

Conversation Contents

FW: Joint Memo

Attachments:

/26. FW: Joint Memo/1.1 USGS-BLM-BOEM assessment plan 6-22-17 RTC_KM sjc WG.docx

Walter Guidroz <wguidroz@usgs.gov>

From: Walter Guidroz <wguidroz@usgs.gov>
Sent: Mon Jun 26 2017 06:24:53 GMT-0600 (MDT)
To: "Houseknecht, David" <dhouse@usgs.gov>
Subject: FW: Joint Memo
Attachments: USGS-BLM-BOEM assessment plan 6-22-17 RTC_KM sjc WG.docx

Sorry, meant to copy you. I've added your edits from last week as we had a final chance to lock things down. Murray and I are also talking to Aimee Devaris this afternoon; we may be able to get some BLM money. We'll learn more later today...

Walter

From: Walter Guidroz [mailto:wguidroz@usgs.gov]
Sent: Monday, June 26, 2017 8:22 AM
To: Scott Cameron <scott_cameron@ios.doi.gov>
Cc: Murray Hitzman <mhitzman@usgs.gov>; Richard Cardinale <richard_cardinale@ios.doi.gov>; Kate MacGregor <katharine_macgregor@ios.doi.gov>; William Werkheiser <whwerkhe@usgs.gov>; 'mnedd@blm.gov' <mnedd@blm.gov>
Subject: RE: Joint Memo

Scott,

Thanks for sending the document. Murray and I have made a few minor tweaks, which can be seen in track changes. FYI, budget numbers in the cost table reflect USGS funds incurred within each respective FY.

Walter Guidroz

Program Coordinator, Energy Resources Program
U.S. Geological Survey
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(703) 648-6421

From: Hitzman, Murray [mailto:mhitzman@usgs.gov]
Sent: Monday, June 26, 2017 7:17 AM
To: Walter Guidroz <wguidroz@usgs.gov>
Subject: Fwd: Joint Memo

can you look over this asap - thanks

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From: Cameron, Scott <scott_cameron@ios.doi.gov>
Date: Fri, Jun 23, 2017 at 8:03 PM

Subject: Re: Joint Memo

To: "Cardinale, Richard" <richard_cardinale@ios.doi.gov>, Michael Nedd <mnedd@blm.gov>, Murray Hitzman <mhitzman@usgs.gov>

Cc: "MacGregor, Katharine" <katharine_macgregor@ios.doi.gov>

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Acting Assistant Secretary for Water and Science, and

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Desk 202 208 0969

Cell 202 706 9031

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Sent: Mon Jun 26 2017 07:46:39 GMT-0600 (MDT)
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To: "Jordan, Lisa" <ljordan@usgs.gov>
CC: David Houseknecht <dhouse@usgs.gov>
Subject: RE: FW: Joint Memo

Lisa, a question has come up on the North Slope assessment proposal we're submitting as to whether we might be able to obligate a larger amount of 2017 funds if we had until October or November 2017 to 'take care of admin work necessary to get cash out the door' rather than the end of FY 2017. Re: Dave's reply on the second point below (reprocessing vintage ANWR seismic) could you please advise whether this might be possible? Thanks...

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DRAFT

Memorandum

DATE: June 22, 2017

TO: Vincent DeVito
Counselor to the Secretary for Energy Policy
Richard Cardinale, Acting Assistant Secretary for Land and Minerals Management
THROUGH: Katharine S. MacGregor, Acting Assistant Secretary -
Land and Minerals Management

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

FROM: William Werkheiser, Acting Director –
United States Geological Survey (USGS)

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

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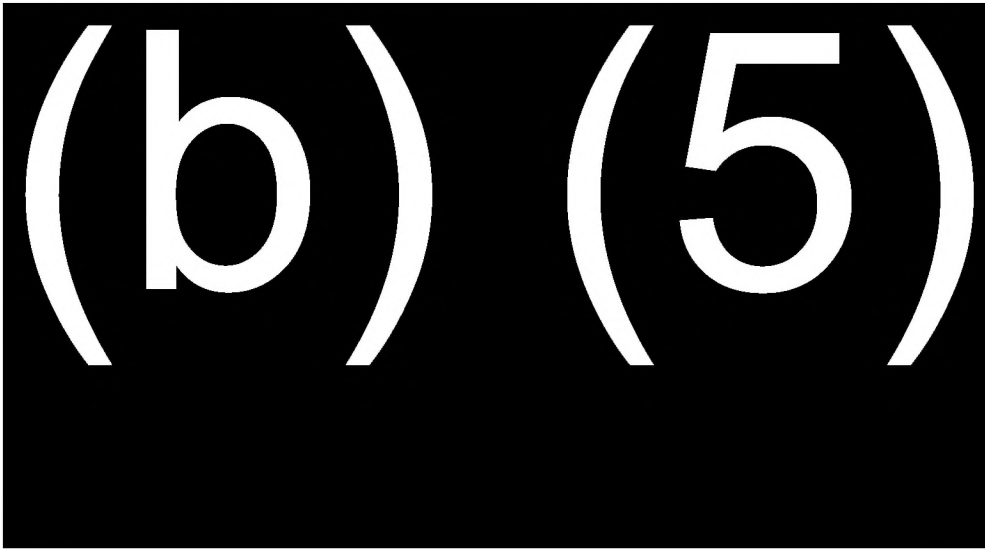
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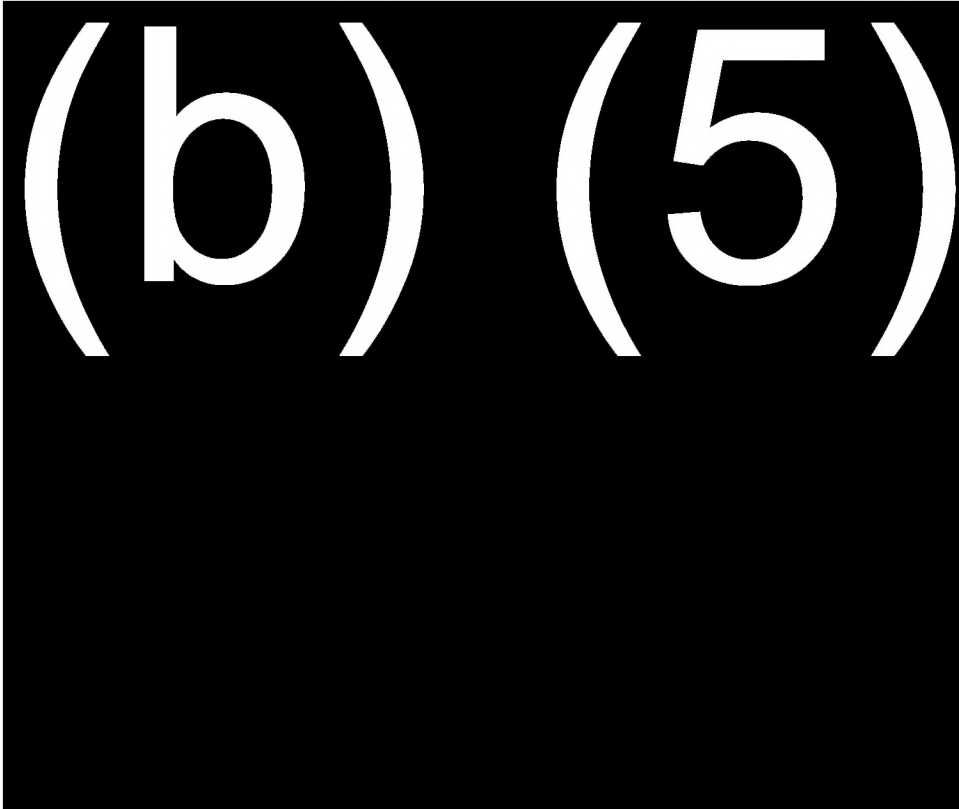
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BACKGROUND



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PROPOSED ASSESSMENTS

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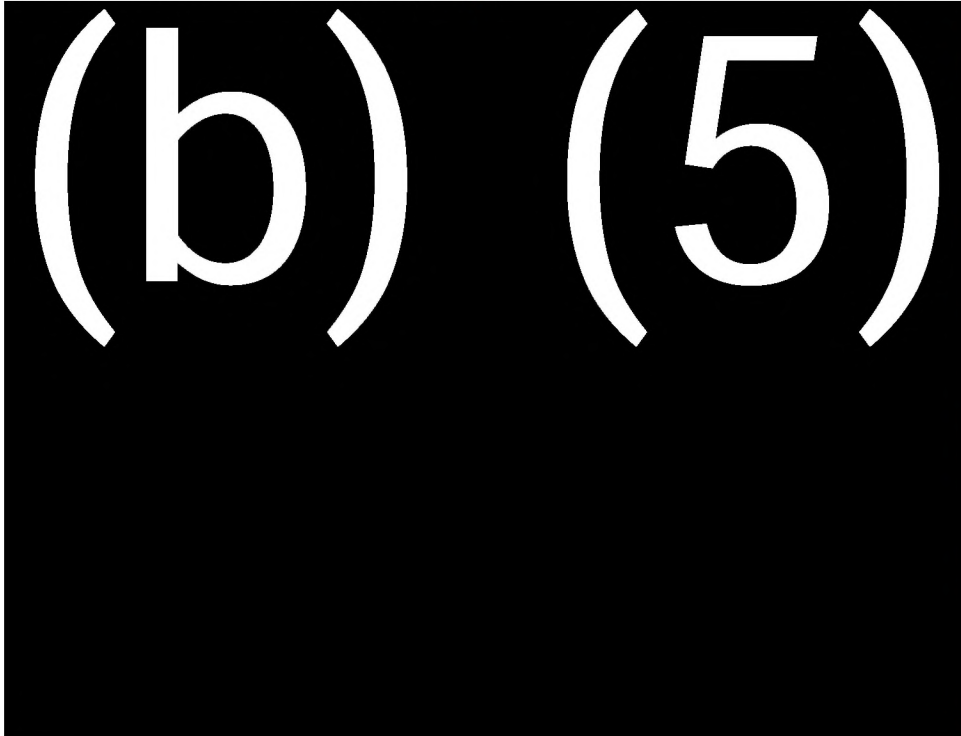
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Table 1: USGS Cost information, Alaska North Slope Assessment Options (numbers in millions of dollars)

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ANWR – Option 2	1.350	2.550	0.950	0.000	0.000	0.000	4.850
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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)



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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												

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Conversation Contents

assessment plan

Attachments:

I27. assessment plan/1.1 USGS-BLM-BOEM assessment plan 6-22-17_dh-track.docx

"Houseknecht, David" <dhouse@usgs.gov>

From: "Houseknecht, David" <dhouse@usgs.gov>
Sent: Fri Jun 23 2017 07:40:17 GMT-0600 (MDT)
To: Murray Hitzman <mhitzman@usgs.gov>, Walter Guidroz <wguidroz@usgs.gov>, Judy J Nowakowski <jnowakowski@usgs.gov>
Subject: assessment plan
Attachments: USGS-BLM-BOEM assessment plan 6-22-17_dh-track.docx

Here's the document with some suggestions and comments in track changes, although I guess this train has left the station.

--

Dave Houseknecht
U.S. Geological Survey
12201 Sunrise Valley Drive
MS 956
Reston, VA 20192
(703) 648-6466

"Hitzman, Murray" <mhitzman@usgs.gov>

From: "Hitzman, Murray" <mhitzman@usgs.gov>
Sent: Fri Jun 23 2017 07:40:56 GMT-0600 (MDT)
To: "Houseknecht, David" <dhouse@usgs.gov>
Subject: Re: assessment plan

thanks for this Dave but it did already go out.

On Fri, Jun 23, 2017 at 9:40 AM, Houseknecht, David <dhouse@usgs.gov> wrote:

Here's the document with some suggestions and comments in track changes, although I guess this train has left the station.

--

Dave Houseknecht
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MS 956

Reston, VA 20192
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--

Murray W. Hitzman
U. S. Geological Survey
Associate Director - Energy and Minerals
12201 Sunrise Valley Dr., MS 102
Reston, VA. 20192
703-648-4576

DRAFT

DATE: June 22, 2017

TO: Richard Cardinale, Acting Assistant Secretary for Land and Minerals Management
Scott Cameron, Acting Assistant Secretary for Water and Science

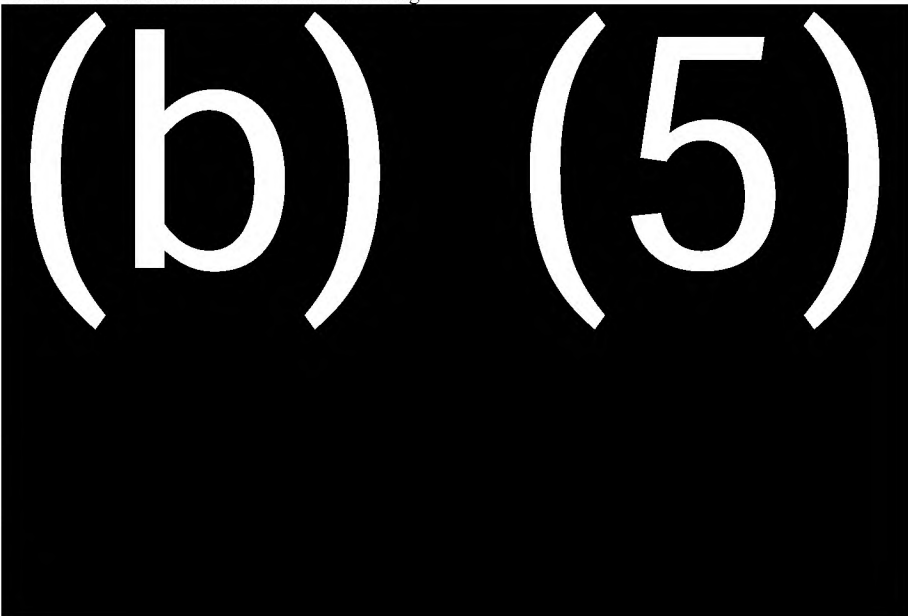
FROM: William Werkheiser, Acting Director – United States Geological Survey (USGS)

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

EXECUTIVE SUMMARY

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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:

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BACKGROUND

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PROPOSED ASSESSMENTS

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Assessment	FY17	FY18	FY19	FY20	FY21	FY22	Total
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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
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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 (NPRA)

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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.												

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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

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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 *				[Orange bar]								
Review technical data and interpret seismic data					[Blue bar]							
Refine interpretations of seismic and well data									[Blue bar]			
Define AUs; prepare for public review & assessment										[Blue bar]		
Conduct public review meetings											[Blue bar]	
Conduct assessment												[Blue bar]
Prepare release document (fact sheet)												[Blue bar]
Conduct technical and editorial review												[Blue bar]
Release assessment												[Blue bar]
Hold briefings for Admin., Congress, State, et al.												[Blue bar]

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

Central North Slope

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West of NPRA

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Conversation Contents

Joint (USGS-BLM-BOEM) Plan for North Slope Resource Assessments

Attachments:

/29. Joint (USGS-BLM-BOEM) Plan for North Slope Resource Assessments/1.1 USGS-BLM-BOEM assessment plan 6-22-17.docx

/29. Joint (USGS-BLM-BOEM) Plan for North Slope Resource Assessments/3.1 USGS Resource Assessment Proposal - Alaska North Slope 062317.docx

"Hitzman, Murray" <mhitzman@usgs.gov>

From: "Hitzman, Murray" <mhitzman@usgs.gov>
Sent: Thu Jun 22 2017 15:58:54 GMT-0600 (MDT)
Richard Cardinale <richard_cardinale@ios.doi.gov>, "Cameron, Scott" <scott_cameron@ios.doi.gov>, William Werkheiser <whwerkhe@usgs.gov>, Judy Nowakowski <jnowakowski@usgs.gov>, Walter Guidroz <wguidroz@usgs.gov>, Katharine MacGregor <katharine_macgregor@ios.doi.gov>, David Houseknecht <dhouse@usgs.gov>
To:
Subject: Joint (USGS-BLM-BOEM) Plan for North Slope Resource Assessments
Attachments: USGS-BLM-BOEM assessment plan 6-22-17.docx

As per conversation with Acting Secretary Cardinale this afternoon I am attaching the draft joint plan report for the north slope resource assessments. This includes data from USGS as well as BLM and BOEM. It is marked "Draft" as Bill Werkheiser has not had a chance to formally approve it. I do not expect any changes however. Let me know if you need anything further at this time.

murray

--

Murray W. Hitzman
U. S. Geological Survey
Associate Director - Energy and Minerals
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Reston, VA. 20192
703-648-4576

"Houseknecht, David" <dhouse@usgs.gov>

From: "Houseknecht, David" <dhouse@usgs.gov>
Sent: Fri Jun 23 2017 07:18:10 GMT-0600 (MDT)
To: "Hitzman, Murray" <mhitzman@usgs.gov>
Richard Cardinale <richard_cardinale@ios.doi.gov>, "Cameron,

CC: Scott" <scott_cameron@ios.doi.gov>, William Werkheiser <whwerkhe@usgs.gov>, Judy Nowakowski <jnowakowski@usgs.gov>, Walter Guidroz <wguidroz@usgs.gov>, Katharine MacGregor <katharine_macgregor@ios.doi.gov>

Subject: Re: Joint (USGS-BLM-BOEM) Plan for North Slope Resource Assessments

After reviewing this document, I want to draw everyone's attention to the fact that ANWR is not the Alaska National Wildlife Refuge, but the ARCTIC National Wildlife Refuge. There are a few other suggestions that I will make later, but they are minor by comparison.

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Walter Guidroz <wguidroz@usgs.gov>

From: Walter Guidroz <wguidroz@usgs.gov>
Sent: Fri Jun 23 2017 07:34:01 GMT-0600 (MDT)
To: David Houseknecht <dhouse@usgs.gov>, Murray Hitzman <mhitzman@usgs.gov>
Richard Cardinale <richard_cardinale@ios.doi.gov>, Scott Cameron <scott_cameron@ios.doi.gov>, William Werkheiser <whwerkhe@usgs.gov>, Judy Nowakowski <jnowakowski@usgs.gov>, Katharine MacGregor <katharine_macgregor@ios.doi.gov>
CC:
Subject: RE: Joint (USGS-BLM-BOEM) Plan for North Slope Resource Assessments
Attachments: USGS Resource Assessment Proposal - Alaska North Slope 062317.docx

Dave, thanks for pointing that out. I've reattached the document, corrected to read 'Arctic' National Wildlife Refuge as appropriate.

From: Houseknecht, David [mailto:dhouse@usgs.gov]

Sent: Friday, June 23, 2017 9:18 AM

To: Hitzman, Murray <mhitzman@usgs.gov>

Cc: Richard Cardinale <richard_cardinale@ios.doi.gov>; Cameron, Scott <scott_cameron@ios.doi.gov>;

William Werkheiser <whwerkhe@usgs.gov>; Judy Nowakowski <jnowakowski@usgs.gov>; Walter

Guidroz <wguidroz@usgs.gov>; Katharine MacGregor <katharine_macgregor@ios.doi.gov>

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From: "Hitzman, Murray" <mhitzman@usgs.gov>
Sent: Fri Jun 23 2017 07:34:18 GMT-0600 (MDT)
To: "Houseknecht, David" <dhouse@usgs.gov>
Subject: Re: Joint (USGS-BLM-BOEM) Plan for North Slope Resource Assessments

thanks dave

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"Houseknecht, David" <dhouse@usgs.gov>

From: "Houseknecht, David" <dhouse@usgs.gov>
Sent: Fri Jun 23 2017 07:35:48 GMT-0600 (MDT)
To: Walter Guidroz <wguidroz@usgs.gov>
Subject: Re: Joint (USGS-BLM-BOEM) Plan for North Slope Resource Assessments

I am preparing a "track changes" version that I will send to you and Murray in a few minutes.

Also, got email from Kate MacGregor this morning - she is going to call me in 30 minutes or so about one thing in the doc.

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From: Houseknecht, David [mailto:dhouse@usgs.gov]
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To: Hitzman, Murray <mhitzman@usgs.gov>
Cc: Richard Cardinale <richard_cardinale@ios.doi.gov>; Cameron, Scott <scott_cameron@ios.doi.gov>; William Werkheiser <whwerkhe@usgs.gov>; Judy Nowakowski <jnowakowski@usgs.gov>; Walter Guidroz <wguidroz@usgs.gov>; Katharine MacGregor <katharine_macgregor@ios.doi.gov>
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DRAFT

DATE: June 22, 2017

TO: Richard Cardinale, Acting Assistant Secretary for Land and Minerals Management
Scott Cameron, Acting Assistant Secretary for Water and Science

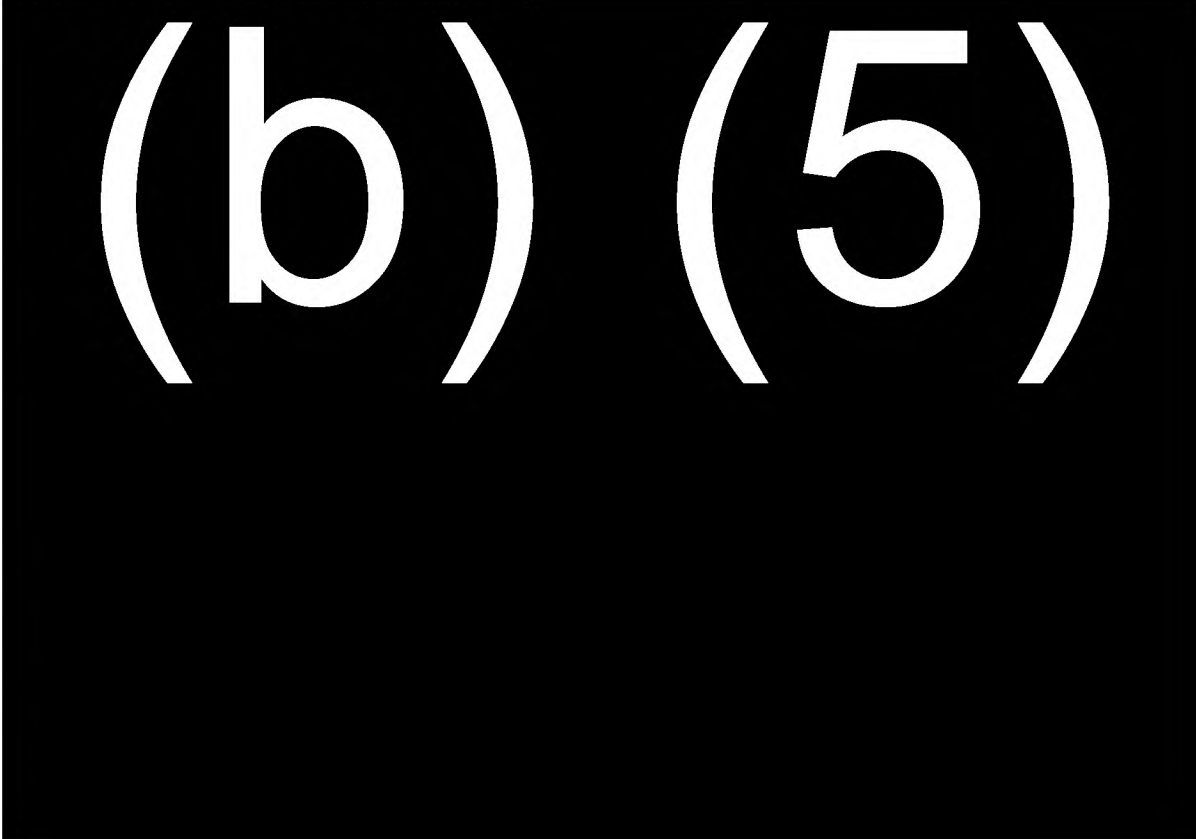
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BACKGROUND

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

National Petroleum Reserve – Alaska (NPRA)

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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.				█								

Alaska National Wildlife Refuge 1002 Area

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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

(b) (5)

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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 *				[Orange bar spanning 4Q 2017 to 3Q 2018]								
Review technical data and interpret seismic data						[Blue bar spanning 3Q 2018 to 2Q 2019]						
Refine interpretations of seismic and well data									[Blue bar spanning 1Q 2019 to 2Q 2019]			
Define AUs; prepare for public review & assessment										[Blue bar spanning 2Q 2019 to 3Q 2019]		
Conduct public review meetings											[Blue bar spanning 3Q 2019 to 4Q 2019]	
Conduct assessment												[Blue bar in 4Q 2019]
Prepare release document (fact sheet)												[Blue bar in 4Q 2019]
Conduct technical and editorial review												[Blue bar in 4Q 2019]
Release assessment												[Blue bar in 4Q 2019]
Hold briefings for Admin., Congress, State, et al.												[Blue bar in 4Q 2019]

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

Central North Slope

(b) (5)

(b) (5)

West of NPRA

(b) (5)

DRAFT

DATE: June 22, 2017

TO: Richard Cardinale, Acting Assistant Secretary for Land and Minerals Management
Scott Cameron, Acting Assistant Secretary for Water and Science

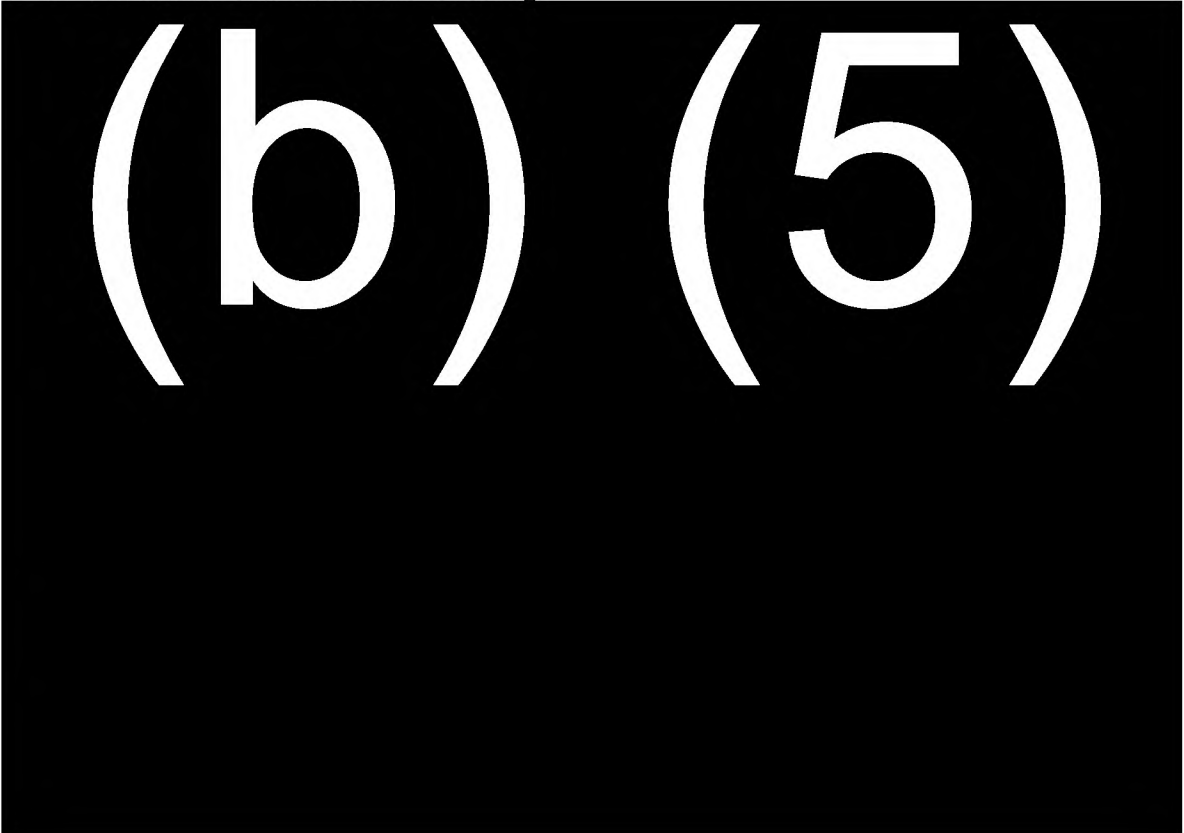
FROM: William Werkheiser, Acting Director – United States Geological Survey (USGS)

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

EXECUTIVE SUMMARY

The purpose of this memo is to respond to Secretarial Order No. 3352, which aims to jump-start Alaskan energy production on the North Slope of Alaska. Specifically, this memo 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. This memo includes information from USGS, BLM, and BOEM.

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:

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BACKGROUND

(b) (5)

PROPOSED ASSESSMENTS

(b) (5)

(b) (5)

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
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 (NPRA)

(b) (5)

(b) (5)

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

(b) (5)

(b) (5)

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

(b) (5)

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

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Central North Slope

(b) (5)

(b) (5)

West of NPRA

(b) (5)

Conversation Contents

Follow-up Alaska questions

Attachments:

/30. Follow-up Alaska questions/7.1 Assessment Budget 20170613.xlsx

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From: Walter Guidroz <wguidroz@usgs.gov>
Sent: Wed Jun 21 2017 09:15:57 GMT-0600 (MDT)
To: "Houseknecht, David" <dhouse@usgs.gov>
Subject: Follow-up Alaska questions

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Hopefully these questions make sense; please let me know if not. Thanks...

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"Houseknecht, David" <dhouse@usgs.gov>

From: "Houseknecht, David" <dhouse@usgs.gov>
Sent: Wed Jun 21 2017 09:38:38 GMT-0600 (MDT)
To: Walter Guidroz <wguidroz@usgs.gov>
Subject: Re: Follow-up Alaska questions

Questions seem redundant, but here goes:

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Walter Guidroz <wguidroz@usgs.gov>

From: Walter Guidroz <wguidroz@usgs.gov>
Sent: Thu Jun 22 2017 08:20:26 GMT-0600 (MDT)
To: David Houseknecht <dhouse@usgs.gov>
Subject: RE: Follow-up Alaska questions

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From: Houseknecht, David [mailto:dhouse@usgs.gov]
Sent: Wednesday, June 21, 2017 11:39 AM
To: Walter Guidroz <wguidroz@usgs.gov>
Subject: Re: Follow-up Alaska questions

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From: "Houseknecht, David" <dhouse@usgs.gov>
Sent: Thu Jun 22 2017 08:22:56 GMT-0600 (MDT)
To: Walter Guidroz <wguidroz@usgs.gov>
Subject: Re: Follow-up Alaska questions

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To: David Houseknecht <dhouse@usgs.gov>
Subject: RE: Follow-up Alaska questions

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To: Walter Guidroz <wguidroz@usgs.gov>
Subject: Re: Follow-up Alaska questions

In gross numbers (net contracts + USGS overhead):

Reprocess ANWR vintage seismic data: \$1,000,000

Analytical services (geochemical analysis of ANWR perimeter wells, oil geochemistry, etc.):
\$1,500,000

Contract personnel: \$500,000

TOTAL: \$3,000,000

These are essentially numbers from the spreadsheet I put together on June 13 - I think you have a copy, but it's attached also. I'm eliminating seismic acquisitions in FY2017, and merging other items between FY17 and FY18 in the numbers above. Considering that this exercise is making me gun shy because we know that it's going to be re-directed/programed, I probably can reduce analytical services to \$1,000,000 (i.e., analyze fewer perimeter wells around ANWR, etc.

I'm not including helicopter contract, etc. as items like that are internal to DOI (helicopter contract, for example, gets paid to DOI Flight Services.

Depending on what you think from the ERP budget perspective, the bottom line could be \$2M or \$3M.

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Subject: Re: Follow-up Alaska questions

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From: Walter Guidroz <wguidroz@usgs.gov>
Sent: Thu Jun 22 2017 09:25:13 GMT-0600 (MDT)
To: David Houseknecht <dhouse@usgs.gov>
Subject: RE: Follow-up Alaska questions

Thanks Dave; this will work

From: Houseknecht, David [mailto:dhouse@usgs.gov]
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forgot attachment

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Sent: Thu Jun 22 2017 10:27:16 GMT-0600 (MDT)
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To: Walter Guidroz <>wguidroz@usgs.gov>
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To: Walter Guidroz <wguidroz@usgs.gov>
Subject: Re: Follow-up Alaska questions

Depends on number of wells we would analyze. In an ideal world, we would analyze 14 wells from Alaska and 2 wells from Canada, just east of the border. Cost for all of that would be ~\$750K. This could be reduced by 50% and still result in significant improvement in characterization of the potential for source rock, thermal maturity, and charge.

So, a conservative estimate would be \$350K. Of this, the state would retain ~\$35K for sampling the cuttings in their repository, ~\$285K would go to Weatherford for the analytical work, and ~\$30K would remain with the state for their "overhead."

An ideal estimate would be \$750K. Of this, the state would retain ~\$50K for sampling, ~\$590 would go to Weatherford for analytical work, ~\$60 would be state overhead, and ~\$50K would cover cost of sampling wells on the Canadian side.

So, roll the dice and pick a number, but \$350 to \$750 is the range of possibilities.

Rationale: The Shublik and Kingak source rocks are absent due to erosion beneath a regional unconformity across most of the 1002 Area. Charge, therefore, is possible from the Upper Cretaceous Hue Shale, which is present across part, but not all, of the 1002 Area plus the Cenozoic Canning Formation, which has source-rock potential only offshore. The highly overpressured gas condensate at Point Thomson field almost certainly migrated from offshore (we currently are getting samples from ExxonMobil to test this hypothesis. If confirmed, then sampling seeps along the coast (to be done during field work this summer) plus sampling the Cenozoic and Upper Cretaceous in perimeter wells is the only way to possibly document a source - charge linkage. Thus, this work contributes directly and significantly to constraining charge potential for all of the 1002 Area.

On Thu, Jun 22, 2017 at 8:37 PM, Walter Guidroz <wguidroz@usgs.gov> wrote:

Dave, how much (\$\$) could the activity mentioned in Bullet 1 amount to?

From: Houseknecht, David [mailto:dhouse@usgs.gov]
Sent: Thursday, June 22, 2017 12:41 PM
To: Walter Guidroz <wguidroz@usgs.gov>
Subject: Re: Follow-up Alaska questions

None. We already are past the deadline for submitting requests to procure items >\$25K, and none of the essential items for either NPRA or ANWR are less than \$25K.

There are only two possible exceptions I can think of:

(1) There may be a mechanism in the state coops agreements that would allow larger "procurements" with a special sign off on the request by the Director. If we could go this route, we could send funds to the state to get started with at least sampling the ANWR perimeter wells, and perhaps even getting

samples from one or two wells sent to Weatherford to start analysis. I talked to Joe East about this mechanism 2-3 weeks ago and he sounded like it was do-able, but only Joe and the person in admin that deals with coops know for sure.

(2) We could add a second helicopter to the field season and invite state folks along - I just had my helicopter contract confirmed a few days ago (\$75K for 8 days). However, considering the hit that other ERP projects are taking as a result of this cluster-fxxx, I'm inclined to NOT do this.

On Thu, Jun 22, 2017 at 12:27 PM, Walter Guidroz <wguidroz@usgs.gov> wrote:

Now I get a different message (this is confusing and frustrating) – how much can we realistically obligate in 17?

From: Houseknecht, David [mailto:dhouse@usgs.gov]

Sent: Thursday, June 22, 2017 10:39 AM

To: Walter Guidroz <wguidroz@usgs.gov>

Subject: Re: Follow-up Alaska questions

In gross numbers (net contracts + USGS overhead):

Reprocess ANWR vintage seismic data: \$1,000,000

Analytical services (geochemical analysis of ANWR perimeter wells, oil geochemistry, etc.):
\$1,500,000

Contract personnel: \$500,000

TOTAL: \$3,000,000

These are essentially numbers from the spreadsheet I put together on June 13 - I think you have a copy, but it's attached also. I'm eliminating seismic acquisitions in FY2017, and merging other items between FY17 and FY18 in the numbers above. Considering that this exercise is making me gun shy because we know that it's going to be re-directed/programed, I probably can reduce analytical services to \$1,000,000 (i.e., analyze fewer perimeter wells around ANWR, etc.

I'm not including helicopter contract, etc. as items like that are internal to DOI (helicopter contract, for example, gets paid to DOI Flight Services.

Depending on what you think from the ERP budget perspective, the bottom line could be \$2M or \$3M.

On Thu, Jun 22, 2017 at 10:24 AM, Walter Guidroz <wguidroz@usgs.gov> wrote:

Outside of salary and OE, how much will we obligate in terms of contractual work – reprocessing, seismic acquisition, field work, etc.

From: Houseknecht, David [mailto:dhouse@usgs.gov]

Sent: Thursday, June 22, 2017 10:23 AM

To: Walter Guidroz <wguidroz@usgs.gov>

Subject: Re: Follow-up Alaska questions

I guess I do not understand the question - the only limits on FY18 obligations are (1) how much OE is available and (2) what administrative/contracts limits are.

Am I missing something, or does this question not make sense???

On Thu, Jun 22, 2017 at 10:20 AM, Walter Guidroz <wguidroz@usgs.gov> wrote:

Thanks Dave. A new follow-up question from Scott Cameron is how much can we realistically obligate in FY18? 'Obligate' is the key word here...

From: Houseknecht, David [mailto:dhouse@usgs.gov]
Sent: Wednesday, June 21, 2017 11:39 AM
To: Walter Guidroz <wguidroz@usgs.gov>
Subject: Re: Follow-up Alaska questions

Questions seem redundant, but here goes:

How much work. . . : Not much. I have already started the process of (1) having specs put together for reprocessing the vintage 2-D data and (2) identifying companies that may be potential bidders on doing the work, both in US and Canada. These two items would not require additional funding. The other item would be travel for Krissy Lewis and Sam Heller to travel to Anchorage to consult with BOEM and BLM (the latter a formality) regarding the reprocessing. So, total funds involved would be between \$5K and \$10K.

Could any obligated ANWR work . . . : Yes, see below.

A. Funding to DGGS to begin sampling wells around the perimeter of ANWR for enhanced geochemical analyses (RockEval, TOC, vitrinite reflectance, etc.). This would require approval to award a late contract through the Coop project.

B. Answered in response to first question.

C. We already have quotes for the geochem work, and both we and DGGS have contracts in place with Weatherford to do the geochem work. We also have BPA in place to do the oil geochemistry. And, beyond that, see answer to question 1. We certainly can reach out to additional seismic vendors (beyond WesternGeco, from which we already have a quote) to get quotes on reprocessing. However, the big procurement step would be going out for bids as soon after Oct. 1 as possible. Naturally, there are time constraints there imposed by USGS contracting folks, who do not permit submission of requisitions for some weeks after Oct. 1 - perhaps we could work on getting a waiver on that.

PLUS - I recommended to Kate MacGregor that she get the SOI to weigh in on DOI's rights regarding the vintage seismic data. One of the questions would be "can we consider WesternGeco to be owners of the data so we could sole source the reprocessing.

On Wed, Jun 21, 2017 at 11:15 AM, Walter Guidroz <wguidroz@usgs.gov> wrote:

Dave, some questions have come about as follow-up to the meeting we held with Scott Cameron et al on Monday. I realize we've already talked about some of this previously but just to have it all in one place could you answer the following specifics:

- How much work (i.e., obligated funding) could we realistically accomplish in about six weeks (an optimistic scenario, as we discussed previously) around either ANWR option in FY17? This assumes that we'd need Congressional approval to reprogram funds within USGS in order to pay for work not presently budgeted.
- Could any obligated ANWR work be started in FY17 with present funding (perhaps about \$150K worth)
 - o What are our options here?
 - o If we're obligated to start work on Day 1 of FY18, what can we do now (i.e., while we're still in FY17) to speed things up such that we can hit the ground running in FY18?
 - o Can we reach out to vendors to get quotes/specs now (i.e., in FY17) for work needed that would start in FY18?

Hopefully these questions make sense; please let me know if not. Thanks...

Walter

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Dave Houseknecht
U.S. Geological Survey
12201 Sunrise Valley Drive
MS 956
Reston, VA 20192
(703) 648-6466

--

Dave Houseknecht
U.S. Geological Survey
12201 Sunrise Valley Drive
MS 956
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(703) 648-6466

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Estimated annual costs for North Slope asses Estimated annual costs for North Slope assessments (\$ thousands)

Assessment	FY2017		FY2018		FY2019		FY2020		FY2021		FY2022	
	Item	Cost	Item	Cost	Item	Cost	Item	Cost	Item	Cost	Item	Cost
NPRA	Salary & benefits	\$200	Salary & benefits	\$300	(b) (5)							
	Contract personnel	\$100	Contract personnel	\$100								
	License seismic data	\$1,000	Computing	\$50								
	Computing	\$50	Travel	\$150								
	Field work	\$150	Analytical services	\$300								
	Travel	\$100	Publication costs	\$50								
	Subtotal	\$1,600	Subtotal	\$950								
ANWR 2	Salary & benefits	\$100	Salary & benefits	\$750	(b) (5)							
	Computing	\$50	Contract personnel	\$300								
	Field work	\$150	Computing	\$100								
	Analytical services	\$750	Field work	\$300								
	Oil geochemistry	\$300	Travel	\$200								
			Analytical services	\$500								
Subtotal	\$1,350	Subtotal	\$2,550									
ANWR 3			Salary & benefits	\$200	(b) (5)							
			Contract personnel	\$100								
			Computing	\$50								
			Travel	\$25								
		Subtotal	\$375									
Central North Slope												
West of NPRA												
Fiscal Year Total	\$2,950		\$3,875									
Annual by category												
	Salary & benefits	\$300		\$1,250								
	Contract personnel	\$100		\$500								
	Acquisitions (seismic etc.)	\$1,000		\$0								
	Computing	\$100		\$200								
	Field work	\$300		\$300								
	Travel	\$100		\$375								
	Analytical services	\$750		\$800								
	Oil geochemistry	\$300		\$400								
	Publication costs	\$0		\$50								
		\$2,950		\$3,875								
DELTA	\$0		\$0									

REMOVED

Reprocess seismic data \$1,200
Airborne gravity survey \$4,000

Conversation Contents

North Slope USGS Assessments

Attachments:

- /31. North Slope USGS Assessments/1.1 USGS Resource Assessment Prop - Alaska North Slope V4.docx
- /31. North Slope USGS Assessments/2.1 USGS-BLM-BOEM assessment plan.docx

"Hitzman, Murray" <mhitzman@usgs.gov>

From: "Hitzman, Murray" <mhitzman@usgs.gov>
Sent: Thu Jun 22 2017 08:48:10 GMT-0600 (MDT)
To: Richard Cardinale <richard_cardinale@ios.doi.gov>, Katharine MacGregor <katharine_macgregor@ios.doi.gov>, Walter Guidroz <wguidroz@usgs.gov>, David Houseknecht <dhouse@usgs.gov>, Judy Nowakowski <jnowakowski@usgs.gov>, William Werkheiser <whwerkhe@usgs.gov>
Subject: North Slope USGS Assessments
Attachments: USGS Resource Assessment Prop - Alaska North Slope V4.docx

Rich
thanks for the call. I am attaching the June 13 memo from Acting Director Werkheiser that I believe was sent to Vincent and Scott. I am also attaching a draft of a shorter memo that includes information from BLM's June 12 memo from Michael Nedd and information Dave Houseknecht has received from BOEM-AK. We are awaiting confirmation from BOEM-AK before finalizing this and getting it to Scott from Bill W.
Let me know if you need anything additional at this time.
best

--
Murray W. Hitzman
U. S. Geological Survey
Associate Director - Energy and Minerals
12201 Sunrise Valley Dr., MS 102
Reston, VA. 20192
703-648-4576

"Hitzman, Murray" <mhitzman@usgs.gov>

From: "Hitzman, Murray" <mhitzman@usgs.gov>
Sent: Thu Jun 22 2017 08:48:39 GMT-0600 (MDT)
To: Richard Cardinale <richard_cardinale@ios.doi.gov>, Katharine MacGregor <katharine_macgregor@ios.doi.gov>, Walter Guidroz <wguidroz@usgs.gov>, David Houseknecht <dhouse@usgs.gov>, Judy Nowakowski <jnowakowski@usgs.gov>, William Werkheiser

<whwerkhe@usgs.gov>

Subject: Re: North Slope USGS Assessments

Attachments: USGS-BLM-BOEM assessment plan.docx

the other attachment

On Thu, Jun 22, 2017 at 10:48 AM, Hitzman, Murray <mhitzman@usgs.gov> wrote:

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U. S. Geological Survey
Associate Director - Energy and Minerals
12201 Sunrise Valley Dr., MS 102
Reston, VA. 20192
703-648-4576

--

Murray W. Hitzman
U. S. Geological Survey
Associate Director - Energy and Minerals
12201 Sunrise Valley Dr., MS 102
Reston, VA. 20192
703-648-4576

"MacGregor, Katharine" <katharine_macgregor@ios.doi.gov>

From: "MacGregor, Katharine" <katharine_macgregor@ios.doi.gov>
Sent: Thu Jun 22 2017 08:59:44 GMT-0600 (MDT)
To: "Hitzman, Murray" <mhitzman@usgs.gov>
Richard Cardinale <richard_cardinale@ios.doi.gov>, Walter
Guidroz <wguidroz@usgs.gov>, David Houseknecht
CC: <dhouse@usgs.gov>, Judy Nowakowski
<jnowakowski@usgs.gov>, William Werkheiser
<whwerkhe@usgs.gov>, Scott Cameron <scameron@usbr.gov>
Subject: Re: North Slope USGS Assessments

Hey looping in Scott but if this ends up incorporating feedback from all involved bureaus, I'm fine if it is a report that comes from the three Directors through ASLM/ASFWS to Vince. I think that might be the simplest course of action - unless anyone objects. That way all five of us can sign it and send it up.

On Thu, Jun 22, 2017 at 10:48 AM, Hitzman, Murray <mhitzman@usgs.gov> wrote:

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Murray W. Hitzman
U. S. Geological Survey
Associate Director - Energy and Minerals
12201 Sunrise Valley Dr., MS 102
Reston, VA. 20192
703-648-4576

--

Kate MacGregor
1849 C ST NW
Room 6625
Washington DC 20240

202-208-3671 (Direct)

"MacGregor, Katharine" <katharine_macgregor@ios.doi.gov>

From: "MacGregor, Katharine" <katharine_macgregor@ios.doi.gov>
Sent: Thu Jun 22 2017 13:32:28 GMT-0600 (MDT)
To: "Hitzman, Murray" <mhitzman@usgs.gov>
Richard Cardinale <richard_cardinale@ios.doi.gov>, Walter
Guidroz <wguidroz@usgs.gov>, David Houseknecht
<dhouse@usgs.gov>, Judy Nowakowski
CC: <jnowakowski@usgs.gov>, William Werkheiser
<whwerkhe@usgs.gov>, Walter Cruickshank
<Walter.Cruickshank@boem.gov>, Michael Nedd
<mnedd@blm.gov>
Subject: Re: North Slope USGS Assessments

Thanks Murray! Reviewing now - have you seen the BOEM additions? I think we need to include two things that are missing: 1) That BOEM can conduct an updated resource assessment of the OCS areas adjacent to NPRA in the nearshore Beaufort; 2) A potential addition in that we could foster a public/private partnership that would allow us to use private dollars as a force multiplier - which perhaps could offset some of these added budgetary requirements? I know we discussed that in our meeting several weeks ago. I have included BLM and BOEM Directors on this to get everyone on the same page to work as a team and produce the best possible document for the Secretary and Vince. This is a really excellent report and I'm very excited by what y'all put together on this project.

-Kate

On Thu, Jun 22, 2017 at 10:48 AM, Hitzman, Murray <mhitzman@usgs.gov> wrote:

the other attachment

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U. S. Geological Survey
Associate Director - Energy and Minerals
12201 Sunrise Valley Dr., MS 102
Reston, VA. 20192
703-648-4576

--

Murray W. Hitzman
U. S. Geological Survey
Associate Director - Energy and Minerals
12201 Sunrise Valley Dr., MS 102
Reston, VA. 20192
703-648-4576

--

Kate MacGregor
1849 C ST NW
Room 6625
Washington DC 20240

202-208-3671 (Direct)

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.

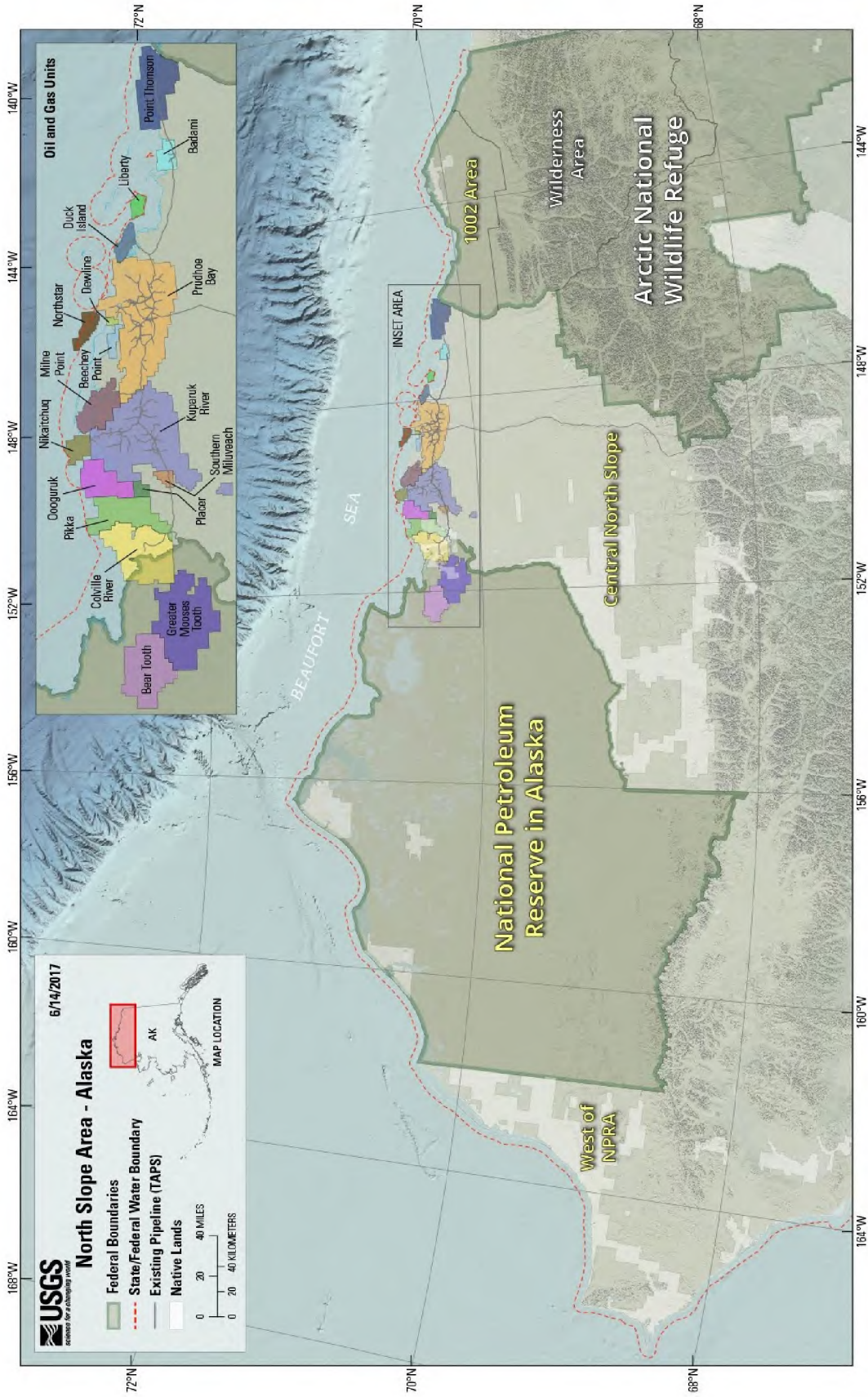


Figure 1: Map of Arctic Alaska showing oil and gas assessment areas (indicated by yellow text). Oil and gas units shown in inset map.

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.

- 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

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.				■								

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)

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 *				[Orange bar spanning 4Q 2017 to 3Q 2018]								
Review technical data and interpret seismic data						[Blue bar spanning 3Q 2018 to 2Q 2019]						
Refine interpretations of seismic and well data									[Blue bar spanning 1Q 2019 to 2Q 2019]			
Define AUs; prepare for public review & assessment										[Blue bar spanning 2Q 2019 to 3Q 2019]		
Conduct public review meetings											[Blue bar spanning 3Q 2019 to 4Q 2019]	
Conduct assessment												[Blue bar in 4Q 2019]
Prepare release document (fact sheet)												[Blue bar in 4Q 2019]
Conduct technical and editorial review												[Blue bar in 4Q 2019]
Release assessment												[Blue bar in 4Q 2019]
Hold briefings for Admin., Congress, State, et al.												[Blue bar in 4Q 2019]

* 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

Task	CY 2019				CY 2020				CY 2021			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Acquire (license) 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.												

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

DRAFT

**INFORMATION/BRIEFING MEMORANDUM
FOR THE ASSISTANT SECRETARY – LAND AND MINERALS MANAGEMENT**

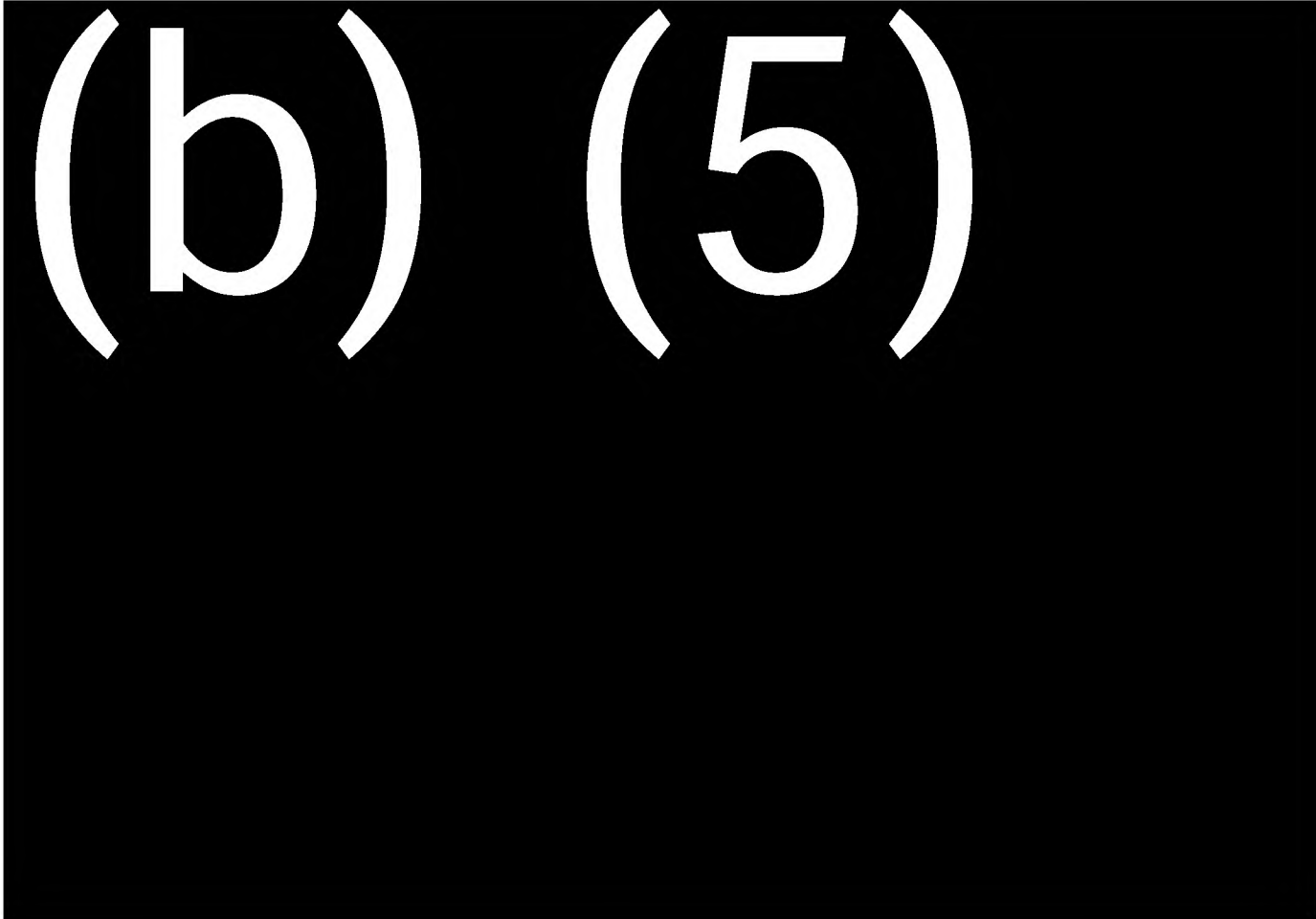
DATE: June 21, 2017

FROM: William Werkheiser, Acting Director – United States Geological Survey (USGS)

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

The purpose of this memo is to respond to Secretarial Order No. 3352, which aims to jump-start Alaskan energy production on the North Slope of Alaska. Specifically, the memo discusses the means to update the current resource assessments in the NPR-A and the Section 1002 Area of the Arctic National Wildlife Refuge. The memo includes information from USGS, BLM, and BOEM.

BACKGROUND



(b) (5)

(b) (5)

PROPOSED ASSESSMENTS

(b) (5)

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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

National Petroleum Reserve – Alaska (NPRA)

(b) (5)

(b) (5)

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.				■								

Alaska National Wildlife Refuge 1002 Area

(b) (5)

(b) (5)

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											■	
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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

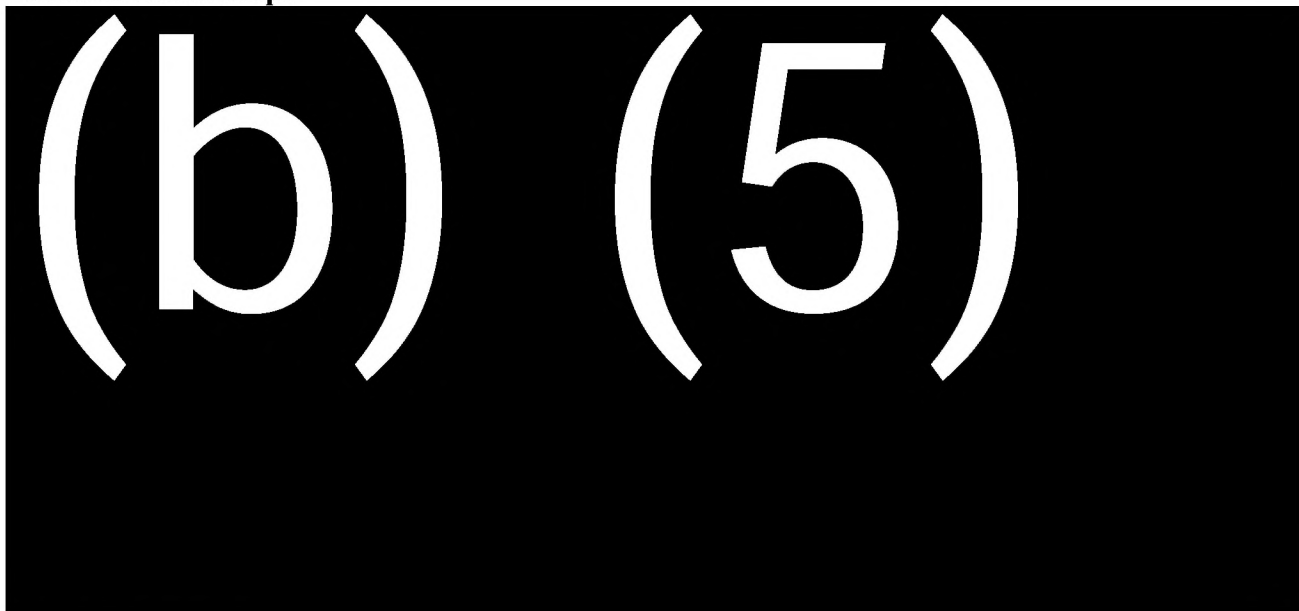
(b) (5)

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

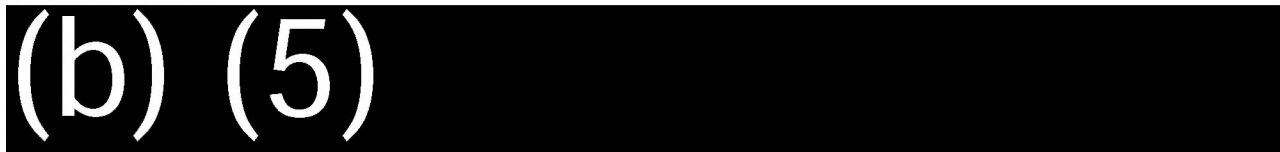
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Review technical data and interpret seismic data						[Blue bar spanning 3Q 2018 to 2Q 2019]						
Refine interpretations of seismic and well data									[Blue bar spanning 1Q 2019 to 2Q 2019]			
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* USGS plays no role in designing or acquiring a 3-D seismic survey

Central North Slope



West of NPRA



(b) (5)

Conversation Contents

USGS Plan for SO3352

Attachments:

/32. USGS Plan for SO3352/1.1 USGS Resource Assessment Prop - Alaska North Slope V4.docx

/32. USGS Plan for SO3352/8.1 USGS Resource Assessment Prop - Alaska North Slope V4.docx



"Hitzman, Murray" <mhitzman@usgs.gov>

From: "Hitzman, Murray" <mhitzman@usgs.gov>
Sent: Wed Jun 14 2017 12:13:14 GMT-0600 (MDT)
William Werkheiser <whwerkhe@usgs.gov>, "Applegate, David" <applegate@usgs.gov>, Judy Nowakowski <jnowakowski@usgs.gov>, Joanne Taylor <jctaylor@usgs.gov>, Walter Guidroz <wguidroz@usgs.gov>, David Houseknecht <dhouse@usgs.gov>, "Meinert, Lawrence" <lmeinert@usgs.gov>
To:
Subject: USGS Plan for SO3352
Attachments: USGS Resource Assessment Prop - Alaska North Slope V4.docx

Bill et al.

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I am attaching a draft USGS plan that has been developed primarily by Walter Guidroz and Dave Houseknecht. I would like your review and then, if you approve, for you to send it to the individuals mentioned above, copying myself, Walter, and Dave.

Thanks
murray

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Murray W. Hitzman
U. S. Geological Survey
Associate Director - Energy and Minerals
12201 Sunrise Valley Dr., MS 102
Reston, VA. 20192
703-648-4576

"Applegate, David" <applegate@usgs.gov>

From: "Applegate, David" <applegate@usgs.gov>
Sent: Wed Jun 14 2017 15:17:05 GMT-0600 (MDT)

To: "Hitzman, Murray" <mhitzman@usgs.gov>
William Werkheiser <whwerkhe@usgs.gov>, Judy Nowakowski
<jnowakowski@usgs.gov>, Joanne Taylor <jctaylor@usgs.gov>,
CC: Walter Guidroz <wguidroz@usgs.gov>, David Houseknecht
<dhouse@usgs.gov>, "Meinert, Lawrence" <lmeinert@usgs.gov>
Subject: Re: USGS Plan for SO3352

Murray/Walter,

This is very well done. Bravo! Joanne has given Walter the green light to share with the other bureaus. Presumably, he will take their feedback into account and send revised version back here for transmittal from the Director's office to DeVito, Scott, Kate and Kerry as you propose.

Many thanks, Dave

David Applegate, Ph.D.
Acting Deputy Director
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703 648 6600 voice, 703 648 7031 fax
applegate@usgs.gov

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From: "Hitzman, Murray" <mhitzman@usgs.gov>
Sent: Wed Jun 14 2017 16:17:01 GMT-0600 (MDT)
To: "Applegate, David" <applegate@usgs.gov>
William Werkheiser <whwerkhe@usgs.gov>, Judy Nowakowski

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Subject: Re: USGS Plan for SO3352

by the way - they wanted this plan down at DOI yesterday or today - so we need to get it transmitted as soon as we can.

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"Nowakowski, Judy" <jnowakowski@usgs.gov>

From: "Nowakowski, Judy" <jnowakowski@usgs.gov>
Sent: Wed Jun 14 2017 16:26:26 GMT-0600 (MDT)
To: "Hitzman, Murray" <mhitzman@usgs.gov>
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CC: Walter Guidroz <wguidroz@usgs.gov>, David Houseknecht <dhouse@usgs.gov>, "Meinert, Lawrence" <lmeinert@usgs.gov>
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U. S. Geological Survey
Associate Director - Energy and Minerals
12201 Sunrise Valley Dr., MS 102
Reston, VA. 20192
703-648-4576

--

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"Nowakowski, Judy" <jnowakowski@usgs.gov>

From: "Nowakowski, Judy" <jnowakowski@usgs.gov>
Sent: Wed Jun 14 2017 16:28:34 GMT-0600 (MDT)
To: "Hitzman, Murray" <mhitzman@usgs.gov>
CC: "Applegate, David" <applegate@usgs.gov>, William Werkheiser <whwerkhe@usgs.gov>, Joanne Taylor <jctaylor@usgs.gov>, Walter Guidroz <wguidroz@usgs.gov>, David Houseknecht <dhouse@usgs.gov>, "Meinert, Lawrence" <lmeinert@usgs.gov>
Subject: Re: USGS Plan for SO3352

ah, okay, I'll go ahead and send it tonight, then, on behalf of Bill. thanks!

On Wed, Jun 14, 2017 at 6:19 PM, Hitzman, Murray <mhitzman@usgs.gov> wrote:
by the way - they wanted this plan down at DOI yesterday or today - so we need to get it transmitted as soon as we can.
thanks
murray

On Wed, Jun 14, 2017 at 4:17 PM, Applegate, David <applegate@usgs.gov> wrote:
Murray/Walter,

This is very well done. Bravo! Joanne has given Walter the green light to share with the other bureaus. Presumably, he will take their feedback into account and send revised version back here for transmittal from the Director's office to DeVito, Scott, Kate and Kerry as you propose.

Many thanks, Dave

David Applegate, Ph.D.
Acting Deputy Director
U.S. Geological Survey
12201 Sunrise Valley Drive MS 111, Reston VA 20192
703 648 6600 voice, 703 648 7031 fax
applegate@usgs.gov

On Wed, Jun 14, 2017 at 2:13 PM, Hitzman, Murray <mhitzman@usgs.gov> wrote:

Bill et al.

USGS was directed last week by Vincent DeVito to prepare a plan for how we will update assessments for North Slope energy resources as per secretarial order 3352. The final plan will incorporate plans from BLM and BOEM. We were directed to send the plan by tomorrow to Mr. DeVito as well as Kate MacGregor and Scott Cameron. (it should also be copied to Kerry Rae).

I am attaching a draft USGS plan that has been developed primarily by Walter Guidroz and Dave Houseknecht. I would like your review and then, if you approve, for you to send it to the individuals mentioned above, copying myself, Walter, and Dave.

Thanks
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David Applegate <applegate@usgs.gov>

From: David Applegate <applegate@usgs.gov>
Sent: Wed Jun 14 2017 16:40:15 GMT-0600 (MDT)
To: "Nowakowski, Judy" <jnowakowski@usgs.gov>
"Hitzman, Murray" <mhitzman@usgs.gov>, William Werkheiser <whwerkhe@usgs.gov>, Joanne Taylor <jctaylor@usgs.gov>, Walter Guidroz <wguidroz@usgs.gov>, David Houseknecht <dhouse@usgs.gov>, "Meinert, Lawrence" <lmeinert@usgs.gov>
CC:
Subject: Re: USGS Plan for SO3352

Murray,

Thanks for the clarification. I misinterpreted Walter's request to share and thought he wanted to get feedback before it went to the principals. Sounds like we are all straightened out and Judy will get it to Vincent and company.

Dave

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Walter Guidroz <wguidroz@usgs.gov>

From: Walter Guidroz <wguidroz@usgs.gov>
Sent: Thu Jun 15 2017 05:54:11 GMT-0600 (MDT)
To: "Houseknecht, David" <dhouse@usgs.gov>
Subject: FW: USGS Plan for SO3352
Attachments: USGS Resource Assessment Prop - Alaska North Slope V4.docx

Judy sent it to DOI so presumably we're clear to send the document to BOEM if you haven't already. In case you're pressed for info, you can refer to Murray's email from last night:

"My instructions were to send a USGS version to Vincent, Kate, and Scott and that they would get similar plans from the other agencies and the politicals would then do or assign the incorporation of all the plans together. It was NOT the plan to have USGS lead the effort to do the integration. I think we should send our plan to Vincent, Scott, and Kate and then await further instructions"

From: Nowakowski, Judy [mailto:jnowakowski@usgs.gov]
Sent: Wednesday, June 14, 2017 6:44 PM
To: Murray Hitzman <mhitzman@usgs.gov>; Walter Guidroz <wguidroz@usgs.gov>; Joanne Taylor <jtaylor@usgs.gov>; William Lukas <wlukas@usgs.gov>
Subject: Fwd: USGS Plan for SO3352

fyi

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

From: Nowakowski, Judy <jnowakowski@usgs.gov>
Date: Wed, Jun 14, 2017 at 6:42 PM
Subject: Fwd: USGS Plan for SO3352
To: Vincent Devito <vincent_devito@ios.doi.gov>, Katharine MacGregor <katharine_macgregor@ios.doi.gov>, Scott Cameron <scott_cameron@ios.doi.gov>
Cc: "Karen (Kerry) Rae" <kerry_rae@ios.doi.gov>, William Werkheiser <whwerkhe@usgs.gov>, David Applegate <applegate@usgs.gov>

Hi all,

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Please let us know if there are questions.

Thanks!
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Chief of Staff
U.S. Geological Survey

"Houseknecht, David" <dhouse@usgs.gov>

From: "Houseknecht, David" <dhouse@usgs.gov>
Sent: Thu Jun 15 2017 05:56:36 GMT-0600 (MDT)
To: Walter Guidroz <wguidroz@usgs.gov>
Subject: Re: FW: USGS Plan for SO3352

I sent it to BOEM and BLM late yesterday - not feedback thus far.

On Thu, Jun 15, 2017 at 7:54 AM, Walter Guidroz <wguidroz@usgs.gov> wrote:
| Judy sent it to DOI so presumably we're clear to send the document to BOEM if you haven't already.
| In case you're pressed for info, you can refer to Murray's email from last night:

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Walter Guidroz <wguidroz@usgs.gov>

From: Walter Guidroz <wguidroz@usgs.gov>
Sent: Thu Jun 15 2017 05:58:20 GMT-0600 (MDT)
To: David Houseknecht <dhouse@usgs.gov>
Subject: RE: FW: USGS Plan for SO3352

OK, thanks for letting me know. Will be interesting if we receive any feedback...

From: Houseknecht, David [mailto:dhouse@usgs.gov]
Sent: Thursday, June 15, 2017 7:57 AM
To: Walter Guidroz <wguidroz@usgs.gov>
Subject: Re: FW: USGS Plan for SO3352

I sent it to BOEM and BLM late yesterday - not feedback thus far.

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Walter Guidroz <wguidroz@usgs.gov>

From: Walter Guidroz <wguidroz@usgs.gov>
Sent: Thu Jun 15 2017 10:40:42 GMT-0600 (MDT)
To: "Houseknecht, David" <dhouse@usgs.gov>
Subject: FW: USGS Plan for SO3352

Dave, I thought I'd let you weigh in on this. Can you send verbiage (brevity appreciated) to me?
Thanks!

From: Nowakowski, Judy [mailto:jnowakowski@usgs.gov]
Sent: Thursday, June 15, 2017 12:38 PM
To: Cameron, Scott <scott_cameron@ios.doi.gov>; Murray Hitzman <mhitzman@usgs.gov>; Walter Guidroz <wguidroz@usgs.gov>
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Hi Scott, best to have Murray or Walter answer directly...

Murray/Walter: can you help?

Thanks!

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Hi Judy,
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From: Walter Guidroz <wguidroz@usgs.gov>
Sent: Thu Jun 15 2017 10:42:41 GMT-0600 (MDT)
To: "Houseknecht, David" <dhouse@usgs.gov>
Subject: RE: USGS Plan for SO3352

Am assuming the answer for point 1 is yes. Re: point 2, I assume we need to clarify that we don't actually do the procurement nor the management of the actual acquisition?

From: Walter Guidroz [mailto:wguidroz@usgs.gov]
Sent: Thursday, June 15, 2017 12:41 PM
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From: "Houseknecht, David" <dhouse@usgs.gov>
Sent: Thu Jun 15 2017 10:52:30 GMT-0600 (MDT)
To: Walter Guidroz <wguidroz@usgs.gov>
Subject: Re: FW: USGS Plan for SO3352

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Walter Guidroz <wguidroz@usgs.gov>

From: Walter Guidroz <wguidroz@usgs.gov>
Sent: Thu Jun 15 2017 10:53:16 GMT-0600 (MDT)
To: David Houseknecht <dhouse@usgs.gov>
Subject: RE: FW: USGS Plan for SO3352

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"Houseknecht, David" <dhouse@usgs.gov>

From: "Houseknecht, David" <dhouse@usgs.gov>
Sent: Thu Jun 15 2017 11:05:24 GMT-0600 (MDT)
To: Walter Guidroz <wguidroz@usgs.gov>
Subject: Re: USGS Plan for SO3352

I think for the purpose of responding to Scott's question, we can delete (3) in response to second question.

Answer to first question is definitely YES.

Answer to second question is more complex:
In discussions between Kate MacGregor and Dave Houseknecht in April, three main issues were discussed in regard to reprocessing the vintage data.

(1) Funding (\$1.5 million) is not included in the USGS enacted level in FY2017, and there is no source within the USGS for redirection.

(2) Procurement - Considering that BLM is responsible for managing and archiving the vintage data, perhaps procurement would be more appropriately handled by BLM, with collaborative technical input from USGS and BOEM. However, if the USGS were funded, either in FY2017 or FY2018, the USGS would procure and manage the reprocessing, with collaborative input from BLM and BOEM.

(3) Legal standing - The vintage data are no longer owned by WesternGeco, the company that originally collected the data. Ownership now rests jointly with 11 oil companies that were part of the original "group-shoot." Because DOI wants to generate maximum interest in industry participation in potential lease sales, it is in the best interest of DOI to have the right to show in public and publish images of the reprocessed data. However, at least some of the industry owners likely would object to this. Houseknecht recommended to MacGregor that SOI be asked to review DOI rights and render a judgement on this issue.

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Sent: Thu Jun 15 2017 11:07:59 GMT-0600 (MDT)
To: David Houseknecht <dhouse@usgs.gov>
Subject: RE: USGS Plan for SO3352

Thanks! Appreciate the quick action; I'll copy you on the response...

From: Houseknecht, David [mailto:dhouse@usgs.gov]
Sent: Thursday, June 15, 2017 1:05 PM
To: Walter Guidroz <wguidroz@usgs.gov>
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(2) Procurement - Considering that BLM is responsible for managing and archiving the vintage data, perhaps procurement would be more appropriately handled by BLM, with collaborative technical input from USGS and BOEM. However, if the USGS were funded, either in FY2017 or FY2018, the USGS would procure and manage the reprocessing, with collaborative input from BLM and BOEM.

(3) Legal standing - The vintage data are no longer owned by WesternGeco, the company that originally collected the data. Ownership now rests jointly with 11 oil companies that were part of the original "group-shoot." Because DOI wants to generate maximum interest in industry participation in potential lease sales, it is in the best interest of DOI to have the right to show in public and publish images of the reprocessed data. However, at least some of the industry owners likely would object to this. Houseknecht recommended to MacGregor that SOI be asked to review DOI rights and render a judgement on this issue.

On Thu, Jun 15, 2017 at 12:42 PM, Walter Guidroz <wguidroz@usgs.gov> wrote:

Am assuming the answer for point 1 is yes. Re: point 2, I assume we need to clarify that we don't actually do the procurement nor the management of the actual acquisition?

From: Walter Guidroz [mailto:wguidroz@usgs.gov]
Sent: Thursday, June 15, 2017 12:41 PM
To: Houseknecht, David <dhouse@usgs.gov>
Subject: FW: USGS Plan for SO3352

Dave, I thought I'd let you weigh in on this. Can you send verbiage (brevity appreciated) to me?
Thanks!

From: Nowakowski, Judy [mailto:jnowakowski@usgs.gov]
Sent: Thursday, June 15, 2017 12:38 PM
To: Cameron, Scott <scott_cameron@ios.doi.gov>; Murray Hitzman <mhitzman@usgs.gov>; Walter Guidroz <wguidroz@usgs.gov>
Cc: Vincent Devito <vincent_devito@ios.doi.gov>; Katharine MacGregor <katharine_macgregor@ios.doi.gov>; Karen (Kerry) Rae <kerry_rae@ios.doi.gov>; William Werkheiser <whwerkhe@usgs.gov>; David Applegate <applegate@usgs.gov>
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Murray/Walter: can you help?

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Please let us know if there are questions.

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Chief of Staff
U.S. Geological Survey

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Dave Houseknecht
U.S. Geological Survey
12201 Sunrise Valley Drive
MS 956
Reston, VA 20192
(703) 648-6466

Walter Guidroz <wguidroz@usgs.gov>

From: Walter Guidroz <wguidroz@usgs.gov>
Sent: Thu Jun 15 2017 11:21:44 GMT-0600 (MDT)
To: Judy Nowakowski <jnowakowski@usgs.gov>, Scott Cameron <scott_cameron@ios.doi.gov>, Murray Hitzman <mhitzman@usgs.gov>
Vincent Devito <vincent_devito@ios.doi.gov>, Katharine MacGregor <katharine_macgregor@ios.doi.gov>, Kerry Rae <kerry_rae@ios.doi.gov>, William Werkheiser <whwerkhe@usgs.gov>, David Applegate <applegate@usgs.gov>, "Houseknecht, David" <dhouse@usgs.gov>
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Scott Cameron <scott_cameron@ios.doi.gov>

From: Scott Cameron <scott_cameron@ios.doi.gov>
Sent: Thu Jun 15 2017 17:31:22 GMT-0600 (MDT)
To: Walter Guidroz <wguidroz@usgs.gov>
Judy Nowakowski <jnowakowski@usgs.gov>, Murray Hitzman <mhitzman@usgs.gov>, Vincent Devito <vincent_devito@ios.doi.gov>, Katharine MacGregor <katharine_macgregor@ios.doi.gov>, Kerry Rae <kerry_rae@ios.doi.gov>, William Werkheiser <whwerkhe@usgs.gov>, David Applegate <applegate@usgs.gov>, "Houseknecht, David" <dhouse@usgs.gov>
CC:
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"Hitzman, Murray" <mhitzman@usgs.gov>

From: "Hitzman, Murray" <mhitzman@usgs.gov>
Sent: Fri Jun 16 2017 07:22:33 GMT-0600 (MDT)
To:
CC: Walter Guidroz <wguidroz@usgs.gov>, Judy Nowakowski <jnowakowski@usgs.gov>, Kerry Rae <kerry_rae@ios.doi.gov>, William Werkheiser <whwerkhe@usgs.gov>, David Applegate <applegate@usgs.gov>, "Houseknecht, David" <dhouse@usgs.gov>
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Murray W. Hitzman
U. S. Geological Survey
Associate Director - Energy and Minerals
12201 Sunrise Valley Dr., MS 102
Reston, VA. 20192
703-648-4576

"Rae, Kerry" <kerry_rae@ios.doi.gov>

From: "Rae, Kerry" <kerry_rae@ios.doi.gov>
Sent: Fri Jun 16 2017 07:24:52 GMT-0600 (MDT)
To: "Hitzman, Murray" <mhitzman@usgs.gov>
Walter Guidroz <wguidroz@usgs.gov>, Judy Nowakowski
<jnowakowski@usgs.gov>, William Werkheiser
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CC: <applegate@usgs.gov>, "Houseknecht, David"
<dhouse@usgs.gov>, Michelle Brown
<michelle_brown@ios.doi.gov>, William Lukas
<wlukas@usgs.gov>
Subject: Re: USGS Plan for SO3352

It's in the works....+Michelle who is working to schedule now.

On Fri, Jun 16, 2017 at 9:22 AM, Hitzman, Murray <mhitzman@usgs.gov> wrote:

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Associate Director - Energy and Minerals

12201 Sunrise Valley Dr., MS 102

Reston, VA. 20192

703-648-4576

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.

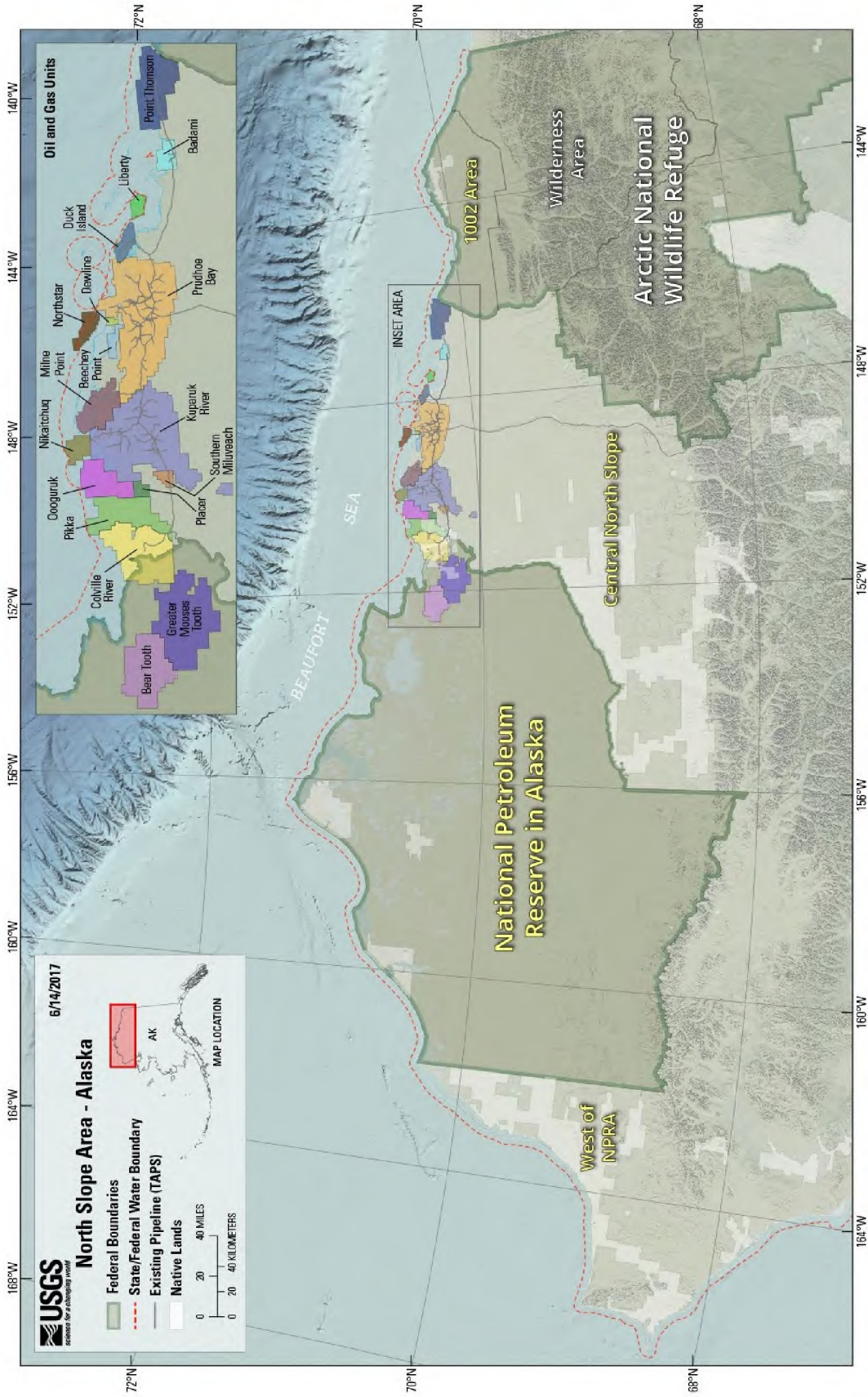


Figure 1: Map of Arctic Alaska showing oil and gas assessment areas (indicated by yellow text). Oil and gas units shown in inset map.

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.

- 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

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.				■								

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)

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 *				[Orange bar spanning 4Q 2017 to 3Q 2018]								
Review technical data and interpret seismic data						[Blue bar spanning 3Q 2018 to 2Q 2019]						
Refine interpretations of seismic and well data									[Blue bar spanning 1Q 2019 to 2Q 2019]			
Define AUs; prepare for public review & assessment										[Blue bar spanning 2Q 2019 to 3Q 2019]		
Conduct public review meetings											[Blue bar spanning 3Q 2019 to 4Q 2019]	
Conduct assessment												[Blue bar in 4Q 2019]
Prepare release document (fact sheet)												[Blue bar in 4Q 2019]
Conduct technical and editorial review												[Blue bar in 4Q 2019]
Release assessment												[Blue bar in 4Q 2019]
Hold briefings for Admin., Congress, State, et al.												[Blue bar in 4Q 2019]

* 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

Task	CY 2019				CY 2020				CY 2021			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Acquire (license) 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.												

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

Conversation Contents

Assessment Plan

Attachments:

/33. Assessment Plan/1.1 USGS Resource Assessment Prop - Alaska North Slope V4.docx



/33. Assessment Plan/2.1 USGS Resource Assessment Prop - Alaska North Slope V4.docx

/33. Assessment Plan/3.1 USGS Resource Assessment Prop - Alaska North Slope V4_BOEM AK.docx

/33. Assessment Plan/4.1 USGS Resource Assessment Prop - Alaska North Slope V4_BOEM AK.docx

"Houseknecht, David" <dhouse@usgs.gov>

From: "Houseknecht, David" <dhouse@usgs.gov>
Sent: Wed Jun 14 2017 15:06:10 GMT-0600 (MDT)
To: David Johnston <david.johnston@boem.gov>
Subject: Assessment Plan
Attachments: USGS Resource Assessment Prop - Alaska North Slope V4.docx

Hi David:

Sorry for being unresponsive - trying to keep too many balls in the air these days!

And, I apologize for not sending this earlier - these were my marching orders: USGS was directed last week by Vincent DeVito to prepare a plan for how we will update assessments for North Slope energy resources as per secretarial order 3352. The final plan will incorporate plans from BLM and BOEM. We were directed to send the plan by tomorrow (June 15) to Mr. DeVito as well as Kate MacGregor and Scott Cameron.

This obviously is a near-final draft that is being reviewed in our Director's Office, but let me know if you have revisions and I will go bang on the door. It has not gone downtown yet.

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12201 Sunrise Valley Drive
MS 956
Reston, VA 20192
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"Houseknecht, David" <dhouse@usgs.gov>

From: "Houseknecht, David" <dhouse@usgs.gov>

Sent: Wed Jun 14 2017 15:19:01 GMT-0600 (MDT)
To: "Svejnoha, Wayne" <wsvejnoh@blm.gov>
Subject: Fwd: Assessment Plan
Attachments: USGS Resource Assessment Prop - Alaska North Slope V4.docx

Wayne - meant to include you in this - sorry!

----- Forwarded message -----
From: **Houseknecht, David** <dhouse@usgs.gov>
Date: Wed, Jun 14, 2017 at 5:06 PM
Subject: Assessment Plan
To: David Johnston <david.johnston@boem.gov>

Hi David:

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"Johnston, David" <david.johnston@boem.gov>

From: "Johnston, David" <david.johnston@boem.gov>
Sent: Thu Jun 15 2017 09:30:47 GMT-0600 (MDT)
To: "Houseknecht, David" <dhouse@usgs.gov>

Subject: Re: Assessment Plan
Attachments: USGS Resource Assessment Prop - Alaska North Slope
V4_BOEM AK.docx

David,

BOEM would prefer that a joint plan be presented--that is our understanding of the request. I've tweaked your USGS proposal to make it more of a joint plan, i.e., a DOI assessment, led by USGS in collaboration with BLM and BOEM.

Your document looks great. I don't think a separate plan from BLM or BOEM would offer much in the way of a different approach. Thus I see little value in submitting separate plans.

Let me know what you think about the joint approach.

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"Houseknecht, David" <dhouse@usgs.gov>

From: "Houseknecht, David" <dhouse@usgs.gov>
Sent: Thu Jun 15 2017 10:05:06 GMT-0600 (MDT)
To: Walter Guidroz <wguidroz@usgs.gov>
Subject: Fwd: Assessment Plan
Attachments: USGS Resource Assessment Prop - Alaska North Slope
V4_BOEM AK.docx

BOEM does not seem to get the message that I attempted to deliver yesterday.

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

From: **Johnston, David** <david.johnston@boem.gov>
Date: Thu, Jun 15, 2017 at 11:30 AM
Subject: Re: Assessment Plan
To: "Houseknecht, David" <dhouse@usgs.gov>

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Walter Guidroz <wguidroz@usgs.gov>

From: Walter Guidroz <wguidroz@usgs.gov>
Sent: Thu Jun 15 2017 10:08:03 GMT-0600 (MDT)
To: David Houseknecht <dhouse@usgs.gov>
Subject: RE: Assessment Plan

Thanks – they're going to have to get over it. We were under pretty clear orders from DOI and we can't go against them. Their level of persistence is interesting...

From: Houseknecht, David [mailto:dhouse@usgs.gov]
Sent: Thursday, June 15, 2017 12:05 PM
To: Walter Guidroz <wguidroz@usgs.gov>
Subject: Fwd: Assessment Plan

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From: Johnston, David <david.johnston@boem.gov>
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"Houseknecht, David" <dhouse@usgs.gov>

From: "Houseknecht, David" <dhouse@usgs.gov>
Sent: Thu Jun 15 2017 10:15:43 GMT-0600 (MDT)
To: Walter Guidroz <wguidroz@usgs.gov>
Subject: Re: Assessment Plan

It is a common event for Alaska BOEM and BLM to march to a different beat than BOEM and BLM HQ.

On Thu, Jun 15, 2017 at 12:08 PM, Walter Guidroz <wguidroz@usgs.gov> wrote:

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Sent: Thursday, June 15, 2017 12:05 PM
To: Walter Guidroz <wguidroz@usgs.gov>
Subject: Fwd: Assessment Plan

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"Houseknecht, David" <dhouse@usgs.gov>

From:

"Houseknecht, David" <dhouse@usgs.gov>

Sent: Thu Jun 15 2017 11:45:04 GMT-0600 (MDT)
To: "Johnston, David" <david.johnston@boem.gov>
Subject: Re: Assessment Plan

David:

Thanks for the feedback - I think all your comments are appropriate and I would have no problem adopting them, except . . .

I asked Monday and Tuesday about incorporating BOEM and BLM feedback, and I today forwarded your email up the chain, and was told each time: Our instructions were to send a USGS version to Vincent, Kate, and Scott and that they would get similar plans from the other agencies and the politicals would then do or assign the incorporation of all the plans together. It was NOT the plan to have USGS lead the effort to do the integration.

Inasmuch as I am not yet eligible for retirement, I am obliged to follow those orders. I urge you to send BOEM feedback to Kate MacGregor and Scott Cameron through your chain, and I will do what I can to see that it gets incorporated into the final document that goes to Vincent DeVito.

I hate it when directives like this get twisted in translation, and I hope this does not cause friction among us working folks!

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From: "Johnston, David" <david.johnston@boem.gov>
Sent: Thu Jun 15 2017 13:10:05 GMT-0600 (MDT)
To: "Houseknecht, David" <dhouse@usgs.gov>
Subject: Re: Assessment Plan

Hi David,

Thanks for the response. Given your instructions, I will shift gears and develop a separate response for the Assistant Secretary. Our approach will be to support your USGS plan, but we will augment it in several ways.

Dave

On Thu, Jun 15, 2017 at 9:45 AM, Houseknecht, David <dhouse@usgs.gov> wrote:

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Sorry for being unresponsive - trying to keep too many balls in the air these days!

And, I apologize for not sending this earlier - these were my marching orders: USGS was directed last week by Vincent DeVito to prepare a plan for how we will update assessments for North Slope energy resources as per secretarial order 3352. The final plan will incorporate plans from BLM and BOEM. We were directed to send the plan by tomorrow (June 15) to Mr. DeVito as well as Kate MacGregor and Scott Cameron.

This obviously is a near-final draft that is being reviewed in our Director's Office, but let me know if you have revisions and I will go bang on the door. It has not gone downtown yet.

--

Dave Houseknecht
U.S. Geological Survey
12201 Sunrise Valley Drive
MS 956
Reston, VA 20192
(703) 648-6466

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U.S. Geological Survey
12201 Sunrise Valley Drive
MS 956
Reston, VA 20192
(703) 648-6466

"Houseknecht, David" <dhouse@usgs.gov>

From: "Houseknecht, David" <dhouse@usgs.gov>
Sent: Thu Jun 15 2017 13:54:00 GMT-0600 (MDT)
To: "Johnston, David" <david.johnston@boem.gov>
Subject: Re: Assessment Plan

Great! Sorry for the hassle, and thanks for your understanding!

On Thu, Jun 15, 2017 at 3:10 PM, Johnston, David <david.johnston@boem.gov> wrote:
Hi David,

Thanks for the response. Given your instructions, I will shift gears and develop a separate response for the Assistant Secretary. Our approach will be to support your USGS plan, but we will augment it in several ways.

Dave

On Thu, Jun 15, 2017 at 9:45 AM, Houseknecht, David <dhouse@usgs.gov> wrote:
David:

Thanks for the feedback - I think all your comments are appropriate and I would have no problem adopting them, except . . .

I asked Monday and Tuesday about incorporating BOEM and BLM feedback, and I today forwarded your email up the chain, and was told each time: Our instructions were to send a USGS version to Vincent, Kate, and Scott and that they would get similar plans from the other agencies and the politicals would then do or assign the incorporation of all the plans together. It was NOT the plan to have USGS lead the effort to do the integration.

Inasmuch as I am not yet eligible for retirement, I am obliged to follow those orders. I urge you to send BOEM feedback to Kate MacGregor and Scott Cameron through your chain, and I will do what I can to see that it gets incorporated into the final document that goes to Vincent DeVito.

I hate it when directives like this get twisted in translation, and I hope this does not cause friction among us working folks!

Cheers,

On Thu, Jun 15, 2017 at 11:30 AM, Johnston, David <david.johnston@boem.gov> wrote:
David,

BOEM would prefer that a joint plan be presented--that is our understanding of the request. I've tweaked your USGS proposal to make it more of a joint plan, i.e., a DOI assessment, led by USGS in collaboration with BLM and BOEM.

Your document looks great. I don't think a separate plan from BLM or BOEM would offer much in the way of a different approach. Thus I see little value in submitting separate plans.

Let me know what you think about the joint approach.

Dave

On Wed, Jun 14, 2017 at 1:06 PM, Houseknecht, David <dhouse@usgs.gov> wrote:
Hi David:

Sorry for being unresponsive - trying to keep too many balls in the air these days!

And, I apologize for not sending this earlier - these were my marching orders: USGS was directed last week by Vincent DeVito to prepare a plan for how we will update assessments for North Slope energy resources as per secretarial order 3352. The final plan will incorporate plans from BLM and BOEM. We were directed to send the plan by tomorrow (June 15) to Mr. DeVito as well as Kate MacGregor and Scott Cameron.

This obviously is a near-final draft that is being reviewed in our Director's Office, but let me know if you have revisions and I will go bang on the door. It has not gone downtown yet.

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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.

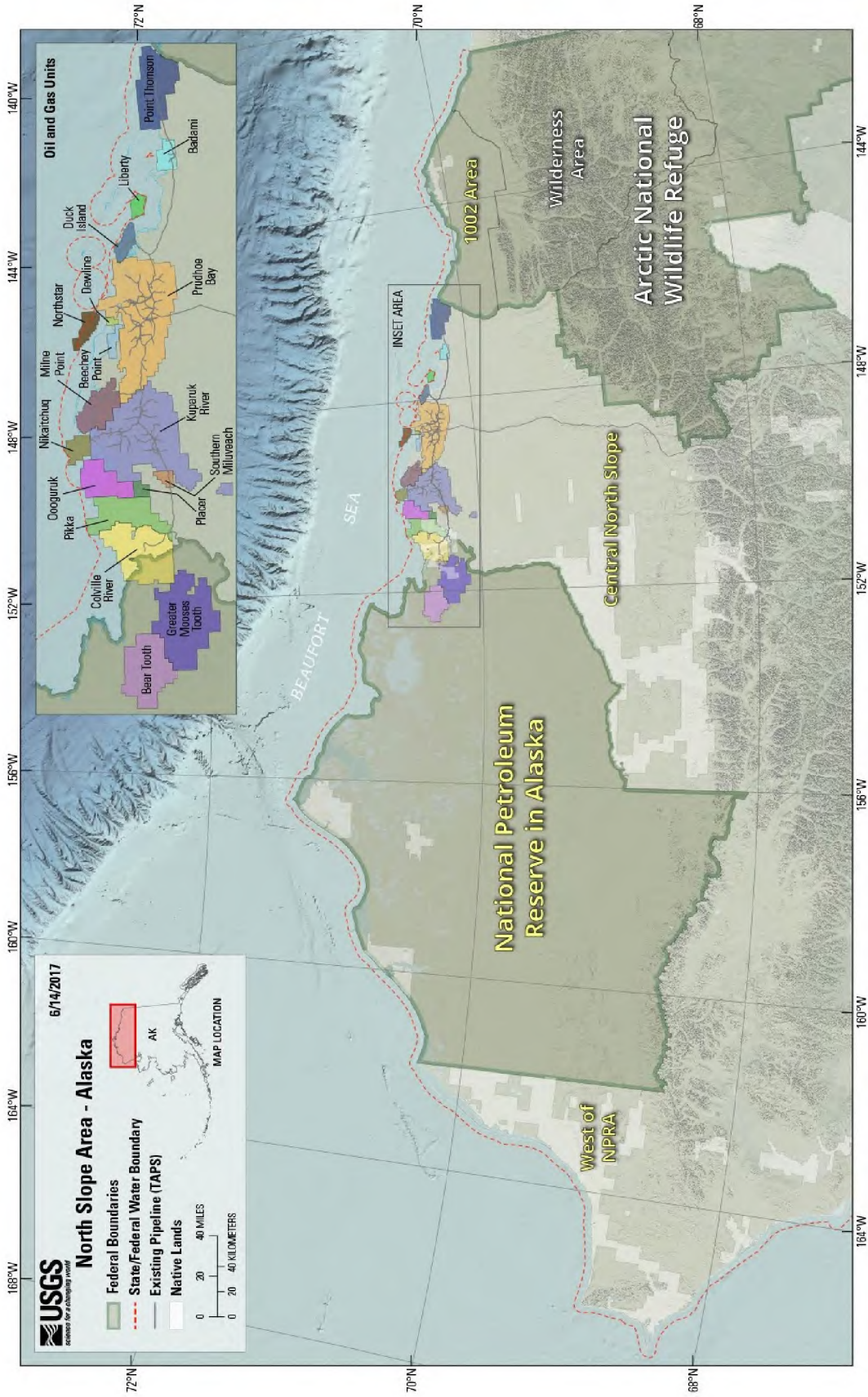


Figure 1: Map of Arctic Alaska showing oil and gas assessment areas (indicated by yellow text). Oil and gas units shown in inset map.

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.

- 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

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.				■								

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)

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 *				[Orange bar spanning 4Q 2017 to 3Q 2018]								
Review technical data and interpret seismic data						[Blue bar spanning 3Q 2018 to 2Q 2019]						
Refine interpretations of seismic and well data									[Blue bar spanning 1Q 2019 to 2Q 2019]			
Define AUs; prepare for public review & assessment										[Blue bar spanning 2Q 2019 to 3Q 2019]		
Conduct public review meetings											[Blue bar spanning 3Q 2019 to 4Q 2019]	
Conduct assessment												[Blue bar in 4Q 2019]
Prepare release document (fact sheet)												[Blue bar in 4Q 2019]
Conduct technical and editorial review												[Blue bar in 4Q 2019]
Release assessment												[Blue bar in 4Q 2019]
Hold briefings for Admin., Congress, State, et al.												[Blue bar in 4Q 2019]

* 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

Task	CY 2019				CY 2020				CY 2021			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Acquire (license) 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.												

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

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

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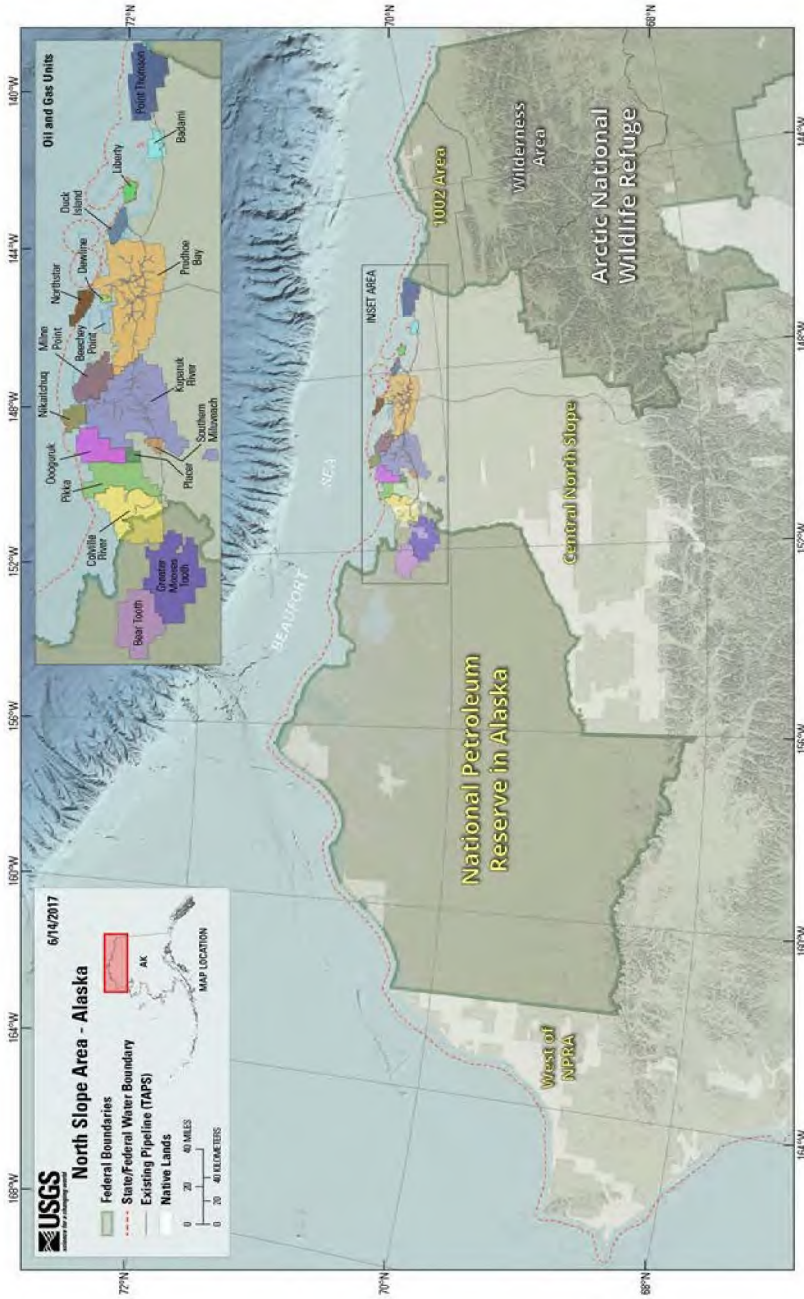


Figure 1: Map of Arctic Alaska showing oil and gas assessment areas (indicated by yellow text). Oil and gas units shown in inset map.

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PROPOSED NORTH SLOPE ASSESSMENTS:

National Petroleum Reserve – Alaska (NPRA)

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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.												

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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.

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(b) (5)

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 *				[Orange bar from 4Q 2017 to 4Q 2018]								
Review technical data and interpret seismic data					[Blue bar from 1Q 2018 to 2Q 2019]							
Refine interpretations of seismic and well data									[Blue bar from 1Q 2019 to 2Q 2019]			
Define AUs; prepare for public review & assessment										[Blue bar from 2Q 2019 to 3Q 2019]		
Conduct public review meetings											[Blue bar from 3Q 2019 to 4Q 2019]	
Conduct assessment												
Prepare release document (fact sheet)												[Blue bar in 4Q 2019]
Conduct technical and editorial review												[Blue bar in 4Q 2019]
Release assessment												
Hold briefings for Admin., Congress, State, et al.												[Blue bar in 4Q 2019]

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

Central North Slope

(b) (5)

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

Task	CY 2019				CY 2020				CY 2021			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Acquire (license) 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.												

West of NPRA

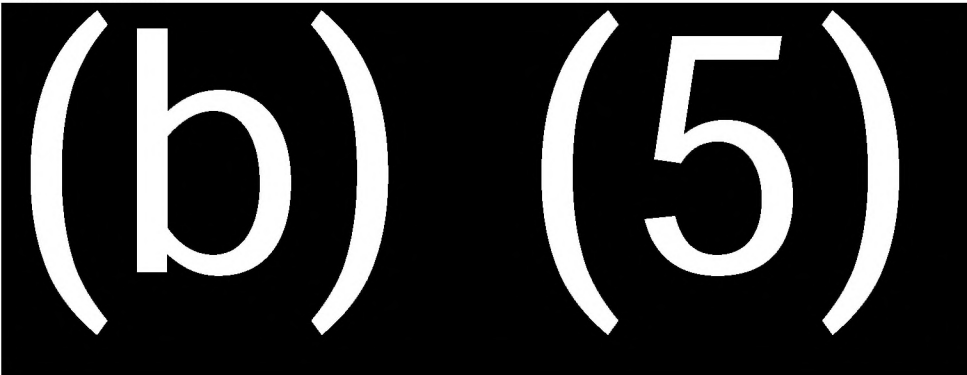


Figure 6: Estimated completion timeline for West of NPRA Resource Assessment

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

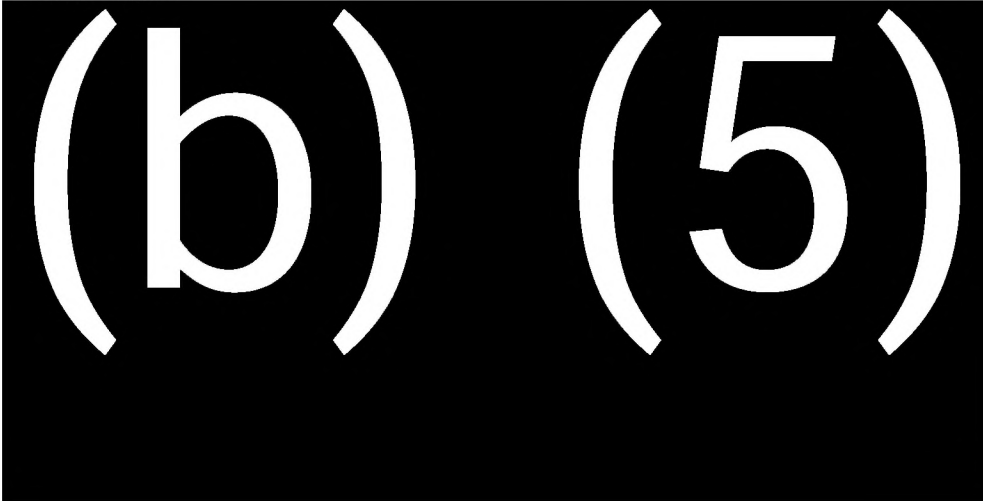


Table 1: Cost information, Alaska North Slope Assessment Options (numbers in millions of dollars)

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

Conversation Contents

after you respond to Scott . . .

"Houseknecht, David" <dhouse@usgs.gov>

From: "Houseknecht, David" <dhouse@usgs.gov>
Sent: Thu Jun 15 2017 11:33:45 GMT-0600 (MDT)
To: Walter Guidroz <wguidroz@usgs.gov>
Subject: after you respond to Scott . . .

Sorry for dwelling on this, but I need to keep the peace with BOEM and BLM collaborators.

re. the BOEM feedback. I just re-read Murray's email to Judy late yesterday - "My instructions were to send a USGS version to Vincent, Kate, and Scott and that they would get similar plans from the other agencies and the politicals would then do or assign the incorporation of all the plans together. It was NOT the plan to have USGS lead the effort to do the integration. I think we should send our plan to Vincent, Scott, and Kate and then await further instructions"

I hope we are not conflicting different parts of the secretarial order. It was my impression from Kate that the USGS was to integrate feedback from BLM and BOEM and produce a joint response to SO 3352 (section 4b), that BLM was to respond to (section 4a) - likely with feedback from BOEM, and that the folks in DOI would integrate those two responses into the document that goes to DeVito.

Murray obviously thinks that USGS, BLM, and BOEM are to submit separate responses to (section 4a) and the folks at DOI will integrate those in addition to the BLM response to (section 4a).

The BOEM feedback is fairly benign and incorporation of at least some of it would in no way change the main content of the proposal. I think I need to either tell BOEM to send their input up the chain of command, or go through Murray to inform Scott that BOEM has suggestions.

--

Dave Houseknecht
U.S. Geological Survey
12201 Sunrise Valley Drive
MS 956
Reston, VA 20192
(703) 648-6466

Walter Guidroz <wguidroz@usgs.gov>

From: Walter Guidroz <wguidroz@usgs.gov>
Sent: Thu Jun 15 2017 11:35:57 GMT-0600 (MDT)
To: David Houseknecht <dhouse@usgs.gov>

Subject: RE: after you respond to Scott . . .

Dave, I'd suggest that BOEM send their input up the chain of command – Murray was pretty emphatic on that point. I think Murray's aware that BOEM has suggestions (we certainly mean this to be inclusive) so sending things directly to Scott is likely their best alternative.

Walter

From: Houseknecht, David [mailto:dhouse@usgs.gov]
Sent: Thursday, June 15, 2017 1:34 PM
To: Walter Guidroz <wguidroz@usgs.gov>
Subject: after you respond to Scott . . .

Sorry for dwelling on this, but I need to keep the peace with BOEM and BLM collaborators.

re. the BOEM feedback. I just re-read Murray's email to Judy late yesterday - "My instructions were to send a USGS version to Vincent, Kate, and Scott and that they would get similar plans from the other agencies and the politicals would then do or assign the incorporation of all the plans together. It was NOT the plan to have USGS lead the effort to do the integration. I think we should send our plan to Vincent, Scott, and Kate and then await further instructions"

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MS 956
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Conversation Contents

Advice

Attachments:

/35. Advice/1.1 14 June 2017 Letter to Houseknecht USGS.pdf
/35. Advice/1.2 USGS Letter to Berendzen 20170615.docx

"Houseknecht, David" <dhouse@usgs.gov>

From: "Houseknecht, David" <dhouse@usgs.gov>
Sent: Thu Jun 15 2017 08:56:46 GMT-0600 (MDT)
To: Walter Guidroz <wguidroz@usgs.gov>
Subject: Advice
Attachments: 14 June 2017 Letter to Houseknecht USGS.pdf USGS Letter to Berendzen 20170615.docx

Overnight, I received a letter from the ANWR Acting Manager denying our request to work some outcrops in the Wilderness area - this was not unexpected. Kate MacGregor offered weeks ago to weigh in if we need help getting a permit. However, before I ask for her help, I am going to respond to the letter - see attached draft. I drafted this thinking that perhaps including a description of the 3 options for an ANWR assessment, with option 1 being something the refuge manager would like to hear, might be a good move. However, as I drafted the remainder of the letter I began to think that we should not share these options with FWS at this point.

What do you think about this?

--

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Walter Guidroz <wguidroz@usgs.gov>

From: Walter Guidroz <wguidroz@usgs.gov>
Sent: Thu Jun 15 2017 09:32:33 GMT-0600 (MDT)
To: David Houseknecht <dhouse@usgs.gov>
Subject: RE: Advice

Dave, thanks for sharing. I think all the points you raise in the letter are good and appropriate. However, since he seems fairly rigid in his application timeline I'm not sure I'm confident that further communication from USGS will move the needle with him now would I share the info. Further, if Kate has volunteered to weigh in on helping us get a permit, I think her word would carry more weight than our would. I think I'd send her a copy of the letter you drafted in response, offer to brief/converse with her as appropriate for

support, and then kindly ask her for her help.

That's my two cents; Murray may have a different take. He'll be back this afternoon; I can ask him as well. It might be worth getting his input as his political sensibilities and networks are more developed than mine.

Walter

From: Houseknecht, David [mailto:dhouse@usgs.gov]
Sent: Thursday, June 15, 2017 10:57 AM
To: Walter Guidroz <wguidroz@usgs.gov>
Subject: Advice

Overnight, I received a letter from the ANWR Acting Manager denying our request to work some outcrops in the Wilderness area - this was not unexpected. Kate MacGregor offered weeks ago to weigh in if we need help getting a permit. However, before I ask for her help, I am going to respond to the letter - see attached draft. I drafted this thinking that perhaps including a description of the 3 options for an ANWR assessment, with option 1 being something the refuge manager would like to hear, might be a good move. However, as I drafted the remainder of the letter I began to think that we should not share these options with FWS at this point.

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"Houseknecht, David" <dhouse@usgs.gov>

From: "Houseknecht, David" <dhouse@usgs.gov>
Sent: Thu Jun 15 2017 10:08:04 GMT-0600 (MDT)
To: Walter Guidroz <wguidroz@usgs.gov>
Subject: Re: Advice

I do plan to send this letter and wait for his response before sending the whole package to Kate. However, I'm thinking the 3 ANWR options should NOT be included. Not sure from your message whether that's what you think also - can you just clarify in one or three words?

On Thu, Jun 15, 2017 at 11:32 AM, Walter Guidroz <wguidroz@usgs.gov> wrote:

Dave, thanks for sharing. I think all the points you raise in the letter are good and appropriate. However, since he seems fairly rigid in his application timeline I'm not sure I'm confident that further communication from USGS will move the needle with him now would I share the info. Further, if Kate has volunteered to weigh in on helping us get a permit, I think her word would carry more weight than our would. I think I'd send her a copy of the letter you drafted in response, offer to brief/converse with her as appropriate for support, and then kindly ask her for her help.

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Walter Guidroz <wguidroz@usgs.gov>

From: Walter Guidroz <wguidroz@usgs.gov>
Sent: Thu Jun 15 2017 10:19:32 GMT-0600 (MDT)
To: David Houseknecht <dhouse@usgs.gov>
Subject: RE: Advice

Send the letter but without ANWR options (sorry that's seven words, not three)

From: Houseknecht, David [mailto:dhouse@usgs.gov]
Sent: Thursday, June 15, 2017 12:08 PM
To: Walter Guidroz <wguidroz@usgs.gov>
Subject: Re: Advice

I do plan to send this letter and wait for his response before sending the whole package to Kate. However, I'm thinking the 3 ANWR options should NOT be included. Not sure from your message whether that's what you think also - can you just clarify in one or three words?

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"Houseknecht, David" <dhouse@usgs.gov>

From: "Houseknecht, David" <dhouse@usgs.gov>
Sent: Thu Jun 15 2017 10:34:45 GMT-0600 (MDT)
To: Walter Guidroz <wguidroz@usgs.gov>
Subject: Re: Advice

Thx

On Thu, Jun 15, 2017 at 12:19 PM, Walter Guidroz <wguidroz@usgs.gov> wrote:

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From: Houseknecht, David [mailto:dhouse@usgs.gov]
Sent: Thursday, June 15, 2017 12:08 PM
To: Walter Guidroz <wguidroz@usgs.gov>
Subject: Re: Advice

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Sent: Thursday, June 15, 2017 10:57 AM
To: Walter Guidroz <wguidroz@usgs.gov>
Subject: Advice

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United States Department of the Interior

FISH AND WILDLIFE SERVICE



IN REPLY REFER TO:

Arctic National Wildlife Refuge
101 12th Avenue Room 236
Fairbanks, Alaska 99701-6293

June 14, 2017

David W. Houseknecht
U.S. Geological Survey
12201 Sunrise Valley Drive, MS 956
Reston, Virginia 20192

Dear Dr. Houseknecht,

Referred to USFWS

United States Department of the Interior

U.S. GEOLOGICAL SURVEY

12201 Sunrise Valley Drive
MS 956
Reston, VA 20192

June 15, 2017

Steve Berendzen
Acting Refuge Manager
U.S. Fish & Wildlife Service
Arctic National Wildlife Refuge
101 12th Avenue Rm. 236
Fairbanks, AK 99701

Dear Mr. Berendzen:

(b) (5)

(b) (5)

(b) (5)

Thanks for your consideration.

Sincerely,

David W. Houseknecht
Senior Research Geologist

Conversation Contents

Other information

"Houseknecht, David" <dhouse@usgs.gov>

From: "Houseknecht, David" <dhouse@usgs.gov>
Sent: Wed Jun 14 2017 15:17:15 GMT-0600 (MDT)
To: David Johnston <david.johnston@boem.gov>
Subject: Other information

I should have mentioned a couple of additional things. At the meeting in DOI last Friday, Murray Hitzman (our Associate Director for Energy and Mineral Resources) told the group (I do not know who attended the meeting, but I know that Kate MacGregor and Vincent DeVito were there) that the NPRA updated assessment could be completed by June 2018. Kate said she wanted in in September 2017. After some discussion, the line drawn in the sand was **end of calendar year 2017**. Thus, part of my frenzy this week has been attempting to get necessary technical staff reassigned and given marching orders, and to find resources that can be redirected this late in the fiscal year. Making this deadline clearly is a heavy lift, but we will get it done with the help of BOEM and BLM.

The other thing that seems to be rapidly shifting is the amount of funding that may be available for the work, particularly in the face of the Presidents budget, in which the USGS overall takes a big hit for FY2018. Considering that all of us have been living with a CRs for many years, it seems unlikely that FY2018 will be different. So, under those conditions, redirection of resources will be challenging.

We'll keep moving forward!

--

Dave Houseknecht
U.S. Geological Survey
12201 Sunrise Valley Drive
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Reston, VA 20192
(703) 648-6466

"Houseknecht, David" <dhouse@usgs.gov>

From: "Houseknecht, David" <dhouse@usgs.gov>
Sent: Wed Jun 14 2017 15:19:17 GMT-0600 (MDT)
To: "Svejnoha, Wayne" <wsvejnoh@blm.gov>
Subject: Fwd: Other information

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

From: **Houseknecht, David** <dhouse@usgs.gov>

Date: Wed, Jun 14, 2017 at 5:17 PM
Subject: Other information
To: David Johnston <david.johnston@boem.gov>

I should have mentioned a couple of additional things. At the meeting in DOI last Friday, Murray Hitzman (our Associate Director for Energy and Mineral Resources) told the group (I do not know who attended the meeting, but I know that Kate MacGregor and Vincent DeVito were there) that the NPRA updated assessment could be completed by June 2018. Kate said she wanted in in September 2017. After some discussion, the line drawn in the sand was **end of calendar year 2017**. Thus, part of my frenzy this week has been attempting to get necessary technical staff reassigned and given marching orders, and to find resources that can be redirected this late in the fiscal year. Making this deadline clearly is a heavy lift, but we will get it done with the help of BOEM and BLM.

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Conversation Contents

FW: BOEM and Alaska

Walter Guidroz <wguidroz@usgs.gov>

From: Walter Guidroz <wguidroz@usgs.gov>
Sent: Wed Jun 14 2017 12:02:21 GMT-0600 (MDT)
To: "Houseknecht, David" <dhouse@usgs.gov>
Subject: FW: BOEM and Alaska

[See message from the boss below](#)

From: Hitzman, Murray [mailto:mhitzman@usgs.gov]
Sent: Wednesday, June 14, 2017 1:58 PM
To: Walter Guidroz <wguidroz@usgs.gov>
Subject: Re: BOEM and Alaska

we can send it - after Bill sends it to Vincent et al. There will be a unified plan but we were asked specifically to submit a plan to Vincent and Kate and then they would assemble the plans. Just got to a computer to open what you sent earlier...

"Houseknecht, David" <dhouse@usgs.gov>

From: "Houseknecht, David" <dhouse@usgs.gov>
Sent: Wed Jun 14 2017 12:03:39 GMT-0600 (MDT)
To: Walter Guidroz <wguidroz@usgs.gov>
Subject: Re: FW: BOEM and Alaska

OK - will someone let us know when Bill sends it?

On Wed, Jun 14, 2017 at 2:02 PM, Walter Guidroz <wguidroz@usgs.gov> wrote:

[See message from the boss below](#)

From: Hitzman, Murray [mailto:mhitzman@usgs.gov]
Sent: Wednesday, June 14, 2017 1:58 PM
To: Walter Guidroz <wguidroz@usgs.gov>
Subject: Re: BOEM and Alaska

we can send it - after Bill sends it to Vincent et al. There will be a unified plan but we were asked specifically to submit a plan to Vincent and Kate and then they would assemble the plans. Just got to a computer to open what you sent earlier...

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Dave Houseknecht
U.S. Geological Survey

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Walter Guidroz <wguidroz@usgs.gov>

From: Walter Guidroz <wguidroz@usgs.gov>
Sent: Wed Jun 14 2017 14:04:04 GMT-0600 (MDT)
To: David Houseknecht <dhouse@usgs.gov>
Subject: RE: FW: BOEM and Alaska

Will do

From: Houseknecht, David [mailto:dhouse@usgs.gov]
Sent: Wednesday, June 14, 2017 2:04 PM
To: Walter Guidroz <wguidroz@usgs.gov>
Subject: Re: FW: BOEM and Alaska

OK - will someone let us know when Bill sends it?

On Wed, Jun 14, 2017 at 2:02 PM, Walter Guidroz <wguidroz@usgs.gov> wrote:

See message from the boss below

From: Hitzman, Murray [mailto:mhitzman@usgs.gov]
Sent: Wednesday, June 14, 2017 1:58 PM
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Walter Guidroz <wguidroz@usgs.gov>

From: Walter Guidroz <wguidroz@usgs.gov>
Sent: Wed Jun 14 2017 14:49:55 GMT-0600 (MDT)
To: "Houseknecht, David" <dhouse@usgs.gov>
Subject: FW: BOEM and Alaska

Murray responded to this on a separate note. I can check and let you know.

From: Murray Hitzman [mailto:mhitzman@usgs.gov]
Sent: Wednesday, June 14, 2017 4:45 PM
To: Walter Guidroz <wguidroz@usgs.gov>
Subject: Re: BOEM and Alaska

U might check w Joanne t to see if the plan has gone to Scott and Vincent and Kate. Just stop by her office - 7th floor

Sent from my iPhone

On Jun 14, 2017, at 1:02 PM, Walter Guidroz <wguidroz@usgs.gov> wrote:

OK, thanks. I'll relay that to Dave. Let me know if any further changes are needed on the document...

From: Hitzman, Murray [mailto:mhitzman@usgs.gov]
Sent: Wednesday, June 14, 2017 1:58 PM
To: Walter Guidroz <wguidroz@usgs.gov>
Subject: Re: BOEM and Alaska

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On Wed, Jun 14, 2017 at 12:50 PM, Walter Guidroz <wguidroz@usgs.gov> wrote:

Murray,

Dave H just got a call from his contact at BOEM re: North Slope assessment plans – the message he left on Dave's phone requested a copy of our plans, indicating along the way that his direction from DOI was submission of a unified plan. I think what we have is fine but would there be any issues on forwarding BOEM a copy of our plans to date? Happy either way; just wanted to run this past you based on previous discussions and context you may have from DOI. Thanks...

Walter

--

Murray W. Hitzman
U. S. Geological Survey
Associate Director - Energy and Minerals
12201 Sunrise Valley Dr., MS 102
Reston, VA. 20192
703-648-4576

Walter Guidroz <wguidroz@usgs.gov>

From: Walter Guidroz <wguidroz@usgs.gov>
Sent: Wed Jun 14 2017 14:53:23 GMT-0600 (MDT)
To: Murray Hitzman <mhitzman@usgs.gov>
CC: "Houseknecht, David" <dhouse@usgs.gov>

Subject: RE: BOEM and Alaska

Just talked to Joanne; she'll ping Bill to see if it's gone out. The intent is that he would cc us all when it does, so it's probably still on his desk. She'll let us know what she finds out.

Walter

From: Murray Hitzman [mailto:mhitzman@usgs.gov]
Sent: Wednesday, June 14, 2017 4:45 PM
To: Walter Guidroz <wguidroz@usgs.gov>
Subject: Re: BOEM and Alaska

U might check w Joanne t to see if the plan has gone to Scott and Vincent and Kate. Just stop by her office - 7th floor

Sent from my iPhone

On Jun 14, 2017, at 1:02 PM, Walter Guidroz <wguidroz@usgs.gov> wrote:

OK, thanks. I'll relay that to Dave. Let me know if any further changes are needed on the document...

From: Hitzman, Murray [mailto:mhitzman@usgs.gov]
Sent: Wednesday, June 14, 2017 1:58 PM
To: Walter Guidroz <wguidroz@usgs.gov>
Subject: Re: BOEM and Alaska

we can send it - after Bill sends it to Vincent et al. There will be a unified plan but we were asked specifically to submit a plan to Vincent and Kate and then they would assemble the plans. Just got to a computer to open what you sent earlier...

On Wed, Jun 14, 2017 at 12:50 PM, Walter Guidroz <wguidroz@usgs.gov> wrote:

Murray,

Dave H just got a call from his contact at BOEM re: North Slope assessment plans – the message he left on Dave's phone requested a copy of our plans, indicating along the way that his direction from DOI was submission of a unified plan. I think what we have is fine but would there be any issues on forwarding BOEM a copy of our plans to date? Happy either way; just wanted to run this past you based on previous discussions and context you may have from DOI. Thanks...

Walter

--

Murray W. Hitzman
U. S. Geological Survey
Associate Director - Energy and Minerals
12201 Sunrise Valley Dr., MS 102
Reston, VA. 20192
703-648-4576

Walter Guidroz <wguidroz@usgs.gov>

From: Walter Guidroz <wguidroz@usgs.gov>
Sent: Wed Jun 14 2017 15:01:00 GMT-0600 (MDT)
To: Murray Hitzman <mhitzman@usgs.gov>
CC: "Houseknecht, David" <dhouse@usgs.gov>
Subject: RE: BOEM and Alaska

Talked to Joanne again – neither Bill nor Dave have looked at the document in detail but they said there's no reason not to share the memo at this time, so Dave you're free to send it to your contact at BOEM.

Walter

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