid 36°	
	Surface Location				**Bottom-Hole Location (For Wells)**			**Completion (For multiple completions, enter separate lines)**	
Lease No.	OCS G-14342				OCS			OCS OCS	
Area Name	West Cameron								
Block No.	544								
Blockline Departures (in feet)	N/S Departure: 912.80'	F N L			N/S Departure:	F L		N/S Departure: N/S Departure: N/S Departure:	F L F L F L
	E/W Departure: 597.54'	F E L			E/W Departure:	F L		E/W Departure: E/W Departure: E/W Departure:	F L F L F L
Lambert X-Y coordinates	X: 1,302,305.89				X:			X: X: X:	
	Y: -108,896.19				Y:			Y: Y: Y:	
Latitude/ Longitude	Latitude 28° 20' 56.7381" N				Latitude			Latitude Latitude Latitude	
	Longitude 93° 30' 06.1660" W				Longitude			Longitude Longitude Longitude	
Water Depth (Feet): 182'					MD (Feet):	TVD (Feet):		MD (Feet): MD (Feet): MD (Feet):	TVD (Feet): TVD (Feet): TVD (Feet):
Anchor Radius (if applicable) in feet:									

Anchor Locations for Drilling Rig or Construction Barge (If anchor radius supplied above, not necessary)

Anchor Name or No.	Area	Block	X Coordinate	Y Coordinate	Length of Anchor Chain on Seafloor
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	

OCS PLAN INFORMATION FORM (CONTINUED)
Include one copy of this page for each proposed well/structure

Proposed Well/Structure Location

Well or Structure Name/Number (If renaming well or structure, reference previous name): A003					Previously reviewed under an approved EP or DOCD?	X	Yes		No
Is this an existing well or structure?		Yes X		No	If this is an existing well or structure, list the Complex ID or API No.	17-712-41087-00			
Do you plan to use a subsea BOP or a surface BOP on a floating facility to conduct your proposed activities?							Yes	X	No

WCD info	For wells, volume of uncontrolled blowout (Bbls/day): 18,585 bbls	For structures, volume of all storage and pipelines (Bbls): 1349 bbls	API Gravity of fluid 36°

	Surface Location	**Bottom-Hole Location (For Wells)**	**Completion (For multiple completions, enter separate lines)**
Lease No.	OCS G14342	OCS	OCS OCS
Area Name	West Cameron		
Block No.	544		
Blockline Departures (in feet)	N/S Departure: F N L 906.80'	N/S Departure: F___ L	N/S Departure: F___ L N/S Departure: F___ L N/S Departure: F___ L
	E/W Departure: F E L 597.50'	E/W Departure: F___ L	E/W Departure: F___ L E/W Departure: F___ L E/W Departure: F___ L
Lambert X-Y coordinates	X: 1,305,305.93	X:	X: X: X:
	Y: -108,890.19	Y:	Y: Y: Y:
Latitude/ Longitude	Latitude 28° 20' 56.7974" N	Latitude	Latitude Latitude Latitude
	Longitude 93° 30' 06.1668" W	Longitude	Longitude Longitude Longitude

Water Depth (Feet): 182'	MD (Feet):	TVD (Feet):	MD (Feet): MD (Feet): MD (Feet):	TVD (Feet): TVD (Feet): TVD (Feet):
Anchor Radius (if applicable) in feet:				

Anchor Locations for Drilling Rig or Construction Barge (If anchor radius supplied above, not necessary)

Anchor Name or No.	Area	Block	X Coordinate	Y Coordinate	Length of Anchor Chain on Seafloor
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	

OCS PLAN INFORMATION FORM (CONTINUED)
Include one copy of this page for each proposed well/structure

Proposed Well/Structure Location

Well or Structure Name/Number (If renaming well or structure, reference previous name): A004					Previously reviewed under an approved EP or DOCD?	X	Yes		No
Is this an existing well or structure?		Yes X		No	If this is an existing well or structure, list the Complex ID or API No.	17-702-41091-00			
Do you plan to use a subsea BOP or a surface BOP on a floating facility to conduct your proposed activities?							Yes	X	No

WCD info	For wells, volume of uncontrolled blowout (Bbls/day): 18,585 bbls	For structures, volume of all storage and pipelines (Bbls): 1349 bbls	API Gravity of fluid 36°

	Surface Location	**Bottom-Hole Location (For Wells)**	**Completion (For multiple completions, enter separate lines)**
Lease No.	OCS G-14342	OCS	OCS OCS
Area Name	West Cameron		
Block No.	544		
Blockline Departures (in feet)	N/S Departure: F N L 918.76'	N/S Departure: F___ L	N/S Departure: F___ L N/S Departure: F___ L N/S Departure: F___ L
	E/W Departure: F E L 604.07'	E/W Departure: F___ L	E/W Departure: F___ L E/W Departure: F___ L E/W Departure: F___ L
Lambert X-Y coordinates	X: 1,302,299.35	X:	X: X: X:
	Y: -108,902.15	Y:	Y: Y: Y:
Latitude/ Longitude	Latitude 28° 20' 56.6779" N	Latitude	Latitude Latitude Latitude
	Longitude 93° 30' 06.2378" W	Longitude	Longitude Longitude Longitude

Water Depth (Feet): 182'	MD (Feet):	TVD (Feet):	MD (Feet): MD (Feet): MD (Feet):	TVD (Feet): TVD (Feet): TVD (Feet):
Anchor Radius (if applicable) in feet:				

Anchor Locations for Drilling Rig or Construction Barge (If anchor radius supplied above, not necessary)

Anchor Name or No.	Area	Block	X Coordinate	Y Coordinate	Length of Anchor Chain on Seafloor
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	

OCS PLAN INFORMATION FORM (CONTINUED)
Include one copy of this page for each proposed well/structure

Proposed Well/Structure Location

Well or Structure Name/Number (If renaming well or structure, reference previous name): Location I					Previously reviewed under an approved EP or DOCD?		Yes	X	No
Is this an existing well or structure?		Yes		No X	If this is an existing well or structure, list the Complex ID or API No.				
Do you plan to use a subsea BOP or a surface BOP on a floating facility to conduct your proposed activities?							Yes	X	No

WCD info	For wells, volume of uncontrolled blowout (Bbls/day): 18,585 bbls	For structures, volume of all storage and pipelines (Bbls): 1349 bbls	API Gravity of fluid 36°

	Surface Location	**Bottom-Hole Location (For Wells)**	**Completion (For multiple completions, enter separate lines)**
Lease No.	OCS G-14342	OCS	OCS OCS
Area Name	West Cameron		
Block No.	544		
Blockline Departures (in feet)	N/S Departure: F N L 918.71'	N/S Departure: F___ L	N/S Departure: F___ L N/S Departure: F___ L N/S Departure: F___ L
	E/W Departure: F E L 610.57'	E/W Departure: F___ L	E/W Departure: F___ L E/W Departure: F___ L E/W Departure: F___ L
Lambert X-Y coordinates	X: 1,302,292.85	X:	X: X: X:
	Y: -108,902.11	Y:	Y: Y: Y:
Latitude/ Longitude	Latitude 28° 20' 56.6771" N	Latitude	Latitude Latitude Latitude
	Longitude 93° 30' 06.3106" W	Longitude	Longitude Longitude Longitude
Water Depth (Feet): 182'		MD (Feet): / TVD (Feet):	MD (Feet): / TVD (Feet): MD (Feet): / TVD (Feet): MD (Feet): / TVD (Feet):
Anchor Radius (if applicable) in feet:			

Anchor Locations for Drilling Rig or Construction Barge (If anchor radius supplied above, not necessary)

Anchor Name or No.	Area	Block	X Coordinate	Y Coordinate	Length of Anchor Chain on Seafloor
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	

OCS PLAN INFORMATION FORM (CONTINUED)
Include one copy of this page for each proposed well/structure

Proposed Well/Structure Location

Well or Structure Name/Number (If renaming well or structure, reference previous name): Location J					Previously reviewed under an approved EP or DOCD?		Yes	X	No
Is this an existing well or structure?		Yes		No X	If this is an existing well or structure, list the Complex ID or API No.				
Do you plan to use a subsea BOP or a surface BOP on a floating facility to conduct your proposed activities?							Yes	X	No

WCD info	For wells, volume of uncontrolled blowout (Bbls/day): 18,585 bbls	For structures, volume of all storage and pipelines (Bbls): 1349 bbls	API Gravity of fluid 36°

	Surface Location	**Bottom-Hole Location (For Wells)**	**Completion (For multiple completions, enter separate lines)**
Lease No.	OCS G-14342	OCS	OCS OCS
Area Name	West Cameron		
Block No.	544		
Blockline Departures (in feet)	N/S Departure: F N 912.71' L	N/S Departure: F____ L	N/S Departure: F____ L N/S Departure: F____ L N/S Departure: F____ L
	E/W Departure: F E 610.53' L	E/W Departure: F____ L	E/W Departure: F____ L E/W Departure: F____ L E/W Departure: F____ L
Lambert X-Y coordinates	X: 1,302,292.89	X:	X: X: X:
	Y: -108,896.11	Y:	Y: Y: Y:
Latitude/ Longitude	Latitude 28° 20' 56.7365" N	Latitude	Latitude Latitude Latitude
	Longitude 93° 30' 06.3114" W	Longitude	Longitude Longitude Longitude
Water Depth (Feet): 182'		MD (Feet): / TVD (Feet):	MD (Feet): / TVD (Feet): MD (Feet): / TVD (Feet): MD (Feet): / TVD (Feet):
Anchor Radius (if applicable) in feet:			

Anchor Locations for Drilling Rig or Construction Barge (If anchor radius supplied above, not necessary)

Anchor Name or No.	Area	Block	X Coordinate	Y Coordinate	Length of Anchor Chain on Seafloor
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	

OCS PLAN INFORMATION FORM (CONTINUED)
Include one copy of this page for each proposed well/structure

Proposed Well/Structure Location

Well or Structure Name/Number (If renaming well or structure, reference previous name): Location K					Previously reviewed under an approved EP or DOCD?		Yes	X	No
Is this an existing well or structure?		Yes		No X	If this is an existing well or structure, list the Complex ID or API No.				
Do you plan to use a subsea BOP or a surface BOP on a floating facility to conduct your proposed activities?							Yes	X	No

WCD info	For wells, volume of uncontrolled blowout (Bbls/day): 18,585 bbls	For structures, volume of all storage and pipelines (Bbls): 1349 bbls	API Gravity of fluid 36°

	Surface Location	**Bottom-Hole Location (For Wells)**	**Completion (For multiple completions, enter separate lines)**
Lease No.	OCS G-14342	OCS	OCS OCS
Area Name	West Cameron		
Block No.	544		
Blockline Departures (in feet)	N/S Departure: F N L 918.67'	N/S Departure: F___ L	N/S Departure: F___ L N/S Departure: F___ L N/S Departure: F___ L
	E/W Departure: F E L 617.07'	E/W Departure: F___ L	E/W Departure: F___ L E/W Departure: F___ L E/W Departure: F___ L
Lambert X-Y coordinates	X: 1,302,286.35	X:	X: X: X:
	Y: -108,902.06	Y:	Y: Y: Y:
Latitude/ Longitude	Latitude 28° 20' 56.6763" N	Latitude	Latitude Latitude Latitude
	Longitude 93° 30' 06.3833" W	Longitude	Longitude Longitude Longitude
Water Depth (Feet): 182'		MD (Feet): / TVD (Feet):	MD (Feet): / TVD (Feet): MD (Feet): / TVD (Feet): MD (Feet): / TVD (Feet):
Anchor Radius (if applicable) in feet:			

Anchor Locations for Drilling Rig or Construction Barge (If anchor radius supplied above, not necessary)

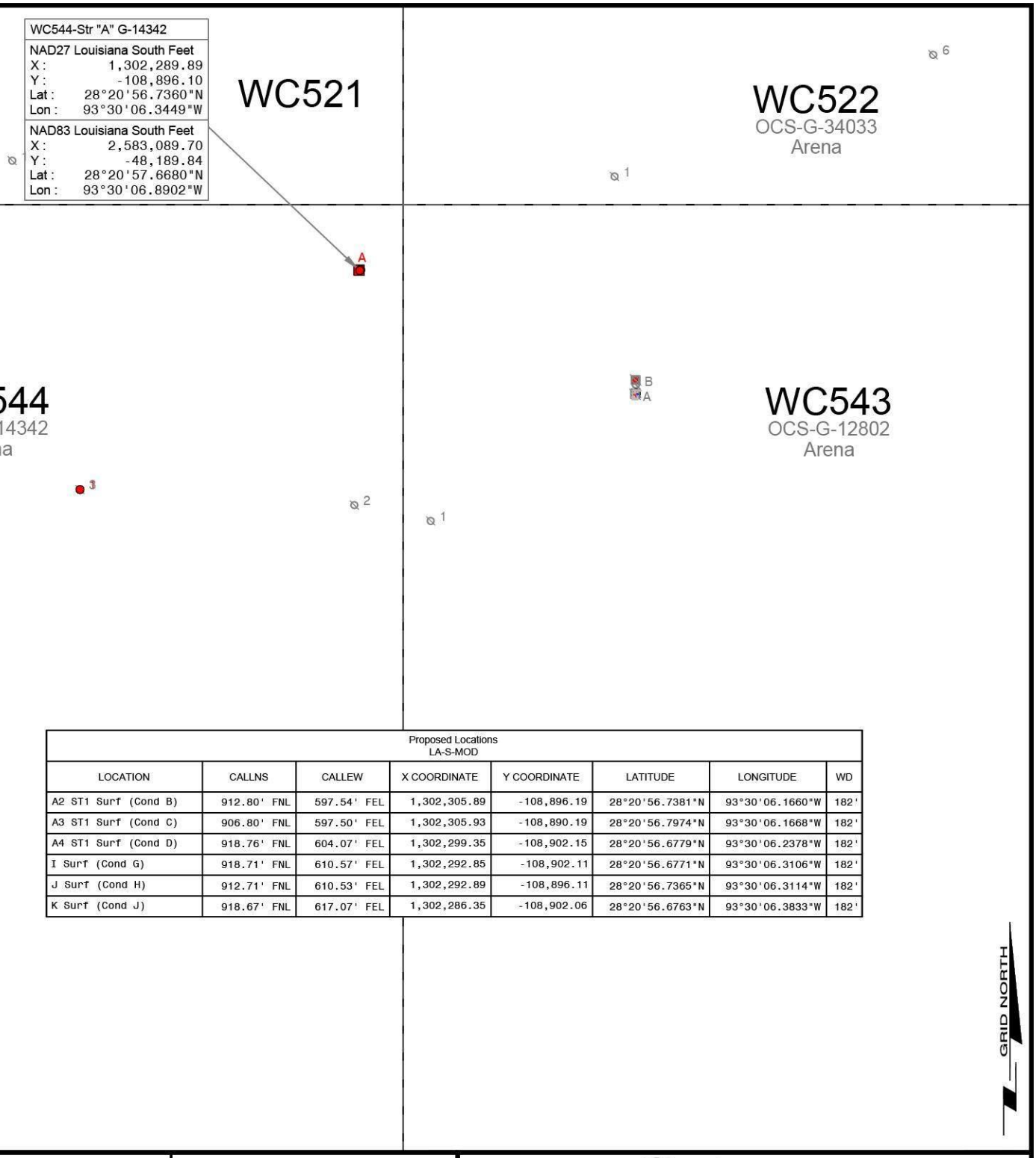
Anchor Name or No.	Area	Block	X Coordinate	Y Coordinate	Length of Anchor Chain on Seafloor
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	

West Cameron Blocks 544/543/522

(Leases OCS-G 14342/12802/34033)

Well Location Plat

Attachment B
(Public Information)



Proposed Locations
LA-S-MOD

LOCATION	CALLNS	CALLEW	X COORDINATE	Y COORDINATE	LATITUDE	LONGITUDE	WD
A2 ST1 Surf (Cond B)	912.80' FNL	597.54' FEL	1,302,305.89	-108,896.19	28°20'56.7381"N	93°30'06.1660"W	182'
A3 ST1 Surf (Cond C)	906.80' FNL	597.50' FEL	1,302,305.93	-108,890.19	28°20'56.7974"N	93°30'06.1668"W	182'
A4 ST1 Surf (Cond D)	918.76' FNL	604.07' FEL	1,302,299.35	-108,902.15	28°20'56.6779"N	93°30'06.2378"W	182'
I Surf (Cond G)	918.71' FNL	610.57' FEL	1,302,292.85	-108,902.11	28°20'56.6771"N	93°30'06.3106"W	182'
J Surf (Cond H)	912.71' FNL	610.53' FEL	1,302,292.89	-108,896.11	28°20'56.7365"N	93°30'06.3114"W	182'
K Surf (Cond J)	918.67' FNL	617.07' FEL	1,302,286.35	-108,902.06	28°20'56.6763"N	93°30'06.3833"W	182'

GRID NORTH

ARENA OFFSHORE

SUPPLEMENTAL DEVELOPMENT OPERATIONS COORDINATION DOCUMENT

OCS-G-14342 BLOCK 544
WEST CAMERON AREA
GULF OF MEXICO

PUBLIC INFORMATION

FUGRO CHANCE INC.
200 Dulles Drive Lafayette, Louisiana 70506 (337) 237-1300

Geodetic Datum: NAD27
Projection: LOUISIANA SOUTH
Grid Units: US SURVEY FEET

SCALE 1:24000 0 2000 FEET

Job No.: 1600318 | Date: 5/19/2016 | Drwn: BCN | Chart: 1 Of: 1

DWG File: H:\2016\1600318\GIS\1600...\WC544-522-543_SDOCD

5/19/2016

West Cameron Blocks 544/543/522

(Leases OCS-G 14342/12802/34033)

Geological Description

Attachment C
(Proprietary Information)

West Cameron Blocks 544/543/522

(Leases OCS-G 14342/12802/34033)

Structure Contour Maps

Attachment D
(Proprietary Information)

West Cameron Blocks 544/543/522

(Leases OCS-G 14342/12802/34033)

Interpreted 2-D and/or Seismic Lines

Attachment E
(Proprietary Information)

West Cameron Blocks 544/543/522

(Leases OCS-G 14342/12802/34033)

Geological Structure Cross-Section Maps

Attachment F
(Proprietary Information)

West Cameron Blocks 544/543/522

(Leases OCS-G 14342/12802/34033)

Stratigraphic Columns

Attachment G
(Proprietary Information)

West Cameron Blocks 544/543/522

(Leases OCS-G 14342/12802/34033)

NOAA Threatened/Endangered Species

Attachment H
(Public Information)

NOAA FISHERIES
Southeast Region
Protected Resources Division

Gulf of Mexico's Threatened and Endangered Species

For more information on listed species please visit:
http://www.nmfs.noaa.gov/pr/species/esa/listed.htm
http://sero.nmfs.noaa.gov/protected_resources/index.html

Marine Mammal Species	Scientific Name	Status
fin whale	*Balaenoptera physalus*	Endangered
humpback whale	*Megaptera novaeangliae*	Endangered
sei whale	*Balaenoptera borealis*	Endangered
sperm whale	*Physeter macrocephalus*	Endangered
Sea Turtle Species		
green sea turtle	*Chelonia mydas*	Threatened[1]
hawksbill sea turtle	*Eretmochelys imbricata*	Endangered
Kemp's ridley sea turtle	*Lepidochelys kempii*	Endangered
leatherback sea turtle	*Dermochelys coriacea*	Endangered
loggerhead sea turtle	*Caretta caretta*	Threatened[2]
Fish Species		
Gulf sturgeon	*Acipenser oxyrinchus desotoi*	Threatened
smalltooth sawfish	*Pristis pectinata*	Endangered
Invertebrate Species		
lobed star coral	*Orbicella annularis*	Threatened
mountainous star coral	*Orbicella faveolata*	Threatened
boulder star coral	*Orbicella franksi*	Threatened
elkhorn coral	*Acropora palmata*	Threatened[3]

Critical Habitat Designations

For final rules, maps, and GIS data please visit:
http://sero.nmfs.noaa.gov/maps_gis_data/protected_resources/critical_habitat/index.html

Loggerhead sea turtle: There are 38 designated marine areas that occur throughout the Southeast Region.

Gulf sturgeon: There are 14 marine and estuarine units located in Northwest Florida, Alabama, Mississippi, and eastern Louisiana.

Smalltooth sawfish: There are two habitat units located in Charlotte Harbor and in the Ten Thousand Islands/Everglades, Florida.

[1] Florida's breeding population is listed as endangered.
[2] Northwest Atlantic distinct population segment.
[3] Colonies located at Flower Garden Banks National Marine Sanctuary.

NOAA FISHERIES
Southeast Region
Protected Resources Division

Species Proposed for Listing Under the Endangered Species Act

Federal action agencies are encouraged to include species proposed for listing under the Endangered Species Act (ESA) in their Section 7 consultation requests. Species that are proposed for listing are those which have been found to warrant federal protection under the ESA, but a final rule formally listing the species has not yet published. By including these species in your Section 7 consultation, reinitiating consultation after the ESA listing is finalized may not be necessary.

For more information on species proposed for listing under the ESA, please visit:
http://www.nmfs.noaa.gov/pr/species/esa/candidate.htm#proposed

West Cameron Blocks 544/543/522

(Leases OCS-G 14342/12802/34033)

Waste Tables

Attachment I
(Public Information)

TABLE 1. WASTES YOU WILL GENERATE, TREAT AND DOWNHOLE DISPOSE OR DISCHARGE TO THE GOM

please specify if the amount reported is a total or per well amount

Projected generated waste			Projected ocean discharges		Projected Downhole Disposal
Type of Waste and Composition	Composition	Projected Amount	Discharge rate	Discharge Method	Answer yes or no
Will drilling occur ? If yes, you should list muds and cuttings					
Water-based drilling fluid	barite, additives	3125 bbls/well	130 bbls/day/well	discharge overboard	No
Cuttings wetted with water-based fluid	water-based fluids	1355 bbls/well	56 bbls/day/well	discharge overboard	No
Cuttings wetted with synthetic-based fluid	Cuttings generated while using synthetic based drilling fluid.	NA	NA	NA	NA
Brine	Brine	10,000 bbls total	<1000 bbl/hr	discharge overboard	
Will humans be there? If yes, expect conventional waste					
Domestic waste (kitchen water, shower water)	grey water	30 gal/person/day	NA	Remove floating solids and discharge	No
Sanitary waste (toilet water)	treated sanitary waste	20 gal/person/day	NA	Chlorinate and discharge	No
Is there a deck? If yes, there will be Deck Drainage					
Deck Drainage	wash water and rainwater	1000 bbl (dependent on rainfall)	15 bbl/hr	discharge overboard	No
Will you conduct well treatment, completion, or workover?					
well treatment fluids	NA	NA	NA	NA	NA
well completion fluids	Calcium Chloride	200 bbls/well	25 bbls/hr (1 day per well)	NA	NA
workover fluids	NA	NA	NA	NA	NA
Miscellaneous discharges. If yes, only fill in those associated with your activity.					
Desalinization unit discharge	NA	NA	NA	NA	NA
Blowout prevent fluid	NA	NA	NA	NA	NA
Ballast water	NA	NA	NA	NA	NA
Bilge water	NA	NA	NA	NA	NA
Excess cement at seafloor	NA	NA	NA	NA	NA
Fire water	NA	NA	NA	NA	NA
Cooling water	NA	NA	NA	NA	NA
Will you produce hydrocarbons? If yes fill in for produced water.					
Produced water	formation water	65,000 to 70,000/month	2170 bbls/day	discharge overboard	No

Will you be covered by an individual or general NPDES permit ?	**GENERAL PERMIT**	GMG290269

TABLE 2. WASTES YOU WILL TRANSPORT AND /OR DISPOSE OF ONSHORE

please specify whether the amount reported is a total or per wel

Projected generated waste		Solid and Liquid Wastes transportation	Waste Disposal		
Type of Waste	**Composition**	**Transport Method**	**Name/Location of Facility**	**Amount**	**Disposal Method**
Will drilling occur ? If yes, fill in the muds and cuttings.					
Oil-based drilling fluid or mud	NA	NA	NA	NA	NA
Synthetic-based drilling fluid or mud	NA	NA	NA	NA	NA
Cuttings wetted with Water-based fluid	NA	NA	NA	NA	NA
Cuttings wetted with Synthetic-based fluid	NA	NA	NA	NA	NA
Cuttings wetted with oil-based fluids	NA	NA	NA	NA	NA
Will you produce hydrocarbons? If yes fill in for produced sand.					
Produced sand	NA	NA	NA	NA	NA
Will you have additional wastes that are not permitted for discharge? If yes, fill in the appropriate rows.					
trash and debris	trash and debris	storage bins on supply boat	Halliburton McCall Dock, Cameron, LA	500 cu ft total	landfill
used oil	NA	drums on supply boat	NA	NA	NA
wash water	NA	NA	NA	NA	NA
chemical product wastes	NA	NA	NA	NA	NA

West Cameron Blocks 544/543/522

(Leases OCS-G 14342/12802/34033)

Air Quality Emissions Report

Attachment J
(Public Information)

DOCD AIR QUALITY SCREENING CHECKLIST

OMB Control No. 1010-0151
OMB Approval Expires: 03/31/2018

COMPANY	Arena Offshore, LP
AREA	West Cameron
BLOCK	544/543/522
LEASE	OCS-G 14342/G-12802/G34033
PLATFORM	A
RIG	Jack-Up
WELL	A2, A3, A4, Locations I-K
COMPANY CONTACT	Aimee P. Deady
TELEPHONE NO.	281-210-3180
REMARKS	Sidetrack drill/drill, complete, and produce the 6 wells

LEASE TERM PIPELINE CONSTRUCTION INFORMATION:		
YEAR	NUMBER OF PIPELINES	TOTAL NUMBER OF CONSTRUCTION DAYS
2016		None
2017		
2018		
2019		
2020		
2021		
2022		
2023		
2024		
2025		

AIR EMISSIONS CUMPUTATION FACTORS

Fuel Usage Conversion Factors	Natural Gas Turbines		Natural Gas Engines		Diesel Recip. Engine		REF.	DATE
	SCF/hp-hr	9.524	SCF/hp-hr	7.143	GAL/hp-hr	0.0483	AP42 3.2-1	4/76 & 8/84

Equipment/Emission Factors	units	PM	SOx	NOx	VOC	CO	REF.	DATE
NG Turbines	gms/hp-hr		0.00247	1.3	0.01	0.83	AP42 3.2-1& 3.1-1	10/96
NG 2-cycle lean	gms/hp-hr		0.00185	10.9	0.43	1.5	AP42 3.2-1	10/96
NG 4-cycle lean	gms/hp-hr		0.00185	11.8	0.72	1.6	AP42 3.2-1	10/96
NG 4-cycle rich	gms/hp-hr		0.00185	10	0.14	8.6	AP42 3.2-1	10/96
Diesel Recip. < 600 hp.	gms/hp-hr	1	1.468	14	1.12	3.03	AP42 3.3-1	10/96
Diesel Recip. > 600 hp.	gms/hp-hr	0.32	1.468	11	0.33	2.4	AP42 3.4-1	10/96
Diesel Boiler	lbs/bbl	0.084	2.42	0.84	0.008	0.21	AP42 1.3-12,14	9/98
NG Heaters/Boilers/Burners	lbs/mmscf	7.6	0.593	100	5.5	84	P42 1.4-1, 14-2, & 14	7/98
NG Flares	lbs/mmscf		0.593	71.4	60.3	388.5	AP42 11.5-1	9/91
Liquid Flaring	lbs/bbl	0.42	6.83	2	0.01	0.21	AP42 1.3-1 & 1.3-3	9/98
Tank Vapors	lbs/bbl				0.03		E&P Forum	1/93
Fugitives	lbs/hr/comp.				0.0005		API Study	12/93
Glycol Dehydrator Vent	lbs/mmscf				6.6		La. DEQ	1991
Gas Venting	lbs/scf				0.0034			

Sulphur Content Source	Value	Units
Fuel Gas	3.33	ppm
Diesel Fuel	0.4	% weight
Produced Gas(Flares)	3.33	ppm
Produced Oil (Liquid Flaring)	1	% weight

Screening Questions for DOCD's	Yes	No
Is any calculated Complex Total (CT) Emission amount (in tons) associated with your proposed exploration activities more than 90% of the amounts calculated using the following formulas: CT = $3400D^{2/3}$ for CO, and CT = 33.3D for the other air pollutants (where D = distance to shore in miles)?		X
Does your emission calculations include any emission reduction measures or modified emission factors?		X
Does or will the facility complex associated with your proposed development and production activities process production from eight or more wells?	X	
Do you expect to encounter H_2S at concentrations greater than 20 parts per million (ppm)?		X
Do you propose to flare or vent natural gas in excess of the criteria set forth under 250.1105(a)(2) and (3)?		X
Do you propose to burn produced hydrocarbon liquids?		X
Are your proposed development and production activities located within 25 miles from shore?		X
Are your proposed development and production activities located within 200 kilometers of the Breton Wilderness Area?		X

Air Pollutant		Plan Emission Amounts[1] (tons)	Calculated Exemption Amounts[2] (tons)		Calculated Complex Total Emission Amounts[3] (tons)
Carbon monoxide (CO)		240.48	70290.64		NA
Particulate matter (PM)		31.16	3130.2		NA
Sulphur dioxide (SO_2)		139.66	3130.2		NA
Nitrogen oxides (NOx)		1067.47	3130.2		NA
Volatile organic compounds (VOC)		34.51	3130.2		NA

[1] For activities proposed in your EP or DOCD, list the projected emissions calculated from the worksheets.

[2] List the exemption amounts in your proposed activities calculated using the formulas in 30 CFR 250.303(d).

[3] List the complex total emissions associated with your proposed activities calculated from the worksheets.

AIR EMISSIONS CALCULATIONS - FIRST YEAR

COMPANY	AREA	BLOCK	LEASE	PLATFORM	WELL		CONTACT	PHONE	REMARKS
Arena Offshore, LP	West Cameron	544/543/522	OCS-G 14342/G	A	A2, A3, A4, Locations I-K		Aimee P Deady	281-210-3180	#REF!

OPERATIONS	EQUIPMENT	RATING	MAX. FUEL	ACT. FUEL	RUN TIME		MAXIMUM POUNDS PER HOUR					ESTIMATED TONS				
	Diesel Engines	HP	GAL/HR	GAL/D												
	Nat. Gas Engines	HP	SCF/HR	SCF/D												
	Burners	MMBTU/HR	SCF/HR	SCF/D	HR/D	DAYS	PM	SOx	NOx	VOC	CO	PM	SOx	NOx	VOC	CO
DRILLING	PRIME MOVER>600hp diesel	16975	819.8925	19677.42	24	31	11.96	54.89	411.29	12.34	89.74	4.45	20.42	153.00	4.59	33.38
	PRIME MOVER>600hp diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	PRIME MOVER>600hp diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	PRIME MOVER>600hp diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	BURNER diesel	0			0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	AUXILIARY EQUIP<600hp diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS>600hp diesel(crew)	2600	125.58	3013.92	8	16	1.83	8.41	63.00	1.89	13.74	0.12	0.54	4.03	0.12	0.88
	VESSELS>600hp diesel(supply)	2600	125.58	3013.92	8	8	1.83	8.41	63.00	1.89	13.74	0.06	0.27	2.02	0.06	0.44
	VESSELS>600hp diesel(tugs)	4600	222.18	5332.32	12	1	3.24	14.87	111.45	3.34	24.32	0.02	0.09	0.67	0.02	0.15
PIPELINE INSTALLATION	PIPELINE LAY BARGE diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SUPPORT VESSEL diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	PIPELINE BURY BARGE diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SUPPORT VESSEL diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS>600hp diesel(crew)	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS>600hp diesel(supply)	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FACILITY INSTALLATION	DERRICK BARGE diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MATERIAL TUG diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS>600hp diesel(crew)	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS>600hp diesel(supply)	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PRODUCTION	RECIP.<600hp diesel (Crane)	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	RECIP.>600hp diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SUPPORT VESSEL diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SUPPORT VESSEL diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	TURBINE nat gas (Compressor)	0	0	0.00	0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00
	TURBINE nat gas (Compressor)	0	0	0.00	0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00
	TURBINE nat gas (Compressor)	0	0	0.00	0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00
	RECIP.2 cycle lean nat gas	0	0	0.00	0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00
	RECIP.4 cycle lean nat gas	0	0	0.00	0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00
	RECIP.4 cycle rich nat gas	0	0	0.00	0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00
	BURNER nat gas (Heater Treater)	0	0.00	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MISC.	BPD	SCF/HR	COUNT												
	TANK-	0			0	0				0.00					0.00	
	FLARE-		0		0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00
	PROCESS VENT-		0		0	0				0.00					0.00	
	FUGITIVES-			0.0		0				0.00					0.00	
	GLYCOL STILL VENT-		0		0	0				0.00					0.00	
DRILLING WELL TEST	OIL BURN	0			0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	GAS FLARE		0		0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00
2016	YEAR TOTAL						18.87	86.58	648.73	19.46	141.54	4.65	21.31	159.72	4.79	34.85
EXEMPTION CALCULATION	DISTANCE FROM LAND IN MILES											3130.20	3130.20	3130.20	3130.20	70290.64
	94.0															

AIR EMISSIONS CALCULATIONS - SECOND YEAR

COMPANY	AREA	BLOCK	LEASE	PLATFORM	WELL		CONTACT	PHONE	REMARKS
Arena Offshore, LP	West Cameron	544/543/522	OCS-G 14342/G	A	A2, A3, A4, Locations I-K		Aimee P Deady	281-210-3180	#REF!

OPERATIONS	EQUIPMENT	RATING	MAX. FUEL	ACT. FUEL	RUN TIME		MAXIMUM POUNDS PER HOUR					ESTIMATED TONS				
	Diesel Engines	HP	GAL/HR	GAL/D												
	Nat. Gas Engines	HP	SCF/HR	SCF/D												
	Burners	MMBTU/HR	SCF/HR	SCF/D	HR/D	DAYS	PM	SOx	NOx	VOC	CO	PM	SOx	NOx	VOC	CO
DRILLING	PRIME MOVER>600hp diesel	16975	819.8925	19677.42	24	197	11.96	54.89	411.29	12.34	89.74	28.28	129.76	972.29	29.17	212.14
	PRIME MOVER>600hp diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	PRIME MOVER>600hp diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	PRIME MOVER>600hp diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	BURNER diesel	0			0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	AUXILIARY EQUIP<600hp diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS>600hp diesel(crew)	2600	125.58	3013.92	8	112	1.83	8.41	63.00	1.89	13.74	0.82	3.77	28.22	0.85	6.16
	VESSELS>600hp diesel(supply)	2600	125.58	3013.92	8	56	1.83	8.41	63.00	1.89	13.74	0.41	1.88	14.11	0.42	3.08
	VESSELS>600hp diesel(tugs)	4600	222.18	5332.32	12	1	3.24	14.87	111.45	3.34	24.32	0.02	0.09	0.67	0.02	0.15
PIPELINE INSTALLATION	PIPELINE LAY BARGE diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SUPPORT VESSEL diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	PIPELINE BURY BARGE diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SUPPORT VESSEL diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS>600hp diesel(crew)	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS>600hp diesel(supply)	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FACILITY INSTALLATION	DERRICK BARGE diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MATERIAL TUG diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS>600hp diesel(crew)	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS>600hp diesel(supply)	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PRODUCTION	RECIP.<600hp diesel (Crane)	80	3.864	92.74	2	102	0.18	0.26	2.47	0.20	0.53	0.02	0.03	0.25	0.02	0.05
PRODUCTION	RECIP.<600hp diesel (BackUpGen #2)	220	10.626	255.02	12	358	0.48	0.71	6.78	0.54	1.47	1.04	1.53	14.57	1.17	3.15
	RECIP>600hp diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SUPPORT VESSEL diesel (supply)	2600	125.58	3013.92	12	51	1.83	8.41	63.00	1.89	13.74	0.56	2.57	19.28	0.58	4.21
	TURBINE nat gas (Compressor)	1250	11905	285720.00	24	358		0.01	3.58	0.03	2.29		0.03	15.38	0.12	9.82
	TURBINE nat gas (Generator #1)	220	2095.28	50286.72	24	358		0.00	0.63	0.00	0.40		0.01	2.71	0.02	1.73
	RECIP.2 cycle lean nat gas	0	0	0.00	0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00
	RECIP.4 cycle lean nat gas	0	0	0.00	0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00
	RECIP.4 cycle rich nat gas	0	0	0.00	0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00
	MISC.	BPD	SCF/HR	COUNT												
	TANK-	200			24	358				0.25					1.07	
	FLARE-		0		0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00
	PROCESS VENT-		0		0	0				0.00					0.00	
	FUGITIVES-			500.0		358				0.25					1.07	
	GLYCOL STILL VENT-		0		0	0				0.00					0.00	
DRILLING WELL TEST	OIL BURN	0			0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	GAS FLARE		0		0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00
2017	YEAR TOTAL						21.37	95.96	725.19	22.62	159.98	31.16	139.66	1067.47	34.51	240.48
EXEMPTION CALCULATION	DISTANCE FROM LAND IN MILES											3130.20	3130.20	3130.20	3130.20	70290.64
	94.0															

AIR EMISSIONS CALCULATIONS - THIRD YEAR

COMPANY	AREA	BLOCK	LEASE	PLATFORM	WELL		CONTACT	PHONE	REMARKS
Arena Offshore, LP	West Cameron	544/543/522	OCS-G 14342/G	A	A2, A3, A4, Locations I-K		Aimee P Deady	281-210-3180	#REF!

OPERATIONS	EQUIPMENT	RATING	MAX. FUEL	ACT. FUEL	RUN TIME		MAXIMUM POUNDS PER HOUR					ESTIMATED TONS				
	Diesel Engines	HP	GAL/HR	GAL/D												
	Nat. Gas Engines	HP	SCF/HR	SCF/D												
	Burners	MMBTU/HR	SCF/HR	SCF/D	HR/D	DAYS	PM	SOx	NOx	VOC	CO	PM	SOx	NOx	VOC	CO
DRILLING	PRIME MOVER>600hp diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	PRIME MOVER>600hp diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	PRIME MOVER>600hp diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	PRIME MOVER>600hp diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	BURNER diesel	0			0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	AUXILIARY EQUIP<600hp diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS>600hp diesel(crew)	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS>600hp diesel(supply)	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS>600hp diesel(tugs)	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PIPELINE INSTALLATION	PIPELINE LAY BARGE diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SUPPORT VESSEL diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	PIPELINE BURY BARGE diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SUPPORT VESSEL diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS>600hp diesel(crew)	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS>600hp diesel(supply)	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FACILITY INSTALLATION	DERRICK BARGE diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MATERIAL TUG diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS>600hp diesel(crew)	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS>600hp diesel(supply)	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PRODUCTION	RECIP.<600hp diesel (Crane)	80	3.864	92.74	2	102	0.18	0.26	2.47	0.20	0.53	0.02	0.03	0.25	0.02	0.05
	RECIP.<600hp diesel (BackUpGen #2)	220	10.626	255.02	12	365	0.48	0.71	6.78	0.54	1.47	1.06	1.56	14.86	1.19	3.22
	RECIP>600hp diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SUPPORT VESSEL diesel (supply)	2600	125.58	3013.92	12	52	1.83	8.41	63.00	1.89	13.74	0.57	2.62	19.65	0.59	4.29
	TURBINE nat gas (Compressor)	1250	11905	285720.00	24	365		0.01	3.58	0.03	2.29		0.03	15.68	0.12	10.01
	TURBINE nat gas (Generator #1)	220	2095.28	50286.72	24	365		0.00	0.63	0.00	0.40		0.01	2.76	0.02	1.76
	RECIP.2 cycle lean nat gas	0	0	0.00	0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00
	RECIP.4 cycle lean nat gas	0	0	0.00	0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00
	RECIP.4 cycle rich nat gas	0	0	0.00	0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00
	MISC.	**BPD**	**SCF/HR**	**COUNT**												
	TANK-	200			24	365				0.25					1.10	
	FLARE-		0		0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00
	PROCESS VENT-		0		0	0				0.00					0.00	
	FUGITIVES-			500.0		365				0.25					1.10	
	GLYCOL STILL VENT-		0		0	0				0.00					0.00	
DRILLING WELL TEST	OIL BURN	0			0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	GAS FLARE		0		0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00
2018	**YEAR TOTAL**						**2.49**	**9.39**	**76.46**	**3.16**	**18.43**	**1.65**	**4.24**	**53.20**	**4.13**	**19.33**
EXEMPTION CALCULATION	**DISTANCE FROM LAND IN MILES**											**3130.20**	**3130.20**	**3130.20**	**3130.20**	**70290.64**
	94.0															

AIR EMISSIONS CALCULATIONS

COMPANY	AREA	BLOCK	LEASE	PLATFORM	WELL
Arena Offshore,	West Cameron	544/543/522	OCS-G 14342/G-1280	A	A2, A3, A4, Locations I

Year	Emitted Substance				
	PM	SOx	NOx	VOC	CO
2016	4.65	21.31	159.72	4.79	34.85
2017	31.16	139.66	1067.47	34.51	240.48
2018	1.65	4.24	53.20	4.13	19.33
2019	1.65	4.24	53.20	4.13	19.33
2020	1.65	4.24	53.20	4.13	19.33
2021	1.65	4.24	53.20	4.13	19.33
2022	1.65	4.24	53.20	4.13	19.33
2023	1.65	4.24	53.20	4.13	19.33
2024	1.65	4.24	53.20	4.13	19.33
2025	1.65	4.24	53.20	4.13	19.33
Allowable	3130.20	3130.20	3130.20	3130.20	70290.64

West Cameron Blocks 544/543/522

(Leases OCS-G 14342/12802/34033)

Oil Spill Response Discussion

Attachment K
(Public Information)

SPILL RESPONSE DISCUSSION

For the purpose of NEPA and Coastal Zone Management Act analysis, the largest spill volume originating from the proposed activity would be a well blowout during drilling operations, estimated to be 18,585 barrels of crude oil with an API gravity of 36°.

Land Segment and Resource Identification

Trajectories of a spill and the probability of it impacting a land segment have been projected utilizing information in the BOEM Oil Spill Risk Analysis Model (OSRAM) for the Central and Western Gulf of Mexico available on the BOEM website. The results are shown in **Figure 1.** The BOEM OSRAM identifies a 12% probability of impact to the shorelines of Galveston County, Texas within 30 days. Galveston County includes the Gulf Beach from the west end of Galveston Island at Texas Highway 3005 to the east coast of High Island at the Jefferson County line. Habitats include marshes at the west end of Seawall Boulevard and on the east end of the island and open beaches and avian feeding areas all along the coastline, including a National Audubon Society Sanctuary. The waters of Galveston Bay are classified as an EPA National Estuary.

Response

Arena Offshore, LP will make every effort to respond to the Worst Case Discharge as effectively as practicable. A description of the response equipment under contract to contain and recover the Worst Case Discharge is shown in **Figure 2.**

Using the estimated chemical and physical characteristics of crude oil, an ADIOS weathering model was run on a similar product from the ADIOS oil database. The results indicate 36% or approximately 6,691 barrels of crude oil would be evaporated/dispersed within 24 hours, with approximately 11,894 barrels remaining.

Spill Response WC 544, Location I	**Barrels of Oil**
WCD Volume	18,585
Less 36% natural evaporation/dispersion	6,691
Remaining volume	11,894

Figure 2 outlines equipment, personnel, materials and support vessels as well as temporary storage equipment available to respond to the worst case discharge. The volume accounts for the amount remaining after evaporation/dispersion at 24 hours. The list estimates individual times needed for procurement, load out, travel time to the site and deployment. **Figure 2** also indicates how operations will be supported.

Arena Offshore, LP's Oil Spill Response Plan includes alternative response technologies such as dispersants and in-situ burn. Strategies will be decided by Unified Command based on an operations safety analysis, the size of the spill, weather and potential impacts. If aerial

dispersants are utilized, 8 sorties (9,600 gallons) from two of the DC-3 aircrafts and 4 sorties (8,000 gallons) from the Basler aircraft would provide a daily dispersant capability of 7,540 barrels. If the conditions are favorable for in-situ burning, the proper approvals have been obtained and the proper planning is in place, in-situ burning of oil may be attempted. Slick containment boom would be immediately called out and on-scene as soon as possible. Offshore response strategies may include attempting to skim utilizing CGA spill response equipment, with a total derated skimming capacity of 107,672 barrels. Temporary storage associated with skimming equipment equals 4,449 barrels. If additional storage is needed, a 47,000 barrel storage barge and three 20,000 barrel storage barges may be mobilized and centrally located to provide temporary storage and minimize off-loading time. **Safety is first priority. Air monitoring will be accomplished and operations deemed safe prior to any containment/skimming attempts.**

If the spill went unabated, shoreline impact in Galveston County, Texas would depend upon existing environmental conditions. Shoreline protection would include the use of CGA's near shore and shallow water skimmers with a totaled derated skimming capacity of 20,655 barrels. Temporary storage associated with skimming equipment equals 185 barrels. If additional storage is needed, a 23,000 barrel storage barge may be mobilized and centrally located to provide temporary storage allowing the skimmers to stay in the area of operations as much as possible. Onshore response may include the deployment of shoreline boom on beach areas, or protection and sorbent boom on vegetated areas. A Master Service Agreement with Miller Environmental will ensure access to 68,000 feet of 18" shoreline protection boom. **Figure 2** outlines individual times needed for procurement, load out, travel time to the site and deployment. Strategies would be based upon surveillance and real time trajectories that depict areas of potential impact given actual sea and weather conditions. Applicable Area Contingency Plans (ACPs), Geographic Response Plans (GRPs), and Unified Command would be consulted to ensure that environmental and special economic resources would be correctly identified and prioritized to ensure optimal protection. Shoreline protection strategies depict the protection response modes applicable for oil spill clean-up operations. Each response mode is schematically represented to show optimum deployment and operation of the equipment in areas of environmental concern. Supervisory personnel have the option to modify the deployment and operation of equipment allowing a more effective response to site-specific circumstances. Arena Offshore, LP's contract Spill Management Team has access to the applicable ACP(s) and GRP(s).

Based on the anticipated worst case discharge scenario, Arena Offshore, LP can be onsite with contracted oil spill recovery equipment with adequate response capacity to contain and recover surface hydrocarbons, and prevent land impact, to the maximum extent practicable, within an estimated 60 hours (based on the equipment's Effective Daily Recovery Capacity (EDRC)).

Initial Response Considerations

Actual actions taken during an oil spill response will be based on many factors to include but not be limited to:

- Weather
- Equipment and materials availability
- Ocean currents and tides
- Location of the spill
- Product spilled
- Amount spilled
- Environmental risk assessments
- Trajectory and product analysis
- Well status, i.e., shut in or continual release

Arena Offshore, LP will take action to provide a safe, aggressive response to contain and recover as much of the spilled oil as quickly as it is safe to do so. In an effort to protect the environment, response actions will be designed to provide an "in-depth" protection strategy meant to recover as much oil as possible as far from environmentally sensitive areas as possible. Safety will take precedence over all other considerations during these operations.

Coordination of response assets will be supervised by the designation of a SIMOPS group as necessary for close quarter vessel response activities. Most often, this group will be used during source control events that require a significant number of large vessels operating independently, but in coordination to complete a common objective, in a small area and in close coordination and support of each other. This group must also monitor the subsurface activities of each vessel (ROV, dispersant application, well control support, etc.). The SIMOPS group leader reports to the Source Control Section Chief.

In addition, these activities will be monitored by the spill management team (SMT) and Unified Command via a structured Common Operating Picture (COP) established to track resource and slick movement in real time.

Upon notification of a spill, the following actions will be taken:

- Information will be confirmed
- An assessment will be made and initial objectives set
- OSROs and appropriate agencies will be notified
- ICS 201, Initial Report Form completed
- Initial Safety plan will be written and published
- Unified Command will be established
    - Overall safety plan developed to reflect the operational situation and coordinated objectives
    - Areas of responsibility established for Source Control and each surface operational site
    - On-site command and control established

Offshore Response Actions

Equipment Deployment

Surveillance

- Surveillance Aircraft: within two hours of QI notification, or at first light
- Provide trained observer to provide on site status reports
- Provide command and control platform at the site if needed
- Continual surveillance of oil movement by remote sensing systems, aerial photography and visual confirmation
- Continual monitoring of vessel assets using vessel monitoring systems

Dispersant application assets

- Put ASI on standby
- With the FOSC, conduct analysis to determine appropriateness of dispersant application (refer to Section 18)
- Gain FOSC approval for use of dispersants on the surface
- Deploy aircraft in accordance with a plan developed for the actual situation
- Coordinate movement of dispersants, aircraft, and support equipment and personnel
- Confirm dispersant availability for current and long range operations
- Start ordering dispersant stocks required for expected operations

Containment boom

- Call out early and expedite deployment to be on scene ASAP
- Ensure boom handling and mooring equipment is deployed with boom
- Provide continuing reports to vessels to expedite their arrival at sites that will provide for their most effective containment
- Use Vessels of Opportunity (VOO) to deploy and maintain boom

Oceangoing Boom Barge

- Containment at the source
- Increased/enhanced skimmer encounter rate
- Protection booming

In-situ Burn assets

- Determine appropriateness of in-situ burn operation in coordination with the FOSC and affected SOSC
- Determine availability of fire boom and selected ignition systems
- Start ordering fire boom stocks required for expected operations
- Contact boom manufacturer to provide training & tech support for operations, if required
- Determine assets to perform on water operation
- Build operations into safety plan
- Conduct operations in accordance with an approved plan
- Initial test burn to ensure effectiveness

Dedicated off-shore skimming systems
General

- Deployed to the highest concentration of oil
- Assets deployed at safe distance from aerial dispersant and in-situ burn operations

CGA HOSS Barge

- Use in areas with heaviest oil concentrations
- Consider for use in areas of known debris (seaweed, and other floating materials)

CGA 95' Fast Response Vessels (FRVs)

- Designed to be a first vessel on scene
- Capable of maintaining the initial Command and Control function for on water recovery operations
- 24 hour oil spill detection capability
- Highly mobile and efficient skimming capability
- Use as far off-shore as safely possible

CGA FRUs

- To the area of the thickest oil
- Use as far off-shore as allowed
- VOOs 140' – 180' in length
- VOOs with minimum of 18' x 38' or 23' x 50' of optimum deck space
- VOOs in shallow water should have a draft of <10 feet when fully loaded

T&T Koseq Skimming Systems

- To the area of the thickest oil
- Use as far off-shore as allowed
- VOOs with a minimum of 2,000 bbls storage capacity
- VOOs at least 200' in length
- VOOs with deck space of 100' x 40' to provide space for arms, tanks, and crane
- VOOs for shallow water should be deck barges with a draft of <10 feet when fully loaded

Storage Vessels

- Establish availability of CGA contracted assets (See Appendix E)
- Early call out (to allow for tug boat acquisition and deployment speeds)
- Phase mobilization to allow storage vessels to arrive at the same time as skimming systems
- Position as closely as possible to skimming assets to minimize offloading time

Vessels of Opportunity (VOO)

- Use Arena Offshore, LP's contracted resources as applicable
- Industry vessels are ideal for deployment of Vessel of Opportunity Skimming Systems (VOSS)
- Acquire additional resources as needed
- Consider use of local assets, i.e. fishing and pleasure craft for ISB operations or boom tending
- Expect mission specific and safety training to be required
- Plan with the US Coast Guard for vessel inspections
- Place VOOs in Division or Groups as needed
- Use organic on-board storage if appropriate
- Maximize non-organic storage appropriate to vessel limitations
- Decant as appropriate after approval to do so has been granted
- Assign bulk storage barges to each Division/Group
- Position bulk storage barges as close to skimming units as possible
- Utilize large skimming vessel (e.g. barges) storage for smaller vessel offloading
- Maximize skimming area (swath) to the optimum width given sea conditions and available equipment
- Maximize use of oleophilic skimmers in all operations, but especially offshore
- Nearshore, use shallow water barges and shuttle to skimming units to minimize offloading time
- Plan and equip to use all offloading capabilities of the storage vessel to minimize offloading time

Adverse Weather Operations:

In adverse weather, when seas are $\geq$ 3 feet, the use of larger recovery and storage vessels, oleophilic skimmers, and large offshore boom will be maximized. KOSEQ Arm systems are built for rough conditions, and they should be used until their operational limit (9.8' seas) is met. Safety will be the overriding factor in all operations and will cease at the order of the Unified Command, vessel captain, or in an emergency, "stop work" may be directed by any crew member.

Surface Oil Recovery Considerations and Tactics
(Offshore and Near-shore Operations)

Maximization of skimmer-oil encounter rate

- Place barges in skimming task forces, groups, etc., to reduce recovered oil offloading time
- Place barges alongside skimming systems for immediate offloading of recovered oil when practicable
- Use two vessels, each with heavy sea boom, in an open-ended "V" configuration to funnel surface oil into a trailing skimming unit's organic, V-shaped boom and skimmer (see page 7, *CGA Equipment Guide Book and Tactic Manual* (CGATM)

- Use secondary vessels and heavy sea boom to widen boom swath beyond normal skimming system limits (see page 15, CGATM)
- Consider night-time operations, first considering safety issues
- Utilize all available advanced technology systems (IR, X-Band Radar, etc.) to determine the location of, and move to, recoverable oil
- Confirm the presence of recoverable oil prior to moving to a new location

Maximize skimmer system efficiency

- Place weir skimming systems in areas of calm seas and thick oil
- Maximize the use of oleophilic skimming systems in heavier seas
- Place less mobile, high EDRC skimming systems (e.g. HOSS Barge) in the largest pockets of the heaviest oil
- Maximize onboard recovered oil storage for vessels.
- Obtain authorization for decanting of recovered water as soon as possible
- Use smaller, more agile skimming systems to recover streamers of oil normally found farther from the source. Place recovered oil barges nearby

Recovered Oil Storage

- Smaller barges in larger quantities will increase flexibility for multi-location skimming operations
- Place barges in skimming task forces, groups, etc., to reduce recovered oil offloading time
- Procure and deploy the maximum number of portable tanks to support Vessel of Opportunity Skimming Systems if onboard storage is not available
- Maximize use of the organic recovered oil storage capacity of the skimming vessel

Command, Control, and Communications (C^3)

- Publish, implement, and fully test an appropriate communications plan
- Design an operational scheme, maintaining a manageable span of control
- Designate and mark C^3 vessels for easy aerial identification
- Designate and employ C^3 aircraft for task forces, groups, etc.
- Use reconnaissance air craft and Rapid Response Teams (RAT) to confirm the presence of recoverable oil

On Water Recovery Group
When the first skimming vessel arrives on scene, a complete site assessment will be conducted before recovery operations begin. Once it is confirmed that the air monitoring readings for O2, LEL, H2S, CO, VOC, and Benzene are all within the permissible limits, oil recovery operations may begin.

As skimming vessels arrive, they will be organized to work in areas that allow for the most efficient vessel operation and free vessel movement in the recovery of oil. Vessel groups will vary in structure as determined by the Operations Section of the Unified Command, but will generally consist, at a minimum, of the following dedicated assets:

- 3 to 5 – Offshore skimming vessels (recovery)
- 1 – Tank barge (temporary storage)
- 1 – Air asset (tactical direction)
- 2 – Support vessels (crew/utility for supply)
- 6 to 10 – Boom vessels (enhanced booming)

Example *(**Note:** Actual organization of TFs will be dependent on several factors including, asset availability, weather, spilled oil migration, currents, etc.)*

The 95' FRV Breton Island out of Venice arrives on scene and conducts an initial site assessment. Air monitoring levels are acceptable and no other visual threats have been observed. The area is cleared for safe skimming operations. The Breton Island assumes command and control (CoC) of on-water recovery operations until a dedicated non-skimming vessel arrives to relieve it of those duties.

A second 95' FRV arrives and begins recovery operations alongside the Breton Island. Several more vessels begin to arrive, including a third 95' FRV out of Galveston, the HOSS Barge (High Volume Open Sea Skimming System) out of Harvey, a boom barge (CGA 300) with 25,000' of 42" auto boom out of Leeville, and 9 Fast Response Units (FRUs) from the load-out location at C-Port in Port Fourchon.

As these vessels set up and begin skimming, they are grouped into task forces (TFs) as directed by the Operations Section of the Unified Command located at the command post.

Initial set-up and potential actions:

- A 1,000 meter safety zone has been established around the incident location for vessels involved in Source Control
- The HOSS Barge is positioned facing the incident location just outside of this safety zone or at the point where the freshest oil is reaching the surface
- The HOSS Barge engages its Oil Spill Detection (OSD) system to locate the heaviest oil and maintains that ability for 24-hour operations

- The HOSS Barge deploys 1,320' of 67" Sea Sentry boom on each side, creating a swath width of 800'
- The Breton Island and H.I. Rich skim nearby, utilizing the same OSD systems as the HOSS Barge to locate and recover oil
- Two FRUs join this group and it becomes TF1
- The remaining 7 FRUs are split into a 2 and 3 vessel task force numbered TF2 and TF3
- A 95' FRV is placed in each TF
- The boom barge (CGA 300) is positioned nearby and begins deploying auto boom in sections between two utility vessels (1,000' to 3,000' of boom, depending on conditions) with chain-link gates in the middle to funnel oil to the skimmers
- The initial boom support vessels position in front of TF2 and TF3
- A 100,000+ barrel offshore tank barge is placed with each task force as necessary to facilitate the immediate offload of skimming vessels

The initial task forces (36 hours in) may be structured as follows:

TF 1

- 1 – 95' FRV
- 1 – HOSS Barge with 3 tugs
- 2 – FRUs
- 1 – 100,000+ barrel tank barge and associated tug(s)
- 1 – Dedicated air asset for tactical direction
- 8 – 500' sections of auto boom with gates
- 8 – Boom-towing vessels
- 2 – Support vessels (crew/utility)

TF 2

- 1 – 95' FRV
- 4 – FRUs
- 1 – 100,000+ barrel tank barge and associated tug(s)
- 1 – Dedicated air asset for tactical direction
- 10 – 500' sections of auto boom with gates
- 10 – Boom-towing vessels
- 2 – Support vessels (crew/utility)

TF 3

- 1 – 95' FRV
- 3 – FRUs
- 1 – 100,000+ barrel tank barge and associated tug(s)
- 1 – Dedicated air asset for tactical direction
- 8 – 500' sections of auto boom with gates
- 8 – Boom-towing vessels
- 2 – Support vessels (crew/utility)

Offshore skimming equipment continues to arrive in accordance with the ETA data listed in figure H.3a; this equipment includes 2 AquaGuard skimmers and 11 sets of Koseq Rigid Skimming Arms. These high volume heavy weather capable systems will be divided into functional groups and assigned to specific areas by the Operations Section of the Unified Command.

At this point of the response, the additional TFs may assume the following configurations:

TF 4

- 2 – Sets of Koseq Rigid Skimming Arms w/ associated 200'+ PIDVs
- 1 – AquaGuard Skimmer
- 1 – 100,000+ barrel tank barge and associated tug(s)
- 1 – Dedicated air asset for tactical direction
- 2 – Support vessels (crew/utility)
- 6 – 500' sections of auto boom with gates
- 6 – Boom-towing vessels

TF 5

- 3 – Sets of Koseq Rigid Skimming Arms w/ associated 200'+ PIDVs
- 1 – AquaGuard Skimmer
- 1 – 100,000+ barrel tank barge and associated tug(s)
- 1 – Dedicated air asset for tactical direction
- 2 – Support vessels (crew/utility)
- 8 – 500' sections of auto boom with gates
- 8 – Boom-towing vessels

TF 6

- 3 – Sets of Koseq Rigid Skimming Arms w/ associated 200'+ PIDVs
- 1 – 100,000+ barrel tank barge and associated tug(s)
- 1 – Dedicated air asset for tactical direction
- 2 – Support vessels (crew/utility)
- 6 – 500' sections of auto boom with gates
- 6 – Boom-towing vessels

TF 7

- 3 – Sets of Koseq Rigid Skimming Arms w/ associated 200'+ PIDVs
- 1 – 100,000+ barrel tank barge and associated tug(s)
- 1 – Dedicated air asset for tactical direction
- 2 – Support vessels (crew/utility)
- 6 – 500' sections of auto boom with gates
- 6 – Boom-towing vessels

CGA Minimum Acceptable Capabilities for Vessels of Opportunity (VOO)
Minimum acceptable capabilities of Petroleum Industry Designed Vessels (PIDV) for conducting Vessel of Opportunity (VOO) skimming operations are shown in the table below. PIDVs are "purpose-built" to provide normal support to offshore oil and gas operators. They include but are not limited to utility boats, offshore supply vessels, etc. They become VOOs when tasked with oil spill response duties.

Capability	FRU	KOSEQ	AquaGuard
Type of Vessel	Utility Boat	Offshore Supply Vessel	Utility Boat
Operating parameters			
Sea State	3-5 ft max	9.8 ft max	3-5 ft max
Skimming speed	≤1 kt	≤3 kts	≤1 kt
Vessel size			
Minimum Length	100 ft	200 ft	100 ft
Deck space for: • Tank(s) • Crane(s) • Boom Reels • Hydraulic Power Units • Equipment Boxes	18x32 ft	100x40 ft	18x32 ft
Communication Assets	Marine Band Radio	Marine Band Radio	Marine Band Radio

Tactical use of Vessels of Opportunity (VOO): Arena Offshore, LP will take all possible measures to maximize the oil-to-skimmer encounter rate of all skimming systems, to include VOOs, as discussed in this section. VOOs will normally be placed within an On-water recovery unit as shown in figures below.

Skimming Operations: PIDVs are the preferred VOO skimming platform. OSROs are more versed in operating on these platforms and the vessels are generally large enough with crews more likely versed in spill response operations. They also have a greater possibility of having on-board storage capacity and the most likely vessels to be under contract, and therefore more readily available to the operator. These vessels would normally be assigned to an on-water recovery group/division (see figure below) and outfitted with a VOSS suited for their size and capabilities. Specific tactics used for skimming operations would be dependent upon many parameters which include, but are not limited to, safety concerns, weather, type VOSS on board, product being recovered, and area of oil coverage. Planners would deploy these assets with the objective of safely maximizing oil- to-skimmer encounter rate by taking actions to minimize non-skimming time and maximizing boom swath. Specific tactical configurations are shown in figures below.

The Fast Response Unit (FRU): A self-contained, skid based, skimming system that is deployed from the right side of a vessel of opportunity (VOO). An outrigger holds a 75' long section of air inflatable boom in place that directs oil to an apex for recovery via a Foilex 250 weir skimmer. The outrigger creates roughly a 40' swath width dependent on the VOO beam. The lip of the collection bowl on the skimmer is placed as close to the oil and water interface as possible to maximize oil recovery and minimize water retention. The skimmer then pumps all fluids recovered to the storage tank where it is allowed to settle, and with the approval of the Coast Guard, the water is decanted from the bottom of the tank back into the water ahead of the containment boom to be recycled through the system. Once the tank is full of as much pure recovered oil as possible it is offloaded to a storage barge for disposal in accordance with an approved disposal plan. A second 100 barrel storage tank can be added if the appropriate amount of deck space is available to use as secondary storage.

Tactical Overview

Mechanical Recovery – The FRU is designed to provide fast response skimming capability in the offshore and nearshore environment in a stationary or advancing mode. It provides a rated daily recovery capacity of 4,100 barrels. An additional boom reel with 440' of offshore boom can be deployed along with the FRU, and a second support vessel for boom towing, to extend the swath width when attached to the end of the fixed boom. The range and sustainability offshore is dependent on the VOO that the unit is placed on, but generally these can stay offshore for extended periods. The FRU works well independently or assigned with other on-water recovery assets in a task force. In either case, it is most effective when a designated aircraft is assigned to provide tactical direction to ensure the best placement in recoverable oil.
Maximum Sea Conditions – Under most circumstances the FRU can maintain standard oil spill recovery operations in 2' to 4' seas. Ultimately, the Coast Guard licensed Captain in charge of the VOO (with input from the CGAS Supervisor assigned) will be responsible to determine when the sea conditions have surpassed the vessel's safe operating capabilities.

Possible Task Force Configuration (Multiple VOOs can be deployed in a task force)
1 – VOO (100' to 165' Utility or Supply Vessel)
1 – Boom reel w/support vessel for towing
1 – Tank barge (offshore) for temporary storage
1 – Utility/Crewboat (supply)
1 – Designated spotter aircraft

The VOSS (yellow) is being deployed and connected to an out-rigged arm. This is suitable for collection in both large pockets of oil and for recovery of streaming oil. The oil-to-skimmer encounter rate is limited by the length of the arm. Skimming pace is ≤ 1 knot.

Through the use of an additional VOO, and using extended sea boom, the swath of the VOSS is increased therefore maximizing the oil-to-skimmer encounter rate. Skimming pace is ≤ 1 knot.

The Koseq Rigid Sweeping Arm: A skimming system deployed on a vessel of opportunity. It requires a large Offshore or Platform Supply Vessel (OSV/PSV), greater than 200' with at least 100' x 50' of free deck space. On each side of the vessel, a 50' long rigid framed Arm is deployed that consists of pontoon chambers to provide buoyancy, a smooth nylon face, and a hydraulically adjustable mounted weir skimmer. The Arm floats independently of the vessel and is attached by a tow bridle and a lead line. The movement of the vessel forward draws the rubber end seal of the arm against the hull to create a collection point for free oil directed to the weir by the Arm face. The collection weir is adjusted to keep the lip as close to the oil water interface as possible to maximize oil recovery while attempting to minimize excess water collection. A transfer pump (combination of positive displacement, screw type and centrifuge suited for highly viscous oils) pump the recovered liquid to portable tanks and/or dedicated fixed storage tanks onboard the vessel. After being allowed to sit and separate, with approval from the Coast Guard, the water can be decanted (pumped off) in front of the collection arm to be reprocessed through the system. Once full with as much pure recovered oil as possible, the oil is transferred to a temporary storage barge where it can be disposed of in accordance with an approved disposal plan.

Tactical Overview

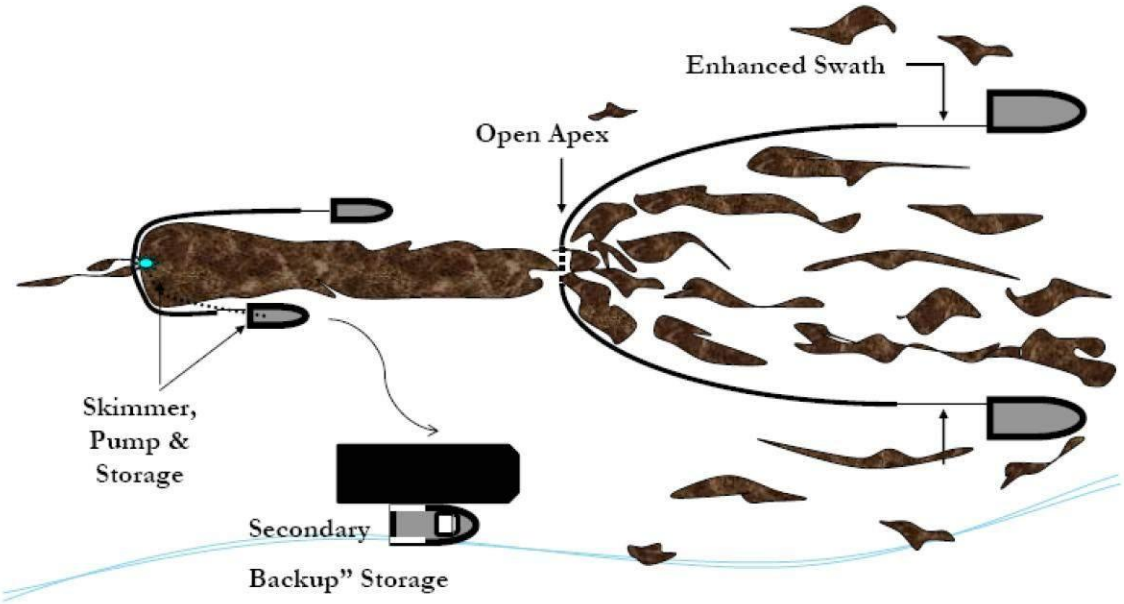
Mechanical Recovery – Deployed on large vessels of opportunity (VOO) the Koseq Rigid Sweeping Arms are high volume surge capacity deployed to increase recovery capacity at the source of a large oil spill in the offshore and outer nearshore environment of the Gulf of Mexico. They are highly mobile and sustainable in rougher sea conditions than normal skimming vessels (9.8' seas). The large Offshore Supply Vessels (OSV) required to deploy the Arms are able to remain on scene for extended periods, even when sea conditions pick up. Temporary storage on deck in portable tanks usually provides between 1,000 and 3,000 bbls. In most cases, the OSV will be able to pump 20% of its deadweight into the liquid mud tanks in accordance with the vessels Certificate of Inspection (COI). All storage can be offloaded utilizing the vessels liquid transfer system.

Maximum Sea Conditions - Under most circumstances the larger OSVs are capable of remaining on scene well past the Skimming Arms maximum sea state of 9.8'. Ultimately it will be the decision of the VOO Captain, with input from the T&T Supervisor onboard, to determine when the sea conditions have exceeded the safe operating conditions of the vessel.

Command and Control – The large OSVs in many cases have state of the art communication and electronic systems, as well as the accommodations to support the function of directing all skimming operations offshore and reporting back to the command post.

Possible Task Force Configuration (Multiple Koseq VOOs can be deployed in a task force)

1 – $\geq$ 200' Offshore Supply Vessels (OSV) with set of Koseq Arms
2 to 4 portable storage tanks (500 bbl)
1 – Modular Crane Pedestal System set (MCPS) or 30 cherry picker (crane) for deployment
1 – Tank barge (offshore) for temporary storage
1 – Utility/Crewboat (supply)
1 – Designated spotter aircraft
4 – Personnel (4 T&T OSRO)



Scattered oil is "caught" by two VOO and collected at the apex of the towed sea boom. The oil moves thought a "gate" at that apex, forming a larger stream of oil which moves into the boom of the skimming vessel. Operations are paced at >1. A recovered oil barge stationed nearby to minimize time taken to offload recovered oil.

This is a depiction of the same operation as above but using KOSEQ Arms. In this configuration, the collecting boom speed dictates the operational pace at $\geq$ 1 knot to minimize entrainment of the oil.

Clean Gulf Associates (CGA) Procedure for Accessing Member-Contracted and other Vessels of Opportunity (VOOs) for Spill Response

- CGA has procedures in place for CGA member companies to acquire vessels of opportunity (VOOs) from an existing CGA member's contracted fleet or other sources for the deployment of CGA portable skimming equipment including Koseq Arms, Fast Response Units (FRUs) and any other portable skimming system(s) deemed appropriate for the response for a potential or actual oil spill, WCD oil spill or a Spill of National Significance (SONS).

- CGA uses Port Vision, a web-based vessel and terminal interface that empowers CGA to track vessels through Automatic Identification System (AIS) and terminal activities using a Geographic Information System (GIS). It provides live AIS/GIS views of waterways showing current vessel positions, terminals, created vessel fleets, and points-of-interest. Through this system, CGA has the ability to get instant snapshots of the location and status of all vessels contracted to CGA members, day or night, from any web-enabled PC.

Near Shore Response Actions

Timing

- Put near shore assets on standby and deployment in accordance with planning based on the actual situation, actual trajectories and oil budgets
- VOO identification and training in advance of spill nearing shoreline if possible
- Outfitting of VOOs for specific missions
- Deployment of assets based on actual movement of oil

Considerations

- Water depth, vessel draft
- Shoreline gradient
- State of the oil
- Use of VOOs
- Distance of surf zone from shoreline

Surveillance

- Provide trained observer to direct skimming operations
- Continual surveillance of oil movement by remote sensing systems, aerial photography and visual confirmation
- Continual monitoring of vessel assets

Dispersant Use

- Generally will not be approved within 3 miles of shore or with less than 10 meters of water depth
- Approval would be at Regional Response Team level (Region 6)

Dedicated Near Shore skimming systems

- FRVs
- Egmopol and Marco SWS
- Operate with aerial spotter directing systems to observed oil slicks

VOO

- Use Arena Offshore, LP's contracted resources as applicable
- Industry vessel are usually best for deployment of Vessel of Opportunity Skimming Systems (VOSS)
- Acquire additional resources as needed
- Consider use of local assets, i.e. fishing and pleasure craft
- Expect mission specific and safety training to be required
- Plan with the US Coast Guard for vessel inspections
- Operate with aerial spotter directing systems to oil patches

Shoreline Protection Operations

Response Planning Considerations

- Review appropriate Area Contingency Plan(s)
- Locate and review appropriate Geographic Response and Site Specific Plans
- Refer to appropriate Environmentally Sensitive Area Maps
- Capability for continual analysis of trajectories run periodically during the response
- Environmental risk assessments (ERA) to determine priorities for area protection
- Time to acquire personnel and equipment and their availability
- Refer to the State of Louisiana Initial Oil Spill Response Plan, Deep Water Horizon, dated 2 May 2010, as a secondary reference
- Aerial surveillance of oil movement
- Pre-impact beach cleaning and debris removal
- Shoreline Cleanup Assessment Team (SCAT) operations and reporting procedures
- Boom type, size and length requirements and availability
- Possibility of need for In-situ burning in near shore areas
- Current wildlife situation, especially status of migratory birds and endangered species in the area
- Check for Archeological sites and arrange assistance for the appropriate state agency when planning operations the may impact these areas

Placement of boom

- Position boom in accordance with the information gained from references listed above and based on the actual situation
- Determine areas of natural collection and develop booming strategies to move oil into those areas
- Assess timing of boom placement based on the most current trajectory analysis and the availability of each type of boom needed. Determine an overall booming priority and conduct booming operations accordingly. Consider:
    - Trajectories
    - Weather forecast
    - Oil Impact forecast
    - Verified spill movement
    - Boom, manpower and vessel (shallow draft) availability
    - Near shore boom and support material, (stakes, anchors, line)

Beach Preparation - Considerations and Actions

- Use of a 10 mile go/no go line to determine timing of beach cleaning
- SCAT reports and recommendations
- Determination of archeological sites and gaining authority to enter
- Monitoring of tide tables and weather to determine extent of high tides
- Pre cleaning of beaches by moving waste above high tide lines to minimize waste

- Determination of logistical requirements and arranging of waste removal and disposal
- Staging of equipment and housing of response personnel as close to the job site as possible to maximize on-site work time
- Boom tending, repair, replacement and security (use of local assets may be advantageous)
- Constant awareness of weather and oil movement for resource re-deployment as necessary
- Earthen berms and shoreline protection boom may be considered to protect sensitive inland areas
- Requisitioning of earth moving equipment
- Plan for efficient and safe use pf personnel, ensuring:
    - A continual supply of the proper Personal Protective Equipment
    - Heating or cooling areas when needed
    - Medical coverage
    - Command and control systems (i.e. communications)
    - Personnel accountability measures
- Remediation requirements, i.e., replacement of sands, rip rap, etc.
- Availability of surface washing agents and associated protocol requirements for their use (see National Contingency Plan Product Schedule for list of possible agents)
- Discussions with all stakeholders, i.e., land owners, refuge/park managers, and others as appropriate, covering the following:
    - Access to areas
    - Possible response measures and impact of property and ongoing operations
    - Determination of any specific safety concerns
    - Any special requirements or prohibitions
    - Area security requirements
    - Handling of waste
    - Remediation expectations
    - Vehicle traffic control
    - Domestic animal safety concerns
    - Wildlife or exotic game concerns/issues

Inland and Coastal Marsh Protection and Response Considerations and Actions

- All considered response methods will be weighed against the possible damage they may do to the marsh. Methods will be approved by the Unified Command only after discussions with local Stakeholder, as identified above.
    - In-situ burn may be considered when marshes have been impacted
- Passive clean up of marshes should considered and appropriate stocks of sorbent boom and/or sweep obtained.
- Response personnel must be briefed on methods to traverse the marsh, i.e.,
    - use of appropriate vessel
    - use of temporary walkways or road ways
- Discuss and gain approval prior cutting or moving vessels through vegetation
- Discuss use of vessels that may disturb wildlife, i.e, airboats

- Safe movement of vessels through narrow cuts and blind curves
- Consider the possibility that no response in a marsh may be best
- In the deployment of any response asset, actions will be taken to ensure the safest, most efficient operations possible. This includes, but is not limited to:
    - Placement of recovered oil or waste storage as near to vessels or beach cleanup crews as possible.
    - Planning for stockage of high use items for expeditious replacement
    - Housing of personnel as close to the work site as possible to minimize travel time
    - Use of shallow water craft
    - Use of communication systems appropriate ensure command and control of assets
    - Use of appropriate boom in areas that I can offer effective protection
    - Planning of waste collection and removal to maximize cleanup efficiency
- Consideration or on-site remediation of contaminated soils to minimize replacement operations and impact on the area

Decanting Strategy

Recovered oil and water mixtures will typically separate into distinct phases when left in a quiescent state. When separation occurs, the relatively clean water phase can be siphoned or decanted back to the recovery point with minimal, if any, impact. Decanting therefore increases the effective on-site oil storage capacity and equipment operating time. FOSC/SOSC approval will be requested prior to decanting operations. This practice is routinely used for oil spill recovery.

CGA Equipment Limitations

The capability for any spill response equipment, whether a dedicated or portable system, to operate in differing weather conditions will be directly in relation to the capabilities of the vessel the system in placed on. Most importantly, however, the decision to operate will be based on the judgment of the Unified Command and/or the Captain of the vessel, who will ultimately have the final say in terminating operations. Skimming equipment listed below may have operational limits which exceed those safety thresholds. As was seen in the Deepwater Horizon (DWH) oil spill response, vessel skimming operations ceased when seas reached 5-6 feet and vessels were often recalled to port when those conditions were exceeded. Systems below are some of the most up-to-date systems available and were employed during the DWH spill.

Boom	3 foot seas, 20 knot winds
Dispersants	Winds more than 25 knots Visibility less than 3 nautical miles Ceiling less than 1,000 feet.
FRU	8 foot seas
HOSS Barge/OSRB	8 foot seas
Koseq Arms	8 foot seas
OSRV	4 foot seas

Environmental Conditions in the GOM

Prevailing winds, waves and currents along the Texas coast are from the southeast and northeast quadrants. Ten to 20 foot waves may occur during hurricanes. The combined effect of the winds, surface currents, and waves refracting shoreward produce the prevailing westerly longshore currents.

Tides are semi-diurnal and diurnal, and range in height from less than 1 foot to 2.5 feet. The direction, force, and duration of the wind has a considerable effect on the tides and currents. Fifteen foot tides may be expected during severe hurricanes and very low tides may accompany strong northerlies of long duration.

Surface water temperature averages slightly less than 90° F and ranges between 80 and 100° F during the late summer. During the winter the average is slightly less than 60° F and the range is between 35 and 80° F.

The Atlantic and Gulf of Mexico hurricane season is officially from 1 June to 30 November. 97% of all tropical activity occurs within this window. The Atlantic basin shows a very peaked season from August through October, with 78% of the tropical storm days, 87% of the minor (Saffir-Simpson Scale categories 1 and 2) hurricane days, and 96% of the major (Saffir-Simpson categories 3, 4 and 5) hurricane days occurring then. Maximum activity is in early to mid September. Once in a few years there may be a hurricane occurring "out of season" - primarily in May or December. Globally, September is the most active month and May is the least active month.

FIGURE 1
TRAJECTORY BY LAND SEGMENT

Trajectory of a spill and the probability of it impacting a land segment have been projected utilizing Arena Offshore, LP's WCD and information in the BOEM Oil Spill Risk Analysis Model (OSRAM) for the Central and Western Gulf of Mexico available on the BOEM website using 30 day impact. The results are tabulated below.

Area/Block	OCS-G	Launch Area	Land Segment and/or Resource	Conditional Probability (%) within 30 days
WC 544, Location I *94 miles from shore*	G14342	C34	Kenedy, TX Kleberg, TX Nueces, TX Aransas, TX Calhoun, TX Matagorda, TX Brazoria, TX **Galveston, TX** Jefferson, TX Cameron, LA Vermilion, LA Iberia, La Terrebonne, LA	1 1 1 2 3 9 5 **12** 6 11 3 1 1

WCD Scenario– <u>BASED ON WELL BLOWOUT DURING DRILLING OPERATIONS</u> (94 miles from shore)
11,894 bbls of crude oil (Volume considering natural weathering)
API Gravity 36°

FIGURE 2 – Equipment Response Time to WC 544, Location I

Dispersants/Surveillance

Dispersant/Surveillance	Dispersant Capacity (gal)	Storage Capacity	Persons Req.	From	Hrs to Procure	Hrs to Loadout	Travel to site	Total Hrs
Basler 67T	2000	NA	2	Houma	2	2	1	5
DC 3	1200	NA	2	Houma	2	2	1.3	5.3
DC 3	1200	NA	2	Houma	2	2	1.3	5.3
Aero Commander	NA	NA	2	Houma	2	2	1	5

Offshore Response

Offshore Equipment No Staging	EDRC	Storage Capacity	VOO	Persons Required	From	Hrs to Procure	Hrs to Loadout	Hrs to GOM	Travel to Spill Site	Hrs to Deploy	Total Hrs
CGA											
HOSS Barge	76285	4000	3 Tugs	5	Harvey	7	0	5	22.5	1	35.5
95' FRV	22885	249	NA	4	Galveston	2	0	2	5	0	9
Boom Barge (CGA-300) 42" Auto Boom (25000')	NA	NA	1 Tug 50 Crew	4 (Barge) 2 (Per Crew)	Leeville	4	0	6	30	1.5	41.5
Recovered Oil Storage No Staging	**EDRC**	**Storage Capacity**	**VOO**	**Persons Required**	**From**	**Hrs to Procure**	**Hrs to Loadout**	**Hrs to GOM**	**Travel to Spill Site**	**Hrs to Deploy**	**Total Hrs**
Enterprise Marine Services LLC (available through contract with CGA)											
CTCo 2604	NA	20000	1 Tug	6	Amelia	25	12	4	18	1	60
CTCo 2605	NA	20000	1 Tug	6	Amelia	25	12	4	18	1	60
CTCo 2606	NA	20000	1 Tug	6	Amelia	25	12	4	18	1	60
CTCo 5001	NA	47000	1 Tug	6	Amelia	25	12	4	18	1	60

Staging Area: Galveston

Offshore Equipment With Staging	EDRC	Storage Capacity	VOO	Persons Req.	From	Hrs to Procure	Hrs to Loadout	Travel to Staging	Travel to Site	Hrs to Deploy	Total Hrs
CGA											
FRU (1) + 100 bbl Tank (1)	4251	100	1 Utility	6	Galveston	2	2	0	8.3	1	13.3
FRU (1) + 100 bbl Tank (2)	4251	200	1 Utility	6	Lake Charles	2	2	4.7	8.3	1	18
Hydro-Fire Boom	NA	NA	8 Utility	40	Harvey	2	4	10.7	8.3	6	31

Nearshore Response

Nearshore Equipment No Staging	EDRC	Storage Capacity	VOO	Persons Required	From	Hrs to Procure	Hrs to Loadout	Hrs to GOM	Travel to Spill Site	Hrs to Deploy	Total Hrs
CGA											
46' FRV	15257	65	NA	4	Lake Charles	2	0	2	4.5	0	8.5
Enterprise Marine Services LLC (available through contract with CGA)											
CTCo 2607	NA	23000	1 Tug	6	Amelia	28	12	4	15	1	60

Staging Area: Galveston

Nearshore and Inland Skimmers With Staging	EDRC	Storage Capacity	VOO	Persons Req.	From	Hrs to Procure	Hrs to Loadout	Travel to Staging	Travel to Deployment	Hrs to Deploy	Total Hrs
SWS Egmopol	1810	100	NA	3	Galveston	2	2	0	2	0	6
SWS Marco	3588	20	NA	3	Lake Charles	2	2	4.7	2	0	10.7

Shoreline Protection

Staging Area: Galveston

Shoreline Protection Boom	VOO	Persons Req.	Storage/Warehouse Location	Hrs to Procure	Hrs to Loadout	Travel to Staging	Travel to Deployment	Hrs to Deploy	Total Hrs
Miller Environmental (available through MSA)									
14,000' 18" Boom	6 Crew	12	Sulphur, LA	1	1	4.8	2	2	10.8
14,000' 18" Boom	6 Crew	12	Beaumont, TX	1	1	2.3	2	2	8.3
30,000' 18" Boom	10 Crew	20	Corpus Christi, TX	1	2	7.5	2	8	20.5
10,000' 18" Boom	5 Crew	10	Texas City, TX	1	1	0.5	2	2	6.5

Wildlife Response	EDRC	Storage Capacity	VOO	Persons Req.	From	Hrs to Procure	Hrs to Loadout	Travel to Staging	Travel to Deployment	Hrs to Deploy	Total Hrs
Wildlife Support Trailer	NA	NA	NA	2	Harvey	2	2	10.7	1	2	17.7
Bird Scare Guns (24)	NA	NA	NA	2	Harvey	2	2	10.7	1	2	17.7
Bird Scare Guns (12)	NA	NA	NA	2	Galveston	2	2	0	1	2	7
Bird Scare Guns (12)	NA	NA	NA	2	Aransas Pass	2	2	5.7	1	2	12.7
Bird Scare Guns (48)	NA	NA	NA	2	Lake Charles	2	2	4.7	1	2	11.7
Bird Scare Guns (24)	NA	NA	NA	2	Leeville	2	2	11.1	1	2	18.1

Response Asset	Total
Offshore EDRC	107,672
Offshore Recovered Oil Storage	111,449
Nearshore / Shallow Water EDRC	20,655
Nearshore / Shallow Water Recovered Oil Storage	23,185

West Cameron Blocks 544/543/522

(Leases OCS-G 14342/12802/34033)

NTL 2015-N01 –
Worse Case Discharge Calculations

Attachment L
(Public Information)

WCD Scenarios / Relief Rig Availability

ARENA OFFSHORE, LP

West Cameron Block 543
OCS-G 12802 Well Location "I"
WCD Supplemental Information

Discharge Scenario:

Case I. Well Bridging Over – The WC 543 Field was developed with completions in the respective horizons that Arena anticipates on encountering in their proposed Well Location "I". The previous Operators of the lease gravel packed most of the wells due to the unconsolidated nature of these producing intervals. It is anticipated that a loss of well control from the surface will result in the well bridging over in less than 48 hrs as supported by the BOEM database where 49% of all blowout events during the period from 1992 through 2006 stopped flowing in less than 24 hrs. The drawdown at the sandface that would be experienced during a loss of well control event in this shallow, unconsolidated formation will result in the wellbore collapsing across multiple sand/shale interfaces.

Case II. Conventional Surface Intervention – It is assumed that a loss of well control from the surface will result in mobilizing 3rd party well control equipment to the rig. It is assumed that the BOP's are compromised, that the rig has not caught fire and is capable of supporting well control efforts with the assistance of a support vessel. As an example, the intervention would consist of top killing the well with kill weight mud or possibly replacing BOP's with another set to contain flow from the breached equipment.

Case III. Relief Well Intervention – It is assumed that a jack-up rig is immediately available to mobilize to location to commence drilling a relief well. The mobilization and estimated time to drill the relief well is based upon the actual drilling performance of offset wells drilled in this field development.

Case IV. Relief Well Intervention – It is assumed that a jack-up rig is not immediately available to mobilize to location to commence drilling a relief well. The estimated mobilization time of a rig to location incorporates the suspension of activities by an Operator before the rig can be released for relief well operations. The time to drill the relief well is based upon the actual drilling performance of offset wells drilled in this field development.

Timeline for each worst case discharge scenario:

Case I.	Well Bridging Over:	2 days
Case II.	Conventional Surface Intervention:	
	• Assess well condition:	2 days
	• Mobilize 3rd party equipment:	2 days
	• Contain discharge:	10 days
	○ Total:	14 days
Case III.	Relief Well Intervention – rig immediately available:	
	• Assess well condition:	2 days
	• Mobilize rig:	2 days
	• Drill relief well:	22 days
	○ Total:	26 days
Case IV.	Relief Well Intervention – rig not immediately available:	
	• Assess well condition:	2 days
	• Suspend current operations:	10 days
	• Mobilize rig:	2 days
	• Drill relief well:	22 days
	○ Total:	36 days

Relief Rig Availability:

- The WC 543 Well Location "I" will be drilled from Platform "A" utilizing an independent cantilever jack-up in 182' of water. There are currently 4 independent leg jack up rigs and 6 mat supported jack up rigs marketed in the GOM that are capable of drilling a relief well in this water depth. Attached in the appendix is a May 2016 report from Riglogix of the listing of rigs and their current location.

- There are no platforms in the area that would be capable of utilizing a platform rig to reach the bottom hole location of the proposed WC 543 Well "I".

BOP Prevention Measures

ARENA OFFSHORE, LP

West Cameron Block 543
OCS-G 12802 Well Location "I"
WCD Supplemental Information

Blowout Prevention Measures

The purpose of this document is to describe measures that Arena Offshore, LP will take, above and beyond what is detailed in BOEM 30 CFR 250, to enhance its ability to prevent a blowout, to reduce the likelihood of a blowout, and conduct effective and early intervention in the event of a blowout on the WC 543 OCS-G 12802 Well Location "I" well as required by US DOI BOEM NTL No. 2010-N06.

Blowout Prevention

The following measures will be taken in attempt to ensure the WC 543 OCS-G 12802 Well Location "I" well is kept under control at all times:

- An Arena Offshore onsite representative will witness and review all BOP tests, casing tests and formation integrity tests.
- An Arena Offshore Superintendent in the office will review all FIT tests prior to moving forward with drilling operations
- Prior to commencing cementing operations on any casing string, a minimum of 1½ bottoms up will be circulated with drilling mud, so long as full returns are maintained, in order enhance the ability of achieving a successful cement job.
- All production casing strings will be centralized across hydrocarbon bearing zones in order to ensure the proper isolation of individual pay sands by cementation and to prevent the transmission of hydrocarbons up the annulus behind the production casing.
- The proposed well will be drilled on a mud weight schedule utilizing extensive offset data from the original development of the WC 543 Field. Proposed drilling mud weights will allow for at a minimum, the known hydrostatic pressures required to drill the known hydrocarbon zones encountered in the original development of the field.
- Lost circulation material in the form of properly distributed particle sized mud additives (PSDs) will be added to the mud system in the form of sweeps while drilling the production hole section. PSD additives will be utilized to prevent uncontrolled mud losses should any partially depleted hydrocarbon bearing horizons be encountered.
- Wiper trips will be performed as hole conditions dictate in order to quantify the stability of the wellbore and determine if sufficient mud weights are being utilized to prevent influx of formation fluids, prevent swabbing of wellbore fluids while pulling pipe and prevent losses of wellbore fluids to the formation.

- Mudloggers may will be utilized during the drilling of the well in order to specifically evaluate wellbore conditions including, but not limited to weights of returning drilling fluids as compared to that of the fluid entering the hole, gas content of mud returns, formation characteristics and abnormalities of cuttings and estimated paleo aging of cuttings.
- Logging while drilling tools (LWD) will be utilized to evaluate and estimate lithology, formation pressures and fluid content from surface casing point to wellbore total depth. This will enable the real time identification of any changes in anticipated formation pressures and assist in the picking the production casing point. Log data will be regularly provided to the office for evaluation.
- Pressure While Drilling (PWD) data will be utilized to ensure the stability of, and to maintain constant monitoring of hydrostatic pressures applied to, the wellbore.

Blowout Intervention

In the event of an uncontrolled flow of hydrocarbons from the WC 543 OCS-G 12802 Well Location "I" wellbore, the Oil Spill Response Plan (OSRP) as described in the DOCD will be activated. In addition to the activation of this plan two scenarios of well intervention have been described in the attached documentation and current availability of equipment to enact both well intervention scenarios identified:

- Assuming in an uncontrolled flow situation, where the jack up rig is intact and not sufficiently damaged and that the "I" wellbore is accessible, wellbore intervention would be performed from the jack up rig itself with the possible assistance of a barge mobilized nearby. Master Service Agreements (MSAs) have been established with Halliburton and Wild Well Control in order to expedite response in the case of an uncontrolled flow situation. As an example, flow could be controlled from either a "top kill" method or from the removal of the surface BOP stack and subsequent replacement of the stack and the wellbore shut in.
- In the event that the jack up rig and/or the "I" wellbore is irreparably damaged during a blowout scenario, wellbore intervention would be performed by contracting a MODU, mobilizing it to location and the subsequent spudding and drilling of a relief well. Arena Offshore currently has in place established contracts with all contractors that operate jack-up rigs in the Gulf of Mexico. Such contracts would be utilized to expedite the contracting of a rig in order to drill a relief well.

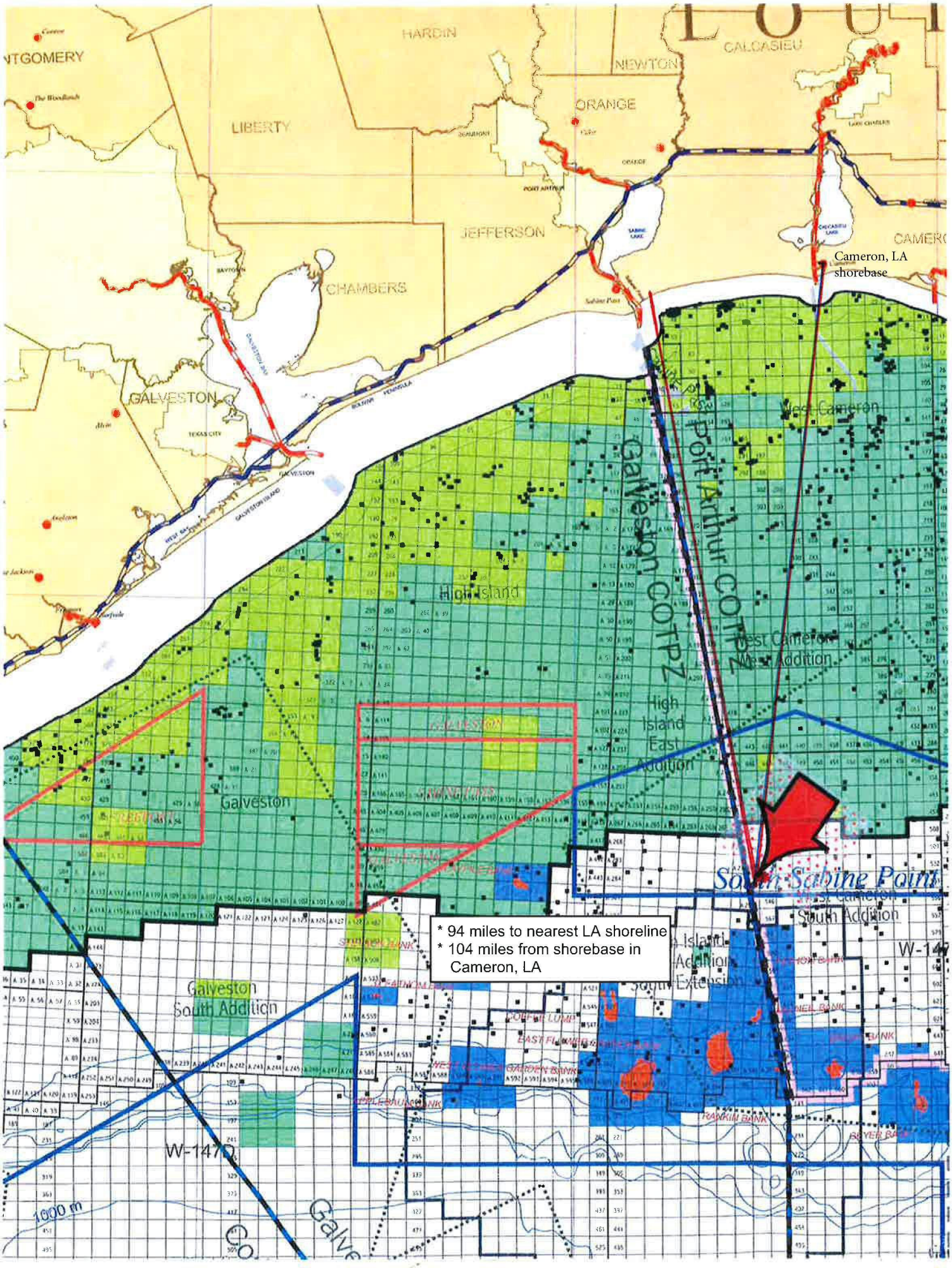
In the case of an uncontrolled flow of hydrocarbons, Arena Offshore will simultaneously pursue multiple wellbore intervention methods in an attempt to mitigate and terminate the spill, until the wellbore is brought under control.

West Cameron Blocks 544/543/522

(Leases OCS-G 14342/12802/34033)

Vicinity Map

Attachment M
(Public Information)


HARDIN
NEWTON
CALCASIEU
ORANGE
LIBERTY
JEFFERSON
CHAMBERS
GALVESTON
Cameron, LA
shorebase
Galveston COTPZ
Port Arthur COTPZ
West Cameron
West Addition
High Island
High Island East Addition
Galveston
Galveston South Addition
South Sabine Point
South Addition
W-147
W-147D
1000 m
* 94 miles to nearest LA shoreline
* 104 miles from shorebase in Cameron, LA