



CONSIDERING A POTENTIAL NSF INVESTMENT IN A NORTHERN HEMISPHERE EXTREMELY LARGE TELESCOPE

Note that these Frequently Asked Questions are posted at beta.nsf.gov/tmt and will be updated as needed throughout the environmental review process.

Q1. What is the purpose of the National Science Foundation's (NSF's) scoping meetings, scheduled for August 9-12, 2022, on the Island of Hawai'i?

- A. The scoping process is conducted as the first step in NSF's formal environmental review process to solicit public comments and identify issues that will be analyzed in an Environmental Impact Statement (EIS). NSF welcomes public comments on potential alternatives, information, and analyses relevant to the environmental review. The comments received during these meetings will play a key role in (1) determining the list of alternatives to ultimately be evaluated in the Draft Environmental Impact Statement (DEIS); (2) informing the scope of the analysis, including any necessary studies and significant issues to be evaluated in the DEIS; and (3) determining appropriate ways to engage the community in a meaningful and effective manner during NSF's environmental review.

Q2. How many Extremely Large Telescope (ELT) projects exist?

- A. Only three such projects are under some level of development in the world: the European-ELT (E-ELT), the Giant Magellan Telescope (GMT), and Thirty Meter Telescope (TMT). Of those, only two are currently undertaking on-site construction activities, E-ELT and GMT, both in Chile, in the Southern Hemisphere. TMT is the only ELT project currently proposed to be built in the Northern Hemisphere.

Q3. How will NSF decide whether to fund construction and operations of TMT?

- A. Any consideration of NSF funding for construction and operations of TMT would be dependent upon several factors, including the results of a comprehensive environmental review with public input, the completion of NSF's major facilities review process (which evaluates technical readiness, financial viability, and project management capabilities), consideration of other NSF priorities, the availability of funds, and other factors.

Q4. Why are you only doing an EIS on TMT and not GMT?

- A. The proposed action that NSF is currently considering is a potential future investment in an ELT in the Northern Hemisphere. GMT is a separate project that will be located in the Southern Hemisphere outside of the United States and is not, therefore, subject to the requirements of the National Environmental Policy Act (the federal statute that requires agencies to prepare an EIS for projects anticipated to result in major environmental impacts).

Q5. Why would NSF consider contributing federal funding to the construction of TMT, which already has significant private funding?

- A. While TMT has significant non-federal funding available, without NSF's participation, science priorities and access to the telescope would be restricted to the private institutional partners. NSF's participation would provide for a public-private partnership that would allow the broader U.S. community to gain access to and shape the science goals of a US-ELT program.

Q6. Does undertaking this environmental process mean that NSF intends to fund construction of TMT on Maunakea?

- A. It is important to note that **no decision regarding whether NSF will contribute funding to TMT's construction and operations has been made**; any decision to fund TMT would be preceded by a thorough environmental review with public input, the completion of NSF's major facilities review process (which evaluates technical readiness, financial viability, and project management capabilities), consideration of other NSF priorities, the availability of funds, and other factors. In addition, a decision not to further consider the potential funding of TMT could be made at any time, even before the environmental review is completed. Also, while the Thirty Meter Telescope International Observatory has declared a preferred site for TMT on Maunakea, NSF has not identified a preferred Action Alternative, which means that NSF has not identified that building TMT on Maunakea is its preferred Action Alternative.

Q7. Hasn't there already been an environmental review of TMT?

- A. In 2010, the University of Hawaii Hilo (UH) in its capacity as the proposing agency, prepared an Environmental Impact Statement under the Hawaii Environmental Policy Act for the proposed issuance (by the Board of Land and Natural Resources) of a Conservation District Use Permit and approval of a sublease.

While NSF does not have jurisdiction over use of land on Maunakea, it has a legal obligation to prepare an Environmental Impact Statement (EIS) under the National Environmental Policy Act because it is considering a potential future investment of taxpayer dollars for the construction and operations of TMT, which could result in major impacts.

Q8. What happens after the EIS process is completed?

- A. Following completion of an EIS and all other environmental compliance requirements, NSF will consider all relevant factors (including scientific merit, broader impacts, project readiness, potential environmental impacts, availability of funding, NSF priorities, the results of NSF's major facilities review process, etc.) before issuing a Record of Decision (NSF's final funding decision).

Q9. Why do we need to build TMT when we now have the James Webb Space Telescope (Webb or JWST)? Won't JWST search for signatures of life around other stars?

- A. While the James Webb Space Telescope (JWST) will have some capability to search for signatures of life (atmospheric biosignatures), this capability will be very limited. JWST was not specifically designed to search for these atmospheric biosignatures, which are very weak compared to the light of its host star. Therefore, its search will be limited to a few of the brightest nearby star systems mostly with giant (Jupiter-size) planets. TMT will have more than 14 times the light-collecting area of JWST; the more light a telescope can collect, the smaller, dimmer and more distant objects it can study. TMT with its thirty-meter (98-foot) diameter mirror will, therefore, be able to directly image and characterize the weak signals from the atmospheres of rocky Earth-sized planets that lie in the “habitable” zones of their host stars. It is these planets that have the greatest chance of harboring signatures of life, which are only within reach of the capabilities of Extremely Large Telescopes like TMT.

Q10. During your Informal Outreach Effort, you were told that there is fierce opposition to the construction and operations of TMT on Maunakea. Knowing that, how can you even consider investing in TMT?

- A. Importantly, conducting an environmental review is not a decision to invest in TMT. While it is an important step in the decision-making process, it does not mean that a decision to fund TMT has been made. NSF's environmental review will be a comprehensive process that will take approximately two years to complete. During our Informal Outreach Effort, we learned that there are very strong views on all sides of the issue of whether TMT should be built. This is why receiving public comments now, through NSF's formal environmental review, is so important. Only comments received during this process will be considered during NSF's decision-making process.

Q11. The Maunakea Stewardship and Oversight Authority was just established, but no members have yet been appointed. How can you study your Action Alternative 2 (which includes the development of a plan to define and practice responsible astronomy in Hawaii in partnership with the Mauna Kea Stewardship and Oversight Authority, the Maunakea Observatories, and the affected Hawaiian community) until the new Authority is up and running?

- A. NSF recognizes that any plan that is developed would need to be cognizant of the Authority's role as the exclusive entity with jurisdiction to manage the resources of Maunakea. Although it would be preferable to have the Authority members appointed and able to participate in the upcoming workshop focused on the development of the components of this plan, efforts can go forward even though the members are not yet in place. Following the scoping phase of NSF's environmental review process and the workshop, Action Alternative 2 could be revised, with appropriate deference given to the new Authority's role.

Q12. How does NSF's environmental review process interface with the Maunakea Stewardship and Oversight Authority's role?

- A. NSF's environmental review process is being conducted under federal environmental laws that require NSF to consider anticipated environmental and cultural impacts of a potential future investment in the construction and operations of TMT as part of its decision-making process. NSF's ultimate decision will be whether to invest in TMT's construction and operations. In contrast, the new Maunakea Stewardship and Oversight Authority is responsible for managing the resources of Maunakea. This will include issuing leases to allow the operation of astronomy facilities. NSF's role is different from that of the Authority, however, NSF looks forward to working together with the Authority during this environmental review within the context of each entity's role.

Q13. What is the timeline for NSF's environmental review following the Notice of Intent?

- A. A federal environmental review for TMT is anticipated to take approximately 24 months (see Figure 1 for a timeline).
- Scoping period will occur from July 19, 2022 through September 17, 2022
 - A draft plan for any needed resource studies/analyses will be posted to the NSF webpage for additional public comment in Fall/Winter 2022
 - NSF will finalize the Draft CEP based on public input (target late 2022) and implement the measures identified therein throughout the remainder of NSF's environmental review process
 - NSF will host a workshop to help inform Alternative 2 and the Section 106 process in late 2022/early 2023
 - Section 106 consulting parties will meet to refine the Area of Potential Effects and identify historic properties during late 2022/early 2023
 - NSF will conduct any necessary studies and analyses and prepare the Draft EIS between Winter 2022 and Spring/Summer 2023
 - The Draft EIS and accompanying public comment period, including public meetings, are anticipated in the late Spring/early Summer 2023; NSF anticipates that it will continue to meet with consulting parties, pursuant to Section 106, to identify and resolve adverse effects throughout 2023 and continuing until Spring/Summer 2024
 - Final EIS is anticipated in Spring/Summer 2024
 - Record of Decision is anticipated in Fall 2024

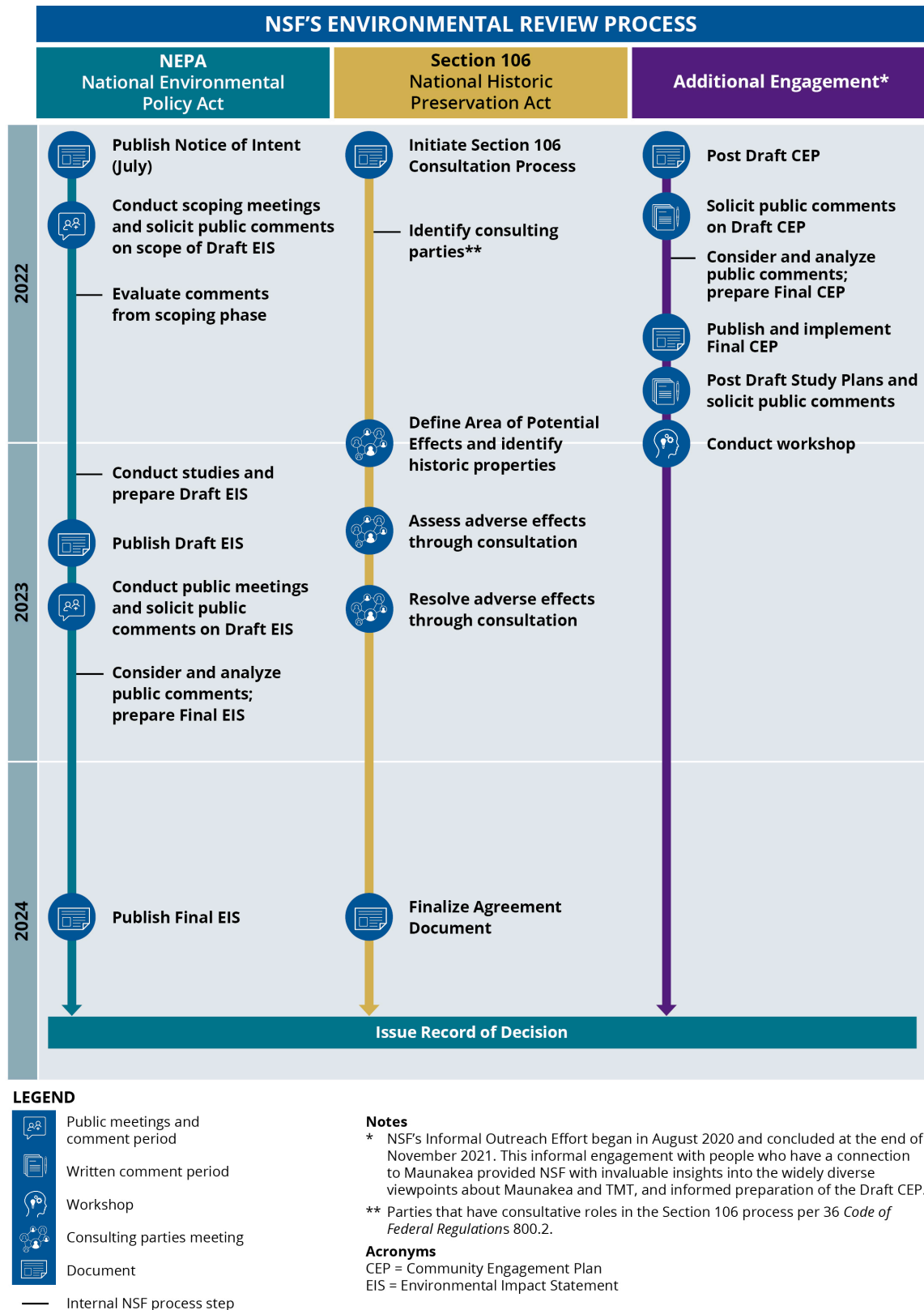


Figure 1. NSF's environmental review process as described in the Draft Community Engagement Plan