



Harris, Margo &lt;mrharris@usgs.gov&gt;

**Fwd: SO 3352**

2 messages

**Werkheiser, William** <whwerkhe@usgs.gov>  
To: Margo Harris <mrharris@usgs.gov>

Mon, Sep 18, 2017 at 11:56 AM

----- Forwarded message -----

From: **Michael Nedd** <mnedd@blm.gov>

Date: Tue, Jun 27, 2017 at 6:25 PM

Subject: RE: SO 3352

To: Richard Cardinale <richard\_cardinale@ios.doi.gov>, Katharine MacGregor <katharine\_macgregor@ios.doi.gov>, Scott Cameron <scott\_cameron@ios.doi.gov>, William Werkheiser <whwerkhe@usgs.gov>, Walter Cruickshank <walter.cruickshank@boem.gov>, Walter Guidroz <wguidroz@usgs.gov>, Murray Hitzman <mhitzman@usgs.gov>  
Cc: Kerry Rae <kerry\_rae@ios.doi.gov>, Jeff Brune <jbrune@blm.gov>, Emily Lindow <emily.lindow@boem.gov>, Jill Moran <jcmoran@blm.gov>, Troy Ezell <troy.ezell@boem.gov>

Rich thank-you and I also second your thank-you to the team...

*Take care and have a wonderful day! : )**Michael Nedd**202-208-3801 Office**202-208-5242 Fax*

mnedd@blm.gov

*A thought to consider "Do all the good you can, in all the ways you can, for all the people you can, while you can!"***From:** Cardinale, Richard [mailto:richard\_cardinale@ios.doi.gov]**Sent:** Tuesday, June 27, 2017 6:03 PM**To:** Katharine Macgregor; Scott Cameron; William Werkheiser; Walter Cruickshank; Nedd, Mike; Walter Guidroz; Murray Hitzman**Cc:** Kerry Rae; Jeff Brune; Emily Lindow; Moran, Jill; Troy Ezell**Subject:** SO 3352

All,

Attached please find the final copy of the 21-day memo to Vince DeVito in connection with Secretary's Order 3352. I delivered the memo to Vince a short time ago.

Thanks to everyone for your assistance in getting this over the finish line.

Rich

--  
William H. Werkheiser  
Acting Director, U.S. Geological Survey  
12201 Sunrise Valley Drive, MS 100  
Reston, VA 20192  
703-648-7411


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**Werkheiser, William** <whwerkhe@usgs.gov>  
To: Margo Harris <mrharris@usgs.gov>

Mon, Sep 18, 2017 at 11:56 AM

[Quoted text hidden]

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 **Signed 21-day Memo re SO 3352.pdf**  
699K



# United States Department of the Interior

OFFICE OF THE SECRETARY  
Washington, D.C. 20240

Memorandum

JUN 27 2017

**TO:** Vincent DeVito  
Counselor to the Secretary for Energy Policy

**THROUGH:** Katharine S. MacGregor, Acting Assistant Secretary  
Land and Minerals Management

*for* Scott J. Cameron, Acting Assistant Secretary -  
Water and Science

**FROM:** William Werkheiser, Acting Director -  
United States Geological Survey

Michael D. Nedd, Acting Director  
Bureau of Land Management

Walter D. Cruickshank, Acting Director -  
Bureau of Ocean Energy Management

**SUBJECT:** Joint Plan (USGS-BLM-BOEM) Response for Resource Assessment to  
Secretarial Order No. 3352

## EXECUTIVE SUMMARY

This memo responds to Secretary's Order No. 3352, which aims to jump-start energy production on the North Slope of Alaska. Specifically, this memo, which includes information from the United States Geological Survey (USGS), Bureau of Land Management (BLM) and Bureau of Ocean Energy Management (BOEM), discusses plans by which current resource assessments in the National Petroleum Reserve-Alaska (NPR-A) and the Section 1002 Area of the Arctic National Wildlife Refuge will be updated

The proposed resource assessments will be conducted using established USGS protocol and as transparently as permitted by non-disclosure agreements related to proprietary data. This work will be coordinated with and will involve Alaska technical agencies, including the Division of Geological and Geophysical Services, the Division of Oil and Gas, and the Alaska Oil and Gas Conservations Commission. The assessments include the following:

- **NPR-A:** A review of technical data has started, which includes 3-D seismic reflection data, exploration well data, and a large volume of ancillary data generated by ongoing

USGS research and data submitted to BLM by industry. Estimated completion is the end of Calendar Year (CY) 2017<sup>1</sup>; total USGS costs are \$2.55 million.

- **Arctic National Wildlife Refuge (ANWR) 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 compel a new assessment.
- **ANWR Scenario 2 – Assumes that 1984-1985 2-D seismic data will be reprocessed:** State-of-the-art industry reprocessing<sup>2</sup> of this vintage data will be procured. Estimated completion is the end of 2018; total USGS costs are estimated to be \$4.85 million.
- **ANWR Scenario 3 – Assumes that a new 3-D seismic survey is conducted (conducted and paid for by the private sector):** A new 3-D seismic grid will aid interpretation and mapping, which will lead to updated play (assessment unit) definition. Estimated completion is the fourth quarter of 2019; total USGS costs are \$3.575 million. If the 3-D seismic survey is not completed during the winter of 2017-18, then completion will be delayed by one year (to the end of 2020). In that case, the Central North Slope assessment will be advanced by one year.
- **Central North Slope:** Relies heavily on the public release of tax-incentive 3-D seismic data by the Alaska Department of Natural Resources. Estimated completion is the end of 2020; total USGS costs are estimated to be \$6.4 million.
- **West of NPR-A:** This area, both onshore and beneath Alaska state waters, contains only sparse and very old (1970s vintage) 2-D seismic data. Unless new seismic data become available, existing data will be reviewed and interpreted. Estimated completion is the fourth quarter of 2021; estimated USGS costs are \$4.4 million.

Furthermore, BOEM anticipates completing a Beaufort Sea nearshore resource assessment by the end of September 2017, in sufficient time for findings to be incorporated into the USGS assessments.

## BACKGROUND

On May 31, 2017, Secretary Zinke issued Secretary's Order No. 3352 (Order 3352) that, among other things, directs the Assistant Secretaries of Land and Minerals Management and Water and Science to submit a joint plan to the Counselor for Energy Policy for updating assessments of undiscovered, technically recoverable oil and natural gas resources of Alaska's North Slope, focusing on Federal lands, including the NPR-A and the Section 1002 Area of the Arctic National Wildlife Refuge (ANWR). Specifically, Section 4 b of Order 3352 states:

*Within 21 days of the issuance of this Order, the Assistant Secretary – Land and Minerals Management and the Assistant Secretary – Water and Science shall 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 Alaska's North Slope, focusing on Federal lands including the NPR-A and the Section*

<sup>1</sup> All references to completion dates are based on the calendar year.

<sup>2</sup> The reprocessing of 2-D seismic data involves applying updated data algorithms to original raw seismic data. When combined with the use of present state-of-the-art computing systems, seismic reprocessing allows for clearer and more detailed seismic resolution than would have been possible when the original data were acquiring in the mid-1980s.

*1002 Area [of the Arctic National Wildlife Refuge]. The joint plan shall include consideration of new geological and geophysical data that has become available since the last assessments, as well as potential for reprocessing existing geological and geophysical data.*

The effort to update the current resource assessments in the NPR-A and the Section 1002 Area of ANWR is currently underway and led by the USGS in close coordination with the BLM and BOEM. The new resource assessments will replace the 2010 NPR-A and 1998 1002 Area USGS petroleum resource assessments. An estimate of more favorable hydrocarbon resources could increase the level of interest in leasing in these areas.

The BLM will provide institutional knowledge and geologic data that will be useful to the USGS while comparing and evaluating existing information about the NPR-A and the 1002 Area to produce a public report to estimate undiscovered, technically recoverable oil and gas resources. The BLM has the data from numerous geophysical surveys conducted throughout NPR-A, including from some high potential areas that are currently unavailable for leasing. Geophysical data for the 1002 Area is more limited; the last geophysical survey was conducted in 1984-85. The BLM will provide a technical review of the draft assessment report.

## **PROPOSED ASSESSMENTS**

The assessments directed by Section 4 b of Order 3352 will be conducted using established USGS protocols. The assessments will involve public review meetings in Anchorage, Houston and other locations, as appropriate, to foster “buy-in” and support for assessment results from State agencies and the oil industry. The assessment results will be incorporated into non-technical fact sheets summarizing results and technical reports that reflect the geological science that forms the foundation of the assessment. These documents will be submitted to USGS technical and editorial review as required by USGS Science Integrity Policy.

Proprietary industry geologic and geophysical data held by BOEM is unlicensed to the USGS. These 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 analysis. 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. Finally, BOEM, in conjunction with BLM, will pursue the acquisition of the Alaska state portion of the NPRA 3-D dataset collected in Smith Bay. This seismic data is vital in analyzing the possible geological impact on resources from the Caelus discovery. The cost to purchase the Smith 3D data is currently unknown.

As this work will be carried out jointly by USGS, BLM and BOEM, it is imperative that the bureaus conduct a consistent analysis between onshore and offshore resources, subject to rigorous statistical analysis and supportable probabilistic results.

The total USGS costs for each assessment by Fiscal Year are included in Table 1 below. Detailed plans and timelines for conducting various North Slope assessments are discussed more fully below.

**Table 1: USGS 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
Arctic 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

#### **National Petroleum Reserve – Alaska (NPR-A)**

Review of technical data has started and involves personnel from the USGS, BOEM and BLM. The data currently under review includes 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 staff and resources will be available for assessing the oil and gas potential of NPR-A and the 1002 area of ANWR.

BOEM geologists and geophysicists have analyzed the geologic and geophysical data for all sales in the NPR-A, starting with the 1999 sale through the most recent sale in 2016, and USGS has conducted research on all rock units to be evaluated. In addition, BOEM has 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 the NPR-A 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.

Accordingly, the first three tasks of the workflow will consist of a review of all data and analyses by an integrated team of USGS, BLM and BOEM personnel with the goal of reaching consensus on the plays to be assessed and risk structure to be imposed on the assessment. This 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. The USGS, BOEM, BLM and other government experts will review geologic play risks for consistency. We anticipate this step can be completed late in the third quarter of 2017.

BOEM scientists will also assess the Beaufort OCS potential as might be influenced by new discoveries onshore. The BOEM will also revise the resource assessment of two existing plays equivalent to the Torok and Nanushuk Formations in the Beaufort Sea. The BOEM anticipates completing the Beaufort Sea nearshore assessment by the end of September 2017, and in sufficient time to be incorporated into the updated NPR-A assessment due at the end of 2017.

Public review meetings and the USGS assessment will be held during the fourth quarter of 2017, and results could be released late in the fourth quarter of 2017. Total USGS costs are estimated at \$2.55 million; a timeline of assessment tasks is included in Figure 2. Included in these costs is \$500,000 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**

Task	CY 2017				CY 2018				CY 2019			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
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.				■								

**Arctic 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.
- 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 the fourth quarter of 2017, and reprocessing of the vintage data during late in the fourth quarter of 2017 through early in the second quarter of 2018 (the seismic company that collected original data estimates six months for reprocessing). The BLM will work with the USGS regarding the reprocessing of existing geological and geophysical data of the 1002 Area and will assist as required in the collection of any additional seismic data collected on onshore Federal mineral estate.

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 will be collected from well samples adjacent to the 1002 Area and from outcrop samples collected during a short field season in 2017. These data will include constraints on oil source-rock quality, uplift and exhumation history, and reservoir-rock quality. The USGS recommends collection of an airborne gravity gradiometry survey across the 1002 Area pending sufficient funds, but neither procurement nor interpretation of such a survey are included in the USGS budget. The collection of this type of survey, which is collected from the air and is non-invasive, would provide a 3-dimensional gravity surface that would help enhance the interpretation of the reprocessed 2-D seismic data. However, given the cost involved (about \$2.5 million), USGS will forego the collection of this survey and rely on the enhancement brought about from the 2D seismic data.

After reprocessed seismic data are delivered, a team of USGS and BOEM scientists will interpret the data, produce maps, and define plays (assessment units) to be evaluated. These tasks are estimated to be completed during the first through third quarters of 2018. This schedule will allow public review meetings to be held during that same period, and the assessment and technical review of release materials during the fourth quarter of 2018. Public release of results is planned for late in the fourth quarter of 2018.

Total USGS costs are estimated at \$4.85 million over three fiscal years, and a timeline of assessment tasks is included in Figure 3 below. Included in these costs is \$750,000 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										<input type="checkbox"/>			
Release assessment										<input type="checkbox"/>			
Hold briefings for Admin., Congress, State, et al.										<input type="checkbox"/>			

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

- **ANWR Scenario 3: Assumes that a 3-D seismic survey is conducted during the fourth quarter of 2017 and first quarter of 2018 (conducted and paid for by the private sector)**

This task will be difficult, but not impossible to achieve in the timeline shown, including initial processing of the new 3-D data. Interpretation and mapping of the 3-D and ancillary data by USGS and BOEM scientists will occur during third and fourth quarters of 2018 and the first quarter of 2019. Definition of plays (assessment units) through public review of the assessment work products will be completed by late in the third quarter of 2019, and the assessment, report preparation, technical review, and release of the assessment results will occur during the fourth quarter of 2019.

If the 3-D seismic survey is not completed during the winter of 2017-18, then completion will be delayed one year (to the end of 2020). In that case, the workflow for assessment of the Central North Slope will be advanced by one year and will commence during third or fourth quarter of 2018.

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. As 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.

Total USGS costs are estimated at \$3.575 million, and a timeline of assessment tasks is included in Figure 4 below. Included in these costs is \$500,000 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)**

Task	CY 2017				CY 2018				CY 2019			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
3-D seismic survey and processing of 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 plays no role in designing or acquiring a 3-D seismic survey

**Central North Slope**

Assessment of the Central North Slope will 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 the second quarter of 2018, and that funding is available for the USGS to license other 3-D and 2-D seismic data, an assessment likely can be completed by the end of 2020. As no Federal lands are involved in this assessment, much or all of the technical analyses will be completed by USGS scientists, with the expectation that BOEM and BLM scientists will provide technical review of the interpretations. Alaska state agencies will be invited to collaborate on data interpretation and play (assessment unit) definition.

If the ANWR 1002 Area 3-D seismic survey is not completed during the winter of 2017-2018, the timeline in Figure 4 will be advanced by one year. In that case, the workflow for assessment of the Central North Slope will commence during third or fourth quarter of 2018.

Total USGS costs are estimated at \$6.4 million. Included in these costs is \$400,000 dedicated to the Alaska Department of Natural Resources to collaborate in field work and ancillary analytical tasks.

### **West of NPR-A**

The area west of the NPR-A, both onshore and beneath Alaska state waters, contains only sparse and very old (1970s vintage) 2-D seismic data. Workflow for this assessment will 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, we anticipate that existing data can be reviewed and interpreted, and that an assessment can be conducted between the third quarter of 2020 and fourth quarter of 2021. We anticipate that much or all of the technical analyses will be completed by USGS scientists with the expectation that BOEM and BLM scientists will provide technical review of the interpretations. As much of the onshore area consists of Native lands, the USGS will invite the Arctic Slope Regional Corporation to also provide a technical review of USGS's work.

Total USGS costs are estimated at \$4.4 million. Included in these costs is \$200,000 dedicated to the Alaska Department of Natural Resources to collaborate in field work and ancillary analytical tasks.

### **Budget Strategy for Funding the Work**

Given that we are presently about to enter the fourth quarter of FY 2017, it will be very challenging to be able to obligate USGS FY17 funding in FY 2017 to begin this work. USGS indicates that it has approximately \$100,000 in uncommitted FY 2017 resources to start work. They believe that the nature of the work, given the Alaska field season, that could be accomplished over the balance of FY 2017 represents about \$825,000. Additional funds beyond the \$100,000 (namely \$725,000) would need to be identified for redirection from elsewhere in the USGS enacted budget. As a practical matter, this late in the fiscal year we would need to find available grant funds from another program, or money that was intended for a contract that could be redirected for this purpose.

However, the reprogramming rules imposed by the Appropriations Committee in this instance would seem to require that a shift of more than \$150,000 into this line item would require a formal reprogramming request. The process for a reprogramming would require USGS to identify another program within its budget to be the donor of funds, the Departmental Budget Office would then need to submit a reprogramming request to the Office of Management and Budget for approval, and then the reprogramming would need to sit with the House and Senate Interior Appropriations Subcommittees for up to 30 days, unless the committees chose to approve it sooner. The 30-day clock might realistically run out by the middle of August. Finally, once we got approval in mid-August we would need a method for obligating the \$825,000 in the six weeks before the end of the fiscal year, assuming the funds to be used were one-year money that would expire September 30, 2017.

The fastest way to obligate funds would be by adding a new task order onto an existing contract whose scope of work was broad enough to accommodate the new work, or through an existing cooperative agreement with a state or university. USGS will explore an appropriate funding vehicle.

Note that we could also accept contributed funds from non-Federal parties to support this work, which presumably would not be subject to the Hill's reprogramming guidelines. That assumption also needs to be validated.

BLM and FWS have indicated they do not have available FY 2017 funds to support this work.

Bottom line, only \$825,000 in Federal funds of the possible \$2,950,000 shown in Table 1 could plausibly be obligated this year. Assuming no non-Federal funds were available, the balance of \$2,125,000 would need to be obligated in FY 2018. USGS would need to evaluate whether obligating that money in FY2018 instead of FY 2017 would push the overall schedule for the work a bit further into the future.