Devaris, Aimee <adevaris@usgs.gov>

follow up on Sec Order

4 messages

Devaris, Aimee <adevaris@usgs.gov> Tue, Jun 20, 2017 at 8:59 AM
To: James Kendall <james.kendall@boem.gov>

Hi Jim,

I talked with Murray Hinzman (Associate Director for Energy and Minerals at USGS HQ) about how we are working with BOEM on the assessment plans. He responded that Vincent DeVito directed each agency to come up with their own plan -- then submit to DOI so they could assemble a final plan. He acknowledged we are all supposed to work together, and they see that as a critical "next step."

Attached is what USGS submitted. I don't see any reason not to share this with you.

Once the plan is finalized at DOI, I'd like to pull us all together to discuss/coordinate (Bud, Greg, Steve, etc.). If you think we need to get together sooner, let me know.

Aimee

--
Aimee M. Devaris
Regional Director
U.S. Geological Survey
4210 University Drive
Anchorage, Alaska
907-786-7091

USGS Resource Assessment Prop - Alaska North Slope V4 (1).docx
719K

Kendall, James <james.kendall@boem.gov> Tue, Jun 20, 2017 at 9:03 AM
To: "Devaris, Aimee" <adevaris@usgs.gov>

Thanks!

It's going to be interesting.....

jjk

[Quoted text hidden]
--

Dr. James (Jim) Kendall
Regional Director
Alaska OCS Region
Bureau of Ocean Energy Management
3801 Centerpoint Drive, Suite 500
Anchorage, AK 99503-5823
Office: 907-334-5200
Cell: 907-250-3852
james.kendall@boem.gov

BOEM
Bureau of Ocean Energy Management

Kendall, James <james.kendall@boem.gov> Tue, Jun 20, 2017 at 9:41 AM
To: "Devaris, Aimee" <adevaris@usgs.gov>

This is what we sent up through Walter on Friday.

jjk

On Tue, Jun 20, 2017 at 8:59 AM, Devaris, Aimee <adevaris@usgs.gov> wrote:
[Quoted text hidden]

--

Dr. James (Jim) Kendall
Regional Director
Alaska OCS Region
Bureau of Ocean Energy Management
3801 Centerpoint Drive, Suite 500
Anchorage, AK 99503-5823
Office: 907-334-5200
Cell: 907-250-3852
james.kendall@boem.gov

BOEM
Bureau of Ocean Energy Management

BOEM-AK NS Assessment Proposal.docx
93K

Devaris, Aimee <adevaris@usgs.gov> Tue, Jun 20, 2017 at 10:07 AM
To: "Hitzman, Murray" <mhitzman@usgs.gov>, Walter Guidroz <wguidroz@usgs.gov>

Hi Murray,

You probably have this but just in case...

---------- Forwarded message ---------
From: Kendall, James <james.kendall@boem.gov>
Date: Tue, Jun 20, 2017 at 9:41 AM
Subject: Re: follow up on Sec Order
To: "Devaris, Aimee" <adevaris@usgs.gov>

This is what we sent up through Walter on Friday.

jjk

--

Dr. James (Jim) Kendall
Regional Director
Alaska OCS Region
Bureau of Ocean Energy Management
3801 Centerpoint Drive, Suite 500

Anchorage, AK 99503-5823
Office: 907-334-5200
Cell: 907-250-3852
james.kendall@boem.gov

BOEM
Bureau of Ocean Energy Management

--
Aimee M. Devaris
Regional Director
U.S. Geological Survey
4210 University Drive
Anchorage, Alaska
907-786-7091

BOEM-AK NS Assessment Proposal.docx
93K

DATE: June 13, 2017
TO: Vincent DeVito, Department of Interior Energy Counselor
FROM: William H. Werkheiser, Acting Director, U.S. Geological Survey
SUBJECT: Alaska North Slope Assessment Proposal (S.O. 3352)

Secretarial Order 3352 (Section 4b) directs the Assistant Secretary – Land and Minerals Management and the Assistant Secretary – Water and Science to submit to the Counselor to the Secretary for Energy Policy a joint plan for updating current assessments of undiscovered, technically recoverable oil and natural gas resources of the Alaska North Slope, focusing on Federal lands including the National Petroleum Reserve in Alaska (NPRA) and the Section 1002 Area of the Arctic National Wildlife Refuge (ANWR). This document represents the USGS submission for the joint plan.

KEY TAKEAWAYS

- USGS can conduct energy resource assessments of NPRA, ANWR 1002 area, central North Slope, and west of NPRA. Assessments would be conducted in collaboration with Alaska Region BLM and BOEM. Alaska Department of Natural Resources Division of Geological and Geophysical Surveys (DGGS) and the Alaska Department of Natural Resources Division of Oil and Gas (DOG) personnel would be invited to contribute if funding can be secured.
- A USGS energy resource assessment of NPRA could be completed by late 4Q CY2017. Total USGS costs for this NPRA assessment are estimated at $2.55 M. USGS FY17 costs of $1.6 M can be covered but an additional $0.5M for support of Alaska DGGS and DOG personnel is required. FY18 costs of $0.95M for the project have not been fully included in the President's FY18 budget request.
- Three options are possible for a USGS energy resources assessment of ANWR 1002:
    - Determination of no new data so no assessment is conducted (cost $0)
    - New USGS energy resource assessment based on reprocessing of 1984-85 2-D seismic data. However, USGS has neither the funds nor the administrative capacity to procure the reprocessed data. Public release of results of such an assessment would be planned for late 4Q CY2018. Total USGS costs (FY17-19) are estimated at $4.85 M.
    - New USGS energy resource assessment utilizing data from a new 3-D seismic survey (not procured or managed by USGS). Release of the assessment results would occur during late CY2019. Total USGS costs (FY17-19) are estimated at $3.575 M.
- USGS energy resource assessments could be completed by end CY2020 for the central North Slope and by late CY2021 for the area west of NPRA. Funding for the proposed assessments has not been included in the President's FY18 request.
- The Energy Resources Program would have to secure additional funding for FY18 and beyond to undertake the proposed assessments.

Background

USGS assesses undiscovered, technically recoverable oil and gas resources of the U.S. and the world, using a variety of methodologies that have been peer reviewed by the American Association of Petroleum Geologists Committee on Resource Evaluation. USGS conducts assessments when directed to do so by the Administration or Congress, when requested to do so by Federal land-management agencies, or when compelling new data become available that may substantially modify the scientific perspective of undiscovered resource potential.

This plan for energy assessments of the North Slope of Alaska (Figure 1) was prepared by the U.S. Geological Survey (USGS) in collaboration with the Bureau of Land Management – Alaska Region (BLM) and the Bureau of Ocean Energy Management – Alaska OCS Region (BOEM). USGS's mission includes assessing oil and natural gas resources of all onshore and State waters areas of the United States. BLM and BOEM manage oil and gas resources of Federal lands and the Outer Continental Shelf (OCS), respectively. Their missions include conducting lease sales and collecting and archiving pertinent exploration and development data.

These assessment plans include personnel from the Alaska Department of Natural Resources Division of Geological and Geophysical Surveys (DGGS) and the Alaska Department of Natural Resources Division of Oil and Gas (DOG) to work in support of the assessments.

Current Alaska North Slope Assessments

Current USGS assessments of the North Slope include:

* Conventional oil and gas in NPRA (2010)
* Conventional oil and gas in the Central North Slope (2005)
* Conventional oil and gas in the ANWR 1002 area (1998)
* North Slope-wide assessments of "unconventional" oil and gas in shale (self-sourced) reservoirs (2012), gas in coal beds (2006), and gas in hydrates (2008)

USGS assessments of the Alaska North Slope differ somewhat from those of the Lower 48 because the North Slope is an under explored basin, with fewer exploration wells and producing fields than most Lower 48 basins. North Slope assessments therefore rely more heavily on interpretation of seismic reflection and other subsurface data and on information derived from field work focused on rock formations that may be exploration objectives beneath the North Slope.

For example, the USGS conducted an assessment of NPRA in 2002 following the discovery and development of the giant Alpine (Colville River) field, which represented a petroleum trap type previously unknown on the North Slope. However, subsequent industry drilling in NPRA on leases covering geologic features similar to Alpine revealed that the oil charge in the Alpine field changes to mainly a gas charge just 25 miles west of Alpine. As these results became known and a sufficient amount of data from the new wells became available, USGS updated the NPRA assessment in 2010, with the main result being a significant reduction in the volume of oil estimated to be present.

In the 2010 NPRA assessment, the two plays estimated to contain the greatest potential for undiscovered oil were the Torok and Nanushuk Formations, in which huge oil discoveries have been announced since 2015. Recently announced discoveries include Pikka (>1,200 million barrels of oil (MMBO) recoverable from Nanushuk), Willow (>300 MMBO recoverable from Nanushuk), and Smith Bay (perhaps >1,000 MMBO recoverable from the Torok). If these announced volumes of recoverable oil are verified by development, the estimated largest oil accumulation size (a significant input to the assessment methodology) would be increased by one to two orders of magnitude compared to the assessment input used in the 2010 assessment of these formations. Thus, these significant discoveries represent compelling new data that may substantially modify the scientific perspective of potential resources in these plays.

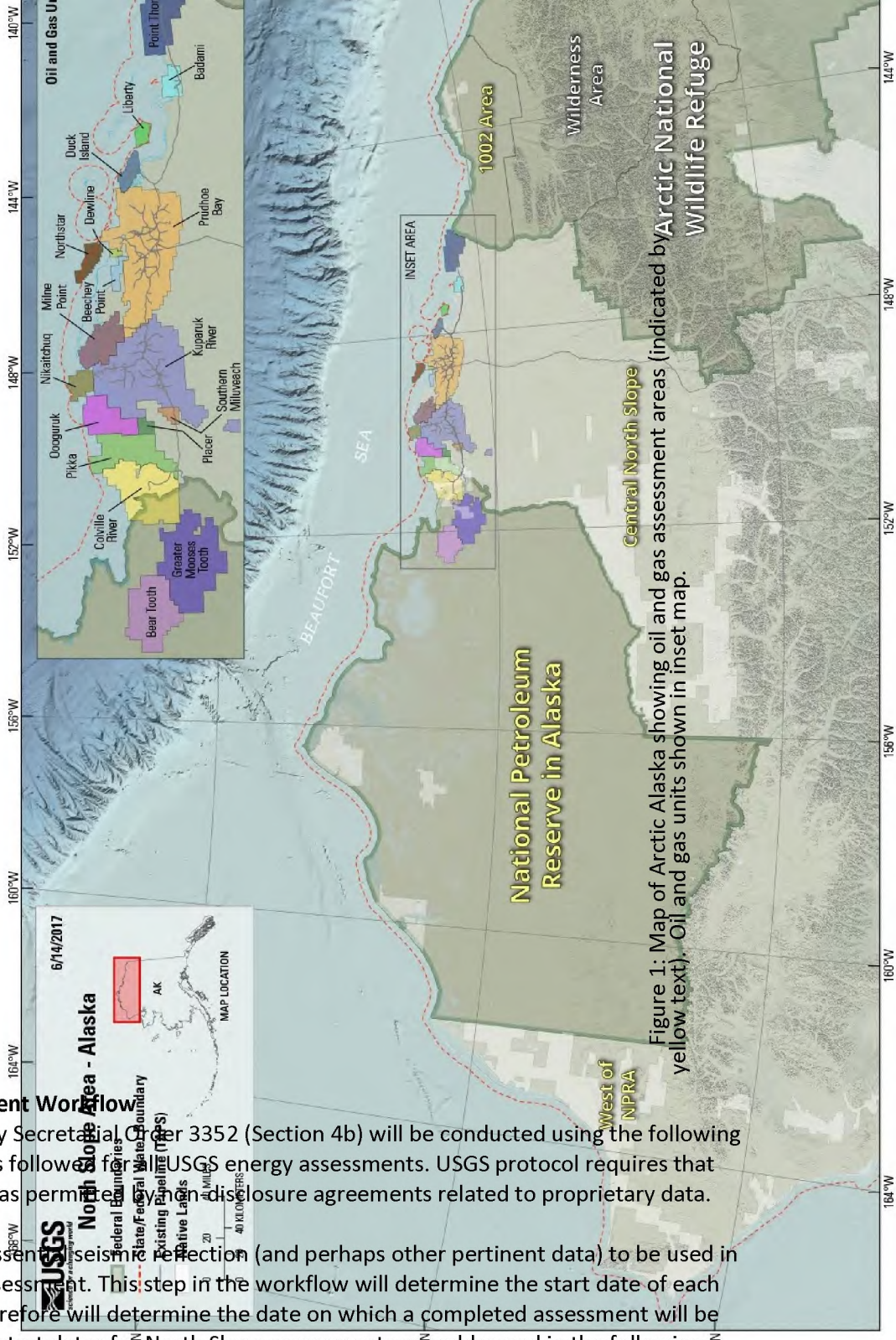


Figure 1: Map of Arctic Alaska showing oil and gas assessment areas (indicated by yellow text). Oil and gas units shown in inset map.

Generalized USGS Assessment Workflow

The assessments directed by Secretarial Order 3352 (Section 4b) will be conducted using the following generalized workflow that is followed for all USGS energy assessments. USGS protocol requires that steps 1-7 be as transparent as permitted by non-disclosure agreements related to proprietary data.

1. Acquire or access essential seismic reflection (and perhaps other pertinent data) to be used in conducting each assessment. This step in the workflow will determine the start date of each assessment and therefore will determine the date on which a completed assessment will be published. Possible start dates for North Slope assessments are addressed in the following section.

2. Assemble a team of scientists with expertise in pertinent disciplines of the earth sciences (e.g., petroleum geologist, geophysicist, seismic interpreter, organic geochemist, structural geologist, etc.). Assessment workflow steps 1 – 7 for NPRA and the ANWR 1002 Area will comprise a team that includes scientists from USGS, BLM and BOEM.

3. Compile all additional data pertinent to the assessment, determine additional data needs, acquire additional data as budget permits, integrate all data into digital data base, and analyze/interpret all data in a digital workflow.

4. Define petroleum systems, plays, or assessment units that fully represent formations known to contain or hypothesized to contain technically recoverable oil and natural gas resources.

5. Communicate and coordinate with Alaska technical agencies, as appropriate, throughout the data collection, analysis, and interpretation workflow. The Alaska agencies will include DGGS, DOG, and the Alaska Oil and Gas Conservations Commission.

6. Hold public review meetings in Anchorage, Houston and other locations as appropriate to (a) explain rationale for conducting, and timeline for completing, assessment; (b) present scientific basis of assessment (e.g., explain framework geology, regional and local petroleum systems, likely reservoir units, trap geometries, and key risk factors that determine the probability that technically recoverable resources are present; (c) present fundamental geological entities (i.e., plays or assessment units) to be assessed; (d) present details of assessment methodology to be used; and (e) seek constructive feedback from knowledgeable scientists. USGS experience indicates that these public meetings build buy-in and support for assessment results from State agencies and the oil industry.

7. Revise fundamental aspects of the geological framework of the assessment based on constructive feedback from public meetings and follow-up discussions with petroleum geology experts from State agencies and the oil industry.

8. Conduct assessment – USGS Alaska project team presents the assessment framework and inputs to USGS National and Global Assessment review panel. Results from this meeting are subjected to rigorous statistical analysis, which generates probabilistic results.

9. Technical reports will be produced that summarize the geological science that forms the foundation of the assessment. The assessment results are then incorporated into non-technical fact sheets summarizing results. These documents are submitted to USGS technical and editorial review as required by USGS Science Integrity Policy. Fact sheets are given priority to assure timely release.

10. Assessment results are released to the public by publication of fact sheet. Simultaneous briefings are presented to the Department of the Interior and elsewhere to share results with the Administration, Congress, and the public at large.

PROPOSED NORTH SLOPE ASSESSMENTS:

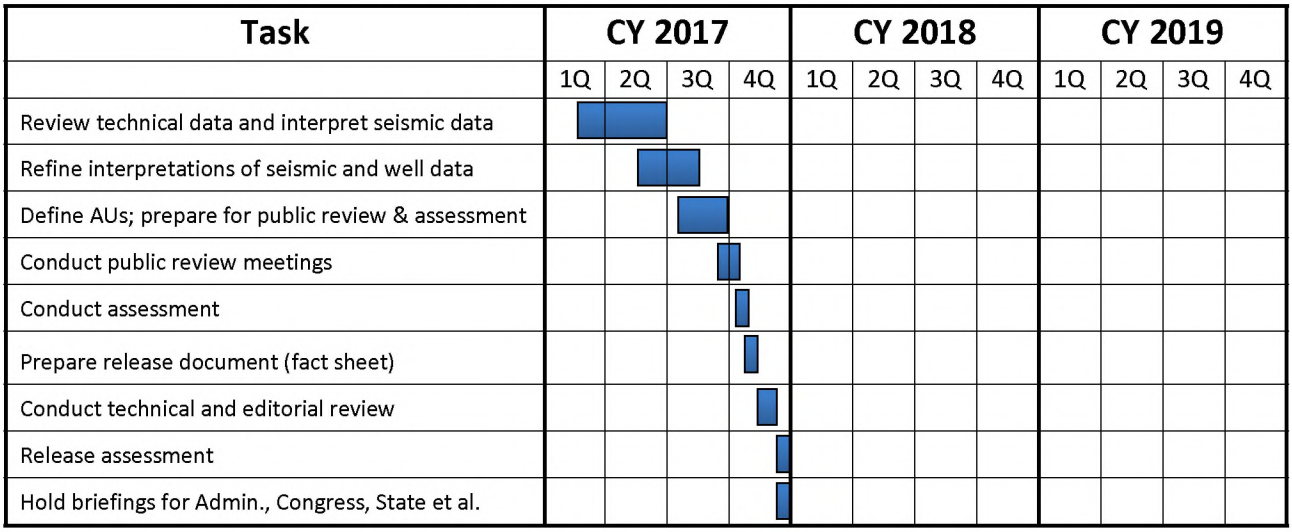
National Petroleum Reserve – Alaska (NPRA)

Review of technical data has been initiated and involves personnel from USGS, BOEM and BLM. Primary data will include 3-D seismic reflection data, exploration well data, and a large volume of ancillary data generated by ongoing USGS research and data submitted to the BLM by industry.

BOEM has conducted advanced analysis of 3-D seismic data for NPRA lease sales, and USGS has conducted research on all rock units to be evaluated. The first three tasks of the workflow, therefore, will comprise review of all data and analyses by an integrated team of USGS, BLM and BOEM personnel and building of consensus on plays to be assessed and risk structure to be imposed on the assessment. It is anticipated that this step can be completed late in the third quarter (3Q) of calendar year (CY) 2017.

Public review meetings and the USGS assessment could be held in 4Q CY2017, with a date for results release in late 4Q CY2017 (Figure 2). Total USGS costs for this NPRA assessment are estimated at $2.55 million. Included in these costs is $0.50 million dedicated to the Alaska Department of Natural Resources to conduct analytical services in support of the NPRA resource assessment.

Figure 2: Estimated completion timeline for NPRA Resource Assessment



Alaska National Wildlife Refuge 1002 Area

Three ANWR 1002 Area assessment scenarios are considered, which are detailed below:

Scenario 1: Assumes that existing vintage 2-D seismic data are not reprocessed

No updated assessment would be conducted because no new post-1998 data exist that would compel the USGS to consider conducting a new assessment. The only new information available since completion of the 1998 assessment is summarized below.

A. Information from two wells (Stinson and Warthog) drilled in nearby state waters prior to completion of the 1998 assessment was released after the assessment and analyzed by USGS. The Stinson well discovered oil in two rock units, but the volumes of oil were determined to be sub-economical. The Stinson lease blocks were relinquished and subsequently acquired by another company, although no further exploration has been conducted. The Warthog well was declared a dry hole, and the lease blocks were relinquished and never re-acquired. The formations in which oil was found in the Stinson well and the formation that was the main objective of the Warthog well were assessed by USGS in 1998. The information gleaned from data released from both wells is consistent with the results of the 1998 assessment.

B. After nearly three decades of delays, the giant oil, gas, and condensate accumulation at Point Thomson is now being developed by ExxonMobil. The limited available seismic and well data indicate that little or none of the main reservoir extends into the 1002 area. Moreover, the structure of the hydrocarbon trap indicates unfavorable conditions in the 1002 area (i.e., the ANWR area is down dip from the Point Thomson accumulation).

C. Oil accumulations discovered by Exxon in 1975 on Flaxman Island, just offshore from the 1002 Area, and by BP in 1994 at Sourdough, located less than a mile west of the 1002 area, have not been developed. BP dropped the leases over Sourdough, whose well data remain proprietary, after disappointing results at the nearby Badami field, but the leases have been incorporated into the Point Thomson Unit. ExxonMobil has indicated that it is evaluating the possibility of developing the Flaxman Island and Sourdough accumulations but no development decision has been made. Despite these recent developments, USGS was aware of the Flaxman Island and Sourdough discoveries prior to completion of the 1998 assessment.

Based on the information summarized above, the USGS concludes that no basis for conducting an updated assessment exists.

Scenario 2: Assumes that the 1984-1985 2-D seismic data will be reprocessed (not procured or managed by USGS)

The timeline for this scenario includes procurement of state-of-the-art industry reprocessing of the vintage data during 4Q CY2017, and reprocessing of the vintage data during late 4Q CY2017 through early 2Q CY2018 (the seismic company that collected original data estimates six months for reprocessing). USGS and BOEM scientists would make multiple visits to the company conducting the reprocessing to provide interactive geological constraints to assure optimal results. During the reprocessing, new data would be collected from well samples adjacent to the 1002 Area and from outcrop samples collected during a short field season in 2017. These data would include constraints on oil source-rock quality, uplift and exhumation history, and reservoir-rock quality. USGS recommends

collection of an airborne gravity gradiometry survey across the 1002 Area pending sufficient funds (would require approximately $2.5M), but neither procurement nor interpretation of such a survey are included in the USGS budget.

After reprocessed seismic data were delivered, a team of USGS and BOEM scientists would interpret the data, produce maps, and define plays (assessment units) to be evaluated. It is estimated that these tasks could be completed during 1Q-3Q CY2018 (Figure 3). This schedule should allow public review meetings to be held during 3Q-4Q CY2018, with the assessment and technical review of release materials during 4Q CY2018. Public release of results would be planned for late 4Q CY2018.

Total USGS costs are estimated at $4.85 million over three fiscal years. Included in these costs are $0.75 million dedicated to the Alaska Department of Natural Resources to conduct tasks associated with analytical services in support of the ANWR 1002 Area assessment.

Figure 3: Estimated completion timeline for ANWR Resource Assessment (Scenario 2)

Task	CY 2017				CY 2018				CY 2019			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Seismic data reprocessing (existing 2-D data) *												
Review technical data and interpret seismic data												
Refine interpretations of seismic and well data												
Define AUs; prepare for public review & assessment												
Conduct public review meetings												
Conduct assessment												
Prepare release document (fact sheet)												
Conduct technical and editorial review												
Release assessment												
Hold briefings for Admin., Congress, State, et al.												

* USGS does not procure reprocessed vintage 2-D seismic data, but provides geological and geophysical advice to seismic vendor.

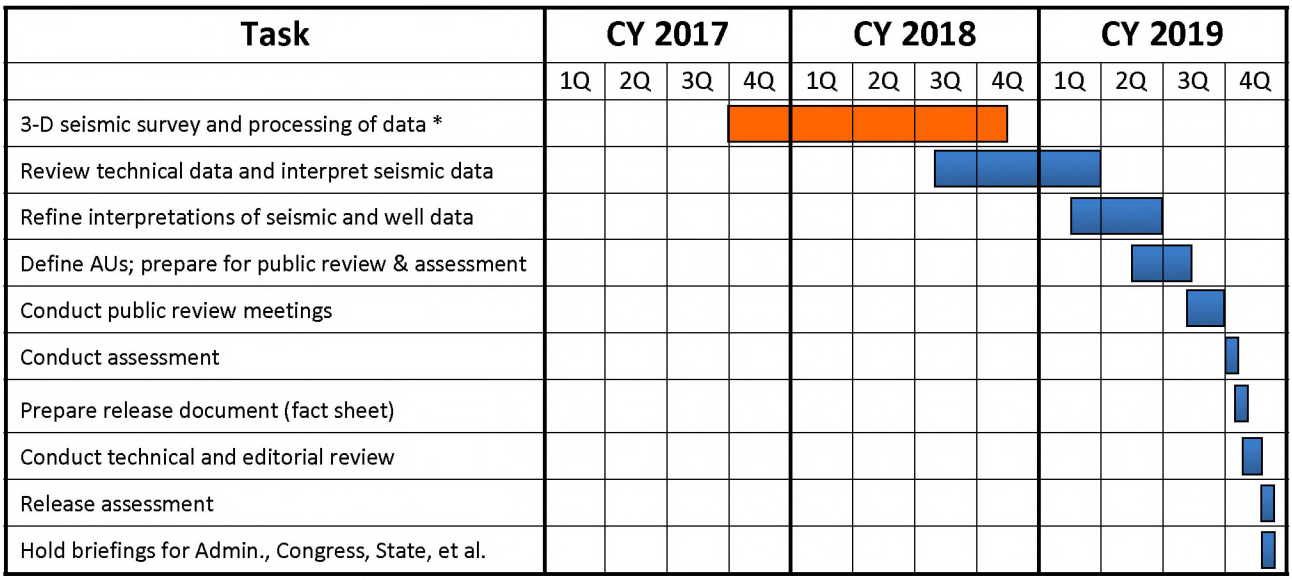
Scenario 3: Assumes that a 3-D seismic survey is conducted during 4Q CY2017 and 1Q CY2018 (not procured or managed by USGS)

This task, including initial processing of the new 3-D data, would be difficult, but not impossible, to achieve by end CY 2019 (Figure 4). Interpretation and mapping of the 3-D and ancillary data by USGS and BOEM scientists would occur during 3Q and 4Q of CY 2018 and 1Q of CY2019. Definition of plays (assessment units) through public review of the assessment work products would be completed by late 3Q of 2019, and the assessment, report preparation, technical review, and release of the assessment results would occur during 4Q of 2019.

If the 3-D seismic survey was not completed until winter 2018-2019, the timeline would be delayed by one year. In that case, the workflow for assessment of the Central North Slope would be advanced by one year and would commence during 3Q or 4Q of 2018.

Total USGS costs are estimated at $3.575 million. Included in these costs are $0.5 million dedicated to the Alaska Department of Natural Resources to collaborate in field work and ancillary analytical tasks.

Figure 4: Estimated completion timeline for ANWR Resource Assessment (Scenario 3)



* USGS plays no role in designing or acquiring a 3-D seismic survey.

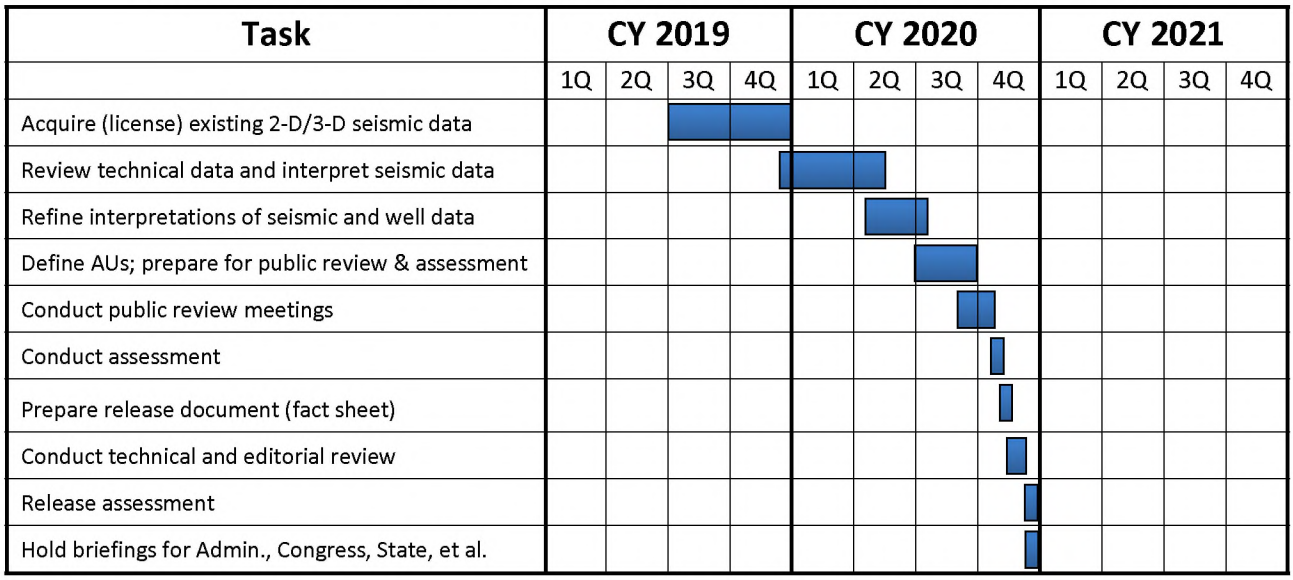
Central North Slope

Assessment of the Central North Slope would rely heavily on the public release of tax-incentive 3-D seismic reflection data by the Alaska Department of Natural Resources. Assuming that several of these data sets are released before or during 2Q CY2018 and that funding is available for the USGS to license other 3-D and 2-D seismic data, an assessment could be completed by the end of CY2020 (Figure 5). As no Federal lands are involved in this assessment, much or all of the technical analyses would be completed by USGS scientists, with the expectation that BOEM and BLM scientists could provide technical review of the interpretations. Alaska state agencies would be invited to collaborate on data interpretation and play (assessment unit) definition.

If the ANWR 1002 Area 3-D seismic survey is not completed until winter 2018-2019, the timeline in Figure 5 could be advanced by one year. In that case, the workflow for assessment of the Central North Slope would commence during 3Q or 4Q of 2018.

Total USGS costs are estimated at $6.4 million. Included in these costs are $0.4 million dedicated to the Alaska Department of Natural Resources to collaborate in field work and ancillary analytical tasks.

Figure 5: Estimated completion timeline for Central North Slope Resource Assessment



West of NPRA

The area west of NPRA, both onshore and beneath Alaska state waters, contains only sparse and very old (1970s vintage) 2-D seismic data. Workflow for this assessment would include review with BOEM of seismic data in the Chukchi Sea to evaluate the extent to which those data may inform the geology of the onshore and state waters. Unless new seismic data become available, it is anticipated that existing data could be reviewed and interpreted, and that an assessment would be conducted between 3Q CY2020 and 4Q CY2021 (Figure 6). It is anticipated that much or all of the technical analyses would be completed by USGS scientists with the expectation that BOEM and BLM scientists will provide technical review of the interpretations. Because much of the onshore area consists of Native lands, USGS would also invite the Arctic Slope Regional Corporation to provide a technical review of USGS work.

Total costs are estimated at $4.4 million. Included in these costs are $0.2 million dedicated to the Alaska Department of Natural Resources to collaborate in field work and ancillary analytical tasks.

Figure 6: Estimated completion timeline for West of NPRA Resource Assessment

Task	CY 2019				CY 2020				CY 2021			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Acquire existing 2-D/3-D seismic data												
Review technical data and interpret seismic data												
Refine interpretations of seismic and well data												
Define AUs; prepare for public review & assessment												
Conduct public review meetings												
Conduct assessment												
Prepare release document (fact sheet)												
Conduct technical and editorial review												
Release assessment												
Hold briefings for Admin., Congress, State, et al.												

USGS Budgets

Costs for each assessment by Fiscal Year are included in Table 1 on the following page. The current annual budget (FY17) of the USGS Alaska Petroleum Systems (APS) project is $1.5 million. This budget includes research on North Slope and southern Alaska basins. The Energy Resources Program is currently redirecting a limited amount of funding (approximately $0.1 million) from work in southern Alaska to the North Slope. The current budget shortfall to the APS to accomplish what is required for the assessments from the FY17 budget is $2.85 million. To increase the efficiency of the rapidly upcoming in-state summer field work USGS requests that personnel from both the Alaska Division of Geological and Geophysical Surveys (DGGS) and the Alaska Department of Natural Resources Division of Oil and Gas (DOG) participate in field studies in support of the assessments if a second helicopter can be contracted; USGS would pay per diem costs for all personnel involved (cost of $0.5M). The current budget does not cover the costs for the Alaska personnel. Funds to supplement the existing APS budget need to be secured as soon as possible within the Department.

Funding for the proposed assessments has not been included in the President's FY18 request. Proposed budgets for the Energy Resources Program will have be modified to cover the proposed assessments and additional funding secured. Funding for the assessments in FY19 and beyond will be built into upcoming budget requests.

Table 1: Cost information, Alaska North Slope Assessment Options (numbers in millions of dollars)

Assessment	FY17	FY18	FY19	FY20	FY21	FY22	Total
National Petroleum Reserve – Alaska	1.600	0.950	0.000	0.000	0.000	0.000	**2.550**
Alaska National Wildlife Refuge							
ANWR – Option 1	0.000	0.000	0.000	0.000	0.000	0.000	**0.000**
ANWR – Option 2	1.350	2.550	0.950	0.000	0.000	0.000	**4.850**
ANWR – Option 3	0.000	0.375	2.250	0.950	0.000	0.000	**3.575**
Central North Slope	0.000	0.000	3.250	2.200	0.950	0.000	**6.400**
West of NPRA	0.000	0.000	0.000	1.250	2.400	0.750	**4.400**

Note: Totals not provided due to range of assessment scenarios provided.

Contacts: Murray Hitzman, Associate Director for Energy and Minerals, U.S. Geological Survey, mhitzman@usgs.gov, 703-648-4576
Walter Guidroz, Energy Resources Program Coordinator, U.S. Geological Survey, wguidroz@usgs.gov, 703-648-6421

United States Department of the Interior
BUREAU OF OCEAN ENERGY MANAGEMENT
Alaska OCS Region
3801 Centerpoint Drive, Suite 500
Anchorage, Alaska 99503-5823

Memorandum

To: Vincent DeVito, Department of Interior Energy Counselor

From: Walter Cruickshank, Acting Director, Bureau of Ocean Energy Management

Subject: Alaska North Slope Assessment Proposal (S.O. 3352)

The Bureau of Ocean Energy Management (BOEM) has reviewed the USGS's June 13 proposal for updating the assessment of undiscovered, technically recoverable oil and natural gas resources of the Alaska North Slope, focusing on Federal lands in the National Petroleum Reserve in Alaska (NPRA) and the Section 1002 Area of the Arctic National Wildlife Refuge (ANWR). BOEM supports the USGS plan, and believes we can augment the plans in several ways.

Below, for ease of review, BOEM is repeating the USGS workflow steps and showing in bold font where BOEM would augment the USGS approach. We look forward to working cooperatively with USGS and BLM on this important project.

"Generalized USGS Assessment Workflow
The assessments directed by Secretarial Order 3352 (Section 4b) will be conducted using the following generalized workflow that is followed for all USGS energy assessments. USGS protocol requires that steps 1-7 be as transparent as permitted by non-disclosure agreements related to proprietary data.

1. Acquire or access essential seismic reflection (and perhaps other pertinent data) to be used in conducting each assessment. This step in the workflow will determine the start date of each assessment and therefore will determine the date on which a completed assessment will be published. Possible start dates for North Slope assessments are addressed in the following section.

2. Assemble a team of scientists with expertise in pertinent disciplines of the earth sciences (e.g., petroleum geologist, geophysicist, seismic interpreter, organic geochemist, structural geologist, etc.). Assessment workflow steps 1 – 7 for NPRA and the ANWR 1002 Area will comprise a team that includes scientists from USGS, BLM and BOEM.
    - **BOEM geologists and geophysicists have analyzed the geologic and geophysical data for all sales in the NPRA starting with the 1999 sale through the most recent sale in 2016. BOEM analysts have access to all BLM seismic and well information as it becomes available. BOEM has also assessed the resource potential of adjacent Outer Continental Shelf (OCS) offshore of NPRA and**

ANWR. Re-examining the geologic settings of both the onshore and offshore areas will enhance our understanding of the oil and gas potential of the Alaska North Slope.

3. Compile all additional data pertinent to the assessment, determine additional data needs, acquire additional data as budget permits, integrate all data into digital data base, and analyze/interpret all data in a digital workflow.
    - **Proprietary industry geologic and geophysical data held by BOEM is unlicensed to the USGS. This data (subject to appropriate non-disclosure agreements) will be available for analysis and interpretation in Anchorage at the BLM Alaska State Office and the BOEM Alaska Regional Office.**
    - **Any new geophysical and geological data acquired (seismic reflection, non-federal well data, etc.) not currently available (i.e., proprietary State of Alaska data) will be shared between the three bureaus for the purpose of this analyses. BOEM is researching the availability and cost of the Smith Bay portion of the BLM 3D dataset pertinent to the assessment of the Caelus discovery.**
    - **BOEM, in conjunction with BLM, will pursue the acquisition of the Alaska state portion of the NPRA 3D dataset collected in Smith Bay. This seismic data is a critical piece of information for analyzing the possible geological impact on resources from the Caelus discovery. The cost to purchase the Smith 3D data is currently unknown.**

4. Define petroleum systems, plays, or assessment units that fully represent formations known to contain or hypothesized to contain technically recoverable oil and natural gas resources.
    - **BOEM has an integrated system of high performance computer workstations, specialized geological and geophysical interpretive software, and trained staff for analyzing and managing the large volumes of geophysical and geological data used in the exploration for oil and gas on the OCS of Alaska. BOEM staff and resources will be available for assessing the oil and gas potential of NPR-A and the 1002 area of ANWR.**

5. Communicate and coordinate with Alaska technical agencies, as appropriate, throughout the data collection, analysis, and interpretation workflow. The Alaska agencies will include DGGS, DOG, and the Alaska Oil and Gas Conservations Commission.

6. Hold public review meetings in Anchorage, Houston and other locations as appropriate to (a) explain rationale for conducting, and timeline for completing, assessment; (b) present scientific basis of assessment (e.g., explain framework geology, regional and local petroleum systems, likely reservoir units, trap geometries, and key risk factors that determine the probability that technically recoverable resources are present; (c) present fundamental geological entities (i.e., plays or assessment units) to be assessed; (d) present details of assessment methodology to be used; and (e) seek constructive feedback from knowledgeable scientists. USGS experience indicates that these public meetings build buy-in and support for assessment results from State agencies and the oil industry.
    - **BOEM will work collaboratively with USGS and BLM and, by consensus, the team will determine the geologic risk of plays and assessment units to ensure**

resources are consistently evaluated, especially where geologic plays extend from onshore to offshore. BOEM, USGS, BLM and other government experts will review geologic play risks for consistency.

7. Revise fundamental aspects of the geological framework of the assessment based on constructive feedback from public meetings and follow-up discussions with petroleum geology experts from State agencies and the oil industry.

8. Conduct assessment – USGS Alaska project team presents the assessment framework and inputs to USGS National and Global Assessment review panel. Results from this meeting are subjected to rigorous statistical analysis, which generates probabilistic results.
    - **BOEM scientists regularly assess the undiscovered technically recoverable resources on OCS lands using rigorous analytical methods. BOEM also conducts fair market value analysis for BLM's annual NPR-A lease sales. It is imperative for this North Slope assessment that the DOI agencies conduct a consistent analysis between onshore and offshore resources, subject to rigorous statistical analysis and supportable probabilistic results.**
    - **BOEM scientists will assess the Beaufort OCS potential as might be influenced by new discoveries onshore. BOEM will also revise the resource assessment of two existing plays equivalent to the Torok and Nanushuk Formations in the Beaufort Sea using new information and our geological and geophysical interpretive software.**

9. Technical reports will be produced that summarize the geological science that forms the foundation of the assessment. The assessment results are then incorporated into non-technical fact sheets summarizing results. These documents are submitted to USGS technical and editorial review as required by USGS Science Integrity Policy. Fact sheets are given priority to assure timely release.

10. Assessment results are released to the public by publication of fact sheet. Simultaneous briefings are presented to the Department of the Interior and elsewhere to share results with the Administration, Congress, and the public at large."

Alaska National Wildlife Refuge 1002 Area

BOEM has no disagreement with the USGS proposed scenarios for assessing the 1002 area of ANWR, except to add that a request should be made to the owners of the KIC well (API #025-20001-00) to release the well data for purposes of this assessment. The KIC well was drilled by a consortium of oil companies led by Chevron on Kaktovik Inupiat Corporation lands in ANWR in 1986. It is the only well drilled within the confines of ANWR. Data from this well would significantly influence our understanding of the geology and resource potential of the 1002 area.