# United States Department of the Interior

BUREAU OF SAFETYAND ENVIRONMENTAL ENFORCEMENT

Alaska OCS Region

3801 Centerpoint Drive, Suite 500

Anchorage, Alaska 99503-5823


Ms. Susan Childs
Shell Gulf of Mexico, Inc.
3601 C Street, Suite 1334
Anchorage, AK 99503
United States of America

AUG 30 2012

Dear Ms. Childs:

The Alaska Region of the Bureau of Safety and Environmental Enforcement (BSEE) is in receipt of Shell's Application for a Permit to Drill (APD) **Well Number 001, Burger A, on lease OCS Y-2280, Block 6764, in the Chukchi Sea (API number 55-352-0000200).** The application was partially submitted and dated January 31, 2012 and completed on July 18th 2012. More recently, in a letter to BSEE from Shell Vice President Peter Slaiby, dated August 21, 2012, you sought "conditional approval" of the APD to allow for limited drilling operations before the arrival of the Arctic containment system. In particular, you requested permission to drill and set the 30" structural and the 20" surface casings. Your application has been reviewed for compliance with the Outer Continental Shelf Lands Act, 30 CFR Part 250 and other statutes and regulations applicable to APD's. BSEE finds that Shell has complied with those authorities and approves the subject APD to a depth equal to the casing point associated with the 20 inch casing at approximately 1440 feet true vertical depth. Upon completion of the testing and siting of the Arctic Containment System Shell will submit an Application for Permit to Modify, which, if approved, would allow Shell to continue operations outlined in the initial APD.

This approval is based on the findings below and subject to the conditions attached to this communication as Attachment A, Conditions of Approval for the Burger A, Well #001 and Attachment B Procedures for Well Data and Records Submittal. It is also conditioned on Shell's compliance during the permitted activities with all applicable BSEE regulations and requirements, U.S. Coast Guard regulations and requirements, provisions in the Exploration Plan (EP) dated May 2011, as approved by the Bureau of Ocean Energy Management (BOEM), BOEM regulations and requirements, provisions in the Oil Spill Response Plan approved by BSEE, conditions of approval for all permits or authorizations issued by Federal agencies, all lease stipulations, and Notices to Lessees.

This approval is valid unless and until there is a material change to conditions or facts as presented in Shell's application.

If any provision contained in any plan or application conflicts with any provision or condition approved in writing by BSEE, the provision or condition approved by BSEE later in time will control. In the event another agency approves deviations from plans, permits or conditions initially issued by that agency, copies of such approvals must be sent to BSEE. Except when emergency action is required, a written request for authorization must be sent to BSEE for the bureau's review and approval prior to deviating from BSEE approved plans, applications, or conditions.

BSEE finds that you have provided sufficient data, as required with relation to the applicable provisions of 30 CFR 250.417, to show that the Mobile Offshore Drilling Unit Noble Discoverer is in compliance and

is hereby approved for all exploratory drilling operations conducted in the Chukchi Sea of the Arctic Outer Continental Shelf (OCS) pursuant to this application and the EP.

BSEE also finds that you have provided sufficient data, as required with relation to the applicable provisions of 30 CFR 250.417, to show that the designated relief well drilling unit Kulluk is in compliance, and is hereby approved, for all exploratory drilling operations conducted in the Chukchi Sea of the Arctic Outer Continental Shelf (OCS) pursuant to this application and to the EP. In the event hydrogen sulfide Is found during the drilling operations the Kulluk will be required to comply with 30 CFR 250.490 if used as a relief well rig.

BSEE further finds that Shell's proposed well capping and containment systems have been designed for the projected worst case discharge conditions. The intended uses of these systems are hereby approved. BSEE will require that a witnessed deployment test of the containment system in which Shell has demonstrated that it has the ability to successfully deploy the system and have it on location pursuant to the oil spill response plan prior to BSEE's consideration of Shell's request to drill below the 20 inch casing point.

BSEE hereby approves Shell's Welding and Burning Program and Hydrogen Sulfide Contingency Plans for operations conducted on the Noble Discoverer.

BSEE will provide a continuous inspection presence during drilling operations and will use Shell transportation and lodging for this purpose. As allowed in 30 CFR 250.133, Shell will request reimbursement for transportation based on the existing agreement between Shell, DOI Aviation Management Division and BSEE. Reimbursement for lodging must be submitted within 90 days of the completion of the drilling program. In addition BSEE will be conducting inspections and collecting data in regard to the EPA's National Pollutant Discharge Elimination System General Permit No. AKG-28-0000 and EPA issued air quality permits at the request of the EPA by letter dated July 27, 2012(copy enclosed).

After office hours, weekends, and holidays, all notifications relating to activities approved pursuant to this application should be made to the BSEE active duty officer at 855-277-2733 (toll free) and during business hours, all notifications should be made to the BSEE, active duty officer at (907) 334-5300.

Sincerely,

Mark Fesmire PE, JD
Regional Director, BSEE

Attachments

cc: U.S. DOI, BOEM, AKOCSR, Regional Director
U.S. DOC, NOAA, NMFS
U.S. DOI, Fish and Wildlife

## Conditions of Approval for the Burger A, #001 Well

1. The following waivers have been authorized:
    a. Testing of casing strings as indicated on Form BSEE -0123S is approved.
    b. Your request for a waiver to the requirements under 30 CFR 250. 423 (c) regarding a negative pressure test is approved.
    c. Testing of the BOP components to the pressures indicated on Form BSEE -0123S is approved.
    d. Your test pressure for the annular preventer as indicated on Form BSEE -0123S is approved.
    e. Deployment of a remote BOP control panel intended to operate the BOP stack from the sea floor is approved.
    f. Your request to test the deadman/autoshear system during the stump test only is approved.
    g. Your requested method to temporarily abandon the proposed pilot hole is approved.
2. This office will conduct a predrill inspection of your drilling vessel prior to the start of operations.
3. Shell will not be able to drill below the 20 inch casing point without fulfilling the conditions stated in the letter accompanying these conditions.
4. No drilling activities may be conducted beyond each additional casing shoe unless specifically approved by the BSEE inspector on location. BSEE will evaluate the condition of the well, results of safety equipment tests, the nature and duration of the next phase of the drilling program, existing and forecasted environmental conditions, and the procedures under an approved contingency plan [30 CFR250.417(c)(2)] that addresses design and operating limitations of the drilling unit as well as the actions necessary (i.e. suspension, curtailment, or modification of drilling or rig operations) to remedy various operational or environmental situations in order to maintain safety and prevent damage to the environment; including implementing well capping and containment or relief well drilling plans.
5. Final certification of the blowout preventer system as required in 30 CFR 250.416 (f) shall be provided to this office prior to the initial use of the BOP on this well.
6. Data submission procedures and criteria for this well are listed in a attached document (Procedures for Well Data and Records Submittal)
7. Shell must submit a daily summary report on form BSEE-0133 to this office until the final status of the well is established (one copy). Daily marine mammal reports shall be attached to the form.
8. Shell must notify this office immediately in the event the well encounters shallow gas, abnormal pressure, or lost circulation.
9. Shell must provide this office with representative dry samples collected during the drilling of this well as soon as available. Shell is also requested to collect and retain a set of wet well cuttings for the Bureau of Ocean Energy Management. This request is voluntary and the samples are intended to provide for public access once the proprietary term for the samples is concluded. Further discussions related to this voluntary request can be concluded with appropriate BOEM representatives.
10. Shell must submit within thirty days of completion of the well all oceanographic and meteorological data collected during the drilling of this well.
11. Shell must submit an Application for Permit to Modify to change any approved portion of the APD prior to the commencement of the proposed operations. Verbal approval in an emergency

may be granted, however written APM's must be submitted no later than the end of the 3rd business day following the verbal approval.

12. Shell shall notify this office as well as the onsite representative 24 hours in advance of a Blowout Preventer test.
13. Shell must submit form BSEE – 0124 in advance of either temporarily or permanently abandoning this well. This form must contain all information required in 30 CFR 250, Subpart Q for abandonment of wells.

# BUREAU OF SAFETY AND ENVIRONMENTAL ENFORCEMENT
# ALASKA OCS REGION

## Procedures for Well Data and Records Submittal

This document defines the procedures on how lessees/operators submit well records required by 30 CFR 250.468 and 469, and clarifies the specific well records you should submit, the submittal dates of the various well records, and the correct locations where you should send these well records.

The BSEE collects, verifies, and stores data by the well's unique 12-digit American Petroleum Institute (API) number we assign. The BSEE Alaska Outer Continental Shelf Region (AKOCS) uses the data collected to make informed regulatory decisions based on your timely submittal of complete and accurate well records. We define "submittal date" as the original date the data are due to the appropriate office.

According to 30 CFR 250.468(a), "you must submit copies of logs or charts of electrical, radioactive, sonic, and other well-logging operations; directional and vertical well surveys; velocity profiles and surveys; and analysis of cores to BSEE." Also, in accordance with 30 CFR 250.469(b), the AKOCS will also require submittal of paleontological reports as well as washed and dried samples collected from the well.

### When to Submit Well Data Records

1. Field Data

   As stated in the approval documents for these operations this office will take an active role in assess plans for the continuation of well activities. Shell will be expected to make available digital data and field prints electronically from the well site via a secure website data delivery system or equivalent to enable this review from this office. This should be done for all logging operations including pilot hole, surface, intermediate and final runs(both wireline and Logging While Drilling logs). This also includes detailed mud logging data.

2. Final Data

   Operators should submit one copy of the digital data on a CD or DVD in a read-only format to the appropriate entity as outlined in Attachment 1. Each CD or DVD should be properly labeled with the Area, Block, OCS, Well Number, Well Suffix, API, and the data type (i.e., Paleo Report, Conventional Core Report, Vertical Seismic Survey, etc.). Digital and image NMR data must be submitted on separate physical media and nomenclature for NMR data files and tool codes should clearly identify them as NMR datasets.

Well records are divided into four groups for the timely submittal of the data.

a) Well Log Data, Directional Surveys, Velocity Surveys, Analyses of Percussion Sidewall Cores, Wireline Formation Test Logs, Drill Stem Tests and Mudlogs/Reports

Submit:

Well log data,
Directional surveys,
Velocity surveys (time/depth pairs),
Percussion/rotary sidewall analysis of cores,
Wireline formation tests logs (summary log), and
Drill stem tests (initial report)

To be submitted within 30 days of the "Date Operations Completed" of the last logging run (MWD/LWD or wireline) that you report in Item 7 of the Open Hole Report (Form BSEE-0133S) for each 12-digit wellbore, sidetrack, and/or bypass. Note: "Date Operations Completed" for MWD/LWD is when the data is retrieved from the drill string.

b) Paleontological, Detailed Rotary Sidewall and Conventional Core Analyses, and Vertical Seismic Profile Reports and Information

For each wellbore in which these data were collected, submit no later than 90 days after the "TD DATE" you report in Item 10 of the Well Activity Report (Form BSEE-0133).

Detailed paleontological reports and information,
Detailed rotary sidewall and conventional core analyses/reports and information, and
Detailed vertical seismic profile reports

Submit these well records when the report is completed, even if the report is generated by you and/or third party (i.e., academic partners, non-lessee partners and/or consultants) years after the wellbore is completed.

c) Geochemical Analyses and PVT Analysis of Fluid Samples

For each wellbore in which these data were collected, submit geochemical analyses and/or PVT Analysis of Fluid Samples no later than 120 days after the "TD DATE" that you report in Item 10 of the Well Activity Report (Form BSEE-0133). Submit these well records when the report is completed, even if the

report is generated by you and/or third party (i.e., academic partners, non-lessee partners and/or consultants) years after the wellbore is completed.

d) End of Operations Report (Form BSEE-0125)

For each wellbore, submit an End of Operations Report (Form BSEE-0125) and all its attachments no later than 30 days after the "END DATE" you report in Item 10 of the Well Activity Report (Form BSEE-0133).

The BSEE AKOCS uses the Well Activity Report (Form BSEE-0133) and Open Hole Report (Form BSEE-0133S) to track well activity; therefore, it is crucial that you submit a complete and accurate report to the appropriate BSEE AKOCS District Office in a timely manner. We will treat delinquent and/or incomplete reports in the same manner as delinquent and/or incomplete well data, and such violations may result in the BSEE AKOCS exacting an appropriate remedy, such as issuing an Incident of Non-compliance (INC).

The BSEE AKOCS may request that you submit well logging data, directional surveys, velocity profiles and surveys, percussion sidewall analyses of cores, wireline formation tests, and drill stem tests before the 30- day limit when we determine that circumstances warrant such action. When we determine that circumstances so warrant, we may also request that you submit preliminary reports of analytical data, namely

Geochemical analyses/reports and information,
PVT analyses of fluid samples,
Detailed paleontological reports and information,
Detailed rotary sidewall core analysis and information, and
Detailed conventional core analysis and information before the respective 90-day or 120-day limits.

The BSEE AKOCS recognizes that you need adequate time to submit complete and accurate well records. If you request it, BSEE AKOCS may grant you a departure under 30 CFR 250.142 for a new required date for submitting the data pertaining to that wellbore.

## Where to Submit Well Records

Shell will need to coordinate access to field digital well logs with the following office. This office will also handle receipt of dry samples.

Bureau of Safety and Environmental Enforcement
Alaska OCS Office
3801 Centerpoint Dr., Suite 500
Anchorage, AK 99503
Office Phone: 907-334-5300
Office Fax: 907-334-5302

Shell will provide final copies of all digital image and vector well log data and related reports to both the Alaska BSEE office and to:

A2D Technologies
d/b/a TGS Geological Products and Services
1010 Common Street, Suite 2040
Attn: BSEE Well Records (Alaska)
New Orleans, LA 70112
Office telephone: 504-524-3450
Fax: 504-524-3454

A "Well Records Submission Summary" in Attachment 1 of this NTL provides an overview of the various well records, including which entity receives which well records and the addresses and contact numbers of the appropriate BSEE AKOCS Offices, and A2D Technologies. We strongly recommend that you provide a transmittal letter when you submit any well records. This transmittal should contain the following information:

- Operator's Name
- Operator's Contact Name and Telephone Number
- Bottomhole Location: Area/Block/Lease/Well Name and Number/API Number
- Date Well Records Sent
- Detailed List of Well Records

It is your responsibility to ensure that the BSEE AKOCS and A2D Technologies receive all well data and information within the specific periods. If we notify you of delinquent data, we will initiate an appropriate remedy, such as issuing an Incident of Non-Compliance (INC). If you choose to use a third party to submit well data, it remains your responsibility to ensure that the data are timely received by the BSEE AKOCS and A2D Technologies. Realizing that you may need time beyond the specified deadlines to prepare unique data or information, we will address the submission of such on an individual basis. We will address INC's issued by the BSEE AKOCS Office for the delinquent data submittal at your yearly performance review or through other appropriate and timely measures.

## Well Naming and Numbering

Show the API Number and well name assigned by the BSEE AKOCS Office on all well records you submit to us. You can find these on the approved Application for Permit to Drill (Form BSEE-0123) for the original hole, sidetracks, and/or bypasses.

# Data Types and Formats

A. Well Log Data types

a. Log Curve Requirements: Submit the following curve types and log images in final form, if the data were obtained in the open-hole portion of a wellbore, sidetrack, or bypass****:

- Acoustic or Sonic
- Bulk Density
- Caliper
- Conductivity
- Density Correction
- Dipmeter (computed)
- Gamma Ray
- Resistivity/Induction
- Spontaneous Potential
- Nuclear Magnetic Resonance *
- Mudlogs***
- Neutron
- Tension
- Porosity
- Borehole Image
- Equivalent circulation density
- Rwa
- Temperature
- Formation Tester**
- Rate of Penetration
- Photoelectric
- Slide Indicator

b. Cased hole log data: Submit all curve types and log images as identified above for any cased hole logs collected in lieu of, or in addition to, open hole logs.

* For the submittal of digital NMR vector curve data,. The following are examples of curve types are to be submitted, and are not limited to you should submit:

- Quality Control Curves
- Computed Curves
- T2 Bin Distributions

Due to NMR file sizes and complexities, the BSEE now requires that digital and image NMR data are submitted on separate physical media (separate from other well log data) to its logging contractor, A2D Technologies. Also, NMR data file and tool code nomenclature should clearly identify these data as NMR-related. We encourage direct submittal of the completed log data set from the acquiring service company.

** Formation Tester is considered any logging tool that collects pressure data and/or fluid samples from the borehole. Summary Print log images, pressure gradient plots, and preliminary sample analysis must be submitted. Formation Tester summary data should also be submitted in ASCII format. All detailed reports (i.e., PVT Analysis) generated from the samples collected from the borehole must be submitted in a timely manner (see Attachment 1).

*** For mudlog specifications, see section Part I, Section G of this NTL. You will be required to submit an image file for these types of logs to A2D Technologies.

****Although API Recommended Practice (RP) 31A, Standard Form for Hardcopy Presentation of Downhole Well Log Data, is not incorporated by reference in BSEE regulation's, you may use it for guidance on providing complete and accurate well information.

Note: Do not submit digital data for Formation Tester, Borehole Image, and Computed Dipmeter to A2D Technologies.

c. Well Log Image File:

Submit image files in one of the formats listed below. For Formation Tester type logs, the summary logs will suffice. See Part I, Section H of this NTL for mudlog specifications.

i. For all vertical wells, as defined in 30 CFR 250.461, submit image files for

- Measured depth (MD) 1-inch, or 2-inch correlation, and 5-inch formation evaluation logs and
- Any additional scales you obtained.

ii. For all non-vertical wells, as defined in 30 CFR 250.461, submit image files for

- True vertical depth (TVD) 1-inch, or 2-inch correlation and, 5-inch formation evaluation logs,
- Measured depth (MD) 1-inch, or 2-inch correlation, and 5-inch formation evaluation logs, and
- Any additional scales you obtained.

Detailed 5- inch image logs must be composited, but individual runs do not need to be spliced.

If logging data from more than one logging vendor are collected in a borehole, you may submit either an image of the logging data from all vendors composited into a single set of logs or a set of images of the composited logs from each individual vendor.

d. Image File Formats: If the original log is in color, the submitted image file should also be in color.

i. The following image file formats are preferred:

- Computer Graphic Metafile (CGM) version 1-4
- Baker Metafile
- Schlumberger PDS (PDS files are usually for one logging run; any borehole with multiple runs should submit composited file format)
- Halliburton CGM
- Weatherford DPK

If the preferred formats listed above are not available, you may submit the image file in the Tag Image File Format (TIFF) with the following specifications:

ii. Format (TIFF) with the following specifications:

1. Black and White TIFF Images:

- Header tags as per TIFF standard
- Resolution – 200 dpi
- Compression – CCITT group IV
- Tiling – No

2. Color TIFF Images:

- Header tags as per TIFF standard
- Resolution – 200 dpi
- Palette color – 256 colors
- File format LZW Compressed TIFF
- Tiling - No

Clearly label each well log image with its associated API number, bottom hole lease number, well name, well name suffix, log type, scale and depth domain (MD or TVD).

e. Digital (Vector) Well Log Data: Submit composite digital curve data (one value per curve for each depth value and with individual tool runs merged) in the Canadian Well Log Society Log ASCII Standard (LAS), Version 2.0 format; and Digital Log Interchange Standard (DLIS) or Log Interchange Standard (LIS) format . Ensure that the curve data are in a MD composite layout, including full headers for each wireline and MWD/LWD logging tool run and curve description for all curves. Ensure that all required log curves (see Part A.1 of this NTL ) represented on the log image file are included in the digital curve file. If you collect logging data from more than one logging vendor in a single borehole, submit a separate set of composited log curves from each individual vendor . Do not splice digital curves from different vendors to form a set of composited log curves.

i. Full header information, should including the following:

- 12-digit API number
- well name suffix
- bottom hole lease number
- bottom hole area and block
- well name

ii. Information for each tool run, should including the following:

- borehole fluids
- depth interval
- mud
- filtrate resistivity and temperatures
- casing information
- bottomhole or maximum recorded temperature
- circulation history information
- tool schematic
- tool calibration record

Full logging tool parameters (including matrix values), position of logging tool (i.e., centered or eccentered), and logging engineer's comments; and adequate curve description and

Tool -specific and service provider-specific curve and parameter mnemonics (names and abbreviations) maintained as originally acquired.

If a log is spliced, the splice depth should be clearly noted along with which files were used.

Submit digital and image logs on CD or DVD ROM (read-only memory). Digital and image logs may be submitted on the same CD or DVD.

Directional Surveys

Submit one digital copy of the final composite directional survey. For the Digital Directional Survey format, see NTL 2009-N10.

- Submit, on CD or DVD ROM these survey results coded in ASCII.
- According to 30 CFR 250.461(d) (2), "You must correct all surveys to Universal-Transverse-Mercator-Grid-north or Lambert-Grid-north after making the magnetic-to-true-north correction."

If your use of more than one vendor prevents the consolidation of the separate surveys within a well, submit the final composite survey from each vendor .

Velocity Profiles and Surveys

Vertical Seismic Profiles: Submit the results from all borehole seismic data (in cased or uncased holes), as well as concurrently run directional surveys for both vertical and directional wells, if they are different from directional surveys referred to in Part I, Section B of this NTL . Submit, on CD or DVD ROM, digitally recorded data in a industry standard format (LAS, DLIS, ASCII, CGM, TIFF, JPG, SEGY, DOC), that include, but are not limited to:

- Normal Incidence VSP;
- Acoustic Log Calibration Report;
- Final VSP and Corridor stacks for 2D data and final stacked and migrated volume for 3D VSP data;
- Composite plot with VSP, Corridor stacks, synthetic seismogram, and well logs;
- any referenced information within the report correlative with the acquisition, such as 2-way time indexed depths and velocities, survey parameters, digital images, and computed survey data and directional; and
- If acquired, format time/depth pairs.

Velocity Surveys (Time-Depth Pairs/Checkshots): Submit, on CD or DVD ROM, one digital copy coded in ASCII format (see Attachment 2 of this NTL ). The report should include or be annotated with the following:

- API number
- Well name and number
- Well name suffix
- Contractor or service provider
- Contact name (phone number or e-mail address)

Note that the digital format has been modified to expand the columns for True Vertical Depth and One-Way Travel Time from 5 to 8 to include two decimal places for each column.

We encourage direct submittal of the completed survey from the acquiring service company .

Analysis of Conventional Cores, Percussion/Rotary Sidewall Cores, Wireline Formation Tests, and Drill Stem Tests

IF...
you conduct any of the following:

- Conventional cores descriptions and analysis
- Percussion/Rotary sidewall core analysis or equivalent,
- Wireline formation tests - include any logs (summary logs are acceptable) and associated lab results, or
- Drill stem tests

THEN...

As soon as the final and/or revised conventional core, percussion/rotary sidewall core reports and/or data become available to you, send one digital copy of the entire, detailed report. Reports should include, but are not limited to the following:

- Standard analyses for porosity,
- Permeability
- Water saturation
- Core photos
- compaction analyses
- laser grain size analyses
- stressed brine porosity and permeability analyses
- rock mechanic studies
- water extraction and core gamma logs
- core photos

In addition, provide one copy of all studies you performed on the core(s) and tests for the purpose of describing and characterizing the reservoir architecture through detailed stratigraphic or depositional analyses. In certain situations, the BSEE AKOCS may require that you submit preliminary or interim reports .

Submit, on CD or DVD ROM, one copy of the description and analysis of the conventional core, the percussion/rotary sidewall core, wireline formation tests, and drill stem tests reports in the original digital format (i.e., WordPerfect, Word, Excel, Lotus 1-2-3). Any data acquired in a log format should be submitted as a log image.

Geochemical Analyses/Reports and Information

Submit one copy of the Geochemical Analyses/Reports and Information in the original digital format (i.e., WordPerfect, Word, Excel, Lotus 1-2-3, JPEG, CGM, TIFF) if you conducted any geochemical analyses/reports, including internal company or external contractor interpretation reports on

- Cuttings,
- Sidewall or conventional cores, and
- Fluid samples from the well. The term "sample" encompasses:
- Hydrocarbon gases, specifically methane through pentanes and C6+ hydrocarbons;
- Non-hydrocarbon gases (carbon dioxide, hydrogen sulfide, argon, helium, and radon); and
- Any liquid hydrocarbons (such as condensate, crude, and bitumen) encountered by the well in cuttings or shows and from any other well sampling or fluid testing.

The analyses, reports, and interpretations to be submitted include, but are not necessarily limited to , the following types of data:

- Total organic carbon
- Polynuclear aromatic hydrocarbons
- Rock-eval pyrolysis
- Stable isotope analyses of carbon & hydrogen
- Thermal chromatography-gas chromatography
- Compound-specific isotope ratio mass spectrometry
- Bulk pyrolysis & hydrous pyrolysis

- Isotope ratio mass spectrometry
- Gas chromatography
- Kerogen isolation & bitumen separation
- Pyrolysis/gas chromatography
- Organic petrography
- Complete saturated biomarker & aromatic hydrocarbon analysis by GC MS
- Vitrinite reflectance
- Elemental analysis of kerogen

In addition, submit all data and reports on geochemical characterization of produced oils, including

- All whole-oil GC, GC MS on oils,
- SARAH (or SARA),
- Isotopes on the fractions,
- Molecular and isotopic analyses of C1-C5 hydrocarbons metals data, and
- Any other geochemical data used from production samples intended for reservoir characterization studies.

Submit, on CD or DVD ROM, digitally recorded data in industry standard formats.

Detailed Paleontological Reports and Information

As soon as the final and/or revised paleontological information and/or data become available to you, submit one copy in digital format of the entire, detailed paleontological report(s), chart(s), striplog(s), checklist(s), and any other paleontological records. Include the following:

The range of samples taken,

- Sample analysis identifying fossils and lithology by MD,
- Summary and interpretation (based on identification of foraminifera, nannofossils, or other microfossils) of all biostratigraphic markers, zones, tops, or local markers,
- Description of paleontological ecological zones with water depth at the time of deposition (e.g., Middle Shelf/Neritic 20-100 meters, Outer Shelf/Neritic 100-200 meters),
- Sequence analysis interpretations based on histograms of faunal abundance,
- Identification of all rock units by depth to the top of relative chronostratigraphic stages (e.g., Upper Pleistocene, Middle Miocene, or Lower Oligocene), and
- 
- Pleistocene, Middle Miocene, or Lower Oligocene), and
- Biostratigraphic chart noting the relative ages of the biostratigraphic zones you used in the detailed paleontological reports.

Submit, on CD or DVD ROM, one copy of the detailed paleontological report in the original digital format (i.e., WordPerfect, Word, Excel, Lotus 1-2-3, JPEG, CGM, TIFF).

Mudlogs and Reports

Submit one image copy of the following types of Mudlogs:

- Physical Formation Log
- Pore Pressure Log
- Engineering Log
- Show Report Log

Image File Formats for Mudlogs: If the original log is in color, the submitted image file must also be in color.

The following image file formats are preferred:

- Geologix - geo draft file (.gdf)
- Geologix - output data file (.odf)

If the preferred formats listed above are not available, submit the image file in the Tag Image File

Format (TIFF) with the following specifications:

Black and White TIFF Images
- Header tags as per TIFF standard
- Resolution – 200 dpi
- Compression – CCITT group IV
- Tiling – No

Color TIFF Images
- Header tags as per TIFF standard
- Resolution – 200 dpi
- Palette color – 256 colors
- File format LZW Compressed TIFF
- Tiling – No.

Submit one copy of the following types of Mudlogs reports, if collected:
- Show reports – composite into one file
- Mud reports – composite into one file
- End of Well reports – composite into one file
- Daily Drilling reports – composite into one file

Submit, on CD or DVD ROM, digitally recorded data in industry standard formats.

End of Operations Report (Form BSEE-0125 ) and Attachments

Pursuant to 30 CFR 250.465(a), you must submit End of Operations Report (Form BSEE-0125) and the required attachments.

Additional Information

Pursuant to 30 CFR 250.469(d), the BSEE AKOCS may require that you submit additional well reports or records for a specific well(s).