

BUREAU OF LAND MANAGEMENT

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37

**RED DEVIL MINE REMEDIATION PROPOSED PLAN
PUBLIC MEETING**

Tuesday, October 20, 2020

Virtual Community Meeting

ATTENDEES:

- Lesli Ellis-Wouters, Communications Director, BLM
- Joy Huntington, Facilitator, Uqaqti Consulting
- Bonnie Million, Anchorage Field Station Manager, BLM
- Matt Varner, Presenter
- Mike McCrum, Presenter
- Nicole Hayes
- Maureen Clark
- Bill Richards
- Anne Marie Palmieri
- Catherine Billor
- T.R. Barrett
- Court Reporter, Betty Caudle, Metro Court Reporting

1 taking the time to participate in this discussion. It is
2 important for us to provide this information to you in such a
3 way that it does not compromise your health in these difficult
4 times, but also allows us to move forward on this important
5 process to your community.

6 Today we are using the Zoom webinar platform, which I hope
7 you find to be an interactive experience. You will be able to
8 ask questions verbally by raising your hand, the hand icon at
9 the bottom of your screen. And if I could ask everybody right
10 now if you could go ahead and raise your hands so we make sure
11 that it works? Perfect, Catherine, Ann Marie, T. Barrett,
12 perfect. And, Bill, if you could raise your hand? It's the
13 icon at the bottom of the screen. Perfect, thank you. And I
14 don't see that we have anybody joining by phone, but if you do
15 join by phone, star and nine will raise your hand and then star
16 six will unmute you. If you do have questions today, feel free
17 to raise your hand and then we will allow you to talk or you
18 can ask questions by entering them into the Q & A box which is
19 at the bottom of your screen. So feel free to ask questions at
20 any time. We will also be taking pauses during the
21 presentations for you ask them verbally. And with that, I'm
22 going to turn things over to our facilitator today, Joy, who
23 will provide an overview of today's meeting. Take it away,
24 Joy.

25

1

2

3 **MEETING OVERVIEW (FACILITATORS)**

4 JOY HUNTINGTON: Thank you, Lesli. And welcome to
5 everyone that is presenting -- or sorry, participating in our
6 meeting today. And we appreciate you joining us online for
7 everyone's safety. And we are hoping to make this as
8 interactive as possible. And that's really part of my role
9 today as the facilitator is to make sure that people that are
10 logged in through their computers and people that are calling
11 in via their phelines have multiple opportunities for asking
12 questions, and of course for providing testimony at the end.

13 So I live here in Fairbanks, and I own a consulting
14 business called Uqaqti Consulting. And I've been doing
15 communications with Kismal (ph) communities and rural villages
16 for 18 years now. And I also lived in a few rural villages for
17 15 years growing up. I am Koyukon Athabaskan, and very proud
18 to be from the villages of Manley Hot Springs, Stevens Village,
19 Tanana, and Rampart in the interior on the Yukon River. So a
20 very warm welcome. And I know it's colder temperatures out
21 there, so glad that we're all online today.

22 And a few notes on our agenda. As you can see, the screen
23 shows that we're going to have a welcome, and we're also going
24 to have two presentations for you today from two of our BLM key
25 subject-matter experts on this project. And so looking forward

1 to their presentations. And then we will have questions
2 throughout the meeting. I will stop numerous times for that.
3 And then, of course, testimony at the end. But right now, I
4 wanted to turn it over for a welcome from Bonnie Million, who
5 is the field manager for BLM's Anchorage Field Office. So,
6 Bonnie, if you would please turn your camera on?

7

8

9

10 **ANCHORAGE FIELD OFFICE MANAGER WELCOME**

11 BONNIE MILLION: Thanks. Thank you so much, Joy. So good
12 afternoon, everyone. I wanted to start by thanking you all for
13 joining us today in this virtual setting. If you're anything
14 like me, I would love nothing more than to be able to be having
15 these meetings face to face to see you all again, to share in
16 this process, and have these conversations in person, but we
17 are in a little bit of a different time this year. And it is
18 out of the sincerest respect for all Alaska communities and our
19 Alaska families that we are conducting these meetings virtually
20 in a sign of support for the health and safety of the public.

21 It is through this virtual setting that we are able to
22 provide a couple of more opportunities for folks to gain
23 information, and for us to receive your feedback to keep this
24 important remediation project moving forward.

25 For those of you who might know, might not know, this

1 project has been moving forward ever since 2010 when the
2 initial remedial investigation work started. The BLM held
3 community meetings in 2010 and 2011 on the initial workplan.
4 And then we came back out again in 2012 and in 2014 to report
5 out on some of the preliminary results for both the
6 investigation and the initial fish tissue study. And it was
7 really -- it was great to have those communications and that
8 interaction with communities.

9 One of the main feedback points that we got in 2014
10 resulted in the BLM doing some temporary stream work along Red
11 Devil Creek to prevent the tailings from continuing to migrate
12 down into the Kuskokwim River. And so getting that feedback
13 throughout the process of this project has been really, really
14 important.

15 Then between 2014 and 2018, the project team moved into
16 the feasibility study stage. We came back out to communities
17 in 2017 and 2018 where we provided an opportunity to summarize
18 some of the investigation findings and the feasibility study
19 findings, because we knew that this is a pretty complicated
20 project. There's a lot of data associated with it. There's a
21 lot of detail, and it can be pretty complicated. And so we
22 came out. The intent of those meetings in 2017 and 2018 is to
23 present some of the preliminary findings to try to talk through
24 and set the stage for some of the communities for this stage
25 that we're in now, which is the public comment process.

1 And then in 2019, we did do a little bit of an extended
2 modeling, a metanalysis for some of the groundwater and
3 repository designs.

4 So that's where we're at now. We were originally planning
5 to have some of these public meetings back in March, and I
6 think we all know what happened then, so we're into the virtual
7 stage now. Again, thank you all so much for taking the time.
8 This is a brave new world with virtual meetings, and I greatly,
9 greatly appreciate everybody's participation. And with that, I
10 will pass it back to Joy.

11

12

13

14 JOY HUNTINGTON: Thank you so much, Bonnie. And as some
15 of you can probably see, we are recording the meeting. We do
16 have a transcriptionist who is going to provide a transcript of
17 the meeting. Not only does that help to share the information
18 with people who may not have participated today, but also, we
19 really need to make sure that we capture the testimony that we
20 receive from you as clearly as possible. And so when we open
21 up for public comment at the end of the meeting, we will ask
22 for you to say and spell your name and also share the community
23 that you're participating from. So just a heads up on the
24 recording.

25 And again, we are going to stop throughout the

1 presentations. It is a high level of information, so we wanted
2 to make sure that you have ample opportunities to ask questions
3 along the way. And with that, I'm excited to be working with
4 BLM on this project. I've been working with BLM facilitating
5 meetings for about two and a half years now on different
6 projects and so excited to join this project team as your
7 facilitator for today's meeting. And this is the first of four
8 meetings. And so if you do know of anyone that was unable to
9 participate, please look at the website and check the other
10 times, because we'll be doing this same presentation again
11 three more times after today.

12 So with that, I know we have a lot of information to get
13 through. I would like to invite Matt Varner to start sharing
14 his screen. And while Matt is pulling up his presentation,
15 I'll just share with you that Matt is the Fisheries and
16 Riparian Resource Lead for the Aquatic Habitat Management
17 Program for BLM, and he is based in Anchorage and has been
18 working on this project for quite some time. And he'll be
19 giving the first of two presentations.

20 Again, I'll stop three times for questions throughout his
21 presentation. And again, if you can just utilize the raise
22 hand button, we will call on you when we're asking for
23 questions. Also the Q & A box down at the bottom of your
24 screen is another great way to ask questions throughout Matt's
25 presentation. And if you ask a question and it doesn't get

1 answered immediately, it's because I'm probably going to read
2 it so everyone can hear the question and the answer, because
3 they might be -- other people might be wondering the same thing
4 as you. So we're going to have Matt answer those when we stop.
5 So if you don't see an answer right away, don't worry, we're
6 going to read it out loud. And thank you. With that, I will
7 hand it over to Matt.

8

9

10

11 **MERCURY CONCENTRATIONS IN THE ENVIRONMENT, MATT VARNER**

12 MATT VARNER: All right. Good afternoon everybody.
13 Again, my name is Matt Varner. I'm a fisheries biologist with
14 the Bureau of Land Management. I led a multi-year study
15 examining the concentrations of mercury and other metals in
16 fish species within the Middle Kuskokwim from Aniak to McGrath
17 during the period of 2010 to about 2014. Over the next half
18 hour or so, I'm going to talk about what we did and some of the
19 key findings from the study.

20 During this presentation, I'm going to talk about
21 (indiscernible) of the project as they relate to
22 (indiscernible). Thank you everybody on just (indiscernible)
23 jumping onto slide 3 right now. (Indiscernible) primary
24 (indiscernible) body containing mercury and is common in
25 Western Alaska. This slide shows the number of known cinnabar

1 deposits in Western Alaska. Some are mined and some are
2 unmined. The Yukon watershed is shown here in tan and the
3 Kuskokwim watershed (indiscernible) is a very high
4 (indiscernible) and in part why we refer to this
5 (indiscernible) given all the known (indiscernible) it's pretty
6 clear why 99 percent of (indiscernible).

7

8

9

10 LESLI ELLIS-WOUTERS: So, Matt, this is Lesli. You are
11 kind of freezing up there. I apologize for that. We may want
12 to go to Mike instead. And, Matt, maybe you log out and log
13 back in, because you are -- you're not coming in. You're
14 freezing up.

15

16

17

18 MATT VARNER: (Indiscernible.)

19

20

21

22 LESLI ELLIS-WOUTERS: Yeah, I think we may need to --
23 let's move along with Mike. I know that you weren't prepared
24 to go first, Mike, but let's start with your presentation and
25 then we can come back to Matt maybe if he can fix his

1 connectivity while you're presenting.

2

3

4

5 **RED DEVIL MINE PLAN PROPOSAL, MIKE McCRUM**

6 MIKE McCRUM: Okay. I believe I have my presentation up.

7 Can you hear me?

8

9

10

11 LESLI ELLIS-WOUTERS: We can hear you. I'm just stopping

12 Matt's presentation so that you can go ahead. Okay. All

13 right, Mike, you are on.

14

15

16

17 MIKE McCRUM: Okay. Well what we had attempted to do was

18 to have Matt present on the fish tissue study that he and his

19 team completed between 2010 and 2014. And the reason that we

20 wanted to do that was because some of the data that they

21 collected fed into some of the work that we did as part of the

22 RIFS on the river. So I'll try and pick up those threads

23 during my presentation so we can connect those dots. And then

24 if we get Matt back online, he'll be able to provide some of

25 the more detailed information that really was very valuable to

1 us in our risk assessment of the sediment in the river.

2 So today I want to talk about the Red Devil project. We
3 have just completed a document called a proposed plan, which is
4 a major step in the circula process that we're using for this
5 project. And in that plan, we summarized, in very fundamental
6 terms, the results of the investigation, and the results of the
7 feasibility study that we did where we looked at different
8 cleanup alternatives. And I want to summarize each of those
9 for you today very briefly, and then I want to talk about a
10 preferred cleanup alternative that we developed based upon that
11 work that we did before. And this will be the first time that
12 we've talked about it. And I want to emphasize, as has been
13 done earlier, that this is the kind of official public
14 participation step in the circula process. This is your chance
15 to provide us with feedback on a preferred cleanup alternative.
16 And it's important that if you have concerns or you have
17 questions or you have opinions that you express those. We have
18 a court reporter with us today. We'll be developing a
19 transcript, and we'll be formally responding to all the
20 comments that we receive. So just to kind of reiterate this is
21 your chance to actively participate in this process, and we
22 hope that you do. So having said that.

23 I'm going to start with the work that we did as part of
24 the investigation. And I'm just going to take a few slides
25 here and condense about four- or five-years' worth of work into

1 half a dozen slides. We talked about a lot of this in previous
2 meetings, and so hopefully people are fairly familiar with what
3 we did and what we found.

4 This slide here, it capsulates really the key issues or
5 the key points that came out of that investigation, beginning
6 with the contaminants of concern. Our sampling covered lots
7 and lots of different kinds of chemical compounds. And through
8 that work, we identified three metals, mercury and arsenic and
9 antimony, as the primary contaminants of concern. And any
10 cleanup action we do will be focused on those three metals.

11 Not surprisingly, those three metals really come from the
12 ore deposit that was mined here. They represent the three
13 minerals, cinnabar for mercury, arsenopyrite and realgar for
14 arsenic, and stibnite for antimony. Those were the minerals
15 that were mined in the processed here, and it's the remnants of
16 that process that are really our main focus for this project.
17 Because they processed the ore onsite, they did that by heating
18 the material and extracting the mercury, and then they pushed
19 the remnants, what we call tailings, out onto the ground. They
20 still had high concentrations of these three metals. The
21 heating that they did through the process changed the chemistry
22 of those things, and that's what lead to the mobility, if you
23 will, of those metals. And through that mobility, they've
24 affected the soil and the sediment of the Red Devil Creek.
25 They've affected the groundwater down in the lower part of the

1 watershed near the creek. And they've had an effect on the
2 Kuskokwim River sediment by that material migrating offsite.

3 We took the results of the investigation and we did a risk
4 assessment where we looked at various scenarios, and we
5 evaluated the potential risk to humans and animals through
6 different kinds of exposure. And we found that there were high
7 levels of risk on the mine side itself. And the significance
8 of that finding is that is the main reason why we need to take
9 action. It's that elevated risk to both animals and humans
10 that we estimated.

11 So I just want to provide you with a little bit more
12 detail on what we found so you can get a better picture of
13 where the contamination is, because that will be the focus of
14 the action that we are intending to take. You may have seen
15 this (indiscernible) before. This is an aerial photo of the
16 mine site. You can see the river off to the right. And Red
17 Devil Creek runs right through the middle of it. This black
18 line kind of outlines the flatter area within the valley of Red
19 Devil Creek. And on either outside that line, the slopes are
20 quite steep. The significance of that steep topography is it
21 contained the tailings and most of the effects of the mine and
22 the process to this relatively small, about 20-acre area, right
23 around Red Devil Creek. As you can see from the red dots, we
24 collected soil samples at a large number of locations, both at
25 the surface and in the subsurface. You can see that we got

1 concentrations from each of those samples. In this case, the
2 size of the purple dot correlates with the concentration that
3 we found in the samples. So if the dot is big, the
4 concentrations were high. If the dot is small, such as right
5 here, the concentrations are relatively low. And if you see a
6 yellow dot, that means that the concentrations were essentially
7 below detection.

8 So what this tells us is that the concentrations of those
9 three contaminants of concern, the mercury and the arsenic and
10 the antimony, were highest in the places where the tailings
11 were piled up. Right here where they were processed in this
12 building. Right here where they were the processing in the
13 early days of the mine was happening. And then to a lesser
14 extent but also noticeable, further down the creek where we
15 don't have large piles of tailings, but through the actions of
16 the miners who were managing those tailings piles as well as
17 the creek intended to move the material down the creek and out
18 onto the barge landing, which we now call the Red Devil Creek
19 delta, and out into the river.

20 In addition to looking at soil, we also did a lot of
21 sampling within Red Devil Creek itself, both the water and the
22 sediment. This figure really just speaks to the water
23 concentrations. At these locations, you can see along here --
24 and again, the size of the circle correlates with the
25 concentration. The trend that you can see here is that if you

1 go upstream of the mine, there were detectable concentrations,
2 but they were relatively low. And as you move downstream and
3 the stream comes into contact with the tailings, the
4 concentrations jump pretty high, and they stay relatively high
5 until you get to the mouth of the creek and into the river. So
6 this pretty clearly indicates that the creek is being affected
7 by the presence of those tailings.

8 This is a little bit different look at the mine site.
9 It's a very, very busy figure. You don't need to pay attention
10 to everything that's here. I just want to draw your attention
11 to the fact that the river is on the right. Red Devil Creek
12 runs right through the middle. If you're familiar with contour
13 lines, these shaded back lines are the topography, and they
14 show steep slopes both to the north and the south. Anybody who
15 has been out there has seen that. These contour lines indicate
16 the direction of groundwater flow. And I don't really want to
17 get into that. I really want to focus primarily on the
18 groundwater concentrations. Again, the size of the circle is
19 proportional to the concentration in the groundwater at that
20 location. So what we can see is near the creek, monitoring
21 wells that we constructed and sampled had by far the highest
22 concentrations of those contaminants of concern. And the very
23 highest concentrations were right in the tailings piles
24 themselves.

25 I do want to point out that these wells in this area are

1 up slope of the mine. And we didn't really find any tailings
2 up there, but we do have, in some locations, very high
3 concentrations. Those reflect the influence of natural ore in
4 the bedrock that increases those concentrations in the
5 groundwater naturally. So we have a little bit of a
6 complicated situation here in that we have tailings down
7 (indiscernible) of the watershed that are affecting the
8 groundwater at that location, but we have quite variable
9 background, natural background concentrations due to the
10 presence of the ore.

11

12

13

14 JOY HUNTINGTON: Mike, if I can jump in really quick? And
15 if you want to go back to the last slide, just to see if
16 there's any questions from our attendees at this time. Thank
17 you, Mike. I do not see any questions in the Q & A box. And
18 again, you can just type them in. It's down at the bottom of
19 your screen. And to raise your hand, I think everybody already
20 used the raise hand function just to test it, so I know it
21 should be working. And if there's no questions now, we will
22 stop again in a few minutes. I'm checking to see if any
23 questions are maybe just being typed in the Q & A box.
24 Sometimes it takes a few minutes for them to get in there. But
25 I don't see any, Mike, and I don't see any hands raised either,

1 so I will hand it back to you to continue with the
2 presentation. Thank you.

3

4

5

6 MIKE McCRUM: Okay, thank you, Joy. While we're stopped,
7 I understand that there are some people who are unable to
8 participate via the Zoom platform, and so they're probably not
9 able to see the slides that we're presenting, but hopefully
10 they're following along with hard copy that we mailed out.
11 This slide here, I believe, is slide five. I will try and
12 remember, as I move through, to periodically mention the slide
13 number to help people follow as we're going through the
14 presentation.

15

16

17

18 JOY HUNTINGTON: And, Mike, a quick update on that.
19 Everyone that's participating today in our meeting is actually
20 online, and so they should be able to see the screen. If any
21 of you can't see the screen and aren't seeing -- and you do
22 have a hard copy that you're following, please let us know in
23 the Q & A box. But my impression, Mike, is that everyone is
24 online, and so we may not need to read the slide numbers. We
25 were ready to do that just in case we had folks calling in from

1 their telephones, but I don't see anybody calling in today.

2

3

4

5 MIKE McCRUM: Thanks, Joy.

6

7

8

9 JOY HUNTINGTON: Yep.

10

11

12

13 MIKE McCRUM: Okay. As I mentioned before, we did a risk
14 assessment based upon the results that we compiled from the
15 investigation. In the risk assessment, we look at exposure
16 scenarios. What would happen if someone were to live onsite
17 and drill wells and drink the groundwater? What would happen
18 if someone were hunting and moved across the site, you know, in
19 a relatively short period of time? Perhaps they took a drink
20 from Red Devil Creek. I think we also looked at what would
21 happen if they were to open a mine there again and people were
22 working there all day, but not living there. All three of
23 those scenarios involve different levels of exposure and
24 different ways in which they're exposed. And in the risk
25 assessment, we looked at all those scenarios, and then we sort

1 of did a cumulative estimate of the risk to those people from
2 all of those different scenarios. We looked at the toxicity of
3 these contaminants. And we also looked at cancer risk for
4 those same contaminants as part of the risk assessment.

5 What we found for the site itself is that people, or
6 animals really, exposed to the contaminants that we have on the
7 site and the concentrations that we measured, you'll clearly
8 have levels of risk, both toxic risk and cancer risk. Most of
9 the risk was due to the presence of the arsenic. The mercury
10 does contribute, but the arsenic, which is a little bit more
11 mobile after it's been processed, therefore is quite prevalent,
12 really led to the greatest level of risk both for potential
13 cancer and for toxicity.

14 Later on in the project, we did a second risk assessment
15 looking at the sediment in the river. And the concentrations
16 in the river are highest right at the mouth of the creek and
17 then they diminish as you go downstream. And that pattern
18 pretty clearly indicates that the source of the material that
19 we were monitoring was coming from the mine via the creek.
20 What we found through that second risk assessment was something
21 a little bit different. Both the EPA and the DEC has standards
22 that you use to compare your risk assessment results to, both
23 for cancer risk and toxicity. And for both of those things, we
24 met the EPA standard, but we were slightly above the DEC
25 standard for both the toxicity and the cancer risk. So that's

1 a little bit different situation. It's a little bit more gray.
2 And that's reflected in some of the feasibility study work that
3 we did.

4 So just to summarize real quick. We did an investigation.
5 We found high concentrations near the tailings and the media
6 such as water and soil that are affected by the tailings. We
7 used those results to develop objectives for the cleanup. And
8 those four objectives are listed here. We want to be able to
9 prevent direct and indirect contact to that contaminated
10 (indiscernible). We want to eliminate the impacts of those
11 tailings on the creek and on the groundwater. And then we
12 understand that no matter action we take, we're going to have
13 to do some monitoring to verify that whatever action we take is
14 effective.

15 As I mentioned, we did a feasibility study where we looked
16 at cleanup alternatives that are based upon the results of the
17 investigation. This is a very succinct summary of the four
18 alternatives that we developed and evaluated through that
19 feasibility study.

20 The first one, SW1, is a no action alternative that you
21 have to do just for the process to assess the baseline
22 condition.

23 The second one is a fairly simple approach in which we
24 would encircle the site, that's about 190 acres, with a 12-foot
25 high fence. It would address some of the risk, particularly

1 risk associated with direct contact with the tailings
2 themselves, but there are other ways that the risk is not
3 mitigated. So we evaluated this alternative, but it's not as
4 effective as we think it would need to be.

5 Alternatives three and four are similar in that both of
6 them really focus on excavating those tailings and the
7 contaminated sediment and the contaminated soil associated with
8 them from that area right around Red Devil Creek. Where they
9 differ is what we do with those tailings. One involves keeping
10 them onsite and controlling them and keeping them away from
11 water. The other involves transporting that material to a
12 permitted hazardous waste disposal facility, probably in
13 eastern Oregon.

14 An estimate I provided on the right side, the estimated
15 cost for each of these alternatives. And I think the level of
16 effort required for each is reflected in the pricing that you
17 see.

18 So to summarize those alternatives again in a little bit
19 more graphic form, there's no need to talk about the baseline.
20 Alternative two involving a fence would essentially encircle
21 all of the colored areas here including this blue area that is
22 the area that we would monitor depending up on what alternative
23 we select. And as I mentioned before, that encompasses
24 something on the order of about 190 acres. Under alternatives
25 three and four, we would excavate somewhere between 205,000 and

1 215,000 cubic yards of material. Most of the material that
2 would get excavated is in this yellow area here, and at least
3 three small areas along the edge of the river. If it's yellow,
4 it's all on shore. If it's light green, like these two, then
5 it's very shallow sediment right on the edge of the river. All
6 of this material would be excavated and either consolidated in
7 a repository at this location or taken offsite. In addition,
8 there's a small monofil here that contains tailings and the
9 remnants of the process building. And that monofil from both
10 alternatives three and four would be demolished. The tailings
11 would be consolidated with the rest of the tailings. The
12 building materials and the process equipment would be hauled
13 offsite for disposal.

14

15

16

17 JOY HUNTINGTON: Mike, can we stop for questions after
18 this slide?

19

20

21

22 MIKE McCRUM: Sure. And that would be now.

23

24

25

1 JOY HUNTINGTON: Okay. I do not see any in the Q & A box.
2 And let me just see if there's any hands raised. Any questions
3 on the slides that have been presented so far? We will have
4 two more opportunities for asking questions on Mike's slides.
5 And I see that Matt is ready to go as well after this, and he's
6 going to talk a little bit more specifically about levels of
7 mercury in the environment, and so there may be some questions
8 related to that when Matt presents. And still not seeing any
9 hands raised or any questions, so carry on, Mike. Thank you.

10

11

12

13 MIKE McCRUM: This is a follow-up to that other slide.
14 It's a little bit more, I don't know, focused look, if you
15 will, on the composed location for the repository that is part
16 of alternative three. You can see that it's on the edge of the
17 Red Devil Creek watershed. It sits at an elevation that's
18 about 300 feet above the river. Excuse me. Part of the reason
19 for this location is, as I mentioned before, the contaminants
20 of greatest concern are metals. The potential for
21 environmental harm from metallic contaminants is greatest in an
22 aquatic environment. So it's important that we get that
23 material out of the location where it is now, right at about
24 the Red Devil Creek valley bottom, and in place where they
25 won't come into contact with water as leach, which is what

1 happens when water comes into contact with that kind of stuff,
2 it picks up those metals. And because it's in the water, it
3 has the potential to travel to other places and affect other
4 media. So that's the reason why the proposed repository is at
5 this location. You can see an estimated quantity of 205,000
6 cubic yards here. That reflects a range, but somewhere in that
7 neighborhood.

8 So I want to spend the next few slides talking about that
9 repository. It was the subject of an awful lot of discussion
10 through the course of the feasibility study, a lot of data
11 collection in the location of the proposed location. It's a
12 pretty detailed analysis. This is a cross-sectional view of
13 what the repository would look like. It's actually pretty
14 simple. It would sit on the rock, on the bedrock, so we would
15 have to clear away the vegetation. We would place about five
16 feet, a minimum of five feet, of locally derived loess, which
17 is very silty soil, on the top of the bedrock as a way of
18 preparing the surface. Then we would consolidate that 200,000
19 plus cubic yards of tailings and soil and sediment on top of
20 that loess. We would place a cap over the top of it consisting
21 of a material that's referred to as a geomembrane. And I'll
22 get into the details of that just a little bit later. And then
23 over that, we would place more soil, and then we would plant
24 it. And the reason that we do that is because it would provide
25 additional stability. It protects the geomembrane from the

1 elements. And it also actually contributes to helping to
2 prevent rain and snowmelt from getting -- you know, coming into
3 contact with the tailings just through the respiration of the
4 grasses and the other stuff that we plant. So that's the
5 general idea behind the repository.

6 On the next two slides, we're going to look at some
7 details here where the repository comes into contact with the
8 ground, and then a more general cross-sectional view where
9 we're going to talk about some of the analysis that we did of
10 this facility.

11 So this is a cross-sectional view of the repository, but
12 it's kind of a close-up of that edge. We have the tailings and
13 the soil and sediment on top of the soil and the bedrock here.
14 We have that extra layer of silty soil here. We have this
15 geomembrane here. And it's a heavy, heavy plastic material.
16 It comes in very long rolls. You lay it out, and we seal the
17 seams, and it prevents a watertight cover over the top of this.
18 And this is the main defense against water that is in this cap.
19 Over that, we would add additional soil, and then we would
20 plant it. The edge of this thing would be a slope that's no
21 steeper than three-to-one, as it's shown here, to maintain the
22 stability of this thing. Over time, we don't want the side
23 slopes to get too steep. We would put ditches in around the
24 outer edge, particularly on the uphill side, so that if there's
25 any surface water that ponds, we can direct it away from this

1 thing and, again, try and keep it dry.

2 The geomembrane itself, we would dig a trench around the
3 very outer edge of the respiratory, as shown here. And we
4 would place it in that trench and then backfill above it to key
5 it in place, to hold it in place so that it doesn't move
6 around, and it doesn't tear.

7 This is a more general cross-sectional view of that
8 repository. Again, we have the bedrock, the soil, the tailings
9 in the soil, and the sediment with more dirt, and then a soil
10 grass cover with this geomembrane liner right in here.

11 We used models to evaluate the potential for rain and
12 snowmelt to come into contact with this material, which has
13 high concentrations of the contaminants in it. And then
14 whatever comes into contact with it is going to take on some of
15 those metals. And it has the potential to continue to migrate
16 or flow down through the bottom of this thing and into the
17 bedrock. As you can see, the proposed approach here, the
18 proposed design, includes a cap, but it doesn't include a
19 bottom liner. That was the reason why we did the modeling to
20 demonstrate that this design, without a bottom liner, would be
21 effective in protecting the water table, the groundwater, from
22 being contaminated by any material that flows through this, any
23 water that flows through it.

24 So as part of this effort, we used two different models.
25 The first one was an EPA model called Help, and it simulates

1 waterflow through the repository itself. And it estimates on
2 an annual basis how much water would pond at the bottom. We
3 estimated based upon data that we collected from monitoring
4 wells as well as the data we collected through some leaching
5 samplings, some leaching analysis. We estimated that the
6 concentration of the three metals in that leaching, once it had
7 flowed all the way through this at the bottom, would
8 essentially have concentration of antimony, arsenic and mercury
9 about equivalent to these three. These are (indiscernible)
10 reference these are quite high, quite high concentrations.

11 (Pause.)

12

13

14

15 JOY HUNTINGTON: Mike, you still there?

16

17

18

19 MIKE McCRUM: I'm still here. Pardon the delay. I'm
20 going to have to learn how to cough without coughing into my
21 mic.

22

23

24

25 JOY HUNTINGTON: Okay. I just want to make sure we didn't

1 lose you, too. Sorry.

2

3

4

5 MIKE McCRUM: No, I'm here. I'm here. So we used a
6 second model to simulate flow of that leaching through the
7 bedrock in an unsaturated condition beginning with these very
8 high concentrations in the water. This table kind of
9 summarizes the results. Again, these are the initial
10 concentrations in that water that's ponding at the base of the
11 repository. These are standards that are developed by the DEC,
12 against which we need to compare our concentrations. What the
13 modeling showed us is that by the time that liquid had
14 penetrated to these depths below the bottom of the repository,
15 the concentrations were quite low, approaching zero. So what
16 this tells us is that by the time that water made it partway
17 through the soil above the bedrock at the base of this
18 repository, those concentrations had diminished to well below
19 these standards. So, Joy, do we need to stop for questions?

20

21

22

23 JOY HUNTINGTON: Yes, we do. Thank you. And again, I do
24 not see any in the Q & A box. And if anyone would like to ask
25 a question that's participating, please raise your hand and we

1 will open your line to ask your question verbally. And I do
2 not see any hands raised or any questions in the Q & A box.
3 Really quick, just to check in on last questions, we will stop
4 again at the very end of Mike's presentation, which is just in
5 about three more slides, and ask a final time for questions for
6 Mike. And then we'll turn it over to Matt to give his
7 presentation. And you will have a few opportunities then as
8 well before we transition over to the public testimony. And
9 once we do transition to public testimony, we will stop
10 answering questions live. We want to just focus on the
11 testimony at that point. And so definitely any questions for
12 Mike, you'll have another opportunity here in a few more
13 slides. And then during Matt's presentation as well. So I
14 don't see any questions at this time, so I'll hand it back to
15 you, Mike. Thank you.

16

17

18

19 MIKE McCRUM: Okay. I'm just going to go back through
20 this really quick, because it's a very key component of the
21 process that we went through to select the preferred
22 alternative. And it's a little hard to follow, so just to
23 reverse myself here a little bit. Just one second, please.
24 I'm a little bit ahead of myself.

25 So we used two different models. We simulated waterflow

1 through the pile. We used data from the investigation to
2 estimate the concentration of that water at the base of the
3 pile. We used a second model to simulate flow from the bottom
4 of the pile through this dirt layer and through the bedrock to
5 the water table, with this being the initial concentration and
6 condition. The result of that analysis was that the
7 concentrations do diminish. And they actually diminish to a
8 level approaching zero, certainly within these DEC based
9 limits, at depths that are really quite shallow. We will
10 design the repository to try and maintain a physical separation
11 of at least 10 feet between the bottom of the repository and
12 water table. And so what this modeling showed us is that those
13 concentrations diminish at depths that are significantly less
14 than 10 feet.

15 The other thing that I want to emphasize here is that we
16 modeled this for 50 years. The first two years of the modeling
17 period were during construction where there was no cap. So the
18 majority of the water that made its way from rainfall and
19 snowmelt get into that tailings pile was from the construction
20 period before the cap was constructed. Then the way we modeled
21 it, at the end of the second year, the cap automatically
22 appears. And then we modeled it for another 48 years. And
23 these depths reflect the concentrations of these contaminants
24 after a 50-year modeling period.

25 So it's based upon that analysis that we believe that the

1 preferred cleanup alternative really should be removal of this
2 monofil, removal of all this contaminated material here, as
3 well as these three locations here, and consolidated in an
4 onsite repository with a very, very low permeability cap at an
5 elevation that's well above the creek and well above the river
6 to prevent it from coming into contact with water. Part of
7 that alternative would involve monitoring of the groundwater in
8 this general area here. Right now we have upwards of 60
9 monitoring wells in this area. We wouldn't monitor all of
10 those, but we would certainly monitor a significant percentage
11 of them. And the data that's derived from that monitoring
12 would be key to evaluating whether or not the cap and
13 repository is effective.

14 Part of that monitoring program would also include visual
15 monitoring of the repository itself. We want to make sure that
16 the cap remains in good condition, because that's what protects
17 that material from water. And we would do that on an annual
18 basis.

19 In addition, we would monitor sediment in the river. We
20 still have elevated concentrations due to the presence of
21 tailings in the river here. We performed an action in 2014
22 that we think was effective in preventing additional material
23 from flowing into the river. And we're beginning to see trends
24 that indicate that just the natural conditions that exist in
25 the river with a pretty heavy current are causing those

1 concentrations to diminish over time. And we would expect that
2 to occur, but we would conduct annual monitoring to demonstrate
3 that that's the case.

4 Just to tie this back into the cleanup objectives that we
5 developed based upon the risk assessment, we believe that by
6 excavating this material, we would prevent the direct and
7 indirect human contact of the tailings. We would eliminate the
8 impacts to groundwater from the tailings themselves, but not
9 necessarily from the influence of the natural ore in the
10 bedrock aquifer up in this part of the watershed. We would
11 eliminate the impacts to Red Devil Creek. And we would
12 eliminate potential risk to humans, both direct and indirect,
13 from coming into high contact with high concentration areas
14 here. We believe, as I've just kind of described, that the
15 repository will be effective in protecting groundwater quality
16 in this area. And then over time, we believe that the
17 monitoring in the river will show that those concentrations
18 will diminish on their own.

19 So that's a very quick summary of what we've done, what
20 we've evaluated, and what we think is the best way to clean up
21 this site. As I mentioned at the beginning of the talk, we're
22 presenting this specifically for the purpose of requesting
23 input on that preferred alternative. This is your opportunity
24 to formally comment. And we will review your comments and
25 respond to them formally. So you have my contact information

1 here. You can also contact Bonnie Million. And I would
2 welcome that, you know, questions. If you have any questions,
3 we'll maintain a public comment period through the middle of
4 December to give you time to think about what we presented, ask
5 questions if you need to, and provide comment.

6

7

8

9 JOY HUNTINGTON: Thank you, Mike, for sharing the
10 information. And I think on that note as well, if people would
11 like to provide verbal testimony at one of our meetings now
12 that you've seen the presentation and, you know, you can always
13 to that at a follow-up meeting as well. I believe we have a
14 hand raised, so we do have a question from Ann Marie. And I'm
15 not seeing any in the Q & A box at this time. But, Ann Marie,
16 we have opened your line and you're unmuted, so you can
17 definitely ask your question now. Thank you.

18

19

20

21 ANN MARIE PALMIEN: Hi. This is Ann Marie Palmien with
22 the Alaska Department of Environmental Conservation. And,
23 Mike, I just wanted to let you know that I'm on the line. And
24 I don't know if you want to let people know about kind of the
25 coordination that BLM did with EPA and DEC just so that they

1 know that there were other agencies involved with BLM, you
2 know, in regards to the investigation and the modeling, as well
3 as the development of your cleanup alternatives.

4

5

6

7 MIKE MCCRUM: Yeah, thanks for that, Ann Marie, that's a
8 great point. Actually, you did quite a nice job of summarizing
9 that, but just to reiterate the point that Ann Marie just made.
10 As I think everybody knows, we've been doing this project for a
11 long time, about 10 years. We have been working in pretty
12 close coordination with the DEC and the EPA through most of
13 this project. And in recent years, very close coordination
14 with the DEC, and Ann Marie has been the DEC project manager
15 for Red Devil since the beginning of the (indiscernible). It's
16 been a very good process, a lot of good interchange between the
17 agencies. You know, we've gotten a lot of good ideas from both
18 the EPA and the DEC on how to do things. They've made sure
19 that whatever work we do, whatever analysis we do, we're being
20 held to a very high standard. And I think that's one reason
21 why we can present this (indiscernible) today with about as
22 much confidence as we can have, based on predicted work, that
23 the alternative we have is going to be protective of the
24 environment. So, yeah, thanks for that. I really appreciate
25 it.

1

2

3

4 JOY HUNTINGTON: Thank you, Ann Marie, for providing that
5 input as well. And I'm still not seeing any other hands raised
6 or questions from the Q & A box. And so maybe at this time, we
7 can transition over to Matt's presentation. And then again, we
8 will begin our public testimony. So I think we're just pulling
9 up Matt's presentation now. And we will stop a few times for
10 questions as well during his slide presentation. I know he
11 kind of already got started once, so we're going to try again
12 here. And I'll hand it over to you now, Matt. Thank you.

13

14

15

16 **MERCURY CONCENTRATIONS IN THE ENVIRONMENT**

17 MATT VARNER: All right. Hopefully round two goes a
18 little better here. I apologize for that. Can we just sound
19 check? Can folks hear me okay?

20

21

22

23 JOY HUNTINGTON: Sounds great to me, Matt.

24

25

1

2 MATT VARNER: All right, thank you, Joy.

3

4

5

6 LESLI ELLIS-WOUTERS: You're coming through clear.

7 Thanks.

8

9

10

11 MATT VARNER: All right, great. So just again, my name is
12 Matt Varner. I'm a fisheries biologist with the BLM. And I
13 was the lead for a fish tissue project that went from 2010 to
14 about 2014. And it was very focused on looking at mercury and
15 other metals in fish species within the Middle Kuskokwim. And
16 so over the next half hour or so, I'm going to talk about what
17 we did and really some of the key findings as it relates to the
18 presentation that Mike just provided.

19 Specifically during the presentation, I'm going to cover a
20 little bit about mercury and the environment, why we focused on
21 mercury for this multi-year fish tissue study, and the results
22 of the project as it relates to, of course, the remediation of
23 Red Devil Mine.

24 Cinnabar is the primary ore body containing mercury, and
25 it's fairly common in Western Alaska. This slide shows the

1 number of known cinnabar deposits in Western Alaska. The Yukon
2 watershed is shown in tan, and the Kuskokwim watershed here is
3 shown in a light orange color. And I've circled an area that
4 has quite a few known instances of cinnabar in the geology
5 there. Some of those deposits are mined and some are unmined.
6 However, that high concentration is why we refer to this area
7 as the mercury belt of Alaska.

8 So the mercury belt concept, in and of itself, provides a
9 useful visualization of mercury deposits, both mined and
10 unmined. And that really hits these first two bullets, natural
11 geology and land use. In respect to permafrost, I think most
12 folks maybe don't realize that permafrost contains a
13 substantial amount of mercury as well. And as that permafrost
14 melts, of course mercury is then released into the environment.
15 And studies have confirmed that in Alaska already.

16 The last bullet speaks to atmospheric deposition. And
17 that's really the way mercury gets into the atmosphere from
18 manufacturing emissions, coal-fired power plant emissions in
19 Asia, wildfires, etcetera, and how that is carried from the
20 source and then deposited elsewhere in the globe, including
21 Alaska. So these are four potential mercury sources that we
22 need to think about when we do a study like this.

23 This slide illustrates how mercury, and more importantly,
24 methylmercury moves and accumulates in the aquatic food web,
25 especially at the highest levels for top predator species like

1 Northern Pike. We focused in particular on methylmercury
2 because it's the most toxic form of mercury to humans. And
3 it's created naturally through interactions of mercury in the
4 water and sediments and bacteria. And a very commonly found
5 bacteria, it occurs in swampy areas, slews, and wetlands.
6 Methylmercury, once it's formed, it's easily taken up by the
7 lowest levels in the aquatic food chain, like algae. And then
8 aquatic insects consume that material and are eaten by higher-
9 level predators like Fjord fish, species like Sculpin, for
10 example. And that begins the accumulation of mercury up the
11 food web. And those concentrations continue to increase. And
12 I think most folks are fairly familiar that the highest levels
13 that we see are at the top of the food web. And for fish, that
14 means long-lived predatory species like Pike and Burbot, or
15 Lush fish, in the Kuskokwim. And those are also important
16 subsistence foods in the region.

17 The goal of this study was to build on work that had
18 already been completed by Fish and Wildlife Service in the
19 Lower Kuskokwim, as well as the Lower Yukon, and some of the
20 limited sampling that was done by USGS. And those studies
21 noted that mercury concentrations were elevated in fish sampled
22 downstream of mined areas within the region. But we wanted to
23 expand that. We wanted to take a broader look and look at
24 regional concentrations. And so unlike other contaminant
25 studies completed in Alaska, we focused on multiple levels of

1 the food web from insects up to top predators. And we
2 integrated fish tracking to better understand seasonal habitat
3 use of fish and their proximity to potential mercury sources
4 within a 270-mile section of the Kuskokwim. And so this is a
5 good spot to stop for questions.

6

7

8

9 JOY HUNTINGTON: Yeah, thank you, Matt. And I do not see
10 any questions. I was looking in the Q & A box. Yeah, we did
11 see that someone was jumping on a different call, but I
12 appreciated that message. And I do not see any hands raised
13 from any of our folks that are still here. Again, we'll be
14 stopping in about seven more slides, and then stopping again
15 after that for questions. So everyone must be following along
16 just fine, Matt, and I will hand it back to you. Thank you.

17

18

19

20 MATT VARNER: All right, very good. The results of this
21 study indicated that aquatic life, in particular insects and
22 fish within Red Devil Creek, had much higher mercury levels
23 than most other creeks in the region, except possibly Cinnabar
24 Creek in the headwaters of the Holitna. However, when we
25 sampled Pike throughout the region, we found some of the lowest

1 concentrations of mercury in the section of the Kuskokwim near
2 Red Devil Mine. And we were able to discern a pattern using
3 radiotelemetry tracking. And I'll get into that as we move
4 through the presentation.

5 Burbot had lower concentrations of mercury than Pike. But
6 unlike Pike as well, it was difficult to find a pattern to
7 explain those low levels, but varying levels of mercury. So
8 over the next 13 slides, I'm going to cover this in more
9 detail, and in particular what we found to say that led to
10 these key conclusions.

11 This slide illustrates the study area. And it was
12 essentially from the community of Aniak up to McGrath, and it
13 included many tributaries, both small and large, being sampled
14 from 2010 to 2014. And you can see Red Devil Mine is basically
15 in the center of the study area along the Kuskokwim.

16 Our initial focus was on tributary streams. We sample
17 nine small streams, all of them wadable. Most of those streams
18 had limited fish presence. Our target for sampling was about
19 24 fish each time we sampled, and we seldom were able to
20 capture that many fish within the lower extent of these
21 streams. So fairly limited fish distribution, but fish were
22 generally present. The most common fish that we found was
23 Slimy Sculpin, which is a small fish, generally less than a few
24 inches in length. It's shown here in image of a Sculpin in
25 this slide. And these fish, in particular, don't move very

1 far, 30 square feet in their lifetime is fairly common. Many
2 of the small streams that we sampled were assumed to be
3 fishless at the start of the statement. Like I said, we found
4 fish in about every stream that we sampled, including Red Devil
5 Creek. But again, they were fairly limited. And generally
6 what we found were -- we only found fish within the first few
7 hundred feet of their connection to the mainstem Kuskokwim.

8 This map shows a location of eight of those small streams
9 and how they're positioned in relation to Red Devil Creek, both
10 downstream and upstream on the main Kuskokwim. One stream, and
11 it will show on the next slide, was located in the headwaters
12 of the Holitna. And that's shown here. And the reason why we
13 selected this stream for sampling is because it had been
14 sampled in the past. And this stream is called Cinnabar Creek,
15 so certainly it was something that was of interest to us. And
16 fish that had been sampled there had elevated concentrations of
17 mercury. And so our interest was understanding what those
18 concentrations were, how they correlated with Red Devil Creek,
19 as well as other streams in the region. Cinnabar Creek, like
20 Red Devil Creek, once had a mercury mining operation on it in
21 the past. It was quite a bit smaller, but substantial amounts
22 of mercury were mined from that site, and some evidence of that
23 mining operation does still remain there.

24 These are the results from tributary sampling. And what
25 you see here in these graphs is that the upper charge, it shows

1 results for Slimy Sculpin. And that's total mercury in parts
2 per million in whole body samples. And you can see that
3 samples from Red Devil Creek in 2010 and 2011, fairly small
4 numbers, and you can see the numbers of Slimy Sculpin are in
5 parentheses here, fairly small numbers. Remember, our target
6 was 24 fish, so you can see that we were not able to get that
7 many fish within any of these streams. But the fish that we
8 did sample, we saw elevated levels in Red Devil Creek as well
9 as Cinnabar Creek, but some degree of total mercury was noted
10 in every fish that we collected within the tributaries that we
11 sampled.

12 The same holds true for aquatic insects. We saw some
13 degree of mercury. Total mercury within those samples, but
14 elevated levels in Red Devil Creek as well as Cinnabar Creek.

15 Looking at concentrations of total mercury in parts per
16 million for Dolly Varden and Arctic Grayling, it's a similar
17 pattern. And these are lower concentrations than the previous
18 slide, but you'll see that we did see elevated concentrations
19 in Red Devil Creek as well as Cinnabar Creek. Arctic Grayling
20 concentrations, these are quite a bit lower. And you can see
21 on the Y access, those concentrations are quite a bit lower.
22 And so the limited number of fish that we did find in Red Devil
23 Creek had fairly low concentrations and were very similar to
24 other streams in the area. This is a good place to, I think,
25 pause again for questions.

1

2

3

4 JOY HUNTINGTON: Yeah, thanks, Matt. And again, I do not
5 see any questions in the Q & A box. And there are no hands
6 raised at this time. So I'll pause here for just a minute or
7 two and see if someone was typing in the Q & A box. That's
8 happened before that it just takes a minute to get the question
9 typed and to press send. But I am not seeing any hands raised.
10 And I think some of our participants are with state agencies
11 and maybe don't have any pressing questions at this time. So
12 with that, I will just close this round of questions. And we
13 will have questions one more time, and then we'll open up for
14 public testimony. So I'll hand it back over to you, Matt.
15 Thank you.

16

17

18

19 MATT VARNER: Okay. And these results really weren't
20 surprising. I mean we certainly expected the aquatic
21 environment and the species that resided in Red Devil Creek to
22 show elevated concentrations of mercury, much like Cinnabar
23 Creek, we had that expectation. And it wasn't surprising to
24 see all of the samples across the tributary showing some degree
25 of total mercury within their tissue given the geology of the

1 region. But one of the key questions that we were interested
2 in answering was how does Red Devil Creek influence that larger
3 aquatic environment of the Kuskokwim. And to explore that
4 question further, we sampled predatory fish, Pike and Burbot.
5 And at the same time as we sampled their tissue, we implanted
6 radio tags. And so tracking fish seasonally over the course of
7 time, we were able to better understand their seasonal
8 movements in proximity to Red Devil Creek and try to get a
9 better understanding of the influence of Red Devil Creek in the
10 larger system.

11 From 2011 until 2013, we tagged hundreds of fish. Burbot
12 and Pike tags last about two years, and the Grayling tags that
13 we put out lasted about one year. But we did tag hundreds of
14 fish. And it was a very exciting project in the sense that it
15 had never been done before. The fact that we were able to take
16 small tissue samples, and at the same time implant radio tags
17 in fish and track them seasonally and correlate the
18 concentrations that we saw in individual fish with where they
19 were residing seasonally was exciting and cutting edge in many
20 ways.

21 For the analysis of the telemetry project, we divided the
22 study area based on large tributary junctions, or just simply
23 by large tributaries like the Holitna, for example. Again, we
24 were most interested in the residency of Pike and Burbot within
25 the Kuskokwim between the George and the Holitna, since Red

1 Devil Mine was in that section. And certainly if we saw fish
2 that had high concentrations and they resided in that section
3 of the river, that would give some credence to the influence of
4 Red Devil Mine. That is actually not what we found. For Pike
5 in particular, we found the highest concentrations from fish
6 sampled in the George River, the Holitna, and the Takotna
7 Rivers. Despite sampling all of these areas with the same
8 methods, we found catch rates were much higher in the Holitna
9 where habitats were more ideal for Pike compared to the other
10 stretches of the Kuskokwim. And here you can see the number of
11 samples, number of Pike that we captured within each of these
12 particular sections. And you can see 109 fish were sampled in
13 the Holitna versus only five fish on the Kuskokwim from the
14 George River to Sleetmute, and then one from Sleetmute to the
15 confluence of the Holitna. So fairly limited habitat, limited
16 numbers of Pike. But the real interesting part was these
17 elevated concentrations that we saw within these key
18 watersheds, and that's why these bars are highlighted in yellow
19 here. It was significant. And what we found was that 90
20 percent of the Pike stayed within these watersheds where they
21 were initially captured. And what that meant was that the
22 tissue concentrations of mercury that we found correlated
23 particularly with these watersheds and not with Red Devil Mine
24 or other sections of the Kuskokwim. And Pike are known to be
25 fairly migratory in some regions of their range and in other

1 places not so migratory. And what we found was that Pike, in
2 the Middle Kuskokwim in particular, don't stray very far.
3 Where you find them in the summer is generally where you're
4 also finding them in the winter. So in general, we found very
5 few Pike within the mainstem Kuskokwim. And really that wasn't
6 a surprise. The habitats there are pretty limited for a
7 species of fish that's a visual predator for slow-moving,
8 clear-water habitats like slews or slack water areas. And
9 those are certainly much more common in the George River, the
10 Takotna, and particularly the Holitna River, compared to the
11 mainstem Kuskokwim.

12 This graphic shows the relationship of the Holitna River,
13 the George River, and the Takotna. The Takotna River drains in
14 at McGrath, significantly at quite a distance from Red Devil
15 Mine. The Holitna comes in above Sleetmute. And the George
16 comes well downriver of Red Devil Creek. And so these three
17 watersheds were the watershed where we had the highest average
18 mercury concentrations in the study and were the locations
19 where those Pike did not stray from those particular drainages.

20 Data from this project were very similar to results from a
21 Fish and Wildlife Service study on the Lower Kuskokwim and
22 Lower Yukon, which is shown on the right side of this graph.
23 The Fish and Wildlife Service found higher concentrations in
24 large Pike within the Lower Kuskokwim and the Lower Yukon
25 compared to smaller Pike, which makes complete sense since

1 older, larger Pike wouldn't actually have elevated levels
2 compared to younger, smaller Pike given the accumulation of
3 mercury over time in those large predatory fish.

4 The overall values for the Lower Kuskokwim matches with
5 our data for the Middle Kuskokwim, but certainly was lower than
6 what we found for the George, Holitna, and Takotna.

7 To wrap up, through this multi-year study, what we found
8 was that there's elevated levels of mercury in fish and aquatic
9 insects on streams that had a history of mercury mining, such
10 as Red Devil Creek. That really wasn't a surprise. But we
11 didn't see similar concentrations in the fish community near
12 the mine site on the Kuskokwim. And again, this is likely due
13 to the habitats of the Kuskokwim compared to rivers like the
14 Holitna for species like Pike, but it also could be related to
15 the very small size of Red Devil Creek compared to the
16 Kuskokwim. Quite a bit of dilution that could occur there.

17 Based on the tissue samples and telemetry data, it
18 appears that underlying geology of these large tributaries
19 within the Middle Kuskokwim, coupled with year-round habitat
20 for species like Pike, have more of an influence on fish tissue
21 concentrations of mercury.

22 The report summarizing the results that I've touched on
23 today, plus significantly more details, can be found using the
24 weblink here at the bottom of this slide. The link below the
25 report link will take you to the Alaska Department of Health

1 and Human Services page specific to fish consumption in Alaska,
2 including for regions including the Kuskokwim. And I think
3 that's very important. Commonly, we get questions about human
4 health and fish consumption, so I want to make sure folks have
5 access to the resources there.

6 Lastly, my contact information is shown here, as well as
7 the contact information for Dr. Angela Matz, who works for Fish
8 and Wildlife Service and is an environmental toxicologist. She
9 assisted in the development of this study design as well as the
10 analysis, and she's a great resource for questions related to
11 mercury in the aquatic environment as well. And that's it,
12 Joy.

13
14
15

16 JOY HUNTINGTON: Thank you very much, Matt. And just
17 checking back in with our participants, I do not see any hands
18 raised at this time. And there are no open questions in the Q
19 & A box. So, Matt, you must have done a really great job of
20 explaining everything, and same with Mike. So didn't spur any
21 questions. I feel that, you know, if people had questions,
22 they would be, you know, raising their hands. And I'm going to
23 basically just assume that there's no questions at this time.
24 And if we can move over to the actual public testimony. We
25 only have a few people participating at this time, so we can --

1 we just are shutting down the presentation there. And please
2 raise your hand if you would like to get your mic turned on and
3 provide testimony at this time.

4

5

6

7 **PUBLIC COMMENTS**

8 JOY HUNTINGTON: And I'm just seeing if we have any hands
9 raised, and we do not have any hands raised. I want to give
10 people a few minutes here. They might be just organizing their
11 thoughts before making a statement. A few quick reminders. We
12 will be asking everyone to say their first and last names, and
13 spell them for the record, and also to give the community that
14 you're calling from and/or the agency, if you prefer to use
15 your agency. And we will give it some time here. We don't
16 want to pressure anybody, but if you do have any statements you
17 would like to make officially on the record, please do so
18 either now verbally or, as Mike mentioned, you can also send
19 your testimony in. There was a link provided at the end of his
20 presentation. And I believe we are going to be posting the
21 presentations on the project website as well as sharing one of
22 the videos of the recording of our meeting, probably our next
23 meeting, and a transcript will be provided as well. So there
24 will be a few ways to access the presentation in the future.
25 And it sounds like the comments will be open until -- the

1 comment period will be open until the middle of December, so we
2 have some time. And I hope that the information has been
3 helpful today, and that you have felt that you had many
4 opportunities to ask questions and to provide testimony as
5 well. And I'm going to turn my microphone and my video off for
6 a minute, and then we will come back here in a little bit and
7 decide if we want to leave the line open or if we want to
8 conclude the meeting. Oh, I see Lesli jumping on, too.

9

10

11

12 LESLI ELLIS-WOUTERS: Yeah, I know. And we do have --
13 there is another opportunity if people do want to gather their
14 thoughts. Thursday at 6:00 p.m., we're going to be doing
15 another meeting with another opportunity, so that's a chance if
16 you don't want to speak today. Otherwise, we will have copies
17 of the presentation posted to our website. We were just making
18 them accessible today so that people with readers would be able
19 to follow along. And with that, unless there's any objections,
20 I think we can go ahead and close this meeting out today. And
21 I look forward to conducting the next one Thursday at 6:00
22 o'clock.

23

24

25

1 JOY HUNTINGTON: Lesli, before we go, I just wanted to
2 make a quick comment. If anyone that is participating today is
3 curious about how outreach was done for these meetings, and
4 also how we kind of tried to make them as interactive as
5 possible, I wanted to just hit on the fact that we did send out
6 hard copies of the presentation. You probably heard us
7 referring to that a little bit earlier. But just in case
8 people in the communities close to the project area were not
9 able to utilize the Zoom from their computers, we did send out
10 hard copies directly to the communities and so they could
11 follow along and call in and, you know, ask questions. And
12 that will be my goal as we do have hopefully people calling in
13 that we're, you know, giving them lots of opportunities to ask
14 questions while we have Mike and Matt on the line, and to
15 provide testimony as well. So that's just a side note. If
16 you're wondering how we did outreach and how we're connecting
17 with people that might not be able to get online, so those are
18 just a few side notes on that.

19

20

21

22 LESLI ELLIS-WOUTERS: And I just was informed that the
23 presentations are available on the project page.

24

25

1

2 JOY HUNTINGTON: Awesome.

3

4

5

6 LESLI ELLIS-WOUTERS: So with that, I'm guessing we can go
7 ahead and close this meeting up today.

8

9

10

11 JOY HUNTINGTON: Yeah. Thank you to everyone that joined
12 us and giving us a chance to run through the slides with you and
13 share the information. And again, I hope that it was
14 informative and helpful, and look forward to you participating
15 maybe in future meetings and/or reaching out to Matt or Mike if
16 you have anything specific for them in the future.

17

18

19

20 LESLI ELLIS-WOUTERS: And I hope everybody stays healthy.
21 And we will continue to be in touch. Thank you. Thank you all
22 for joining.

23

24

25

1 JOY HUNTINGTON: Thank you. Bye.

2

3

4

5 THE REPORTER: Off record, 2:20 p.m.

6 (The meeting adjourned at 2:20 p.m.)

7

TRANSCRIBER'S CERTIFICATE1
2
3
4
5
6
7
8
9
10
11

I, Gloria Schein, certify that the foregoing pages numbered 2 through 53 are a true, accurate and completed transcript of the proceedings in the Bureau of Land Management Red Devil Mine Cleanup Public Meeting, transcribed by me from a copy of the electronic sound recording to the best of my knowledge and ability.

Date

Gloria Schein, Transcriptionist