NATIONAL SCIENCE FOUNDATION (NSF)
PUBLIC MEETING ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR GREEN BANK OBSERVATORY

HELD AT:

GREEN BANK SCIENCE CENTER

155 Observatory Road

Green Bank, West Virginia 24915

NOVEMBER 30, 2017

5:30 P.M.

Reported by: Kristina Guthrie

1 P R O C E E D I N G S

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3 MR. AJHAR: Hello and welcome to the public
4 meeting on the Draft Environmental Impact Statement for
5 Green Bank Observatory. I'm going to just go over what
6 we're going to do today in our public meeting. We're
7 just going to start by introducing the team and describe
8 the materials that we have with us today.
9 And then I'm going to take a side track with a
10 little bit of science background on Green Bank, because
11 I hope to indulge that. We won't spend too much time on
12 that because we have to really get to the purpose of our
13 meeting and talk about the, give a summary of the Draft
14 Environmental Impact Statement. And our focus today is
15 all going to be in getting your public comments on that
16 draft.
17 So first, I'm Edward Ajhar. I am the program
18 officer for Green Bank Observatory in the National
19 Science Foundation in the Division of Astronomical
20 Sciences. And joining me from our Division of
21 Astronomical Sciences is Liz Pentecost. Liz is over
22 here. And we have Matt Viau right there. And we also
23 have with us from our Office of General Counsel,
24 Caroline Blanco and Kristen Hamilton.

1 And from our office of Legislative and Public
2 Affairs we have Karen Pearce and Sarah Bates. And we
3 also have with us today CH2M Hill who is providing
4 contractor support to NSF in the preparation of our
5 environmental impact statement and we have Michelle Rau
6 and Valerie Ross with us. They're out front so if you
7 want to know who they are, that's who we have with us.
8 And I also want to acknowledge our court
9 reporter who will be taking notes and transcribing
10 everything that we say today for our record.
11 We have fact sheets available and we have
12 information boards out there so you know what this
13 meeting is about and the context of why we are here
14 today. And this presentation, an electronic version of
15 the fact sheet and information boards will be posted on
16 our Website following the public meetings at
17 www.nsf.gov/ast and click on environmental studies. So
18 everything is there.
19 So now my brief indulgence into the exciting
20 science that goes on at Green Bank Observatory. So I'm
21 only, I can only pick a few things because of the
22 limited time that we have. And I just want to mention
23 pulsars a little bit. This is a really fascinating
24 topic of -- these are special stars and, typically,

1 they're rapidly rotating neutron stars. And you wonder
2 what the heck is a neutron star. Well they are, as
3 they're described, they are made up purely of neutrons
4 and those neutrons are the same things we find in the
5 nucleus of atoms.
6 And if you imagine taking our sun and
7 collapsing it down to the size of a city, that would be
8 about the size of a neutron star. It is incredibly
9 dense. And in that process, that star ends up spinning
10 up really fast and rotating really fast and creating a
11 really powerful magnetic field. And some of those
12 rapidly rotating neutron stars will point radio energy
13 toward the earth and it will give this pulse.
14 And that's what we can measure with telescopes
15 like Green Bank Telescope. And it's something that can
16 be used in many ways. In fact, they are incredibly
17 accurate clocks. But one the things that's really
18 interesting that's happening lately is you may have
19 heard about NSF's LIGO which is a gravational wave
20 observatory and this was a big part of the recent Noble
21 Prize in Physics and there's been some very interesting
22 discoveries that happened recently where they detected,
23 you know, neutron stars coalescing in that moment when
24 it happened. It make a ripple of gravitational waves

which were detected by this LIGO observatory.

And they also detected, last year, block holes coalescing. Well, the thing that we can do with pulsars is use a distribution of pulsars spread throughout our galaxy and by measuring very carefully the timing and doing this over a number of years, it's possible to detect the coalescence of super massive black holes. And that happens when galaxies in our universe form. When they form they, we have galaxies that merge and believe that every galaxy has a massive black hole in its center.

So in this process of this merging, there will be a point where super massive black holes are orbiting each other and then they merge. And when that happens, they can create a ripple of gravitational waves that goes across the galaxy. And with pulsars and careful measurements made at Green Bank and other telescopes, those things are possible to be measured and that will allow us to look at another part of what Einstein predicted many years ago.

So that's something that's very exciting and it's work that's going on at Green Bank and the Green Bank Telescope is an important facility for the NANOGrav consortium as you might be aware of and that's the North

1 American Nanohertz Observatory for Gravational Waves.
2 So I want to mention that. We could spend a long, a
3 whole day talking about it and we have experts in the
4 audience for sure and I'm very happy that they're here
5 and I'm glad that I could mention this.
6 I'm going to mention a couple of more things
7 but, again, I'm not going to spend too much time. I
8 want to talk about Astrochemistry but for a few seconds.
9 You know, maybe you've heard about Astronomy and
10 Astrophysics, very closely related things. Well,
11 Astrochemistry is kind of a newer field and it's kind of
12 an exciting thing because to understand how life started
13 in our universe, we have to really understand how
14 chemistry works.
15 So we are -- there's really important work
16 being done at Green Bank Observatory, and in this
17 emerging field it turns out that Green Bank has been one
18 of the leaders in new detections of organic molecules in
19 our universe. And all of those detections and studying
20 and understanding how Chemistry works in the universe,
21 we can do some of that in the laboratory and we have to
22 help compliment that. But, you know, it's really, a
23 really fascinating thing to learn about Chemistry in the
24 universe and it helps us to understand how stars and

1 planets are formed.

2 And on the little diagram here, it's actually

3 not up-to-date. It's an older one, but all of the

4 molecules that we have modeled here are ones that were

5 first detected in space by Green Bank Telescope. And

6 the list is bigger now and we'll have to get an update

7 one of these days on that.

8 So I'm going to mention one last thing.

9 Again, this is a very brief list of the science that

10 goes on at Green Bank, and that's the search for

11 extraterrestrial intelligence. And you've probably have

12 heard about Breakthrough Listen which is an important

13 funding partner for Green Bank Telescope and they're

14 spending about 20 percent of the Green Bank Telescope

15 time looking for signals from possible extraterrestrial

16 life.

17 And they're surveying a million stars, a

18 million of the closest stars to the earth, and the Green

19 Bank Telescope is actually sensitive enough to detect

20 aircraft radar from the thousand of the nearest stars to

21 our planet.

22 So that ends our indulgence in the science

23 and, again, I wish we could spend a whole day talking

24 about science. That's a lot of fun. But the purpose of

1 our meeting now is what I want to focus on.
2 So our purpose, again, is not to talk about
3 science but it is that in compliance with the National
4 Environmental Policy Act, also called NEPA, a Draft
5 Environmental Impact Statement, DEIS, you're going to
6 hear that a lot today, has been prepared to evaluate the
7 potential environmental effects of proposed operational
8 changes due to funding constraints for the Green Bank
9 Observatory.
10 The DEIS was noticed in the Federal Register
11 and emailed to our full stakeholder list and posted to
12 our Website on November 8th. And the purpose of this
13 meeting is to allow for public comments and, on the
14 DEIS, which will help inform the final draft of the
15 Environmental Impact Statement.
16 So this is a really great moment because this
17 is a case where what we really, the public really plays
18 a very important and vital role in the development of
19 this Environmental Impact Statement and we'll go over
20 this a little more later. But I'm very happy that
21 we're, have you here and we have a large participation.
22 This is a very important part of our process.
23 And we're also going to -- this also allows
24 today public input on historic properties under Section

1 106 of the National Historic Preservation Act.
2 The purpose of the proposed action is to
3 substantially reduce NSF's contribution to the funding
4 of the Green Bank Observatory. And there's a need for
5 that and this is kind of complicated and it's all laid
6 out in the Draft EIS.
7 And NSF is responsible for maintaining a
8 balanced research portfolio, and the scientific
9 community through reviews and surveys, has indicated
10 that the scientific capabilities of Green Bank are lower
11 in priority than other scientific capabilities that NSF
12 funds.
13 And we've -- and so to summarize some of that
14 input that got us to that point, is the Astronomy
15 portfolio, that Astronomical Sciences portfolio at NSF,
16 put together a portfolio review committee and it was
17 formed as a subcommittee of the Math and Physical
18 Sciences Advisory Committee at NSF. And it is subject
19 to all of the Federal Advisories Committee Act and it
20 was charged to provide their report on the astronomy
21 portfolio to the Math and Physical Sciences Advisory
22 Committee.
23 And this report came out in 2012, and it was
24 titled Advancing Astronomy in the Coming Decade:

1 Opportunities and Challenges. And regarding Green Bank
2 telescope, the 2012 review recommended divestment of the
3 Green Bank Telescope, among others, and it stated the
4 following, "The GBT is the world's most sensitive
5 single-dish radio telescope at wavelengths shorter than
6 10 cm; however, its capabilities are not as critical to
7 the Astronomy and Astrophysics the decadal survey New
8 World New Horizons science goals as the higher-ranked
9 facilities."
10 We have further advice in 2016, from the
11 Astronomy and Astrophysics Advisory Committee, and that
12 is a panel that reviews NSF, NASA, and the Department of
13 Energy Astronomy and Astrophysics programs and reports
14 directly to Congress and they stated the following:
15 "Strong efforts by NSF for facility divestment
16 should continue as fast as practical. Efforts to
17 explore partnerships, interagency cooperation, and
18 private resources to maintain some access to facilities
19 for the U.S. community that may mitigate the loss of
20 open access should continue.
21 "Transferring the cost of operating a facility
22 outside of the NSF/Astronomy budget is preferable to
23 complete loss of the capability from the suite of
24 capabilities used by U.S. researchers."

1 And in August of last year, the final report
2 that I'm going to mention, was the National Academies of
3 Sciences Report, they published a Midterm Assessment of
4 the 2010 decadal survey and reaffirmed the 2012
5 Portfolio Review's recommendations for divestment for
6 these yet AST facilities.
7 And their quote is, "The NSF should proceed
8 with divestment from ground-based facilities that have a
9 lower scientific impact implementing the recommendations
10 of the NSF Portfolio Review, which is essential to
11 sustaining the scientific vitality of the U.S. ground-
12 based Astronomy program as new facilities come into
13 operation."
14 So that's how we've gotten here and so that's
15 why this draft Environment Impact Statement has been
16 made. And I would like to now go on to the alternatives
17 that, for possible operations, future operations of
18 Green Bank Observatory as published in our Draft
19 Environmental Impact Statement.
20 So the National Environmental Policy Act
21 requires Federal agencies to consider a range of
22 alternatives that meet the purpose and need for the
23 proposed action, which I've just described to you, and
24 as we presented during the scoping period last year,

1 several alternatives were identified that could meet the
2 purpose of substantially reducing NSF funding.
3 And these were evaluated in the DEIS and
4 include the following, which I have up here. And so the
5 Action Alternative A is our agency, the NSF's preferred
6 alternative. So this is the one that we are identifying
7 as our preferred alternative.
8 And it is described as collaboration with
9 interested parties for continued science and education
10 focused operations with reduced NSF funding. So that's
11 one alternative we looked at and the other are: B,
12 collaboration with interested parties for operation as a
13 technology and education park; C, mothballing of
14 facilities; and D, demolition and site restoration. And
15 finally, we always look at the no-action alternative
16 which is continued NSF investment for science-focused
17 operations.
18 And I just make one other note to this, is
19 that we've identified A as our preferred alternative and
20 that can only be implemented if collaborating parties
21 come forward with viable plans to provide additional
22 non-NSF funding and support of their science and
23 education focused operations.
24 So we note that for each of the proposed

1 action alternatives, A, B, C, and D, as given there, but
2 especially for A and B, we have identified in the draft
3 which buildings and infrastructure could be retained,
4 demolished, mothballed, or safe abandoned, and you can
5 see the appropriate table and in the draft. It's Table
6 2.6-1.
7 But importantly, these alternatives do not
8 mandate the demolition of any buildings. So it's
9 important to understand that, though this level of
10 detail in the DEIS is helpful in ensuring that the
11 environmental impact analysis adequately addresses each
12 proposed action alternative.
13 So we put in the draft the most drastic thing
14 that might happen but we won't really know what that's
15 going to look like until we, you know, finish this
16 process and we know where we're going.
17 And it could be that nothing changes here. So
18 we just want to make sure because sometimes that's very
19 confusing in the draft. So there's nothing mandated in
20 the draft that would have to happen but we analyze sort
21 of a worst case scenario.
22 So at this point, I'm ready to turn this over
23 to my colleague, Kristen Hamilton, who will continue
24 talking about the process and Kristen, Thanks.

1 MS. HAMILTON: Thank you and good evening.
2 So as Dr. Ajhar said, this meeting today is a
3 continuation of the National Environmental Policy Act, a
4 process that began last Fall. So I'm here to give an
5 overview of where we're at with that process. I'll try
6 to be brief so we can get to the most important part of
7 this meeting which is hearing your comments today.
8 So as Dr. Ajhar said, NEPA requires Federal
9 agencies to consider the potential environmental
10 consequences of their proposed actions before making a
11 decision and to collect public input on that review.
12 Because of the potential for significant
13 environmental impacts for this proposed action, we are
14 complying with NEPA by preparing an Environmental Impact
15 Statement.
16 We issued a notice of intent to prepare an
17 Environmental Impact Statement, or EIS as we call it,
18 last October, a little over a year ago, and we held
19 public scoping meetings in this room on November 9th.
20 We had a phenomenal showing of civic
21 engagement. Last year we had over 300 registered
22 participants at those two meetings, over 50 verbal
23 comments were provided. We had a written comment
24 period. We collected over 800 written letters and

1 emails during that scoping comment period.
2 So comments and how they went into the
3 preparation of our Draft Environmental Impact Statement
4 are discussed in Section 5 of the EIS. I hope that you
5 see that many of the findings in our DEIS do reflect
6 what we heard during public scoping.
7 This is the Draft Environmental Impact
8 Statement. You've all read it from cover to cover, I'm
9 sure. It contains an Executive Summary that is
10 particularly helpful. It's about 18 pages of the 263,
11 but it provides a concise summary of the DEIS including
12 all the findings.
13 The Purpose and Need section provides the
14 rationale for NSF's proposed action. The next section
15 provides a full description of each of those four action
16 alternatives and the no-action alternative.
17 What we call the Affected Environmental,
18 Section 3, is essentially the baseline. It says what
19 the existing conditions are here at Green Bank
20 Observatory.
21 The Environmental Consequences section is
22 really the meat of the environmental analysis, so that's
23 where you'll see an evaluation of the potential
24 environmental impacts of the proposed action under the

1 four action alternatives and the no-action alternative.
2 Because the action alternatives would have an
3 implementation phase and then a longer-term operations
4 phase, we identified the impacts for both of those
5 phases for each of the alternatives and we identified
6 whether the impacts are direct, indirect, or cumulative.
7 In addition, you'll see that mitigation
8 measures to address those impacts are identified where
9 appropriate. That's all in that Section 4,
10 Environmental Consequences section.
11 And the final sections of the DEIS provide
12 information on the process thus far and a summary of the
13 consultation that has occurred to inform that Draft
14 Environmental Impact Statement.
15 These are the resource areas that are
16 evaluated in the draft EIS. You'll see that they
17 encompass many aspects of what we call the human
18 environment from biological resources to traffic and
19 transportation.
20 Most of these are very typical of what you
21 would see in an impact statement. But I did want to
22 note that based on what we heard from the community last
23 year during scoping, we did work with our consultant and
24 the economist on socio-economic section at add a

1 sub-topic called community cohesion which gets a
2 community features in there and how they are
3 interconnected. So that's a little bit unique to this
4 review.
5 You'll also see that we addressed cultural
6 resources in the NEPA document and that is typical. I'm
7 highlighting it now to note that we're also evaluating
8 cultural resources particularly historic properties
9 during an ongoing consultation under the National
10 Historic Preservation Act.
11 So that's a separate statue from NEPA that's
12 going on sort of in parallel. And since you might hear
13 about it from time to time, I just wanted to briefly go
14 over the National Historic Preservation Act as well.
15 Section 106 of this act requires Federal
16 agencies to consult with interested parties and the
17 State historic preservation officer, which we call the
18 SHPO, regarding potential effects of proposed actions on
19 nationally significant and historic properties.
20 So here's the four basic steps of an NHPA
21 process and we're currently at step 3 which jives well
22 with where we're at currently with the NEPA process in
23 terms of analyzing impacts.
24 So last year we initiated Section 106

1 consultation with the West Virginia State Historic
2 Preservation Officer and we identified a number of both
3 individuals and organizations that have historic
4 preservation interests and are interested in consulting
5 through this process. We've also contacted tribes that
6 might have interests in this area.
7 For step 2, we conducted evaluations of the
8 buildings and structures here at Green Bank Observatory
9 to identify which might be historic properties. Those
10 are properties that are listed on our eligible for
11 listing on the National Register of Historic Places.
12 And there are historic properties here and I
13 recommend you check out, Section 3 provides a
14 description of what they are in the DEIS. There's also
15 a cultural resources evaluation, a separate report, by a
16 qualified consultant. That's the second appendix in the
17 DEIS and that's a great read on the history of radio
18 astronomy and the Green Bank Observatory.
19 So we have concurrence from the West Virginia
20 SHPO on our findings of which are historic. So that led
21 us to step 3, assessing what the impacts of the various
22 alternatives would be, could be on historic properties.
23 So we're shared an assessment of the facts
24 with the SHPO. Section 4 of the DEIS summarizes the

1 same findings so they are consistent with each other.
2 The next step is to hear back feedback from
3 the SHPO and consulting parties on the assessment. We
4 also are listening today, and during this written and
5 comment period coming up, to hear if you have any
6 thoughts on historic properties. If you do, we will
7 address them both in the final EIS but will also
8 incorporate those comments into our section 106
9 discussion in terms of impacts to historic properties.
10 Because the final step will then be the
11 resolution of adverse affects, that's when NSF will work
12 with consulting parties and the SHPO to identify
13 measures to avoid, minimize, and mitigate adverse
14 effects to historic properties.
15 So any one of six materials and documents are
16 currently up on our Website and we'll continue to post
17 them. The DEIS and all the appendices are also
18 available on our Website. This is the easiest link to
19 jot down. You do then have to click on AST facilities
20 and then you'll see a list of observatories and you
21 click on Green Bank. That will take you to all the
22 public documents.
23 We also have hard copies available for review
24 at two local libraries, Green Bank Public Library, and

1 the Durbin Community Library.
2 There's a number of ways to submit comments on
3 the Draft Environmental Impact Statement. You can
4 provide verbal comments today. You can submit written
5 comments today. We have comment sheets that you can
6 give to one of us or you can mail later, and you can
7 snail mail or email comments to us by January 8th, by
8 the end of the day January 8th. And this address and
9 Website are on the fact sheet that you picked up at the
10 front desk.
11 I'd like to go over the time line for the
12 environmental review process. As I mentioned, we
13 conducted scoping in October and November of 2016.
14 We're currently at the Draft EIS review phase. We'll
15 have a 60-day public comment period. Once we have your
16 comments, we'll take them in, we will review them, and
17 process them, and we will use them to help inform any
18 updates that are needed in order to prepare a Final
19 Environmental Impact Statement, which we expect to
20 publish in the Fall of 2018.
21 Following the Final EIS, NSF will issue a
22 record of decision. That's the agency decision on which
23 alternative to move forward with, and we expect to
24 release that by early 2019.

1 As I mentioned, we'll also be consulting under
2 the National Historic Preservation Act along the same
3 time line. We would have to have resolution of adverse
4 affect, usually done via an agreement document, executed
5 before we could have a record of decision under NEPA.
6 I also wanted to briefly mention that we have
7 completed our required consultation under the Endangered
8 Species act as of March of this past year. And if
9 you're curious about that, there's a summary of that
10 consultation in the Biological Resources section of the
11 DEIS.
12 So you'll see we have, our FEIS has an
13 asterisk. This says, "The viability of the preferred
14 alternative is dependant on the availability of
15 qualified collaborations determined through a parallel
16 NSF process."
17 Dr. Ajhar mentioned this briefly. What does
18 this mean? NSF is actively exploring potential
19 collaborators and they have been, we have been for some
20 time. This is a separate process, separate from NEPA
21 and the Environment Review Process, but it will inform
22 whether the preferred alternative continues to be
23 considered viable as we move forward.
24 The record of decision will state the agency's

1 chosen path, which of these concepts level alternative
2 to move forward with. It will identify all the
3 alternatives that were considered and discuss how the
4 selection was made based on relative factors. So at
5 this point, yes, we consider the environmental impacts
6 that we developed through the DEIS and the FEIS, but we
7 also consider other factors that are relevant including
8 science priorities and the NSF mission, feasibility and
9 budgetary considerations.
10 In summary, we have this 60-day public comment
11 period that goes through January 8th. We encourage you
12 to take a look at the DEIS if you haven't yet and send
13 us any comments. The regs required a 45-day comment
14 period, and we realize that would have comments due
15 December 24th, and we thought that was not the nicest
16 thing to do, so we'll get through the holidays. The
17 deadline we be January 8th. Again, we will address the
18 comments in the Final EIS and NSF will issue a record of
19 decisions selecting which alternative to implement.
20 So we're now going to open up the floor to
21 your comments, move from the presentation portion to the
22 public comments portion. I wanted to just go through a
23 few ground rules because we have quite a few people who
24 would like to speak today, last count about 50 people.

1 So we're going to have about one speaker at a time and
2 because of the number of people, to make sure that
3 everybody has a chance to speak, we're going to have to
4 limit as least the first round of comments, limit them
5 to three minutes. If at the end there's time and you
6 wanted to come back and finish a statement, we could do
7 it at that time.
8 What we're going to do is have people come to
9 this microphone. Please state and spell your name for
10 the court reporter because these comments do go on the
11 record. Try to speak slowly and clearly, and direct
12 your comments or questions to the contents of the DEIS.
13 NSF will not address comments at this time. We're here
14 to hear from you, but they will be addressed and
15 discussed in the Final Environmental Impact Statement.
16 And we're going to take a planned break
17 sometime around 7:00-ish when there's a good time to
18 take a break, for about ten minutes. Okay. So with
19 that, I'm going to start the public comment period. And
20 we do have this row here. What I'm going to do is I'm
21 going to call there or four people at a time just so you
22 know to get ready. If you are sort of buried in one of
23 the rows, feel free to come and use one of the seats up
24 here if you want, sort of make your way; otherwise, just

1 come up in the order that I'm calling you.
2 So the first three we have today is will be
3 Peggy Hause, Mary Eckerson, and Jordan Maynor.
4 Oh, I'm sorry, I should say how I'm going to
5 let you know about the timing. So I will be sitting
6 right here and just so that you have a little hint that
7 you hit the two minute and you have one minute left,
8 I'll just sort of raise my hand.
9 PEGGY HAWSE: Good evening. I'm Peggy Hawse
10 and that's P-e-g-g-y, H-a-w-s (as in Sam)-e, and I'm a
11 regional coordinator for US Senator Joe Manchin. The
12 Senator had a meeting scheduled today with Dr. Cordova,
13 the Executive Director of the National Science
14 Foundation. It was canceled due to the vote on the tax
15 bill. All of the amendments were being voted on today.
16 That has been rescheduled for Tuesday and the
17 Senator would like to take comments with him and hand
18 deliver them to the director. So I'm going to give you
19 my email address right now for you to write down and
20 email me. I will send them to Washington. They're
21 going to print them out and he's going to take them on
22 Tuesday. And I want to give this first in case I run
23 out of time. It's Peggy, P-e-g-g-y and then there's an
24 underscore, just one little underscore, not a dot, but

one underscore, and then Hawse, H-a-w-s, as in Sam, e@manchin.senate.gov. (peggy_hawse@manchin.senate.gov).

I do have comments from Senator Manchin that I want to share with you.

"It is a pleasure to welcome each of you to one our beautiful State's most impressive and nationally significant landmarks, the Green Bank Telescope Observatory. For sixty years, the Foundation, Pocahontas County, and the State of West Virginia have supported the ability of enumerable national and international scientists to make discoveries about our universe using the capabilities located at the observatory within the National Radio Quiet Zone.

"During this time, the local communities have made sacrifices to keep the surrounding area radio silent to ensure that the activities at the observatory can continue without interference. As we look to the future, I believe that the observatory's contributions to national and international science and the West Virginia commitment to this work justifies the Foundation's strong, continued full-time support and presence at the observatory.

"I strongly oppose the proposed arbitrary 21-week implementation period for demolition,

1 mothballing, and/or self abandonment, and I believe that
2 the Foundation has a responsibility to identify and
3 secure additional partners before affecting any change
4 to the infrastructure or funding support at the
5 observatory.
6 "We owe it to our children, our future
7 leaders, to uphold the integrity that this facility has
8 provided in regard to STEM programs and community
9 efforts. By continuing to integrate these skills
10 throughout our communities and in our schools, we are
11 showing our future leaders that we are investing in them
12 and that their statewide community wants them to be
13 succeed in return.
14 "Green Bank is a vital link to the future of
15 our home state and entire nation and we simply can not
16 turn our backs on this word class facility."
17 Am I out of time? Okay.
18 I just want to say that the Green Bank
19 Telescope, or as I affectionately call it The Great Big
20 Thing, is a friend and I don't want to lose my friend.
21 Thank you.
22 MARY ELIZABETH ECKERSON: I'm Mary Elizabeth
23 Eckerson. I'm with U.S. Senator Shelly Moore Capito.
24 My name is M-a-r-y, E-l-i-z-a-b-e-t-h, Eckerson,

1 E-c-k-e-r-s-o-n, and I'm happy to represent Senator
2 Capito today regarding our crown jewel which is the
3 Green Bank Telescope and this entire facility.
4 "Thank you for including me today for your
5 discussion regarding the National Science Foundations's
6 Draft Environmental Impact Study for Green Bank
7 Observatory. I regret that my obligations in the Senate
8 prevent me from joining you in person.
9 "If there is a word to describe the Draft EIS
10 I would use the word "exhaustive." I commend those who
11 took the time and effort to compile this report. Though
12 I'm not able to attend this meeting, if they are
13 anything like those in the past to discuss the future of
14 Green Bank, I know there are First Responders standing
15 next to researchers and school children sitting near
16 their teachers along with current small business owners
17 and maybe more than a few future scientists. This
18 represents the impact and the opportunity that Green
19 Bank embodies.
20 "When I submitted a letter in November of
21 2016, I asked NSF to not overlook the less easily
22 measured impacts which, among soil and climate impact,
23 hit home to me as I read through your report.
24 "We have talked about how Green Bank is the

1 potential portal for history-making research, but let's
2 not overlook that the Green Bank Observatory is a
3 certified Red Cross shelter for this area, that the
4 water tower is used by several fire stations, and that
5 the GBO staff, in addition to their daily work, serve as
6 the backbone to this area through their work in
7 community organizations and emergency service crews.
8 "In addition to monitoring potential life in
9 the solar system, these men and women are playing a huge
10 role in improving life for those in Pocahontas County.
11 I have long advocated the partnership model for Green
12 Bank. In this time of limited financial resources from
13 the Federal government, maximizing partnerships, whether
14 with universities, other government agencies, or private
15 industry, is something we should always be pursuing.
16 "I have been and will continue to be an
17 advocate for the potential that exists at Green Bank.
18 That potential rests in its facilities, its community
19 and in the men and women who work here. Let's work
20 together to fulfill that potential for it holds exciting
21 promise for all of us. It is truly an honor to serve
22 you in the United States Senate. Sincerely, Shelly
23 Moore Capito." Thank you.
24 JORDAN MAYNOR: My name is Jordan Manor and

1 I'm here on behalf of Congressman Evan Jenkins.
2 J-o-r-d-a-n, M-a-y-n-o-r. I also brought a letter to
3 read tonight and I'll be as quick as possible.
4 "Dear friends, I regret that I cannot be here
5 today because of scheduled votes in Washington, DC;
6 however, I do want to express my strongest possible
7 support for the Green Bank Observatory.
8 Green Bank is truly a gem in the mountains of
9 our state and it must be fully funded and preserved. We
10 know the incredible work that takes place here, the
11 undeniable influence this facility has on scientific
12 research and the irreplaceable impact it has on our
13 community and on our State. This facility must remain
14 open and fully operational.
15 "Just yesterday I met with top NSF officials
16 to discuss the future of Green Bank, the Draft EIS, and
17 the work being done to identify new strategic partners
18 to work with NSF here at Green Bank.
19 "I have also had multiple conversations with
20 NSF Director Cordova and the Foundation over the past
21 few years in an effort to make the strongest case
22 possible for a strong, secure future for Green Bank.
23 "I am encouraged and very optimistic that the
24 commitment from NSF is sincere and the future funding

1 possibilities are real. As your Representative in
2 Congress, I am pledging my full, active support to
3 facilitate contacts and build relationships with other
4 Federal agencies to secure a new strategic partner.
5 "We must preserve this world-class telescope
6 and research facility. As potential partners come
7 forward, the focus will always remain in ensuring that
8 Green Bank is able to continue its ground-breaking
9 research and that West Virginia is still able to bring
10 in top scientists and researchers.
11 "We must also preserve the exceptional
12 educational resource the Green Bank Observatory gives
13 students, a truly unique opportunity for hands-on
14 experience.
15 "For many of the students who come to Green
16 Bank, this visit will shape their future career
17 aspirations in science, technology, engineering, and
18 mathematics. The lessons learned at Green Bank will
19 stay with these students for a life time.
20 "The Green Bank Observatory affords incredible
21 job opportunities for the people of West Virginia and
22 those who are here are a true asset to our state. The
23 employees here not only dedicate their time to
24 researching life's great mysteries but they also give so

1 much back to the community by helping students learn and
2 prepare for a successful future.
3 "We have a world-class observatory and world-
4 class employees. The call I make to the NSF and the
5 call I ask you to make here today is that we are here
6 ready to work with you to make sure that Green Bank
7 stays open and fully operational. And we also call on
8 NSF to make sure that the core mission of Green Bank is
9 not lost, the mission of discovering what makes our
10 universe work, discovering how stars and planets form,
11 and how they can support life, and discovering the
12 fundamentals of life.
13 The Green Bank Observatory is important to
14 West Virginia and is important to the world. Thank you
15 for being here and making your voices heard. This is
16 another opportunity for all of us to show the value of
17 Green Bank and what West Virginia has to offer. Keep
18 Green Bank here and keep Green Bank open.
19 Sincerely, Congressman Evan Jenkins."
20 Thank you.
21 KRISTEN HAMILTON: Next up we have Jack Tade,
22 John Taylor, and Jim King. Is Jack Tade here?
23 JACK TADE: Good evening, my name is Jack
24 Tate, that's J-a-c-k, T-a-d-e. I'm the corporate

1 controller for Associated Universities, Incorporated,
2 I'm here to represent the corporate office. AUI is the
3 organization that manages or is responsible for managing
4 the NSF Green Bank Observatory and it's operations. On
5 behalf of AUI I'd like to strongly express that we
6 support the outstanding scientific research performed
7 here at this facility and value the deep involvement
8 with Pocahontas County and their communities. We look
9 forward to working with the National Science Foundation
10 throughout the process and hope to continue our support
11 for and service to the local communities. Thank you.
12 JOHN TAYLOR: My name is John Taylor, J-o-h-n,
13 T-a-y-l-o-r. I am the vice president of the Central
14 Appalachian Astronomy Club, and our club, and I don't
15 know how I got to go right after those high powered
16 speakers, but our Astronomy club annually, for the last
17 14 years, in cooperation with the Kanawha Valley
18 Astronomy Club and with the collaboration, of course, of
19 the Green Bank Observatory has held an affair here,
20 called a star party called Star Quest.
21 Star Quest is billed as the only optical and
22 radio astronomy star party. We get to operate the
23 40-foot telescope as well as look, it's a great dark sky
24 site for a star party. Most star parties are held in

1 tents, we've got this nice facility at our keynote
2 speakers.
3 We have four keynote speakers. It's basically
4 a four-day event. In the past, we've had Alan Bean who
5 is the fourth man to walk on the moon. We've had
6 Carolyn Shoemaker. We've had Seth Shostak. So we've
7 had some really high powered folks to come in to our
8 Green Bank star quest.
9 This is a unique facility to hold a star party
10 in. Like I said, most of them are held in tents. We've
11 got a great facility to do this in. And as an
12 educational facility and -- this is just one of many
13 things that Green Bank Observatory does.
14 I'm a retired school teacher. Some 25 years
15 ago, I participated in a two-week National Science
16 Foundation teachers affair that we had a workshop
17 basically. Then we had a number of speakers in and
18 learned a lot of Astronomy.
19 And basically, I went back to my high school
20 and started an Astronomy class based on that. And I
21 had, for several years, a number of students pass
22 through my classroom taking Astronomy and it was all
23 inspired by Green Bank Observatory.
24 So Green Bank Observatory as an educational

1 facility is unmatched, and it would not exist as an
2 educational facility without the observatory being here
3 and the work that the observatory does. So, you know,
4 we are very grateful.
5 I can't speak to the science as well as a lot
6 of the people, but, you know, this is a facility, it's
7 probably the only observatory, radio observatory that's
8 in a radio quiet zone. There's got to be something to
9 be said to keep that operating.
10 So by all means, I think the Green Bank
11 Observatory should be as fully funded by the National
12 Science Foundation as it can be and collaborators should
13 be found to keep it working. Thank you, very much.
14 JIM KING: My name is Jim King. I'm the
15 co-founder of the Central Appalachian Astronomy Club.
16 And I've been with John here for several years in
17 regards with the Star Quest. He's pretty well told you
18 about that event.
19 Some of the other things that have happened as
20 regards to the star quest is that we have children's
21 events and the children come here with their families
22 and attend star quest and, hopefully, they're inspired
23 to pursue science, and we need scientists.
24 In our own club, we have several of the club

1 members who have gone on after being in the club to be
2 Physicists and Geologists, et cetera. And that -- so
3 it's all from a spark of a place like this, you know.
4 We come here and we learn things and we try, you know,
5 as we come here trying to teach some things, you always
6 learn some things.
7 So it's really a win-win situation for us that
8 Green Bank is here. And it would be a devastating blow
9 to our club if we could not have this facility to
10 present our star party. There is no other facility in
11 the state that we could go to that we would have this
12 kind of infrastructure.
13 The other thing is like Green Bank, if you
14 close your eyes and you can't see anything; right?
15 Well, Green Bank is an eye with a telescope to the sky.
16 It sees things that optical telescopes cannot see.
17 There's, you know, like pictures out in the 00 and
18 they're showing like galaxies. Well, this little
19 picture in the middle, that's what we could see with an
20 optical telescope. With a radio telescope, we saw all
21 these clouds of hydrogen gas all around it. So it's
22 important that we have this kind of equipment
23 infrastructure to see the universe.
24 We are like a small speck in the universe, the

1 whole planet. But if we, you know, can't see and don't
2 understand what's going in the universe then our ability
3 as a race, society, whatever, is limited. We need to
4 understand what's going on out in the universe and this
5 is a, one of the most finest places I've ever been that
6 you can learn and have a lot of real science going on.
7 One other thing here, when we were here, one
8 of the star parties that we had, they had the deep
9 impact where they shot the missile to the comet. And we
10 were the first people -- the head astronomer that was
11 doing this came in here, we were having a meeting that
12 night like this, he came in and told us they had
13 discovered water. They had it had always been
14 hypothesized, but it had never been proven. Am I done?
15 KRISTEN HAMILTON: Complete your thought.
16 MR. KING: Okay. Anyway, but I mean,
17 basically, that's what I wanted to say. I mean, this is
18 a really important place. The people here are top
19 notch. I would hate for them to have to go out and look
20 for other jobs, because, and I'd hate to lose a lot of
21 friends because there's a lot of friends I have here.
22 So thank you, very much.
23 KRISTEN HAMILTON: David Wilfong, I believe, I
24 apologize. I can't tell if that's a U or a W. It says

1 this gentleman is identified as a farmer. Then we have
2 Diane Schou and Sue Ann Heatherly. Is David here?
3 Okay, great.
4 DAVID UMLING: Good evening, I'm sorry, my
5 actual name is David Umling, D-a-v-i-d, U-m-l-i-n-g. I
6 was raised on a small family dairy farm and I, after a
7 30-year career have retired to try to survive on a
8 homestead farm here in West Virginia.
9 And I guess, I haven't read this report. I
10 apologize to anybody for that, but if I had, I'd
11 probably be up here talking about a bunch of acronyms
12 and technical terms that nobody's going to understand
13 and I'd rather just speak plainly to you.
14 But basically, what I'm concerned about is
15 having seen that there are only four options that this
16 National Science Foundation has come up with to evaluate
17 in it's report, I'm quite dismayed that we have here a
18 body that represents the scientists and the intellect
19 that we depend on to try to answer some of the most
20 difficult, perplexing, and complex questions about our
21 existence in the universe that we have to face today.
22 And the best that they can do is come up with
23 four alternatives, two of which is shutting this thing
24 down. This facility has a 50-year life span. Over that

1 time it's had some important discoveries. And now they
2 say there are other facilities that make it obsolete,
3 basically.
4 Well, I would have to ask, you know, if we're
5 not really seeing here the unintended final results from
6 long deferred maintenance and upgrade of our facility,
7 when things could have been made more relevant or kept
8 up to the highest technology that exists today, but I
9 understand this facility still makes important
10 discoveries.
11 So I question, you know, whether we're seeing
12 a self-fulfilling prophecy here and the expectation that
13 NSF is going to divest it's investment in our community.
14 I think the State has done a lot for the National
15 Science Foundation, and for this facility as well as it
16 did for Sugar Grove. I live in Pendleton County and the
17 Sugar Grove facility in our county is in the National
18 Quiet Zone. It was set up for it originally as well.
19 And if the National Science Foundation wants ,
20 is appreciative of the investment that was made on their
21 behalf to make this facility something important, then
22 they should have put money into it while they had it
23 instead of waiting until they get to the point where
24 they don't have money and then saying they need to close

1 it down.

2 Well, I don't think that's a good decision, I

3 don't think it represents perhaps a policy that was

4 sustainable or good to begin with. But I would like to

5 remind them of a scene from the movie, Carl Sagan movie,

6 Carl Sagan's movie Contact, where the star of that

7 particular story Ellen Arroway, has made this discovery

8 of other civilizations and picked up this signal from

9 some other society, extraterrestrial out there in the

10 vicinity of Vega.

11 And she had a person that she worked for by

12 the name of David Drumlin who was very much against

13 everything she did, and wanted to shut it down many

14 times and worked to defeat her efforts to try to fund

15 her program that resulted in this discovery.

16 And of course when the discovery is made,

17 these people from somewhere else has sent us plans for,

18 design plans for transport that will take one astronaut

19 to go and visit them and make the first contact. And

20 Ellen decides she wants to go on this trip. And, but so

21 does David Drumlin and when the two of them compete,

22 she's asked some very difficult questions by a committee

23 that makes it hard for her to tell, to be honest and to

24 be able to earn the committee's support for her

1 candidacy to be the astronaut.
2 But David Drumlin, he goes ahead and tells
3 them whatever they want to hear and he's the one who
4 wins. And later on when he meets up with her he says,
5 Ellen, I'm sorry. I wish this was the kind of world
6 where the integrity and honesty that you showed before
7 the committee in trying to answer those difficult
8 questions were rewarded instead of taken advantage of.
9 And her one line response was, Funny, I thought the
10 world was what we make of it.
11 And I want to ask the National Science
12 Foundation: What do you think you're going to be making
13 of our world when you make this decision?
14 I reject the idea that this facility need to
15 closed down and shuddered. I know what happened to our
16 community in Pendleton County when Sugar Grove was
17 eliminated, and I don't believe that anything good has
18 ever come to West Virginia when outside interests have
19 divested themselves of their obligations to our state.
20 And I would question seriously whether you're just going
21 to do the same thing to us. Thank you.
22 DIANE SCHOU: Hello. My name is Diane Schou,
23 and that's spelled S-c-h-o-u. I am here in Green Bank
24 because of a special environmental -- oh, Dear I lost

1 the word -- but because of the environment here. I was
2 injured by over exposure, from over exposure to
3 emissions from a cell phone tower. There are a number
4 of other people here who are also harmed by
5 electromagnetic radiation.
6 There was one day that several of us reacted.
7 We didn't know why, but there are 82 different symptoms
8 and out of eight people, six of us reacted at the same
9 time. This was about 3:00 o'clock in the morning. We
10 don't know what happened. It woke me up. It woke up
11 six other people.
12 I contacted the government to find out what
13 was it that occurred at 3:00 o'clock in the morning,
14 that we woke up, we got out of bed, we did stuff, we
15 lived miles apart, what happened?
16 And this is why I am here at Green Bank
17 because there are less electromagnetic radiation
18 emissions. It's safer here. And a number of people are
19 here because they have less symptoms by being here.
20 There are many, many emissions that are
21 invisible. Some of them may be legitimate, such as
22 emissions from cell phone towers, fortunately not here
23 in Green Bank. But there are also emissions, they may
24 be illegal. And one emission, I contacted a person when

1 several of us were detecting it, and I was told that it
2 was, they could not tell what that emission was. They
3 were prohibited from doing that. And if they did they
4 could be, I don't know what the consequences were.
5 I guess that's about the summary of this.
6 This is why I'm here in Green Bank, and why the
7 observatory is essential, and it's essential for people
8 around the world, not just for West Virginia but this is
9 the safest place and a safe place to live.
10 SUE ANN HEATHERLY: I'm Sue Ann Heatherly,
11 S-u-e, A-n-n, H-e-a-t-h-e-r-l-y. And I'm the education
12 officer here at the Green Bank Observatory.
13 I didn't read the Draft EIS from cover to
14 cover, but I did do some searching on it and would like
15 to bring up a few points that I think were either
16 understated or need further investigation before final
17 draft or before the Final EIS is produced.
18 And one them is, of course being the education
19 officer, is the impact of the observatory's educational
20 programs which really do depend on having a vibrant
21 scientific operation here. It's just not possible to
22 have the alternative happen where we give tours of, you
23 know, decaying facilities out there in the field and
24 trying to operate an educational program without a

1 scientific program happening here.
2 On page 3-59, the Green Bank Observatory's
3 education programs are listed there and then they're
4 referred to several times throughout the whole document,
5 but they are completely under reported.
6 And when comments were sent in last time
7 around, I sent them a seven page detailed description of
8 numbers, all the educational programs that we do that
9 you can find in the comments from last time. I think
10 they need to be addressed in the final report because
11 it's a lot bigger than was stated.
12 Regarding that the 20-meter telescope was not
13 mentioned very often at all and kind of slated to either
14 be mothballed or a potential telescope to be removed
15 from the site, but it is our robotic telescope that
16 allows students all the way up through undergraduate and
17 even graduate school, to use a regular telescope no
18 matter where they are. And so the impact of the loss of
19 that reaches far beyond our community and our state. So
20 I want that to be addressed also.
21 With regard, regarding historic properties,
22 the 43-meter was listed as one that should be kept, but
23 yet the table telescope was listed as one that could be
24 potentially demolished and I thought that was odd.

1 That's the first one here. That's the one that Frank
2 Drake used, so I don't know what, you know, what
3 rationale went into that but I'd like to see a response
4 to that.
5 And finally, I searched for West Virginia
6 University, I'm an alum, and a lot of the educational
7 programs that I do are in partnership with WVU and we
8 make use of a very vibrant astronomical staff and it's
9 just faculty that are there. And they are there because
10 of the GBT and because of this observatory.
11 Yet that environmental impact, that socio-
12 economic impact which goes far down to our county wasn't
13 really addressed, I didn't see in the Draft EIS as far
14 as the loss of this place for West Virginia University's
15 Astronomy department and what that would do.
16 They have garnered over $13 million in grants
17 since 2012, when this whole nightmare began. So and
18 that's for research using the GBT. So I think that
19 needs to be brought out as a big environmental impact.
20 Thank you, very much.
21 KRISTEN HAMILTON: Next we have Micky Holcomb,
22 Becky Rabel, Blake Humphrey.
23 MICKY HOLCOMB: Hi, my name is Micky Holcomb,
24 that's M-i-c-k-y, H-o-l-c-o-m-b. I'm a faculty member in

1 the Physics and Astronomy department at West Virginia
2 University. I am not an astronomer. I'm a materials
3 physicists. As far as I know, my research field has
4 absolutely nothing to do with anything going on here.
5 In fact, this is my first time coming. It's very nice.
6 I wanted to take time away from my own work
7 today because in the eight and a half years I've been at
8 WVU, I've seen the incredible impact that the Green Bank
9 Observatory has had on our department's research
10 program. Since 2006, our Astrophysics faculty has grown
11 from one to six, and that group brings in more research
12 dollars per capita than any other in our department.
13 The Physics Frontier Center Award, which are
14 very competitive, shows that they are not just one of
15 the flagship research programs at WVU, but thought to be
16 one of the most transformative science programs of the
17 broader Physics community.
18 There are currently 15 graduate students
19 working with the group and the majority of which are
20 involved in research with the Green Bank Observatory.
21 An even greater number of undergraduates are involved
22 with researches for pulsars with the GBT and many of
23 these students got started as high school students in
24 the Pulsar Search Collaboratory Outreach program.

1 Let me do something that's a little unusual
2 and be brutally honest about my own field. Most
3 physicists and maybe even most scientists aren't the
4 best at communicating the importance of their work to
5 young generations; however, this program has been really
6 important, almost like a gateway drug, for bringing
7 awareness to STEM fields in the state and beyond, and in
8 particular, has been critical for increasing the number
9 of West Virginia girls going into these fields.
10 In fact, the fraction of female physicists,
11 Physics majors has increased from 10 percent a decade
12 ago to 30 percent now. And a good fraction of those
13 girls joined because of the Physics Frontier Center.
14 Every once in a while, one of those excellent
15 young women or men will switch to my field and I'm so
16 happy that this program has encouraged them to pursue a
17 career in science, which is so critical for our
18 country's future, not just West Virginia.
19 So the Green Bank Observatory is the premier
20 science facility in the state and is critical for both
21 WVU's research profile and the education that remains
22 open at current funding levels.
23 KRISTEN HAMILTON: Is Becky here, Becky Rabel?
24 UNIDENTIFIED SPEAKER: She was.

1 KRISTEN HAMILTON: Well, if she shows up, she
2 can speak at that time. Blake Humphrey.
3 BLAKE HUMPHREY: Well, good evening. My name
4 is Blake Humphrey, that's spelled B-l-a-k-e,
5 H-u-m-p-h-r-e-y, and I am the student body president at
6 West Virginia University.
7 And less than 48 hours ago I would have never
8 expected that I'd be at the Green Bank Telescope today
9 with you all. But after hearing about this hearing, I
10 wanted to speak on the importance of this to young
11 people, not only at West Virginia University but in the
12 State of West Virginia. And I look here and I see two
13 young people and I think about them all across the
14 state. And I'm from West Virginia and I think of them
15 and the impact that this would have on the future of our
16 young people.
17 But to speak of the student impact, and my
18 friend from WVU just touched on that, not only do we
19 have undergraduate and graduate students here at the
20 Green Bank Telescope and working in partnership with
21 Green Bank, but we also have research, exploration,
22 innovation, education, training, and life changing
23 experiences that can change someone's trajectory.
24 Now, I'm going to talk very briefly about the

1 fact that recently, WVU obtained an R-1 research
2 classification and we have a world-class student body
3 and world-class students who do amazing things each and
4 every day, including in partnership here with the Green
5 Bank Telescope.
6 And my own unique experience here today, and I
7 want to underline that word "unique," I think emphasizes
8 the importance of the Green Bank Telescope for the State
9 of West Virginia. You know, before we started all of
10 this, I had the chance to take -- I just turned off the
11 lights. Only I could do that. I'll keep talking.
12 Maybe it wasn't me.
13 KAREN O'NEIL: I believe someone might be
14 leaning on the light switch in the back. It will wake
15 us up.
16 BLAKE HUMPHREY: I'll reclaim a little bit of
17 my time. But my experience today taking a quick walk
18 out over to the telescope and taking a peek at it only
19 emphasizes to me the importance of it's uniqueness in
20 West Virginia.
21 And the activities that are undergoing here at
22 the Green Bank Telescope can continue to inspire
23 research because of the fact that as it says -- I did it
24 again -- as it says, outside on the wall entering, "The

universe is whispering to us," and no doubt, the Green Bank Telescope is listening.

In Morgantown, we say at West Virginia University that Mountaineers go first. Mountaineers go first. And today I think that we should all say as West Virginians, as a science community and beyond, that the Green Bank Telescope has gone first and by gosh, the Green Bank Telescope must continue to go first.

Thank you, very much.

MS. HAMILTON: Next is Mayuresh Surmis, Sheena Murphy, and Paul T. Baker.

MAYURESH SURMIS: Okay. Good timing, right? Okay. My name is M-a-y-u-r-e-s-h, S-u-r-m-i-s. I'm a post-doc at WVU and I actually work on some of these things like pulsars, for example. I have no written statement with me but people have talked about how science is important so I won't want to go into that.

But the first real experience at the GBT which I had after joining here as a post-doc, is the PSE, which is where school kids actually get involved in active research with us people and, I mean, I have seen how people's faces light up when they see something which only scientists are suppose to see so --

I mean, as a scientist, I would really like

1 this facility to be open but just from a perspective of
2 a layman, in order to understand what people in science
3 are doing and getting inspired by that and, you know,
4 you don't have to necessarily end up being a scientist
5 yourself. But even if you are not ending up as a
6 scientist, you see these people doing those
7 extraordinary things.
8 Being able to be one of them for some time and
9 understand how things work, that's something which I
10 think should not be taken away from school kids. So I
11 guess from that standpoint, I would rather like to have
12 facilities like this open.
13 To add to that, I come from India where
14 there's an another observatory called the GMRT, where I
15 actually wasn't in charge of -- there's something called
16 a science day where about 20,000 people visit the
17 facility in two days. And I have seen the wonder on
18 people's faces when you explain to them what we are
19 doing here so --
20 And I would really like people to still have
21 that sense, you know, adventures, you know, just looking
22 at the sky and, you know, knowing that place in the
23 universe, knowing how things work so such things are
24 real important for that. Thank you.

1 SHEENA MURPHY: So I'm Sheena Murphy,
2 S-h-e-e-n-a, M-u-r-p-h-y, and I'm the Associate Vice
3 President for Research Development at WVU. Thank you
4 for coming to Green Bank and thank you for the
5 opportunity for us to provide input into this important
6 process.
7 I have taken the time to read the draft
8 environmental report. It covers biology, water,
9 geology, culture, visual aspects, but no where in the
10 report, anywhere, does the word "pride" or "proud"
11 appear and that is an oversight.
12 The Green Bank Telescope is one of the premier
13 facilities of which West Virginia is proud and we have
14 every right to be. Indeed, any state would be proud to
15 have this facility and we're just fortunate enough to
16 have it in our backyard. As well as being a linchpin of
17 the community, is it of vital importance to outstanding
18 science at WVU as well as graduate and undergraduate
19 student training.
20 I'm now going to quote from an NSF report that
21 was issued earlier this week which was a review of the
22 Physics Frontier Center, NANOGrav, which is one of the
23 principal users of this facility. It is an exhaustive
24 review. I'm just taking little pieces from it.

1 "NANOGrav is making great scientific progress
2 and has an excellent chance of detecting gravity waves
3 within the award period. The team has an extremely
4 strong publication record resulting from these many
5 research accomplishments. As a result, NANOGrav is a
6 clear and visible leader in the field and well ahead of
7 once comparable efforts based in Europe, South Africa
8 and Australia. The detection of Nanohertz Gravity Waves
9 is probably not far off and will reveal a completely new
10 aspect of the universe."
11 These are directly from a NSF report on the
12 NANOGrav center issued this week. So what isn't there
13 to be proud of.
14 And so when you turn to the environmental
15 impact survey, it's very thorough but the devil is in
16 the details and we don't know what those details are in
17 moving forward.
18 The preferred agency alternative is for
19 continued operation but with reduced funding. What
20 reduction is planned? There are no numbers in the
21 report. If we use what happened to Arecibo as
22 representative of what might happen here, it frightens
23 me because there the funding falls right off the cliff
24 and we don't know what to anticipate here.

1 Likewise, there's a statement that
2 collaborators are being sought and new partnerships.
3 Who are these collaborators? How aggressive is your
4 search for these collaborators?
5 So in closing, the absence of hard numbers and
6 identified collaborators in this preferred action plan
7 A, only offers a false sense of security. We are proud
8 of the GBO and I ask that the NSF keeps it a facility
9 that we in West Virginia and the nation can continue to
10 be proud of. Thank you.
11 PAUL BAKER: Hello. I'm Paul Baker, spelled
12 as you would expect. I'm a post-doctoral fellow at West
13 Virginia University. I work in the Center for
14 Gravational Waves and Cosmology, NANOGrav, which we've
15 heard about a little bit.
16 And I will say that the socio-economic impact
17 on the facility goes well beyond just the local
18 community but extends across the entire state. My job
19 wouldn't exist without the Green Bank Observatory so
20 that's a reason.
21 But just WVU in general is drawing lots and
22 lots of research money from research at the Green Bank
23 Observatory and the strength of the astrophysics group
24 there is dependent upon the Green Bank Observatory. So

1 any reduction in scientific operations will have and
2 economic impact that extends far beyond the local
3 community, throughout the entire state. Thanks.
4 KRISTEN HAMILTON: Next up is Carla Beaudet,
5 Kaitlyn Witt, Rodney Elliott.
6 CARLA BEAUDET: Carla Beaudet, C-a-r-l-a,
7 B-e-a-u-d-e-t, I'm an engineer here at Green Bank.
8 I know that there's going to be more brought
9 out about the socio-economic impact and my focus is just
10 on that segment of the EIS. And it's the only part that
11 I read so here we go.
12 I'd like to thank the members of the EIS
13 committee for doing a great job on the socio-economic
14 impact section of the Green Bank draft EIS. When I
15 addressed this committee last year, I was afraid that in
16 a cut-and-past world that section of the report would
17 come out looking like the socio-economic impact section
18 of the Arecibo EIS which listed minimal impacts.
19 I'm very happy to say it's clear that you
20 listened to the outpouring of concern and disbelief from
21 this community. That which is at stake is well
22 reflected in the Draft EIS both in detail and also in
23 the executive summary by considering the impacts to West
24 Virginia, Pocahontas County, and Arbovale-Green Bank

1 area separately. We did not sweep the worst of impacts
2 under the rug as would have happened if only West
3 Virginia were considered as a whole.
4 By listing to the many ways the Green Bank
5 facility serves the community and by pointing out that
6 alternative services are non-existence in this area, you
7 make it clear what vital resources would be lost if
8 Green Bank Observatory folded.
9 By detailing the numerous capacities in which
10 Green Bank employees participated in and support the
11 local community, you plainly illustrate what's at stake
12 here so thank you, again, for listening to us.
13 KAITLYN WITT: My name is Kaitlyn Witt,
14 K-a-i-t-l-y-n, W-i-t-t, and one of the things I just
15 wanted to point out was that, as some people have said
16 before, Green Bank's impact goes much farther than just
17 the local community or even just the state.
18 I'm a member of NANOGrav which some people
19 have spoke about before, which is a national
20 collaboration and we also collaborate internationally.
21 So Green Bank's data affects not just our country and
22 our state but also research worldwide.
23 And it's not just graduate students or faculty
24 and high-level scientists that benefit from the use of

1 the facility. I teach an undergraduate lab where
2 students are able to use the 20-meter telescope and
3 without that, they would have no way to do that. Many
4 of them have heard of Green Bank before they took the
5 class. A lot of them are from West Virginia and that
6 spurred their interest to pursue Astronomy even though
7 most of them are not Physics or Astronomy majors.
8 So it's been a wonderful opportunity for them
9 and those students will spread nationwide and hopefully
10 spread their interest and knowledge of what they've
11 learned. So it's a great interest-building and
12 inspiration to a lot of people that should stay around.
13 RODNEY ELLIOTT: My name is Rodney Elliott.
14 That's R-o-d-n-e-y, E-l-l-i-o-t-t. I'm a Physics student
15 at WVU as well. I participate in research that relies
16 heavily on observations from GBO, but I'm also the
17 president of the WVU Astronomy Club. And one of the
18 things I get to do in that capacity, I consider a
19 privilege, actually, is a couple of times a month I get
20 to interact with the public and share the night sky with
21 them from our rooftop observatory in Morgantown.
22 I can't tell you how many kids I've met that
23 have been inspired by this facility, inspired to pursue
24 a career in science and I'm concerned that any loss of

1 funding to this facility or others like it will be
2 effectively shutting a door to an entire generation of
3 future American scientists. That's all I have.
4 KRISTEN HAMILTON: Next up is Olivia Young,
5 Bob Sheets and Kathryn Williamson.
6 OLIVIA YOUNG: Hello, my name is Olivia Young,
7 spelled, O-l-i-v-i-a, Y-o-u-n-g.
8 My first actual experience with Green Bank was
9 the week and a half I spent here when I was in tenth
10 grade during West Virginia Youth Science Camp. During
11 that time, the seeds were sewn for this farm girl from a
12 small tiny roadside town in the eastern panhandle of
13 West Virginia, to one day realize that she wanted to be
14 an astrophysicist.
15 Now, that brings me to where I am at this
16 current moment. I am an undergraduate, a sophomore, at
17 WVU studying Physics. I'm involved in the pulsar
18 research with Dr. Maura McLaughlin and we use the GBT to
19 discover and study these fascinating stars that act as
20 laboratories in the sky for some of the most amazing
21 physical processes in the entire universe, including
22 research on detection of gravitational waves.
23 However, my fellow undergraduates, professors,
24 and graduate students and I aren't the only ones that

are having this once-in-a-lifetime opportunities and experiences that the GBT offers, presented to us.

Through groups like SPOT, which is the Scientific Public Outreach Team and the PSC which is Public Search Collaboratory, Pulsar Search Collaboratory, pardon, we go to elementary, middle and high schools throughout the state and bring them wonders of the universe and a passion of scientific discovery to young, brilliant minds of our state.

The impact of the Green Bank Telescope is far reaching and vitally important to not only the progression of scientific research but also to the development of the youth of our state.

I can say with absolute confidence that because I'm a West Virginian, I am a scientist. And I'm a scientist because of the GBT. So I implore you on the grounds of our youth, of our state, and of humanity as a whole, please continue to fund with the utmost of your ability the wonders and opportunities the GBT brings to our tiny planet from beyond the reaches of our solar system and our galaxy. Thank you.

BOB SHEETS: My name is Bob Sheets. B-o-b, S-h-e-e-t-s. I'm here representing the Pocahontas County Historical Landmark Commission. I'm the liaison with

1 that particular organization and the group that is
2 making this assessment. Our president is here and he
3 will speak to you later.
4 The thing I would like to say is I would like
5 to commend the group, as Carla did earlier, for the work
6 they did in the historical section with at least one
7 thing that Sue Ann brought up earlier, the 85-1 Tatel
8 telescope should definitely be on there as an historical
9 landmark. It was the first dish here and it's where
10 Frank Drake went first here in West Virginia in his
11 search for extraterrestrial signals and I think that's
12 something that should be upgraded in the report. I'll
13 address it in written comments later on.
14 The other thing I would like to do in this
15 period as I'm talking to you is encourage those of you
16 that are local and have been here for a while, like
17 Mr. Harold Crist, and have knowledge that we may not
18 have -- and these folks may not have. As I said, they
19 did a good job with the history -- but there are some
20 things out there that we may not be aware; for instance,
21 on the original encouraged action, the Hannah House is
22 preserved but in the next, it is demolished.
23 And that house was the home to George Burner,
24 and Mike Holstein and I serve on the bicentennial

1 commission here and George Burner was one of our first
2 county commissioners. He was a delegate to the Virginia
3 legislature for two terms back in the 1820s, and we
4 would hate to see that historical landmark go away.
5 He took up arms at one point, that was called
6 the Civil War. His father took up arms at one point, it
7 was called the Revolution and he was at Valley Forge
8 with Georgia Washington.
9 So there are some historical components here
10 that these folks may not know about. I think they've
11 done a good job with what they had to work with. But
12 those of you in the community, if you have stories, if
13 you have knowledge, if you have information, please
14 convey them in the written comment period, get in
15 contact with me, Jason Bauserman, we need to add the
16 rich historical legacy that we do have here and make it
17 part of the ongoing record. Thank you.
18 KATHRYN WILLIAMSON: Hey there. My name is
19 Kathryn Williamson, K-a-t-h-r-y-n, W-i-l-l-i-a-m-s-o-n.
20 I'm an Astronomy professor at WVU but I used
21 to work here as the education specialist. I arrived
22 here in 2013, with a big, bad Ph.D. and no practical
23 skills at all. And so thanks to Sue Ann Heatherly and
24 all the staff here in Green Bank, I gained really all of

1 my inspiration to, and all of my purpose, honestly, in
2 giving back to students and giving back to West
3 Virginia.
4 I'm not from West Virginia. I'm from Georgia,
5 but I feel like West Virginia is my state now. I see
6 there's so much potential, there's so much pain, there's
7 so much hardship, but I believe that West Virginia has
8 so much potential. And the Green Bank Observatory is
9 part of that potential.
10 Every semester, over 200 of my Astronomy 106
11 students use the 20-meter telescope through the Sky
12 Night Robotic Telescope Network. So I want to
13 underscore what Sue Ann said, that needs to be included
14 and emphasized in the report.
15 Through using the telescope, my students are
16 able to determine our direction of rotation around the
17 center of the Milky Way, that we live in a spiraling
18 galaxy, and we find evidence of dark matter.
19 Now, most of my students aren't going to be
20 scientists and most of them aren't ever going to need to
21 really talk about dark matter, but it gives them that
22 sense of pride and it gives them the skills to think
23 critically and that's what our nation needs. That's
24 what West Virginia needs.

1 So Green bank Observatory is basically why I'm
2 at WVU. There's no way that I would have the skills in
3 order to give back to the students at WVU and the
4 students in our state without Green Bank Observatory.
5 While I was here, we also started the Science
6 Public Outreach Team which Olivia mentioned. We trained
7 dozens of college students around the state, all
8 operated out of Green Bank. So we're giving back.
9 We're inspiring over 4,000 students every year in K
10 through 12 audiences.
11 But the biggest impact is on the college
12 students. Without any prompting, our ambassadors, our
13 future -- they're education majors. They're our future
14 educators. They have just said on their on volition, I
15 was afraid to teach science and now because of coming to
16 Green Bank, because of participating in SPOT, I'm not --
17 they're excited to teach science now. That's one of the
18 greatest investments we can make in this state.
19 And SPOT is just one of the amazing programs.
20 People have mentioned the pulsar search laboratory. No
21 one has mentioned the First-To Network which is about
22 training first generation college students. And there's
23 also PING, Physicists Inspiring the Next Generation,
24 which is a completely, fully diverse camp of students

1 from all over amazing socio-economic brackets, all
2 different races, all different -- rich, poor, there's
3 all types. And I've just never seen that kind of
4 education anywhere else. And it's what inspires me. So
5 I truly believe that my whole purpose was shaped by my
6 experience here, so thank you.
7 KRISTEN HAMILTON: Next up we have Paul
8 Marganian, followed by Brent Shapiro Albert, and Marty
9 Bloss.
10 PAUL MARGANIAN: My name is Paul Marganian.
11 P-a-u-l, M-a-r-g-a-n-i-a-n.
12 Thank you for giving me the chance to talk.
13 I'm a little bit unprepared because I was busy coaching
14 my kids' robotics team, and we made it into the State so
15 we're getting ready for Saturday's competition. So that
16 wasn't the, you know, shameless plug for the robotics
17 team. We're going to get back to that.
18 So right. So my role, I'm a software engineer
19 here at the Green Bank Observatory so, of course, if we
20 shut down, that would affect me. But I'd like to talk
21 about how this would affect not just me, not just the
22 town of Green Bank, not just Pocahontas County, not even
23 just West Virginia, but how this affects our nation.
24 So let me just tell a little story. So my

1 father is an immigrant. He came to this country back in
2 the '50s. And he came here to get a top-notch education
3 because back then, this is where you went to get a
4 top-notch education, especially in the STEM fields.
5 And that has remained true for decades. But
6 there are certain trends that are visible now and it's
7 not quite clear whether that's going to remain true or
8 not.
9 So an example that I gave when I talked here
10 last year was we've been doing work with the Chinese.
11 The Chinese government is dumping money into basic
12 research. They're not trying to play catch-up. They're
13 trying to pass us. Okay. I was there two years ago and
14 I remember working in their facility and seeing this
15 huge construction right next door and I'm like, what is
16 all of that?
17 Oh, that's our lab.
18 And I come back here back here, you know, to
19 look at Options A, B, C and D and talking about shutting
20 us. So what the hell; right? Sorry. You can scratch
21 the hell part.
22 So -- all right. So where was I.
23 I said I'd get back to the whole robotics
24 thing. Well, I'm teaching robotics because my kids are

interested in STEM subjects. If this continues, when they get to college age, when they get to grad school age, where are they going to go for a top-notch education. Where will the center of that be on this planet? Where is it going to be?

Part of that answer is right now, right here. Are we going to stop investing or are we going to abdicate our leadership role in the world?

Okay. So let's keep America great and let's keep investing in the future. Thank you.

BRENT SHAPIRO ALBERT: Hi, everybody. My name if Brent Shapiro Albert. That's B-r-e-n-t, S-h-a-p-i-r-o, A-l-b-e-r-t. That's great, filling out standardized test forms.

I'm a graduate student in the department of Physics and Astronomy at West Virginia University, and I'm also the president of the Physics and Astronomy graduate student organization there. I think -- and a lot of my work is in pulsars and some of it's with NANOGrav. And pretty much all of my research is only possible because of this facility. And I know that there are also a lot of other graduate students at WVU.

I think there let's 15 or so others in Astronomy, some of who can't me here tonight. They're

1 graduating soon and are filling out job applications and
2 have based their entire career off of observations and
3 research they've done here at Green Bank. And whether
4 that's at WVU or coming down here over the Summer for
5 weeks or months at a time.
6 This place is incredibly important, for them
7 and for building careers and myself, hopefully,
8 included. And just from a personal note, grad school is
9 sometimes rewarding and often very, very grueling and
10 the first time I came down here actually was for this
11 public meeting last year and it was dark by the time we
12 got here and all I got to see of the telescope was this
13 blinking headlight.
14 But I got to come down in May for the
15 observatory training workshop here which was a fantastic
16 workshop, but being able to see the telescope in person
17 is really, really inspiring. It's an incredible
18 facility, this whole place is just an incredible
19 facility and sometimes that really helps to motivate you
20 and to keep doing the research that we're doing.
21 And I really hope that the NSF will continue
22 to fund this facility to the best of their ability in
23 the future. Thank you.
24 MARTY BLOSS: Good evening. My name is Marty

1 Bloss, M-a-r-t-y, B-l-o-s-s. I'm a resident of
2 Pocahontas County and a staff member here at the
3 observatory.
4 My comments are going to be to look beyond the
5 EIS Draft document into the future. I was struck by a
6 very complete document that addressed many issues and
7 leaves many very big issues completely un-addressed, and
8 I'd like to speak to some of those if I may.
9 In particular, there's discussions about
10 potential removal of facilities, modification of
11 facilities, but there are no budget numbers given for
12 any of these things. And I think in a view of
13 transparency, when decision making is happening
14 concerning facilities versus cost of operations, there
15 needs to be some transparency into how those numbers are
16 derived, the assumptions behind them, and how they play
17 out going forward.
18 You can infer a budget, sort of, if you look
19 at the economic impacts and we're talked $3, $4,
20 million, $5 million, potentially from some of these
21 impacts and there's mention of how that is to be funded.
22 And one would assume that had nothing to do with our
23 operational funding but when, in an atmosphere of
24 silence, it's an unknown and I think that needs to be

1 shared more broadly.

2 I would like to speak also to site expansion.

3 So one of our charges has always been, since this

4 process started, is to expand our opportunities, both in

5 the science and commercial endeavors; however, the EIS

6 has actually constrained us greatly in being able to do

7 any changes to the site. Essentially, we were frozen in

8 place for the last couple of years and not able to make

9 an substantial changes because that would upset the

10 baseline, as I understand it, of this report.

11 Well, as we go forward, it's been my

12 experience that once a report exists that people keep

13 coming back to that and back to that and back to that

14 and if the agency preferred approach is followed, we

15 must have relief to be able to do the kinds of things

16 that new endeavors the observatory require with a

17 minimum of obstruction and problems, because it can be a

18 real problem as we go forward.

19 And then lastly, I'd just like to comment that

20 part of this needs to talk about what is considered

21 success criteria for any of these options, and most

22 importantly, the agency preferred option. And right

23 now, everything is about revenue and finances. They're

24 very important. They're what keeps the lights on. But

1 science is what drives the site and there needs to be a
2 metric as we go forward that also looks at the changes
3 in the science community and our contribution to those
4 changes as another metric into the success of the
5 observatory in whichever of these forms that it takes.
6 Thank you.
7 KRISTEN HAMILTON: We're going to take one
8 more round and then we're going to take a brief break.
9 So we'll have Anthony Minter, Sarah B. Spolaor, and Mali
10 Minter. And I'd like to give Becky Rabel the
11 opportunity if you're back in the auditorium, you can
12 come down after Molly.
13 ANTHONY MINTOR: Hi, I'm Anthony Mintor. You
14 can spell that however you wish.
15 In page 4-108, it states that in the worse
16 case scenarios that the loss of STEM education here
17 would be adverse to the county. This is really an
18 understatement. If you look of the number of
19 astronomers in the United States, you can estimate that
20 it's about one out of every hundred thousand people in
21 the United States are actively in astronomy working on
22 advance degrees or with an advanced degree. Of that,
23 only a quarter of those are women. So it's something
24 like one out of 200,000 are women in astronomy.

1 But from Pocahontas County alone, I can think
2 off the top of my head of two women who have gone
3 through the program since I've started working here that
4 have gone on and are seeking an advanced degree or do
5 have an advanced degree working in Astronomy.
6 Our county only has about 8,000 people.
7 That's one out of every 4,000, 50 times my guess at the
8 national average. That's what the STEM education
9 program is doing, amazingly, beyond anything you can
10 imagine in the national average in a state that has
11 historically been at the bottom.
12 So this is a real treasure having the STEM
13 programs here which rely on the science being here and
14 we need to keep that alive because we're doing amazing
15 things, not only locally but within the state and within
16 the region. So I just want to really share that
17 "adverse" is an understatement for catastrophic if we
18 lose these programs. Thank you.
19 SARAH BURKE-SPOLAOR: Hello. My name is my
20 Sarah S-a-r-a-h, B-u-r-k-e--S-p-o-l-a-o-r. Brent and I
21 are friends.
22 So I'm speaking today as a member of both of
23 the West Virginia University Physics and Astronomy
24 department. The department has been a long supporter of

1 Green Bank Telescope and Green Bank Observatory,
2 facilities both in the science and in the outreaches as
3 you've heard a lot of today. I'll highlight that again.
4 I'm also here speaking as a collaborator in
5 the NANOGrav project. I currently lead the Gravational
6 Wave Astrophysics working group. And NANOGrav is, of
7 course, very generously funded by the NSF through the
8 Physics Frontier Center.
9 I know it's really interesting for me to read,
10 at least, the first 20 pages of the DEIS and select
11 other pages and I stumbled upon the phrase where we are
12 meant to consider GBO as a cultural resource. And it
13 struck me that there was a phrase that this is defined
14 as a current historical, cultural and natural aspect,
15 what makes a cultural resource.
16 And it occurs to me that GBT is right now
17 making history through NANOGrav. We are just now in the
18 past two years, LIGO was able to discover gravational
19 waves, just two years ago in 2015, reported just last
20 year in 2016. And really, the ramp up of this science
21 and cultural awareness in humanity has just come about
22 in the past two years. And it has been after the
23 assessment that was done of the importance of the
24 science that's now being discussed in the context of

1 Green Bank.

2 So these developments have all been very rapid

3 and really, you know, NANOGrav is now leading

4 gravational wave science. It will be, in the next few

5 years, expected to really open the gravational wave

6 spectrum and change the world in the way we can perform

7 astronomy and explore the universe, explore the

8 structuring of the universe, through it's studies of

9 black holes.

10 And this is really a change that fundamentally

11 develops us in a way that hasn't been changed since,

12 basically, Galileo started observing Astronomy and

13 electromagnetic emission. We're now using gravational

14 waves.

15 This is a fundamental capability of humanity.

16 GBT gives half the sensitivity to NANOGrav and NANOGrav

17 will play, certainly, a historical role in the coming

18 decade, if no longer.

19 And I just wanted to add to that our continued

20 success with NANOGrav, at least over the next few years,

21 really relies on GBT being available to us to continue

22 this NANOGrav effort.

23 The other main thought I wanted to add to this

24 is that we just want to simply support, express support

1 for either the no-action alternative or the agency
2 preferred alternative, in that first, we really want to
3 continue NANOGrav science. We want to bridge the gap
4 until alternative facilities can come available to
5 support this really historical effort that we are now
6 performing.
7 At WVU itself, the department, you've heard a
8 lot about the really fantastic education programs that
9 have been happening. We use the 20-meter in our intro
10 Astronomy classes. That's about 200 students per
11 semester. We have two semesters a year. Over a couple
12 of years, that accesses thousands of students, brings
13 science directly to them, puts science in their hands
14 and makes them perform research. And that's a really
15 unique thing to be able to do.
16 It's one thing to just have data presented to
17 you and say, hey, make a plot of this. That's science.
18 That's one aspect of science. But actually collecting
19 data, making that into some conclusion, that's very
20 fundamental and observe, something you, yourself,
21 observed about the universe, it's really amazing.
22 And just like through the Pulsar Search
23 Collaboratory, we have accessed hundreds and hundreds of
24 students that are in high school and are able to bring

1 literal Green Bank Telescope data to the computer, the
2 desktops of those students to actually look at the Green
3 Bank Telescope data, look at stuff that scientists have
4 not even looked at because they have been given the
5 responsibility to take a look at that data and make some
6 observation, have we've found a new star in the universe
7 or have we found a burst from a distant galaxy.
8 So I think, I just wanted to conclude that WVU
9 aims to continue to support and use Green Bank
10 facilities, not just GBT but also the 20-meter and other
11 ones on site and we hope to perform what science and
12 what outreach we can going into the future and we aim to
13 support that as much as we can. Thank you.
14 MALI MENTER: Hi. I'm Molly Menter, M-a-l-i,
15 M-e-n-t-e-r. And I just have a couple notes.
16 One is, the EIS draft mentions -- and I know
17 you can't answer this but I'm saying this so that maybe
18 someone will answer this -- it mentions that in 2006, an
19 NSF study was done and it said that the GBT was possibly
20 over-funded. My understanding is that the 2006 report
21 had incorrectly reported the construction cost by a lot.
22 And so a more extensive review was done.
23 However, I cannot find any more extensive
24 report anywhere so I really would like to know if a more

1 extensive report was actually done and what the results
2 were and where it would align with funding from that.
3 The other thing I just wanted to touch on, Sue
4 Ann touched on it, it was one of the main things I was
5 going to talk about, was if -- I mean, of course,
6 everyone is full funding and then we're really happy on
7 Option A; however, if it were to go on to a different
8 option, I think there are some fatal flaws in Option B.
9 It says that you'll go to a tourism education
10 facility. Then later, it says in your statement that
11 the amount of tourists that will come will go down by
12 half, at least, and the less, the less facilities that
13 are up kept as far as mothballing or destroying or
14 whatever you do to the telescopes, the less people that
15 are going to come here.
16 And so, basically, Option B is going to sink
17 further and further and further down where there's no
18 tourism coming and that will really impact our
19 community, and so I think you need to think about that.
20 The other thing is, and I think Sue Ann
21 touched on it, when you do these educational programs,
22 they are fantastic. We have some people here who have
23 bene parts of them; however, when you do them and you're
24 going to reduce the staff to just have education and the

1 science center, I don't know if you really understand
2 that when a group comes in, they call and say, hey Ron,
3 Hey Tony, Hey, Jay, or Hey, all you scientists, or hey
4 you computer engineer or hey you, you know, computer
5 scientist, can you come back talk to this group. We're
6 doing this and we really need someone to talk to them
7 about that. You're not going to do that when those 45
8 people aren't employed here. You're not going to have
9 the educational opportunities you think you're still
10 going to have because you're going to be missing a
11 generous part of your staff.
12 So that said, the only other thing I had, and
13 I know you all want to go on break, is and I'm sorry
14 because I meant to have it typed out, I think there are
15 some issues with -- as everyone said, you've done a
16 really good job putting it all together, but I still
17 think there are a few issues with the housing and the
18 socio-economic impact on the housing because you say,
19 well, you know, people will be moving off-site because
20 they won't be able to live on-site. So that will be
21 good for the housing so there won't be that bog of an
22 impact. But then there's not that many houses on-site
23 compared with how many people are going to be losing
24 their jobs, so there's a lot of people who are leaving.

1 And they can't -- the people that would be losing their
2 jobs if you went to B, C, D, would not be able to be
3 employed in the same manner here in Pocahontas County.
4 So I think some of your statistics may be a
5 little bit off in that but I didn't get it written up
6 nicely so I'm just going to say that in passing.
7 And that's it, thank you.
8 KRISTEN HAMILTON: Has Becky Rabel returned to
9 the auditorium? No? Okay.
10 Thank you all for giving concise and
11 meaningful comments thus far. I think we're on track in
12 terms of timing, so if we can take a brief break and
13 return, we'll get to the rest of you that have signed up
14 to speak, and perhaps those of you who didn't get a
15 chance to sign up, may also have the opportunity. So
16 return here at 7:30. Thank you.
17 (Short break.)
18 Welcome back. I know people are still
19 filtering in we're going to continue with the public
20 comment portion just to make sure everybody has a voice.
21 The next folks up to comment are Charles
22 Sheets, Burt Schou, and Ryan Lynch.
23 CHARLES SHEETS: Thank you. My name is
24 Charles Sheets, C-h-a-r-l-e-s, like sheets of paper.

1 As a resident of Green Bank, West Virginia,
2 and also a member of the Greenbrier Valley Economic
3 Development Corporation which represents Pocahontas
4 County, I'm on record of writing a letter in support of
5 the Green Bank Observatory last November when many of
6 you were here. But I want to thank the National Science
7 Foundation returning to Green Bank Observatory and
8 inviting the public to comment on their draft
9 environmental statement, DEIS.
10 Anyway, I'm happy that the National Science
11 Foundation has acknowledged the importance of the
12 scientific community of Green Bank Observatory and its
13 scientific discoveries over the past 60 years. And in
14 light of the constrained budgetary environment, the
15 National Science Foundation says it must provide a
16 balanced research portfolio with the largest scientific
17 return for taxpayer dollar.
18 In looking up the National Science
19 Foundation's 2018 budget request to Congress in its
20 continued long-standing commitment to support basic
21 research and education across all fields of science and
22 engineering, the budget request is $6.653 billion, which
23 is a decrease from 2016, by the way.
24 The total of the West Virginia government

1 budget, our state budget in West Virginia for 2017-2018
2 is only $4.5 billion for a population of 1.8 million
3 people.
4 The National Science Foundation's only
5 research facility of this type in West Virginia and
6 Green Bank Observatory, working in conjunction with the
7 West Virginia University, is providing a scientific
8 curriculum for students to obtain their Doctorate in
9 Astronomy and that's the only curriculum in West
10 Virginia. And this was evidenced by the great students
11 that we have here. And I'm really inspired by those
12 students. I don't know if they have a class greater
13 back at WVU or not. But I was really inspired to hear
14 them.
15 I want to support Senator Manchin's offer to
16 the National Science Foundation director to have a
17 public hearing with the scientific community of the
18 importance of continuing funding to maintain the Green
19 Bank Observatory scientific facility.
20 I support the DEIS finding in its preferred
21 alternative which keeps Green Bank Observatory open with
22 reduced National Science Foundation funding. Since the
23 agency has acknowledged the importance of Green Bank
24 Observatory to the scientific community, I trust that

1 the funding will continue at GBO at the current level
2 and not engage in a slow strangulation of funding so
3 that Green Bank can no longer exist.
4 Once again, I thank you very much for this
5 opportunity.
6 BERT SCHOU: My name is Bert Schou and that's
7 spelled B-e-r-t, S-c-h-o-u. I'd like to thank the
8 National Science Foundation for the opportunity to
9 respond today and the importance of science and
10 education is what my theme will be.
11 Just before I came to this meeting today I was
12 with a meeting called Sigma Xi. Sigma Xi as you well
13 know has 76,000 members. We have two chapters here in
14 the State of West Virginia; one is in Williamsburg at
15 the West Virginia School Osteopathic Medicine. And one
16 of the persons there asked me to ask why -- he had
17 written letters and had not gotten any response, even
18 that the letters had been responded to, Dr. Larry Davis,
19 our president -- we have an officer's meeting.
20 We have been up here to the Green Bank
21 facility with a whole busload of people and really
22 enjoyed bringing these scientists up here to study
23 what's going on here. In addition, the Green Bank or
24 the West Virginia or the Greenbrier Chapter of Sigma Xi

1 sponsors fairs, their science fairs, and there is a
2 science fair here at this part of Pocahontas and the
3 school here in Green Bank and they're very active.
4 We have four active schools or more that come to
5 the science fair that the Sigma Xi group in Green Bank
6 or down in Williamson or Lewisburg puts on. As you can
7 see, I didn't prepare this and I can write some thoughts
8 afterwards.
9 With this importance to science, I think that
10 we need to look at how important it reacts as well as
11 the students have indicated here. I also think it's
12 important, we have two national presidents, one of them
13 is still in our chapter. We've had one before and he
14 couldn't be here today. He's out in New Mexico or he
15 would have been here.
16 And so there's a great importance of it, of
17 coming here and I think the essence of all of this is
18 science is really important and these students are
19 picking it up here and they're getting enthused and
20 that's of great economic importance. So I wish that you
21 would evaluate that in your whole program. Thank you.
22 RYAN LYNCH: Hi. My name is Ryan Lynch,
23 R-y-a-n-, L-y-n-c-h. I am an astronomer here on staff.
24 I am also the coordinator for our Summer student

1 research programs so I'm going to focus my comments
2 primarily on education and research.
3 So first, I was a little disappointed to see
4 that the Draft EIS did not seem to mention our
5 observatory's long standing and outstanding REU Research
6 Experience for Undergraduates program, which is an NSF
7 funded program, as well as the Physicist Inspiring the
8 Next Generation program.
9 I might have missed it, but if I didn't, I put
10 some numbers and made reference to those in my public
11 oral comments last year, and I'd be happy to share those
12 with you again with you guys, any information that you
13 guys need to make sure that's corrected in the final
14 statement.
15 I also wanted to address the region of
16 influence and how that is defined for the education of
17 socio-economic impacts. So there are a lot of comments
18 already about the impacts of the Observatory, not just
19 within the local community and within the state but
20 really nationally and globally. So I just wanted to
21 share some numbers to kind of back that up.
22 So there were 32 states and territories of the
23 U.S. that were represented during the public scoping
24 period and 13 countries other than the U.S. Out of 201

1 commenters that provided and addressed on the written
2 comments, were from outside the State of West Virginia.
3 That's 44 percent; 61 commenters, 10 percent were
4 outside the U.S.; and 67 percent of all comments dealt
5 with either research or education.
6 So my understanding is that the region of
7 influence as it is defined narrowly as being the local
8 community and maybe extending out to the State. But I
9 think that demonstrates that Green Bank has an impact
10 that is national and really global. And if you really
11 want to assess the impact and education and on
12 employment, you need to include the entire country and
13 the entire world.
14 These are of researchers who depend upon the
15 observatory to further their educational career as well
16 as their professional careers.
17 There was a line in the draft EIS that the RY
18 was not officially widened to the state beyond the State
19 of West Virginia because it would dilute the economic
20 consequences of the proposed action alternative.
21 Those of you that were here last year would
22 remember a young woman, a high school student from West
23 Virginia who got up here and rocked it in her comments.
24 Anyone who listened to her talk cannot possibly say that

1 expanding the region of influence would dilute anything
2 and I think we've heard that from other people here as
3 well.
4 And the other thing I want to address is the
5 magnitude of the impasse under the Action A alternative.
6 There's a line that says that maintaining STEM related
7 training, the impasse would be minor, adverse, and
8 short-term under action alternative A.
9 But that really depends on the funding model
10 that we settle on with partners and whether or not those
11 partners take away from the open sky science time. If
12 the open sky science time really drops, and the research
13 funding also drops then the educational and research
14 opportunities drop as well. And it's not going to be
15 minor and short term. It's going to be severe and long
16 term. And I really encourage you guys to take a look at
17 that and fund the report. Thank you.
18 KRISTEN HAMILTON: Next up is Leslie Goodall,
19 followed by Jason Bauserman, and Ellie White.
20 UNKNOWN SPEAKER: Leslie had to leave. She'll
21 write.
22 KRISTEN HAMILTON: Is Jason Bauserman here?
23 JASON BAUSERMAN: I'm Jason Bauserman,
24 J-a-s-o-n, B-a-u-s-e-r-m-a-n. I am a resident just north

1 of here at Bartow, and I happened to move back here as a
2 back-to-the-lander out of Washington, DC in 1971. This
3 has just been a great place to come. And we've had
4 three sons and they're all living in West Virginia, a
5 couple of them living here still.
6 I just want to say what the observatory has
7 meant to our family. My wife, Julie, has been a piano
8 and voice teacher for 45 years. They -- well, even
9 today, the observatory lets her come down and do
10 rehearsals on the Baby Grand over here and sometimes
11 she's taught lessons here at the Observatory.
12 But I asked my wife before I came today, I
13 said, Julie, how many people, how many kids of
14 observatory people have you taught. And she said, you
15 know, I bet you 75 of my students have been observatory
16 kids. And that's really helped us to finance us and
17 helped us to stay here. So that's a real big thing.
18 Likewise, I was in charge of Green Bank soccer
19 for nine years and that meant finding 12 to 15 coaches
20 each year, finding referees for every game, finding some
21 grass mowers, and, of course, we were on Observatory
22 property for our soccer fields.
23 And I, too, can say probably that 75 percent
24 of my volunteers for the soccer league, and this was

1 through the mid-'80s through the mid-'90s, were
2 observatory personnel. I mean, it was just really
3 helpful and just really a great community thing for the
4 Observatory and for the local people here.
5 Last year, I was actually involved in planting
6 potatoes here on observatory property. I picked 30 tons
7 of rock out of my five acres behind the Green Bank
8 library and I got 15 tons of potatoes. Not a very good
9 conversion but I think we did better than anybody else.
10 Maybe it was those extra rocks that got picked.
11 My son, Jonah, who does work here at the
12 observatory, he happened to go -- well, he finished up
13 Pocahontas County High School and was in the
14 school-to-work program. He -- gee, my time is already
15 up.
16 KRISTEN HAMILTON: No. Just one more minute.
17 JASON BAUSERMAN: Oh, one more minute. Okay.
18 I thought that was going to be it.
19 He wanted to come here to the observatory to
20 do the school-to-work program and he did. And I guess
21 he did so well they asked him, could stay you on with
22 us? When he was here he was, you know, soldering as an
23 electronic technician under a microscope. They said,
24 you're just so nice and clean and do a great job.

1 So he was signed right out of high school in
2 1998. So it's just about been 20 years, it was, he was
3 here. But his first job was to run the stainless steel
4 cryogenics line all the way up the big scope. He had
5 never soldered or welded, whatever you do with stainless
6 steel. He soldered the whole thing from top to bottom,
7 didn't have one leak in it.
8 And then the other great thing, I'm just so
9 proud of him, I guess they had seven new receivers or 14
10 new receivers they needed for the big scope. He
11 actually put together seven of them and still maintains
12 those seven today.
13 But he does have a couple of extra jobs to show you
14 that they're really trying to save here. Not only is he
15 maintaining those seven receivers but he is also, goes
16 out and checks every cell phone tower within 100 miles
17 of here and he rides the little white truck with the
18 antennas to look for RF. So he's really doing what was
19 three jobs as one.
20 But, gee, my time is out. But here just three
21 or four weeks ago or maybe a month, five weeks ago, he,
22 Katie Couric came here -- and that is under-reported,
23 how many people are coming from all over. But he spent
24 five and a half hours running her around and showing her

for her National Geographic article. So I really cannot imagine this community without the personnel and the workers here at the Green Bank Observatory. Thank you.

ELLIE WHITE: All right. So I just want to say thank you to NSF for giving us the opportunity to speak today.

KRISTEN HAMILTON: Your name?

ELLIE WHITE: All right. So my name is Ellie White. It's spelled pretty much how it sounds, E-l-l-i-e, W-h-i-t-e, like the color. Okay.

So I just appreciate you all listening to all of the comments you've received, both written and oral, from all of the people who've been -- well, not all of the people but only just a small fraction of the people impacted by the observatory. I've received hundreds of letters, outpouring of support. But I'd like to speak about why I think the NSF should restore full, 100 percent funding to the Green Bank Observatory.

So I appreciate the fact that you've decided to continue to provide partial funding. But I'd like to bring up some concerns I have about this option.

First of all, a reduced, reduced funding by the NSF means the observatory will have to seek outside partnerships as mentioned in the DEIS. If the GBO

1 becomes beholden to institutions who do not uphold the
2 open skies program that you all make possible, the
3 outcome -- sorry, if you don't care -- this outcome
4 would ultimately --
5 So I'd just like to say that the open skies
6 program is extremely important to the observatory here.
7 If it were to disappear, it would ultimately reduce the
8 diversity of the research currently going on at the
9 observatory and would serve to cut off opportunities to
10 make the next great discoveries in Astrophysics but
11 couldn't do it because their institution couldn't get
12 time on GBT.
13 With the open skies program in place for the
14 GBO researchers and nearly every possible sub-field of
15 Astronomy, are making fantastic findings that bring us
16 closer to a full understanding of our universe. Many of
17 the research topics being investigated with the GBT are
18 in line with the NSF's own astronomical priorities as
19 identified in the New Worlds New Horizons study.
20 GBT is used for and has been used for studies
21 in the following Astrophysical topics that the NSF
22 decided was worthy of completed panels dedicated to in
23 WNH survey.
24 So the first topic would be Planetary System

1 and Star Formation. The GBT has performed several
2 observations concerning astrochemistry, as you covered
3 earlier, in star forming regions and receivers can
4 continue to be developed and proved for high frequency
5 observations of such topics.
6 Also, two other topics, the Galactic
7 Neighborhood and Galaxies Across Cosmic Time, the GBT is
8 used frequently for neutral hydrogen and other frequency
9 studies in the Milky Way and surrounding galaxies. This
10 is something I think really needs to be emphasized. The
11 Green Bank telescope has contributed tremendously to
12 neutral hydrogen studies.
13 In fact, they just implemented a new phaser
14 ray feed on the scope this summer that will basically --
15 it's like a giant camera. Instead of having one pixel
16 it's like seven. So the GBT is constantly being
17 upgraded, it's constantly being given more capability so
18 there's really no way it can go out of date because it's
19 constantly being recycled and reused with relatively a
20 small amount of money.
21 Another topic that I identified was Cosmology
22 and Fundamental Physics. Green Bank has made tremendous
23 contributions there as well. Many dark matter and dark
24 energy experiments have been undertaken with GBT. One

1 particularly notable cosmology project that was
2 undertaken in the past is the Megamaser, and is
3 currently going on, is the Megamaser cosmology project,
4 basically to determine how fast the universe is
5 expanding.
6 So first, NSF has also identified other areas
7 of interest including education and I'd like to just
8 touch on that as well because that's such an important
9 part of what's being done here. So demographics is one
10 area of interest.
11 So as was touched on earlier by so many
12 people, many of the educational programs at the GBO are
13 aimed at growing diversity in the astronomy community by
14 giving under represented minorities and female students
15 a two-week Summer camp experience introducing them to
16 real high level science.
17 In addition to this, the first two programs
18 encourages STEMing involvement among first-generation
19 college students, education, and public outreach. So
20 the number of students impacted in positive ways is
21 absolutely tremendous.
22 From the Hands-On Radio Astronomer for a Day
23 program which goes out almost constantly involving so
24 many students, to the research experience for

1 undergraduate students, to Sky Net Junior Scholars, so
2 many other programs including just casual mentorships.
3 I'm a high school student from Barboursville,
4 so about four hours away from here, and just from a
5 chance encounter a couple of years ago, I've been able
6 to do actual research on radio frequency interference,
7 telescope pointing, and I will be doing some hydrogen
8 research soon.
9 So from my own perspective as well as so many
10 other students, many of whom are from under represented
11 backgrounds, our lives and career paths have been
12 changed by the mentorship experience we've had here at
13 the observatory.
14 For these reasons among so many others, I feel
15 the NSF would reap large benefits and make great strides
16 toward achieving their goals for science and education
17 by continuing to provide 100 percent funding for the
18 GBO.
19 The continuation of the open skies policy is
20 crucial to keeping up the pace of ground breaking
21 science and student opportunities that move us toward
22 great discovery and more inclusive and diverse future
23 for STEM fields everywhere, so thank you.
24 KRISTEN HAMILTON: Next up we have Deana

1 White, and then Nathan Tehrani.

2 DEANA WHITE: Hello, everyone. I'm Deana

3 White. I'm her mom. D-e-a-n-a, W-h-i-t-e.

4 Thank you guys for letting us speak. I'll try

5 and make the time. I think it's evident to anyone who's

6 read the comments from last year that the NSF has had a

7 great return on their investment at Green Bank

8 Observatory. We're here to urge you to choose the

9 no-action alternative, continued NSF investment for

10 science focused operations and restore full funding for

11 the observatory so we can all continue to reap the

12 benefits of this fantastic investment.

13 We know you need the support of many allies to

14 justify this decision in these very competitive times

15 for budget allocations so hopefully all of us here can

16 help with that. As you review the comments made last

17 round, and as I said in my own comment last year, this

18 place is magical. It turns busy, ordinary people into

19 dreamers of what we can achieve just from looking at the

20 feat of human architecture, engineering results that the

21 GBT exemplifies.

22 You can participate in a Radio Astronomer For

23 A Day program and see high school students challenged to

24 learn high level concepts, struggle at first and then

1 step up their game, rise to the challenge and make
2 meaningful discoveries about what they themselves can do
3 in just a 24-hour period.
4 You can witness a young, curious but tentative
5 student growing in meaningful ways from opportunities
6 provided by the amazing astronomers, engineers, and
7 education staff here. The Green Bank Observatory is
8 magic.
9 Your continued investment in the observatory
10 returns exponential benefits to society as we stand now
11 and as we move towards our future. We all eagerly watch
12 and anticipate what question will the Green Bank
13 Observatory answer next.
14 We all know instinctively from each of our own
15 gatherings, of stories and experiences with education in
16 its many forms, that the staff here, the resources here
17 and the Green Bank learning philosophy of open skies
18 open minds, open hearts is a model that should be
19 studied and implemented across our nation.
20 We know it's not just individually but as
21 evidenced by the footprint the Green Bank Observatory
22 has made since its inception to this very day, expressed
23 over and over in the letters you've received. We've
24 read at least 600 of these letters. We noted that

1 people from over 30 states, as mentioned before, and
2 territories, and 13 countries. People from numerous
3 institutions and organizations sent you their unanimous
4 support along with their reasons and unique stories.
5 Each letter was moving, informative, and
6 inspiring. Many cited multiple reasons why this
7 facility should be continued to be funded at the highest
8 level, from cultural to historic, economic to health and
9 safety and so on. But the most often cited reasons were
10 education and research and the two cannot be separated.
11 So many of the letters expressed the
12 importance of the observatory to their research and the
13 ground breaking discoveries that they've made or are on
14 the verge of making and how important and unique the
15 learning opportunities that accompany the research are
16 to so many students ranging from kindergarten to post-
17 doctoral studies.
18 What corporation in America wouldn't leap to
19 be able to write the mission statement that the
20 observatory breathes every day and then reap the
21 enormous returns on investment that the observatory
22 achieves for our future.
23 There's also a more traditional measure of
24 return on investment that's evident. I believe the

1 annual operating budget here is $8 to $10 million and
2 the observatory generates close to $30 million for the
3 thriving Green Bank community, Pocahontas County, and
4 the State of West Virginia. The NSF can post that in
5 their earnings report to taxpayers.
6 So as you can tell, I could go on and on and
7 on and on, but let me just finish by saying that we want
8 to help you, the NSF, to communicate your return on
9 investment in earnings to all that we can to help you
10 garner the support you need to restore full funding to
11 the Green Bank Observatory, an outstanding performer and
12 inspiring treasure in your portfolio. Thank you.
13 KRISTEN HAMILTON: Is Nathan here?
14 NATHAN TEHRANI: Oh, yes.
15 KRISTEN HAMILTON: Come on up.
16 NATHAN TEHRANI: All right. John Mather,
17 Nobel laureate once said, "That to look through a
18 telescope whether it's for work or for pleasure is
19 always a cool experience but it pales in comparison to
20 watching the look on someone else's face when they look
21 through the eye piece."
22 And even though that's a quote from an
23 infrared astronomer about optical astronomy, I think it
24 absolutely holds true for radio astronomy as well, lack

1 of eye pieces not withstanding.

2 I've had the amazing opportunity to be

3 involved in a few educational programs here in a very

4 small way for each of them, but I've had that experience

5 to see hundreds of students gain a confidence in

6 themselves, and in some case, watched students in high

7 school who had very little interest in science chose to

8 study, or other STEM fields, in their college careers

9 and they're now beginning their careers in STEM.

10 Now, that's not all of them, but each and

11 every one of the students who did an educational

12 experience here that I got to see, whether they were

13 working on the 40-foot telescope or the GBT, they

14 discovered something in themselves that they could do

15 science. And, you know, if you can map the galaxy,

16 there really isn't a whole lot that you can't do. And

17 each and every one of them discovered that, you know,

18 out there and they discovered that in themselves.

19 So, yes. This is absolutely an amazing place

20 for science but this place, as was just said, is

21 absolutely magical and I hope that magic never leaves.

22 KRISTEN HAMILTON: Is there anyone else who

23 signed up that they'd like to give verbal comment today

24 that I have missed? That's my first question. I want

to make sure I didn't miss anybody.

So my next question, is there anybody who did not sign up to give verbal comments but would like to come on up? And you are very welcome to. We have plenty --

UNIDENTIFIED SPEAKER: Can I add something? Is that allowed?

KRISTEN HAMILTON: Yes. But let me first see if there's anybody who didn't speak and then move on to that. Thanks. Anybody? Okay. We have one.

Come on up, please.

MICHAEL HOLSTINE: So my name is Michael Holstine, M-i-c-h-a-e-l, H-o-l-s-t-i-n-e.

And I think most of you know me. I'm the business manager here at the observatory, and I just wanted to speak to a few details about this. I will be submitting in the written comment period.

But, you know, as you and I discussed today that this is a cooperative effort between us and the NSF. And I think we've worked well together on this program and I want everyone here to know that we've been working well together on this. And I said earlier today, you have your job to do and I have mine to do. And so now it's my turn to talk a little bit.

1 In the Draft EIS, I do want to say that it was
2 a very thorough job. I was impressed by the amount of
3 detail they went into. Like some of the other
4 commenters, though, I am concerned that there was a lack
5 of specificity to some of the vaguer options and ideas
6 that were in place.
7 And it concerned me a little bit when I read
8 some of the statistics that are fairly based to the
9 organization that were wrong. And it concerns me that
10 if those comments or those statistics are wrong, what
11 else might be wrong since the site is stated as having
12 2200 acres. Well, it's not. It's 2,654.37 acres. I
13 gave them those figures and why that's not reflected,
14 I'm not sure. And I think that's right. It's 45.37 or
15 54.3, anyway. They'll figure that out.
16 The information on the reports of which this
17 whole EIS, sort of, is based, I was a participant in
18 those review committees. I'm a little concerned that
19 the actual summaries given by those review committees is
20 not truly reflective of what was stated on the Green
21 Bank operations at the time; however, those reports are
22 not available that I can find.
23 So I will be either happy to speak to you
24 later about trying to get those summary reports or I

1 will reflect my personal observations of what was truly
2 said as a result of those reviews.
3 I will state for the record that in no review
4 that I have ever participated in, by either NSF or
5 operating in AUI or any thrid-party consultant, has
6 Green Bank ever come out to be too expensive, and, in
7 general, has been stipulated that we needed more funding
8 and we were operating too lean. So I'd really like to
9 figure out where that came from.
10 And lastly, without going into too much detail
11 about other things that, you know, that statistically I
12 can comment on, I'm concerned about the, even option
13 alternative A and the fact that any of the options would
14 have anything to do with the demolition of our housing.
15 If you go through the socio-economic part of
16 this, it mentions that there is a 50 percent vacancy
17 rate in the housing in Pocahontas County, and,
18 therefore, housing is freely available off site and,
19 therefore, housing is not necessary on site.
20 And I kept thinking, there is no where in this
21 county that I think of that has a 50 percent housing
22 vacancy. Then it occurred to me as I read through, I
23 think, part of the appendices, as to where those numbers
24 came from. They're talking about hunting camps.

1 And there are structures, tons of hunting
2 camps but those are not houses. The assessor does
3 include them as either a second home or whatever it
4 might be. Right now, in this last two weeks, I would
5 guess that there is probably a 10 percent vacancy
6 because it's hunting season and in the Summer you'll
7 probably have a 50 percent vacancy because nobody is
8 using them.
9 Any rate, those are the kinds of things that I
10 think need a little bit more massaging and explanation,
11 and I do appreciate the opportunity to speak to you and
12 to have you let all of these people speak to this as
13 well. Thank you.
14 KRISTEN HAMILTON: Thank you. Anybody else
15 who has not yet spoken but who would like to?
16 SUZANNE STEWART: Hi. I'm Suzanne Stewart,
17 S-u-z-a-n-n-e, S-t-e-w-a-r-t.
18 And I'd like to talk about a couple of things
19 that were mentioned tonight. One was pride. Other than
20 the first couple days of my life and nine years for
21 college and work, I have been a resident of Green Bank.
22 And I am proud to say that I was raised and live today
23 in Green Bank.
24 And when I travel around and talk to people

and I say I'm from Green Bank, West Virginia, they say, oh, where is that? And I get to say, have you ever heard of the Green Bank Observatory, the GBT, and they're like -- a lot of people says, oh, yeah. I have heard of that.

And there is a sense of pride to say I am from this place where this facility is and where, it is a unique place to live and be, and our lives would be vastly different if we didn't have this facility anymore.

And the other thing I wanted to talk about was the national impact. And my cousin, Stephanie Stewart, is a middle school English teacher in Tennessee and you're thinking, English, how is that connected to the observatory. Well, she is, you know, a rock star for starters for teaching middle school, but she always tells me that every semester she has a section where she talks to her students about utopian places.

And there are tons of young adult books with utopian stories. And she always uses Green Bank as an example because of the quiet zone and how we don't have cell phone towers and we can't use cell phones and her students are fascinated by that because they can't live without their cell phones.

But I think it's amazing that, you know, she is just one person who has found a way to take what the observatory is and to take what the quiet zone is and to turn it into something that isn't necessarily the first thing you think of when you think of this place.

And you know, she, to call it utopia and to compare it to some of the utopian places that they study, I think is fantastic. And just think about all the other things that could be covered if we continue to have this facility here and I have invited her up with her students. I hope one day she gets to bring them so they can experience it for themselves. So that's all I had to say. Thank you.

KRISTEN HAMILTON: Any other new speakers?

UNIDENTIFIED SPEAKER: I'll go.

JOSH WHITE: Hello. My name is James Espillita, J-a-m-e-s -- that's not my real name. My name is Josh White.

So last year or was it this -- realized that they were going to -- Green Bank Observatory here was going to separate from the NARO and become the Green Bank Observatory which was its own thing. And so I, that was pretty cool.

And there is a video contest to show what does

1 the Green Bank Observatory mean to you. And so my
2 sister, Ellie White, and I both submitted contest
3 entries, a video. Each of us sent in a video, of
4 course. So we both ran and I think hers should have
5 gotten first place. Sadly, I did. So she got second
6 place, I got first, and what happened was I decided, you
7 know, hey, I'm just going to make a video for the Green
8 Bank Observatory. And it was fun.
9 I took, I went and I made an animation with a
10 type of animation software I had never used before and I
11 had just a great time with it and if it wasn't for this
12 observatory, I wouldn't have had that sort of experience
13 but that doesn't have anything to do with the
14 observatory at all much.
15 Something else that happened this year,
16 actually, that I had an absolute blast with, was that
17 I'm a home-schooled kid so, you know, I'm not around a
18 bunch of other kids all the time. So there was this
19 group, I'm in this group called Leo Club which is a
20 non-profit sort of, you know, like you go to the mission
21 and you make Thanksgiving dinner and you do, you know,
22 charity stuff.
23 And we decided, Hey, let's come to the Green
24 Bank Observatory, and I'm like, okay. Let's go to the

1 Green Bank Observatory. So we came to the Green Bank
2 Observatory, whoa, and so then all of them came and just
3 had a blast. We went down to the 40-foot and learned
4 how to operate that and that was fun.
5 I mean, my sister has done this before because
6 she has all of these opportunities here. She's done the
7 40-foot telescope, Radio Astronomer for a Day, Skynet
8 Junior Scholars. She has a mentor named Dr. Richard
9 Prestage. She's doing all kinds of funky stuff with
10 him. I don't understand any of it when she explains it
11 to me, but, you know, pulsars and stuff. And so we came
12 -- where was I -- so we were talking about the Leo Club;
13 right?
14 UNIDENTIFIED SPEAKER: Yes.
15 JOSH WHITE: So we were at the Leo Club and we
16 came and we had a blast with the 40-foot. And I had
17 been there before and then suddenly, I know how to use
18 the 40-foot. Whoa, but not, I mean, I knew how to do it
19 but basically I just hit a button.
20 And so then that was a fun time. I got to
21 hang out with kids and we all played Frisbee and there's
22 a Frisbee on top of the guest house. I don't think
23 anyone has gotten it off yet. And so we just had the
24 best time and we, the next day we went through our data,

you know, all of these little pin marks, you know, and so then -- that was fun.

And I think we should have full funding. Thank you.

KRISTEN HAMILTON: Any other new speakers? It's hard to top that. Don't be shy.

EVAN SMITH: My name is Evan Smith, E-v-a-n, S-m-i-t-h. So here's my two cents.

Two years ago I was about to leave undergraduate education without a job and without acceptance to graduate school even though Astronomy was what I really wanted to do. By a stroke of luck, I ended up getting a job here at the last minute as a tour guide, right in this building. I worked in this room for about a Summer and I was really lucky. And eventually, I got in touch with Richard Prestage, a staff scientist here. He talked me up to three West Virginia University professors who do an extensive amount of work here. It's Loren Anderson, Maura McLaughlin, and D.J. Pisano, and that last guy is now my advisor at WVU.

And so I spent about 15 months here working on my radio astronomy skills and building up my resume and eventually, I got into West Virginia University, which

1 is the only graduate school I got into but good enough.
2 And so now I'm a Ph.D. student and I just
3 wanted to say I owe my career to Green Bank Observatory
4 because before GBO my life was like this, and in 15
5 months, you know, the universe is the limit, not just
6 the sky.
7 So obviously, I'm not just talking about
8 myself here. Ryan Lynch runs a very robust Summer
9 student program and I just, there's probably many other
10 kids that owe their future careers to Green Bank
11 Observatory just like me so -- that's it.
12 KRISTEN HAMILTON: Any additional new
13 speakers? About how many people are planning on
14 speaking who have not spoken, just so that I can get a
15 sense? Okay.
16 STSHIDIG AGGARWAL: Hi, everyone. It's
17 spelled S-t-s-h-i-d-i-g, A-g-g-a-r-w-a-l, a very hard
18 name. I'm a first year Ph.D student at WVU in the
19 Department of Physics and Astronomy. And I'm basically
20 from India so this is my first time at the Green Bank
21 Observatory. And I wanted to see the 100 meter dish
22 although it was dark and I wasn't able to.
23 But, yeah. I was there at a smaller
24 observatory in India, which is GMRT which is a

1 significant diameter dish, and the first time I saw it I
2 was still in my sophomore year and it was so awe
3 inspiring. I was like, oh, God, like such things exist
4 and you can do such wonders with these things.
5 And I wonder how lucky those high schoolers
6 are who can actually visit Green Bank Observatory and
7 see that kind 100-meter dish working. And then more so,
8 you can actually, on a push of a button you can actually
9 make that thing go there, make that thing (inaudible) --
10 look at pulsars or other galaxies, hydrogen and stuff
11 like that and analyze the data.
12 For a high schooler, for a person -- I was
13 from a very small town in Indian that was, that these
14 facilities were not there. But for a person who has
15 access to these resources, it's actually a really
16 valuable thing and it actually inspires a lot of people.
17 And I can understand that, to go into STEM fields, so
18 it's not going to science but actually having solving
19 skills right from the start.
20 And another important factor which I want to
21 point out here is that the radio quiet zone here in this
22 area is a very important factor which radio astronomers
23 appreciate. Because I have experience in radio
24 frequency (inaudible), so I know how noise looks in the

radio frequency data. And the radio quiet zone is like a dream come true for astronomers. There is very, very less noise in the data. And this kind of thing is not everywhere. I don't anywhere else apart from Australia in the world.

So this thing should be appreciated and I believe, and I hope NSF will continue it's full funding for the Green Bank Observatory. Thank you.

PRANAV SANGANVI: My name is Pranav Sanganvi, P-r-a-n-a-v, P as in potato.

I don't really like speaking much but this seems to be quite important. So anyway, this thing has been very informative for everyone that has spoken over here, be it the community or grad students, the staff and the staff scientists. It has been informative for all my mentors.

And it's kind of a legacy that should, I believe, continue. That -- I worked on a project over the Summer called the Research Experience for Teachers, also an NSF funded program, and high school teachers from all over West Virginia, from all over the country, had the chance to come down -- well, we have done the telescopes down at WVU and they were able to get their own scopes built from scratch and use that to observe

1 the night sky in the radio quiet zone.

2 And it's kind of an opportunity that they

3 wouldn't get otherwise because it's quite noisy in the

4 radio frequencies. And they will use whatever they

5 learned, the experience they had. They even got to use

6 the GBT itself. And these high school teachers, some of

7 them taught middle school, and they can go and share

8 this experience with hundreds of students they will be

9 teaching over all.

10 My research is mostly in instrumentation. I'm

11 an engineer. And again, the staff and the facilities

12 over here would make all of my research work possible.

13 Basically my thesis would depend on Green Bank

14 Observatory existing, and that's all I have to say about

15 that.

16 KRISTEN HAMILTON: Is there anyone else that

17 has not spoken but would like the opportunity?

18 Okay. For those who have already spoken, how

19 many of you would like to have perhaps a couple more

20 minutes, just so I can get a feel for that? We have

21 one, two, three. Anybody else?

22 UNIDENTIFIED SPEAKER: I think there's four.

23 KRISTEN HAMILTON: Is there four, four.

24 So if my colleagues can humor extending the

1 meeting by a few minutes we can perhaps allow about two
2 minutes supplement to your prior statements.
3 And I'm going in the order that I saw the
4 hands so if you can come up.
5 MICKY HOLCOMB: I'll be real quick. Again, my
6 name is Micky Holcomb, M-i-c-k-y, H-o-l-c-o-m-b.
7 I'm a Materials Physicist. In my work I've
8 had the privilege to work at a lot of different national
9 laboratories around the United States and globally,
10 Lawrence Berkeley, Argonne, NEST, for example, and it's
11 possible that those facilities might be able to boast
12 more tours to students but I highly doubt more tours per
13 person or more tours per dollar funded. And what I've
14 observed is that this place does way more than just
15 tours.
16 I've observed the tours that have been given
17 to students at other national facilities and never do
18 they get to have hands-on activities that I've heard
19 about today and that I've heard about in the past. So I
20 think that's a really amazing and unique thing that is
21 done here.
22 And I just want to state that as a professor,
23 I hope anyone who's ever tried to teach a child can
24 related to this. There is a huge difference between

1 giving a lecture and letting a person actually get their
2 hands dirty and make mistakes and learn from those
3 mistakes. So this is really a unique capability and it
4 is clear that there's a huge trickle-down effect on
5 state and globally and this impact will not be the same
6 if research were to leave. Thank you.
7 KATHRYN WILLIAMSON: I'll be fast. My name is
8 Kathryn Williamson. I used to work here. I'm of staff
9 at WVU.
10 I would like to see the educational theories
11 that are driving the alternative option B, if this is
12 just going to become an educational facility, because
13 all of the educational theories that I use in my
14 publications and in my NSF funded proposals state that
15 an authentic community of practice is necessary for the
16 highest learning gains. So I don't understand why NSF
17 would chose an option that it's own NSF educational
18 research funded initiatives show is not ideal.
19 That's all I have to say.
20 KRISTEN HAMILTON: I think we had a couple
21 more in the second row.
22 ELLIE WHITE: So my name is Ellie White,
23 again. So I'd like to just get up one more time and say
24 one other thing. Last time I talked about the research

1 and why this was a good investment for the NSF based on
2 their previous studies. But this time I'd like to talk
3 about something a little bit more specific to the
4 Environmental Impact Statement, and that's the community
5 and environmental impact, basically.
6 So I say that one of the things that has made
7 the biggest impression on me since I first came here is
8 just this overwhelming sense of community and
9 togetherness that just permeates this place. It isn't
10 just a world-class research and education facilities,
11 it's also the heart of a vibrant community that
12 exemplifies what's best about West Virginia, our ability
13 to come together for the common good.
14 This place acts as an emergency care center, a
15 gathering place for local events, and an economic
16 revenue generator that puts millions of dollars back
17 into the small economy it's compassed by every year.
18 More broadly speaking, it makes a huge impact
19 on the rest of the State and the U.S as a whole, but the
20 far-reaching unrivaled educational opportunities it
21 offers. Students across West Virginia who might
22 otherwise may not have any other exposure to real STEM
23 research and technical work are given a chance to learn
24 about science and technology through programs such as

1 Radio Astronomer for a Day, Skynet Junior Scholars,
2 Pulsar Search Collaboratory, research Inspiring the Next
3 Generation, RAU, RET, First To, and on and on and on.
4 But -- and as I sort of mentioned before, I've
5 benefited from these programs myself. I basically was
6 just here volunteering for an open house. I ran into
7 Astronomer Dr. Richard Prestage and that's led to a
8 mentorship experience that has helped me find my
9 passions along a program developing radio frequencies
10 interference visualization tools. I like to analyze
11 data and look for trends by working a project to
12 characterize GBT pointings they may result in a
13 published paper, and I've learned to think like engineer
14 from building a small loop antenna to detect solar
15 flares.
16 If I wasn't convinced before, there is no
17 question in my mind I will now be pursuing a career in
18 STEM. In a state like West Virginia, in increasing
19 number of STEM graduates, as a result of these programs,
20 will have a tremendously positive impact on the State
21 economy, not to mention giving a morale boost in the
22 face of the current opoid crisis and the dying coal
23 industry.
24 However, if the NSF reduces its Funding of the

1 Observatory, it's possible that the efficacy of these
2 fantastic program could be diminished greatly.
3 The open skies science with full NSF funding
4 ensuring it's irreplaceable for enabling students from
5 all backgrounds to expand their horizons by pursuing
6 research with the GBT. Students who can't afford to go
7 to an Ivy league or another fancy, expensive school with
8 great research capabilities can have an equal chance to
9 pursue a science or technology career if they have
10 access to an open facility like Green Bank.
11 And that's just one of the many zones from
12 where full funding from NSF is absolutely imperative to
13 the future of the observatory and the many people and
14 communities it impacts every day. So thank.
15 KRISTEN HAMILTON: Was there somebody else --
16 come on up, and then you will be next.
17 DEANA WHITE: I'm Deana White again, Mom of
18 those two, her over there.
19 So a lot of this has been covered but I just
20 want to summarize it really quickly, that open skies
21 policy allows anyone with a merit-based proposal to gain
22 observing time which means real ground-breaking
23 scientific research can be done by anyone from a student
24 at a small college to a world renowned scientist

1 studying gravational waves to a high school student with
2 a great idea, and all of those have happened here.
3 There are many small colleges. When we read
4 those letters, there are many small colleges that don't
5 have the resources or the abilities to do this and they
6 can apply for time and they can give their students
7 opportunities that aren't available anywhere else in the
8 United States.
9 The thing that we need to emphasize, I think
10 people have covered it but I'm going to say it one more
11 time, we've got to remember that while like-minded
12 partnerships are beneficial, partnership reduce the
13 amount of observing time available because they're going
14 to want time. So the many different people institutions
15 that don't have these resources to have their
16 instrumentation in their facilities or to partner up
17 with the GBO would lose out.
18 Education opportunities and diverse research
19 subjects would be reduced. Further, per the Draft
20 report, the Section 106 Historic Assessment, that's
21 concurrently being conducted as we discussed, the
22 adverse impacts that have been identified for the
23 collaboration operation option includes removal of some
24 of the historical structures identified as part of the

1 GBO district, and that's potential, that it's any time
2 there's a potential, that's a problem.
3 It's imperative to the historic preservation
4 of the Green Bank Observatory, the United States birth
5 place of the National Radio Astronomy Observatory in
6 response to the space race with Russia and with a rich
7 history in world-leading research results that are
8 on-going today that the NSF provide full funding to
9 continue to operate this facility.
10 Additionally, reduced funding could impact
11 staffing levels. I know it says that Option A, that
12 reducing funding would not impact staffing levels, but
13 if we start partnering with potential NSA or other
14 agencies, the staff would reduce. I mean, it's a fact.
15 It would reduce and if the staff reduces, the economics
16 in this area go down, youth leadership, local education,
17 emergency response, support of the Arts, on and on, that
18 could be impacted.
19 So it's very important that we strongly
20 consider, doing we need partners other than the ones
21 we've already established, and if so, who they are. And
22 I think specifically that people have mentioned before
23 about partnerships needs to be addressed.
24 So that's all I have. Thank you.

JASON BAUSERMAN: Just two real quick comments. One is, well, just a month ago, I had my 50th college reunion at Bridgewater College in Bridgewater, Virginia, and I met one fellow and he found out that I lived close to Green Bank, and he said, Gee, yeah, 50 years ago he came over here to the observatory and he was a Physics major and I think all Physics majors came over here.

But when I found out what he did, he lives in Nebraska now, he came up with a drill core that drills into the polar ice caps and it was two miles deep that he could go with that drill and come up with really, the history of the earth in the polar ice caps. You know, you can CO2 in those and volcanic ash, it's just amazing, that gee, he kind of started out here in a way.

The other amazing thing is and what I'm so excited about, so many young people here and your excitement and enthusiasm is just great. I mean, my faith in young people has increased. I've been down here a couple of Summers walking around. To me, it's just like a of the college campus down here. It's just a lot of excitement and enthusiasm and that is just great to see. I'd hate to see that go.

KRISTEN HAMILTON: Thank you for speaking,

1 Mr. Bauserman. It's been very inspirational hearing our
2 students speaking.
3 At this point, we don't want to over-stay our
4 welcome with our very generous hosts, so I'd like to say
5 I believe this is was a very successful public meeting
6 because of the thought that you put into your comments.
7 So thank you, very much.
8 We got through over 42 speakers in less than
9 three hours which is phenomenal and you gave us a lot to
10 consider. Please do consider submitting, if you have
11 any additional thoughts that you didn't get to speak
12 about today, please so send us your written comments via
13 email or mail. I also just wanted to put up a point of
14 contact. My colleague, Elizabeth Pentecosta, if you
15 have questions about the process, she can answer them or
16 connect you with the right person to answer your
17 questions, and all the information, all the documents
18 are available on our Website.
19 At this point, I would like bring Dr. Ajhar up
20 for closing remarks.
21 DR. EDWARD AJHAR: Thanks, Kristen, and I just
22 want to express my thanks to the whole public here that
23 was here today and those who have left.
24 These comments are very valuable to us. We --

1 as you know, this is the Draft Environmental Impact
2 Statement so all of these comments are really valuable
3 and you have, just what Kristen said, too, you know,
4 they were very important , they are very important for
5 us. It's very important for us to get the correct, the
6 facts corrected, and where there are deficiencies in the
7 documents, to replace that with things that are
8 appropriately addressed so when that when NSF is in a
9 position to make a decision, we have the right
10 information in this document.
11 So I appreciate, again, your participation.
12 And I especially want to thank the staff here at Green
13 Bank, Karen and Mine and anybody else who have supported
14 us in everything in putting all of this together and
15 helping the public and keeping everything going very
16 smoothly. It is a cooperative effort.
17 We don't operate this observatory under a
18 Federal contract. It's a cooperative agreement and
19 that's something that NSF invented and it is something
20 that we hold very dearly and that's how we make science
21 happen at our facilities. So, again, thank you to the
22 staff. We really appreciate your support, and thank you
23 to the public for being very helpful in making comments
24 and staying within the time limits so everyone has time.

1 And this is not it for comments. Right.
2 We're open until January, through January 8th and you
3 can submit comments through our procedures we've
4 outlined multiple times.
5 So thank you, very much again and we
6 appreciate you excellent cooperation.
7 (Hearing concluded at 8:42 p.m.)
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1 CERTIFICATE OF NOTARY

2 I, Kristina Guthrie, the officer before whom the
3 foregoing hearing was taken, do hereby certify that the
4 hearing was taken by me stenographically and thereafter
5 reduced to typewriting by me; and that said hearing is a
6 true record of the proceedings given at said hearing;
7 that I am neither counsel for, related to, or employed
8 by any of the parties to the action in which this
9 hearing was taken and further that I am not a relative
10 or employee of any attorney or counsel or employed by
11 the parties thereto, nor financially or otherwise
12 interested in the outcome of this action.
13
14
15
16 _____
17
18 Kristina Guthrie
19
20 Notary Public, State of West Virginia
21
22 My Commission expires November 8th, 2020
23
24