

The Clean Energy Dilemma: How the Push for Clean Energy Could Threaten Indigenous Communities and an Exploration of Potential Alternatives

Laura Berglan,* Blaine Miller-McFeeley,**
and Andrea Folds***

*Earthjustice*****

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*Senior Attorney, Tribal Partnerships Program, Earthjustice; J.D. 2001, Lewis and Clark Law School.

**Senior Legislative Representative, Earthjustice; B.A. Political Science and Theater 2008, Muhlenberg College. He has worked on federal hardrock mining policy with Congress and the Executive Branch. This author would like to thank his professional and personal colleagues and family for their support, including Suzy Miller-McFeeley.

***Attorney and Professor of Law Vermont Law School; J.D. 2018, Vermont Law School.

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INTRODUCTION

The Biden Administration's efforts to combat climate change by moving toward clean energy are poised to have an outsized impact on Indigenous communities if critical minerals slated for clean energy projects

are obtained through new mining. This is because much of the untapped supply of these minerals is located near tribal land. The nation's transition to clean energy, including increased production and use of solar photovoltaic plants, electric vehicles ("EV"), and wind farms, requires a greater use of certain minerals. Critical minerals include copper, manganese, lithium, nickel, graphite, and rare earth elements. An electric car, for example, requires six times the mineral inputs of an internal combustion engine.¹ Batteries used in EVs and energy storage require lithium, cobalt, manganese, and graphite.² An onshore wind plant requires nine times more mineral resources than a fossil fuel plant.³ As the share of renewables in power generation has increased, the average amount of minerals needed for a unit of generation has increased fifty percent since 2010.⁴ The electrification of the grid will require large amounts of copper and aluminum.⁵ Put simply, the mineral requirements of a system powered by clean energy are different than one powered by fossil fuels. As the United States and the world seek to move away from fossil fuels, demand for these critical minerals is set to soar—both domestically and internationally. Some projections indicate that the energy sector's needs for critical minerals could increase as much as six times by 2040.⁶ While the Biden Administration's clean energy goals are important, the potential adverse impacts on Indigenous communities should be at the forefront of energy conversations, and alternatives to new mining should be fully explored.

In this essay, we will provide an overview of the White House's clean energy goals that may impact domestic mineral production, review some clean energy projects already impacting Indigenous communities, suggest several solutions that would avoid or minimize the impacts of increased demand for critical minerals on Indigenous communities, and examine the threat of deep seabed mining.

I. THE WHITE HOUSE'S CLEAN ENERGY GOALS INCLUDE EXPANSION OF DOMESTIC MINERAL

¹ TAE-YOON KIM, ET AL., INT'L ENERGY AGENCY, THE ROLE OF CRITICAL MINERALS IN CLEAN ENERGY TRANSITIONS 5 (2002), <https://www.iea.org/reports/the-role-of-critical-minerals-in-clean-energy-transitions>.

² *Id.*

³ *Id.*

⁴ *Id.*

⁵ *Id.*

⁶ *Id.* at 8.

PRODUCTION

In 2017, President Trump issued an Executive Order expanding production of domestic critical minerals in order to reduce the U.S.' vulnerability to supply disruptions.⁷ A critical mineral is identified as: "(i) a non-fuel mineral or mineral material essential to the economic and national security of the United States, (ii) the supply chain of which is vulnerable to disruption, and (iii) that serves an essential function in the manufacturing of a product, the absence of which would have significant consequences for our economy and our national security."⁸ The order came on the heels of a report from the United States Geological Survey ("USGS") assessing the state of critical minerals and concluding that twenty out of the twenty-three critical minerals the nation relies on come from foreign sources.⁹ The United States has untapped deposits of these critical minerals that the order focuses on exploring and extracting through mining.

The initial U.S. Critical Mineral List was published in 2018 in the Federal Register in response to Executive Order No. 13,817 and contained thirty-five minerals.¹⁰ The list identifies non-fuel mineral commodities that are "critical" to the U.S. economy with the greatest supply risk.¹¹ These minerals include lithium, cobalt, and nickel—key minerals for the batteries used in EVs; gallium, germanium, indium, and tellurium—key minerals used to produce solar panels; and rare earth elements used in wind energy for permanent magnets.¹²

The Director of the USGS is required to review the Critical Mineral List every three years.¹³ The 2021 U.S. Critical Mineral List is currently out for comment and seeks to rectify several deficiencies of the 2018 list.¹⁴ Some of the primary differences between the 2018 and 2021 lists include the removal of uranium, the addition of nickel, and the splitting of the rare earth elements and platinum group elements into individual entries.¹⁵ In

⁷ Exec. Order No. 13,817, 82 Fed. Reg. 60,835 (Dec. 20, 2017).

⁸ *Id.*

⁹ CRITICAL MINERAL RESOURCES OF THE UNITED STATES—ECONOMIC AND ENVIRONMENTAL GEOLOGY AND PROSPECTS FOR FUTURE SUPPLY at iii, iv (Klaus J. Schulz et al., eds., 2017), https://pubs.usgs.gov/pp/1802/pp1802_entirebook.pdf.

¹⁰ Final List of Critical Minerals 2018, 83 Fed. Reg. 23,295 (May 18, 2018).

¹¹ *Id.*

¹² *Id.*

¹³ Consolidated Appropriations Act of 2021, Pub. L. No. 116-260, § 7001, 134 Stat. 1182, 2565 (2020).

¹⁴ 2021 Draft List of Critical Minerals, 86 Fed. Reg. 62,199, 62,199–62,200 (Nov. 9, 2021).

¹⁵ *Id.* at 62,200.

addition to the listed critical minerals, copper and silver will be important minerals in the clean energy transition since copper is used in many technologies due to its high electrical conductivity and silver is used in solar panels.¹⁶

The Biden Administration has set a target aimed at a fifty to fifty-two percent reduction in U.S. greenhouse gas pollution from 2005 levels by 2030.¹⁷ Biden also campaigned on a goal of a carbon pollution-free power sector by 2035 and a net zero emissions economy by 2050.¹⁸ Carbon-free power sources compose about 39.5 percent of the current generation.¹⁹ Two key areas that need to be addressed in order to achieve these ambitious goals are power generation and transportation—with specific attention on the transition to electrification and increasing the use of renewables. These goals require the use of mineral resources. EVs require four times as much copper as conventional gas vehicles.²⁰ One report estimates that the demand for copper may increase as much as 350 percent by 2050²¹ and that demand for lithium could increase forty-fold by 2040.²²

As discussed in more detail below, many of the domestic untapped mineral deposits are located near or within areas of cultural importance to Indigenous communities.²³ For example, ninety-seven percent of nickel, seventy-nine percent of lithium, sixty-eight percent of cobalt, and eighty-

¹⁶ Evan Harp, *Gold, Silver, and Copper Could Be Vessels for Green Energy*, ETF TRENDS (Sept. 14, 2021), <https://www.etftrends.com/gold-silver-investing-channel/gold-silver-and-copper-could-be-vessels-for-green-energy/>.

¹⁷ *FACT SHEET: President Biden Sets 2030 Greenhouse Gas Pollution Reduction Target Aimed at Creating Good-Paying Union Jobs and Securing U.S. Leadership on Clean Energy Technologies*, THE WHITE HOUSE (Apr. 22, 2021), <https://www.whitehouse.gov/briefing-room/statements-releases/2021/04/22/fact-sheet-president-biden-sets-2030-greenhouse-gas-pollution-reduction-target-aimed-at-creating-good-paying-union-jobs-and-securing-u-s-leadership-on-clean-energy-technologies/>.

¹⁸ *The Biden Plan Build a Modern, Sustainable Infrastructure and an Equitable Clean Energy Future*, PRESIDENT JOE BIDEN, <https://joebiden.com/clean-energy/> (last visited Nov. 30, 2021).

¹⁹ *Frequently Asked Questions: What is U.S. electricity generation by energy source?*, U.S. ENERGY INFO. ADMIN., <https://www.eia.gov/tools/faqs/faq.php?id=427&t=3> (last visited Nov. 30, 2021).

²⁰ COPPER DEV. ASS'N, INC., *COPPER DRIVES ELECTRIC VEHICLES*, https://www.copper.org/publications/pub_list/pdf/A6191-ElectricVehicles-Factsheet.pdf (last visited Dec. 17, 2021).

²¹ Ayman Elshkaki et al., *Copper demand, supply, and associated energy use to 2050*, 39 *GLOBAL ENV'T CHANGE* 305, 305 (2016).

²² KIM, ET AL., *supra* note 1, at 50.

²³ Samuel Block, *Mining Energy-Transition Metals: National Aims, Local Conflicts*, MSCI BLOG (June 3, 2021), <https://www.msci.com/www/blog-posts/mining-energy-transition-metals/02531033947>.

nine percent of copper deposits are located within thirty-five miles of Native American Reservations.²⁴ It is important to note that most of these mineral reserves are not actually located on reservation or trust lands, which would provide tribes with more control over mining activities. They are instead located within ancestral lands, where tribes once lived and still have cultural resources, but now have limited control due to current day ownership by the federal or state government or private parties.²⁵ Manganese, copper, nickel, and cobalt lie at the bottom of the ocean and this mineral extraction by deep seabed mining threatens Indigenous Peoples of the Pacific Islands.

As the nation makes its transition to clean energy, we have the opportunity to do what the fossil fuel industry never did—to set out from the beginning to better protect the communities and environments impacted by energy development. It is imperative that we avoid disproportionately impacting Indigenous communities by providing sufficient environmental, health, and cultural resource protections for critical mineral mining operations, and by creating a more sustainable supply chain for the products we use for our clean energy transition.

II. CLEAN ENERGY PROJECTS ARE ALREADY THREATENING INDIGENOUS COMMUNITIES

The demand for minerals has historically had, and is currently having, a disproportionate impact on Indigenous communities. Below are just a few examples of current projects that, if approved, would adversely impact Traditional Cultural Properties or Landscapes²⁶ and other sites that are important to Indigenous communities.

²⁴ *Id.*

²⁵ See generally *USGS Mineral Resources Online Spatial Data*, U.S. GEOLOGICAL SURV., <https://mrdata.usgs.gov/> (last visited Jan. 20, 2022).

²⁶ A traditional cultural property is eligible for inclusion on the National Register of Historic Places due to its association with cultural practices or beliefs of a living community. See NAT'L PARK SERV., U.S. DEP'T OF INTERIOR, NAT'L REG. BULL. 38, GUIDELINES FOR EVALUATING AND DOCUMENTING TRADITIONAL CULTURAL PROPERTIES (1990). A traditional cultural landscape is an area associated with a historic event, activity, or person, or other cultural or aesthetic values. The concept includes the resources located within the area, including animals. *Cultural Landscapes 101*, NAT'L PARK SERV., <https://www.nps.gov/articles/cultural-landscapes-101.htm> (last visited Jan. 3, 2022).

A. Big Sandy Lithium Project

The Bureau of Land Management (“BLM”) issued an Environmental Assessment in 2021 for the Big Sandy, Inc., Sandy Valley Exploration Project.²⁷ This is a plan for lithium and poly-mineral exploration by Hawkstone Mining Limited.²⁸ Following the exploration phase, Hawkstone plans to construct an open-pit mine and dig an underground slurry to pipe the ore fifty miles to a plant in Kingman, Arizona.²⁹ This project is proposed to occur in northwestern Arizona on BLM land that surrounds the Hualapai Tribe’s land on three sides, including Ha’Kamwe (Cofer Hot Springs), a medicinal spring sacred to the Hualapai. Ha’Kamwe is part of a larger cultural landscape that constitutes the Salt Song Trail.³⁰ The songs ritually guide a departed person along the trail to a specified physical or spiritual place.³¹ These songs continue to be used today by the Hualapai Tribe and neighboring tribes.³²

At publication, this project has not yet been approved by the BLM and the Hualapai Tribe continues to voice its opposition.

B. Resolution Copper Project

The Resolution Copper Project is a proposed copper mine near Superior, Arizona. If approved, it would be one of the largest copper mines in the United States, producing forty billion pounds of copper over the life of the project.³³ The proposed project would employ panel caving, a form of underground mining that causes the ground above to subside.³⁴ This could

²⁷ BUREAU OF LAND MGMT., DOI-BLM-AZ-C010-2021-0029-EA, ENVIRONMENTAL ASSESSMENT BIG SANDY INC. SANDY VALLEY EXPLORATION PROJECT (PHASE 3) (Mar. 2021), https://eplanning.blm.gov/public_projects/2012598/200480507/20037319/250043516/Big%20Sandy%20EA%203-30-21.pdf.

²⁸ *Big Sandy Lithium Project*, ARIZ. LITHIUM, <https://www.arizonalithium.com/big-sandy-lithium-project/> (last visited Jan. 3, 2022).

²⁹ Maya L. Kapoor, *Mining for lithium, at a cost to Indigenous religions*, HIGH COUNTRY NEWS (June 9, 2021), <https://www.hcn.org/issues/53.7/indigenous-affairs-mining-for-lithium-at-a-cost-to-indigenous-religions>.

³⁰ *Id.*

³¹ Ruth A. Musser-Lopez & Steve Miller, *Archaeological Trails and Ethnographic Trails: Can They Meet?*, 24 SCA PROCEEDINGS 1, 2 (2010), <https://scahome.org/publications/proceedings/Proceedings.24Musser-Lopez1.pdf>

³² *See id.* at 1.

³³ U.S. DEP’T OF AGRIC., MB-R3-12-10, FINAL ENVIRONMENTAL IMPACT STATEMENT RESOLUTION COPPER PROJECT AND LAND EXCHANGE 3 (Jan. 15, 2021), <https://www.resolutionmineeis.us/documents/final-eis>.

³⁴ *Id.* at 23.

lead to a subsidence crater expanding up to 1,115 feet deep and roughly 1.8 miles wide.³⁵ It would destroy an area sacred to the San Carlos Apache Tribe called Chich'il Bildagoteel (or Oak Flats), which is listed on the National Register of Historic Places as a Traditional Cultural Property.³⁶ This area is important for Apache ceremonies and resource gathering. A portion of the project area was subject to a land exchange approved in 2014 that would allow the project to move forward pending completion of an Environmental Impact Statement ("EIS"), which was issued in 2021.

The San Carlos Apache Tribe, along with an Indigenous group called Apache Stronghold and other conservation groups, all subsequently filed separate suits.³⁷ The EIS was then withdrawn,³⁸ in part to allow the Forest Service time to understand tribal concerns surrounding the project. Tribal consultation has been renewed and all litigation is stayed pending reissuance of the EIS.³⁹

C. Rosemont Copper Project

Rosemont Copper proposes to develop the third largest open pit mine in the United States.⁴⁰ The mine would be in the Santa Rita Mountains in Southern Arizona on a combination of private and National Forest System lands.⁴¹ The Rosemont mine is expected to produce an estimated 5.88 billion pounds of copper (approximately eleven percent of U.S. copper production).⁴² The proposed operation entails dumping 1.9 billion tons of toxic mining waste on public lands, thus burying over 3,500 acres of National Forest System lands that contain dozens of prehistoric cultural

³⁵ *Id.*

³⁶ National Register of Historic Places, Notification of Pending Nominations & Related Actions, 81 Fed. Reg. 3469 (Jan. 21, 2016).

³⁷ San Carlos Apache Tribe v. U.S. Forest Serv., No. 2:21-cv-68 (D. Ariz. filed Jan. 14, 2021); Apache Stronghold v. United States, 519 F. Supp. 3d 591, 596 (D. Ariz. 2021); Ariz. Mining Reform Coal. v. U.S. Forest Serv., No. 2:21-cv-122 (D. Ariz. Filed Jan. 22, 2021).

³⁸ Environmental Impact Statements, Notice of Availability, 86 Fed. Reg. 12,942, 12,943 (Mar. 5, 2021).

³⁹ *USFS Rescinds EIS for Resolution Copper Project*, ENG'G & MINING J. (Mar. 2, 2021), <https://www.e-mj.com/breaking-news/us-forest-service-rescinds-environmental-impact-statement-for-resolution-copper-project/>.

⁴⁰ *Rosemont Copper Project, Arizona*, NS ENERGY, <https://www.nsenergybusiness.com/projects/rosemont-copper-project-arizona/> (last visited Jan. 3, 2022).

⁴¹ U.S. FOREST SERV., RECORD OF DECISION ROSEMONT COPPER PROJECT AND AMENDMENT OF THE CORONADO LAND AND RESOURCE MANAGEMENT PLAN 3-4 (June 2017), <https://www.rosemonteis.us/files/final-eis/rosemont-feis-final-rod.pdf>.

⁴² *Id.* at 4.

resource sites.⁴³ The project threatens the ancestral lands of the Tohono O’odham Nation, Hopi Tribe, and Pascua Yaqui Tribe, among others. The area is known as Ce:wi Duag by the Tohono O’odham Nation, who have stated that the mine will disinter ancestral remains, obliterate archaeological and cultural sites, and permanently scar the Santa Rita Mountains, a Traditional Cultural Landscape.⁴⁴

In 2018, the Tohono O’odham Nation, Hopi Tribe, Pascua Yaqui Tribe, and conservation groups sued the United States Forest Service (“USFS”) over their approval of the Rosemont Copper Project. The Tribes were successful in the District Court. The USFS and Rosemont appealed the decision, which is currently pending in the Ninth Circuit Court of Appeals.⁴⁵

D. Thacker Pass

Thacker Pass, located in northwestern Nevada, contains one of the largest domestic lithium reserves.⁴⁶ In 2021, the BLM approved the Thacker Pass Lithium Project, which is a 1,000-acre project near the Fort McDermitt-Paiute Shoshone Tribes of the Fort McDermitt Reservation.⁴⁷ Lithium Americas plans to mine the area over forty-six years and expects to generate up to 60,000 tons of lithium carbonate a year—roughly a fifth of global lithium production in 2020.⁴⁸ The site is known as Peehee mu’huh in honor of the ancestors that were massacred there in 1865 and is significant to the Fort McDermitt-Paiute Shoshone Tribes, Reno-Sparks Indian Colony, Burns Paiute Tribe, and Pyramid Lake Paiute Tribe, among others.⁴⁹

⁴³ *Id.* at 31.

⁴⁴ Complaint at 3–4, Tohono O’odham Nation et al. v. U.S. Forest Serv. et al. (2018) (No. 1), *consol. sub nom* Ctr. for Biological Diversity v. U.S. Fish & Wildlife Serv., 409 F. Supp. 3d 738 (D. Ariz. 2019).

⁴⁵ Ctr. for Biological Diversity v. U.S. Fish & Wildlife Serv., 409 F. Supp. 3d 738 (D. Ariz. 2019), *appeal docketed*, No. 19-17585 (9th Cir. Dec. 27, 2019).

⁴⁶ *Thacker Pass*, LITHIUM AMERICAS, <https://www.lithiumamericas.com/thacker-pass/> (last visited Nov. 30, 2021).

⁴⁷ *Humboldt River Field Office Issues a Record of Decision for the Thacker Pass Lithium Mine*, BUREAU OF LAND MGMT. (Jan. 15, 2021), <https://www.blm.gov/press-release/humboldt-river-field-office-issues-record-decision-thacker-pass-lithium-mine>.

⁴⁸ *Thacker Pass*, *supra* note 46.

⁴⁹ Paul Feather, *Finding Ourselves at Peehee Mu’huh: An Interview with Daranda Hinkey*, COUNTERPUNCH (June 4, 2021) <https://www.counterpunch.org/2021/06/04/finding-ourselves-at-peehee-muhuh-an-interview-with-daranda-hinkey/>.

The Reno Sparks Indian Colony, People of Red Mountain, and the Burns Paiute Tribe successfully intervened in federal court litigation challenging the BLM's approval of the mine.⁵⁰ Briefing on the merits will begin in early 2022, and the federal judge intends to rule on the merits before construction would begin in 2022.

III. MITIGATING IMPACTS OF INCREASING MINERAL DEMANDS ON INDIGENOUS COMMUNITIES

The federal government and other project decision makers must first begin to consider Indigenous communities early on in project development. The United States has an opportunity to turn over a new leaf with its transition to clean energy by respecting the rights of Indigenous communities impacted by proposed resource extraction projects. In the context of critical minerals, the federal government should first ensure that the increased demand truly necessitates new mining activities. Alternatives to new mining should be considered and are set out below in Section IV.

Next, federal agencies must incorporate the principle of Free, Prior and Informed Consent ("FPIC") of impacted Indigenous communities into their tribal consultation policies. FPIC should be required for every proposed project.⁵¹ FPIC is recognized in the United Nations Declaration on the Rights of Indigenous Peoples.⁵² Although the United States is not a signatory to the United Nations Declaration on the Rights of Indigenous Peoples, President Obama endorsed it in 2010.⁵³ Various organizations have urged the United States' adoption, including the National Congress of American Indians.⁵⁴ Too often, tribal consultation is viewed as a

⁵⁰ *W. Watersheds Project et al. v. Bureau of Land Mgmt. et al.*, No. 3:21-cv-00103-MMD-CLB, 2021 WL 3193173, at *5 (D. Nev. July 28, 2021) (order granting motion to intervene).

⁵¹ See Food & Agric. Org. of the U.N. [FAO], *Free, Prior and Informed Consent Manual* (2016), <https://www.fao.org/3/i6190e/i6190e.pdf>.

⁵² U.N. GAOR 61st Sess., 107th plen. mtg., U.N. Doc. A/RES/61/295 U.N. Declaration on the Rights of Indigenous Peoples (Sept. 13, 2007).

⁵³ Barack Obama, President, U.S., Remarks by the President at the White House Tribal Nations Conference (Dec. 16, 2010), <https://obamawhitehouse.archives.gov/the-press-office/2010/12/16/remarks-president-white-house-tribal-nations-conference%20>.

⁵⁴ The Nat'l Cong. of Am. Indians, Res. #MKE-17-049, Acknowledging the 10th Anniversary of the Passage of the UN Declaration on the Rights of Indigenous Peoples, (2017).

“check-the-box” exercise without a meaningful exchange of information. The implementation of FPIC would reduce conflict and protracted litigation. The use of FPIC would also symbolize a new era for the clean energy transition—one that rebukes the legacies of fossil fuel development that have historically targeted Indigenous communities for exploitation. Consent of the impacted Indigenous community should be required before any project can proceed.

Third, agencies reviewing new mining applications should be receptive to employing Traditional Ecological Knowledge (“TEK”) throughout these projects. TEK is a deep understanding and knowledge of a place discerned by living in it for generations.⁵⁵ Incorporating TEK requires a collaborative process that respects Indigenous experiences with the ecosystem and allows diverse populations to continually learn from one another.⁵⁶ With on-site knowledge of the local environment, Indigenous communities are the most directly involved with conservation and sustainable use of resources. This knowledge can help reduce any impacts of projects that develop.

IV. ALTERNATIVES TO NEW MINING SHOULD BE PRIORITIZED

As the nation attempts to transition to a clean energy economy, it is not a foregone conclusion that we must incur unintended consequences and new sacrificial zones. We assert that there are three clear solutions that can successfully move us towards decarbonization in a sustainable manner that will promote environmental stewardship and respect human rights: a circular economy, updated mining laws and regulations, and adoption of high importing standards.

First, the United States should boost the circular economy by recycling, reusing, and extending the life of current materials and products. By prioritizing the circular economy, the overall need to extract new raw materials is drastically reduced. Second, national mining laws and certain regulations of the BLM and USFS must be updated so that when mining does occur, it is sustainable and happens only in the lowest-risk areas. Policy and law must be updated and reformed in a comprehensive, conscientious,

⁵⁵ U.S. FISH & WILDLIFE SERV., TRADITIONAL ECOLOGICAL KNOWLEDGE FOR APPLICATION BY SERVICE SCIENTISTS 1 (Feb. 2011), <https://www.fws.gov/nativeamerican/pdf/tek-fact-sheet.pdf>.

⁵⁶ Kyle Powys Whyte, *On the role of traditional ecological knowledge as a collaborative concept: a philosophical study*, 2 ECOLOGICAL PROCESSES 7, 2 (2017).

yet urgent manner to develop and implement the solutions we require. In early June 2021, the Biden Administration released a series of reports laying out its plan for creating a secure supply chain for products, such as critical minerals needed for clean energy technology.⁵⁷ While the reports included many sustainable policy solutions, this is only a first step in ensuring that the government incentivizes solutions that protect not only communities but natural and cultural resources as well. Third, we must set standards for imported minerals by implementing high environmental, labor, and ethical standards, as well as negotiating high standards in trade agreements. Finally, the United States should employ a precautionary approach to deep seabed mining. The exploitation of the deep sea for critical minerals poses unknown risks to the ocean, the climate, valuable fisheries, biodiversity, and the people that depend on the ocean.

Implementation of these solutions would reduce the need for mining, and ensure that what mining does occur is sustainable, held to high environmental and labor standards, and does not disproportionately burden Indigenous communities.

A. The Circular Economy: Recycling, Reusing, and Extending the Life of Products

The demand for critical minerals must be met in the most sustainable way possible. This can be achieved through recycling, reusing, and extending the life of the materials and products already in existence. At the same time, the need for these materials can be reduced through efficiency, substitution, and disincentivizing private car ownership while simultaneously making forms of multimodal and public transport more accessible.

The United States is woefully behind international partners on the creation of a circular economy when it comes to recycling, reusing, and substituting minerals. Estimates indicate that effective recycling of end-of-life batteries has the potential to reduce global demand by fifty-five percent for copper, twenty-five percent for lithium, and thirty-five percent for cobalt and nickel by 2040.⁵⁸ While recycling technology exists today, few mineral recycling facilities are in the United States. This is largely due to

⁵⁷ *FACT SHEET: Biden-Harris Administration Announces Supply Chain Disruptions Task Force to Address Short-Term Supply Chain Discontinuities*, WHITE HOUSE BRIEFING ROOM (June 4, 2021).

⁵⁸ ELSA DOMINISH ET AL., INST. FOR SUSTAINABLE FUTURES, EARTHWORKS, REDUCING NEW MINING FOR ELECTRIC VEHICLE BATTERY METALS: RESPONSIBLE SOURCING THROUGH DEMAND REDUCTION STRATEGIES AND RECYCLING i (2021), <https://earthworks.org/publications/recycle-dont-mine/>.

the lack of a policy framework that incentivizes and eases the collection and transportation of products such as EV batteries or phones as well as the use of recycled minerals in our own new products. With the correct policies in place, the United States can create a market that provides a pathway for these minerals to be locally and sustainably sourced. Additionally, transitioning to a circular economy would subsequently create new clean energy jobs in the recycling sector.

These policies must be implemented at all government levels and can be realized through legal and regulatory changes. In addition, many agencies and departments already have the authority to take certain steps to prioritize and incentivize a circular economy for critical materials. Many of these ideas have already been implemented in places such as the European Union (“EU”), or presently exist at the state level.⁵⁹ One key policy that will be effective is fully implementing a Producer Responsibility Model or Extended Producer Responsibility. This would require the producer of a battery or other clean energy products to be responsible for said product, including the minerals, throughout the entire supply chain. This model is currently being used in the EU for EV batteries,⁶⁰ and if implemented across the board, it could require a certain number of materials used in production to be from recycled products.⁶¹

Another key solution is a Battery Passport, originally conceived by the World Economic Forum.⁶² This is a potential game changer as the Passport would enable international tracking and transparency of the global battery, as well as renewable energy product supply chain.⁶³ It

⁵⁹ See MAGNUS GISLEV & MILAN GROHOL, EURO. COMM’N, REPORT ON CRITICAL RAW MATERIALS AND THE CIRCULAR ECONOMY (2018), https://publications.europa.eu/resource/cellar/d1be1b43-e18f-11e8-b690-01aa75ed71a1.0001.01/DOC_1; See also *Tax Incentives for Recycling*, COOL FIRE TECH., <https://www.cfttech.com/the-brainbank-archive/manufacturing/292-tax-incentives-for-recycling> (last visited Jan. 21, 2022).

⁶⁰ *Development of guidance on Extended Producer Responsibility (EPR)*, EUR. COMM’N, https://ec.europa.eu/environment/archives/waste/eu_guidance/introduction.html (last visited Jan. 19, 2022).

⁶¹ Gemma Alexander, *The State of Producer Responsibility in the United States*, EARTH911 (July 17, 2020), <https://earth911.com/business-policy/producer-responsibility-in-the-united-states/#:~:text=Producer%20responsibility%20is%20a%20strategy,after%20it's%20no%20longer%20functional>.

⁶² GLOB. BATTERY ALL., WORLD ECON. F., THE GLOBAL BATTERY ALLIANCE BATTERY PASSPORT: GIVING AN IDENTITY TO THE EV’S MOST IMPORTANT COMPONENT (2020), https://www3.weforum.org/docs/WEF_GBA_Battery_Passport_Overview_2021.pdf.

⁶³ A supply chain comprises the steps that involve bringing a product from conception to distribution, and everything in between—such as procuring raw materials, manufacturing functions, and marketing activities.

would also provide consumers with key life cycle accountability data on social (e.g., labor standards) and environmental (e.g., emissions and recycled content) factors. Having this information available will allow the battery or materials to be reused or recycled more often, more effectively, and more efficiently.

Another straightforward policy change would be requiring that all batteries manufactured or sold in the United States be labeled with the source of the critical materials used, the percentage of the critical materials that were sourced from recycled content, and other key environmental and social factors. Like the Battery Passport, this information will allow consumers to readily verify the mineral content, return products to appropriate recycling sites easily, and ultimately streamline the efficiency of processing the product to be reused or recycled.

There are many other potential policies to incentivize a circular economy—from a certification system (like Energy Star), to a public ad campaign, or even tax incentives. Many of these are already adopted in various product lines (such as plastics and aluminum). These applications would go a long way towards creating a robust circular economy in the United States and ensuring that the collection, recycling, and safe disposal of critical materials is affordable and reliable for years to come.

In tandem with these policies on recycling and reuse, there must be a focus on reduction. This could come through material efficiency, substitution of a material—which would generally be through technological advancement—or the reduction in consumer demand. Substitution has been a focus of the U.S. Department of Energy, which has a goal of eliminating nickel and cobalt from lithium batteries by 2030.⁶⁴ Continued research and incentives for this substitution and material efficiency could reduce demand for some materials by an additional twenty percent in some cases.⁶⁵ This is especially important for products such as solar panels, which have a much longer lifetime than EV batteries, and thus the timeline for recycling will be longer.

Regarding reduction of consumer demand, we should look towards decreasing single occupancy vehicle use. Solutions to achieve this goal have long been discussed in the context of reducing carbon output and pollution,⁶⁶ but the same solutions apply to EVs. These would largely be

⁶⁴ FED. CONSORTIUM FOR ADVANCED BATTERIES, NATIONAL BLUEPRINT FOR LITHIUM BATTERIES 18 (June 2021).

⁶⁵ ELSA DOMINISH ET AL., *supra* note 58, at 23.

⁶⁶ Tik Root & John Schwartz, *One Thing We Can Do: Drive Less*, N.Y. TIMES (Aug. 28, 2019), <https://www.nytimes.com/2019/08/28/climate/one-thing-we-can-do-drive-less.html>.

implemented at the state, city, and county level and include everything from increasing multimodal opportunities and funding, to making public transit cheaper and more accessible, to planning communities for walkability.

B. Update Mining Laws and Regulations

Many of the impacts to communities, lands, and waters occur because of our antiquated mining laws and regulations. Even if policy is implemented to create a circular economy, some amount of hardrock⁶⁷ mining will still occur in the United States. That makes it imperative to ensure the laws and regulations for hardrock mining are updated to create a truly balanced and sustainable critical materials supply chain. Currently, mining in the United States is controlled by a law from 1872,⁶⁸ a relic of the Wild West era. The 1872 General Mining Act helped entice colonizers to settle western lands and, in the process, displace Indigenous people.

The law does not require mining companies to clean up their toxic messes, resulting in more than 500,000 abandoned hardrock mines across the West.⁶⁹ Many of the abandoned mines have a legacy of pollution that continues to contaminate water, cause ongoing health problems for Indigenous communities, harm wildlife and habitat, and permanently scar natural landscapes.⁷⁰ Even today, mining companies indicate in their plans that pollution is expected to last for hundreds of years, potentially into perpetuity.⁷¹ The law also does not require companies to compensate taxpayers by paying a royalty for harming the public lands we all share. It offers virtually no discretion to land managers who want to deny a mine proposed in a problematic or special place—because mining is considered the highest and best use of public lands under this outdated law.

This means the United States has some of the least protective mining laws in the world. Our laws effectively have no safeguards for lands,

⁶⁷ Hardrock mining is the extraction of non-fuel metal and mineral deposits, including critical minerals.

⁶⁸ *Hardrock Mining on Federal Lands*, U.S. GOV'T ACCOUNTABILITY OFF., <https://www.gao.gov/hardrock-mining-federal-lands> (last visited Dec. 3, 2021).

⁶⁹ U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-20-238, ABANDONED HARDROCK MINES 15 (2020), <https://www.gao.gov/assets/gao-20-238.pdf>.

⁷⁰ Johnnye Lewis et al., *Mining and Environmental Health Disparities in Native American Communities*, 4 CURRENT ENV'T HEALTH REP. 130 (2017).

⁷¹ LISA SUMI & BONNIE GESTRING, EARTHWORKS, POLLUTING THE FUTURE: HOW MINING COMPANIES ARE CONTAMINATING OUR NATION'S WATERS IN PERPETUITY 4 (May 2013), <https://earthworks.org/assets/uploads/archive/files/publications/PollutingTheFuture-FINAL.pdf>.

water, or wildlife habitat. There are few protections in place for the front-line communities that face devastating mining impacts, including destruction of sacred sites. That is why the Environmental Protection Agency identifies metal mining as the most toxic industry in America⁷² and estimates that forty percent of western watersheds have been contaminated by hardrock mines.⁷³ That is also why the mining industry itself consistently ranks multiple states in the United States as “top jurisdiction[s] in the world for investment.”⁷⁴ In 2020, Nevada was ranked the top jurisdiction, with Alaska, Arizona, and Idaho consistently in the top ten.⁷⁵ The United States must update its mining law as well as implement regulations at the BLM and USFS. Through this modernization, mining can occur sustainably and only in the lowest risk areas.

U.S. House of Representatives Natural Resources Committee Chairman Raul Grijalva’s Hardrock and Leasing Reclamation Act accomplishes these necessary reforms.⁷⁶ There are five pillars of this bill that are necessary to protect frontline communities, health, public lands and waters, and taxpayers. It first levels the playing field with all other uses of public lands—such as recreation, grazing, hunting, and energy development—while preserving the existing land-use planning processes.⁷⁷ Second, it ends the outdated patenting system under which hardrock mining technically operates, preventing unfettered access for mining on nearly all public lands.⁷⁸ Third, it explicitly prohibits hardrock mining on certain types of special public lands that are already largely protected from other extractive industries.⁷⁹ Next, it establishes a 12.5 percent royalty on new mining operations—the same amount as oil and gas—and an eight percent royalty on existing operations, excluding small miners.⁸⁰ The fifth pillar in Chairman Grijalva’s Hardrock Leasing and Reclamation Act would

⁷² U.S. ENV’T PROT. AGENCY, TOXICS RELEASE INVENTORY NATIONAL ANALYSIS: SECTION 4 – COMPARING INDUSTRY SECTORS 2 (2019), <https://www.epa.gov/trinational-analysis/2019-national-analysis-materials>.

⁷³ U.S. ENV’T PROT. AGENCY, EPA-840-B-00-001, LIQUID ASSETS 2000: AMERICA’S WATER RESOURCES AT A TURNING POINT 10 (May 2000), https://permanent.fdlp.gov/LPS50713/assets_2000.pdf.

⁷⁴ JAIRO YUNIS & ELMIRA ALIAKBARI, FRASER INST., ANNUAL SURV. OF MINING COMPANIES 2020, at 1 (Feb. 23, 2021), <https://www.fraserinstitute.org/sites/default/files/annual-survey-of-mining-companies-2020.pdf>.

⁷⁵ *Id.* at 1–2.

⁷⁶ Hardrock Leasing & Reclamation Act of 2019, H.R. 2579, 116th Cong. (2019).

⁷⁷ *Id.* § 201.

⁷⁸ *Id.* § 102.

⁷⁹ *Id.* § 111.

⁸⁰ *Id.* § 107.

establish strong reclamation standards and a dedicated funding source for a new program, created in 2021, to reclaim and restore abandoned mines and areas impacted.⁸¹

In 2021, Congress passed the Infrastructure Investment and Jobs Act, also known as the Bipartisan Infrastructure Bill. President Biden subsequently signed it into law on November 15, 2021.⁸² As part of that legislation, the first program dedicated exclusively to hardrock mining reclamation was established.⁸³ Unfortunately, the Bipartisan Infrastructure Bill did not provide any immediate funding for that program—it only authorized the potential for future funding.⁸⁴

BLM and USFS regulations implementing the hardrock mining law are not as antiquated as the 1872 General Mining Law, but they are decades old. Updating them could happen under a relatively rapid timeline and have a substantial impact on hardrock mining standards, including provisions for protecting Indigenous communities. An update to the BLM regulations occurred at the close of the Clinton Administration, but those regulations were never finalized.⁸⁵ In September 2021, a wide array of conservation groups, Indigenous tribes, and Indigenous organizations from across the country petitioned the BLM for a rulemaking under the Administrative Procedure Act to update hardrock mining regulations.⁸⁶ The primary update requested in the petition—which calls for domestic mining to become more sustainable—is an update to language that prevents “unnecessary or undue degradation.”⁸⁷ It would ultimately provide Indigenous communities the right to FPIC since no modern hardrock mine

⁸¹ *Id.* §§ 501–14.

⁸² Infrastructure Investment & Jobs Act, H.R. 3684, 117th Cong. (2021).

⁸³ See Press Release, Sen. Michael Heinrich, Heinrich Amendment. To Establish Hardrock Mining Reclamation Fund Advances In Bipartisan Infrastructure Package (July 14, 2021). The amendment authorizes a funding program to clean up land and water resources affected by hardrock mining activities. Half of these funds would be directly distributed to States and Tribes.

⁸⁴ H.R. 2579, *supra* note 76, at Title VII.

⁸⁵ Andrew P. Morris et al., *Between a Hard Rock and a Hard Place: Politics, Midnight Regulations and Mining*, 55 ADMIN. L. REV. 551, 558–59 (2003).

⁸⁶ Letter from Tribes & Indigenous Org. Petitioners to Debra Haaland, Sec’y of Interior, U.S. Dep’t of Interior, & Nada Wolff Culver, Deputy Dir. of Pol’y & Programs, Bureau of Land Mgmt (Sept. 16, 2021), <https://earthworks.org/assets/uploads/2021/09/APA-DOI-Hardrock-Mining-Rules-Petition-Combined-1.pdf>. As of Feb. 2022, the Bureau of Land Mgmt has not yet responded to the petition but there is a strong possibility they will undertake this rule.

⁸⁷ *Id.* at 2.

operations have demonstrated they can stop acid mine drainage and pollution once the mining operations occur on a large scale.⁸⁸

Updating mining laws and regulations is key to ensuring a sustainable critical minerals supply chain and must be advanced rapidly if this country is to avoid building clean energy supply chains on the backs of Indigenous Peoples. Those updates are in line with a multitude of executive orders and commitments made by the Biden Administration. A great example is the memorandum issued shortly after President Biden's inauguration on tribal sovereignty and environmental justice,⁸⁹ as well as several policies announced during the White House Tribal Nations Summit in November 2021.⁹⁰ These include a joint initiative between the U.S. Department of the Interior and the U.S. Department of Agriculture to establish the Tribal Homelands Initiative.⁹¹ This initiative will strengthen the role of tribal communities in co-stewardship with the federal government of public lands.⁹² In addition, a memorandum from the White House Office of Science & Technology Policy and the Council on Environmental Quality was sent to the heads of federal departments and agencies establishing the role of Indigenous TEK in informing federal decision making.⁹³

C. Increase Standards for Imported Minerals

If the United States wants other countries to have a higher bar of labor and environmental standards for mining, it must lead by example. The United States is far from a perfect example of sustainable policy for mining, and internationally there is a spectrum of community, worker, and land and water policy protections already established that the United States can, in some cases, look towards. In most cases, though, the United States must push to be stronger by improving its own standards, along with using its trade policy and purchasing power. Some of these high standards the United States should adopt for itself were discussed in the mining reform section above. However, we can go further and negotiate even higher

⁸⁸ SUMI & GESTRING, *supra* note 71, at 4.

⁸⁹ Memorandum from President Joe Biden on Tribal Consultation & Strengthening Nation-to-Nation Relationships (Jan. 26, 2021).

⁹⁰ *Fact Sheet: Building A New Era of Nation-to-Nation Engagement*, THE WHITE HOUSE (Nov. 15, 2021), <https://www.whitehouse.gov/briefing-room/statements-releases/2021/11/15/fact-sheet-building-a-new-era-of-nation-to-nation-engagement/>.

⁹¹ Joint Secretarial Ord. on Fulfilling the Trust Responsibility to Indian Tribes in the Stewardship of Fed. Lands & Waters, Secretarial Ord. No. 3403 (Nov. 15, 2021).

⁹² *Id.*

⁹³ Memorandum on Indigenous Traditional Ecological Knowledge & Fed. Decision Making (Nov. 15, 2021).

standards in trade agreements—including through verifications and certifications such as the Initiative for Responsible Mining Assurance (“IRMA”). IRMA defines good practices for what responsible mining should look like.⁹⁴ It provides the list of expectations that independent auditors use as the benchmark for responsible mines regarding labor standards, environmental standards, and business standards.

Cleantech companies, recyclers, and manufacturers currently have the market power to demand responsibly sourced minerals and drive improvements in efficiency. Automakers such as BMW and Ford are already committing to these certifications.⁹⁵ Therefore, the next logical step would be to include IRMA-type requirements for both the United States and its trading partners through enforceable trade agreements. Simultaneously, the purchasing power of the U.S. government, especially the Department of Defense (“DOD”) and the General Services Administration (“GSA”), could be used to pressure mining companies and producers to act more responsibly. The DOD, for example, could require that critical materials in all their products (clean energy or otherwise) be IRMA certified. Or the GSA could require all EVs purchased for government use have batteries with either recycled or IRMA certified minerals. Using trade agreements and the purchasing power of the U.S. government will create more of a market demand for responsibly sourced materials—whether recycled or mined—and will ensure that the United States is able to source in a secure and sustainable manner here at home or from allies abroad.

The solutions to reduce impacts on Indigenous communities are clear: we must first reduce the demand for raw critical minerals—and thus mining—through a robust circular economy; we must update our mining laws and regulations to give impacted communities a voice where mining projects are proposed or developed; and finally, we must set high import standards that will incentivize a more sustainable clean energy supply chain that respects all peoples domestically and internationally. Whether the Biden Administration will follow this roadmap remains an open question.

V. INDIGENOUS COMMUNITIES IN THE PACIFIC REGION FACE AN EMERGING THREAT: DEEP

⁹⁴ *Discover the IRMA Standard*, INST. FOR RESPONSIBLE MINING ASSURANCE <https://responsiblemining.net/what-we-do/standard/> (last visited Dec. 3, 2021).

⁹⁵ *Ford Motor Company is First American Automaker to Join Initiative Promoting Responsible Mining*, FORD (Feb. 15, 2021), <https://media.ford.com/content/fordmedia/fna/us/en/news/2021/02/15/ford-initiative-promoting-responsible-mining.html>.

SEABED MINING

One area of emerging concern for Indigenous communities is deep seabed mining (“DSM”)—a high-risk activity presented as a lower-risk alternative to conventional terrestrial mining.⁹⁶ Many Indigenous communities have a deep connection to the ocean and depend on healthy ocean ecosystems for their livelihoods and cultures, and DSM threatens to disrupt that connection.

Indigenous Peoples in the Pacific—including in Hawaii and Guam—are under growing threat from DSM as pressure mounts on the International Seabed Authority (“ISA”) to authorize mining for critical minerals.⁹⁷ Valuable deposits of manganese, copper, nickel, cobalt, and more lie at the bottom of the ocean. A large concentration of those deposits is located in the Clarion Clipperton Zone (“CCZ”), an underwater area between Mexico and Hawaii as large as the continental U.S.⁹⁸ Also present in the deep-sea ecosystem of the CCZ is a dazzling array of marine habitat and species that scientists are only beginning to understand.⁹⁹ Research so far suggests that the deep sea is vital to the health and functioning of the entire ocean and its related climate systems.¹⁰⁰ In the Pacific, where mining claims are pending, a broad coalition of Indigenous rights advocates, conservationists, legal scholars, and scientists warn that mining could destroy the ocean ecosystems that Indigenous Peoples have stewarded and relied upon for millennia.¹⁰¹ They further warn that the

⁹⁶ Deep seabed mining is the process of exploring and extraction of minerals from the deep seabed.

⁹⁷ See Julian Aguon & Julie Hunter, *Second Wave Due Diligence: The Case for Incorporating Free, Prior, and Informed Consent into the Deep Sea Mining Regulatory Regime*, 38 STAN. ENV'T L. J. 3 (2019).

⁹⁸ *Deep-sea Mining Interests in the Clarion-Clipperton Zone*, NOAA OFF. OF OCEAN EXPL.: DEEPCCZ, <https://oceanexplorer.noaa.gov/explorations/18ccz/background/mining/mining.html> (last visited Dec. 17, 2021).

⁹⁹ See, e.g., Franck Lejzerowicz et al., *Eukaryotic Biodiversity and Spatial Patterns in the Clarion-Clipperton Zone and Other Abyssal Regions: Insights From Sediment DNA and RNA Metabarcoding*, 8 FRONTIERS MARINE SCI. 671033, at 12–18 (May 2021); see also Travis W. Washburn et al., *Patterns of Macrofaunal Biodiversity Across the Clarion-Clipperton Zone: An Area Targeted for Seabed Mining*, 8 FRONTIERS MARINE SCI. 626571, at 15–18 (Apr. 2021).

¹⁰⁰ Katherine Beem, *Rolling in the Deep: Climate Change and Deep Sea Ecosystems News*, COLUM. CLIMATE SCHOOL (July 29, 2020), <https://climatesociety.ei.columbia.edu/news/rolling-deep-climate-change-and-deep-sea-ecosystems>.

¹⁰¹ Marjo K. Vierros et al., *Considering Indigenous Peoples and local communities in governance of the global ocean commons*, 119 MARINE POL'Y 104039 (2020), <https://www.sciencedirect.com/science/article/pii/S0308597X19309212>.

current framework for developing mining regulations fails to account for Indigenous rights and sovereignty.¹⁰² While industrial-scale DSM has not yet begun in international waters, the ISA announced at its December 2021 meeting that it intends to finalize regulations authorizing DSM by June 2023.¹⁰³ The Biden Administration has thus far remained silent on the looming prospect of a new, high-risk industry operating close enough to the United States and its territories to significantly impact them. As June 2023 approaches, the Administration's window of opportunity to honor its commitment to a sustainable critical minerals supply chain and to preserve and advance the rights of Indigenous Peoples is closing.

A. Deep Seabed Mining Threatens Ecosystem Functioning and Climate Regulation

Deep seabed mining refers to the extraction of mineral deposits from the seafloor using a range of methods, including drilling, stripping, or cutting into the substrate.¹⁰⁴ Commercially targeted mineral resources include: (1) seafloor massive sulfides rich in copper, gold, zinc, and silver; (2) polymetallic nodules of manganese, iron, nickel, copper, and other valuable metals; and (3) cobalt-rich crusts.¹⁰⁵ As demand for these minerals has grown, so too has the pressure to begin extracting them, despite ample evidence of the severe environmental risks of doing so.¹⁰⁶ No commercial-scale DSM has occurred on the high seas, but limited exploratory mining has been conducted in U.S. national waters.¹⁰⁷

The potential risks of DSM include but are not limited to: (1) large sediment plumes that travel thousands of meters and choke the ecosystems in their wake; (2) mining tailings comprised of toxic chemicals and heavy metals that bioaccumulate throughout food chains and contaminate water

¹⁰² See *The Pacific Blue Line Statement*, THE PAC. BLUE LINE, <https://www.pacific-blueline.org/pacific-blue-line-statement> (last visited Dec. 17, 2021).

¹⁰³ Elizabeth Alberts, *Deep-sea mining regulator's latest meeting on rules only muddies the water*, MONGABAY ENV'T NEWS (Dec. 17, 2021), <https://news.mongabay.com/2021/12/deep-sea-mining-regulators-latest-meeting-on-rules-only-muddies-the-water/>.

¹⁰⁴ K.A. Miller et al., *An Overview of Seabed Mining Including the Current State of Development, Environmental Impacts, and Knowledge Gaps*, 4 FRONTIERS MARINE SCI. 6, 12 (Jan. 10, 2018).

¹⁰⁵ *Id.* at 2–10.

¹⁰⁶ See Helen Reed, *Pacific Island of Nauru sets two-year deadline for U.N. deep-sea mining rules*, REUTERS (June 29, 2021), <https://www.reuters.com/article/mining-deepsea-idAFL5N2OB1SQ>.

¹⁰⁷ Miller, *supra* note 104, at 2.

columns;¹⁰⁸ (3) loss of biodiversity and productivity in pelagic and benthic ecosystems;¹⁰⁹ (4) release of sequestered carbon and decreased functioning of biological and microbial carbon pumps;¹¹⁰ and (5) release of methane and decreased stability of methane stores.¹¹¹

The limited studies on the effects of simulated or exploratory mining confirm these risks.¹¹² A 1989 experiment using a plough harrow to simulate the effects of remotely operated vehicles found decreased biodiversity and in-tact plough marks twenty-six years later, supporting the risk of irreversible loss of ecosystem functioning in mined areas.¹¹³ While these results would be harmful at any scale, it is impossible to predict their full extent given remaining uncertainty about deep-sea ecosystems and related processes of global climate regulation. This damage resulted from a single year of experimentation. The ISA has the authority to grant exploitation contracts for up to thirty years,¹¹⁴ during which contractors could discharge up to 50,000 tons of sediment daily.¹¹⁵

Scientists generally consider it impossible to fully mitigate or remediate the impacts of DSM given the expense, the unique services of deep-sea ecosystems, and the limited information on deep-sea ecology.¹¹⁶ Scientists also warn that it is likely impossible to conduct DSM without a net loss of biodiversity, even if limited offsets were feasible.¹¹⁷ The impacts of commercial-scale DSM that currently can be contemplated are thus just the tip of the iceberg, and they would likely be irreversible.

¹⁰⁸ Bernd Christiansen et al., *Potential effects of deep seabed mining on pelagic and benthopelagic biota*, 114 MARINE POL'Y 6 (2020).

¹⁰⁹ *Id.*

¹¹⁰ Jennifer T. Le et al., *Incorporating ecosystem services into environmental management of deep-seabed mining*, 137 DEEP SEA RSCH. PART II: TOPICAL STUD. OCEANOGRAPHY 486 (2017).

¹¹¹ Miller, *supra* note 104, at 14.

¹¹² See, e.g., Erik Simon-Lledó et al., *Biological effects 26 years after simulated deep-sea mining*, 9 SCI. REP. 8040, at 1–2 (2019).

¹¹³ *Id.*

¹¹⁴ See Miller, *supra* note 104, at 11.

¹¹⁵ PIPPA HORWARD ET AL., FAUNA & FLORA INT'L, AN ASSESSMENT OF THE RISKS AND IMPACTS OF SEABED MINING ON MARINE ECOSYSTEMS 205 (2020), https://cms.fauna-flora.org/wp-content/uploads/2020/03/FFI_2020_The-risks-impacts-deep-seabed-mining_Report.pdf.

¹¹⁶ K.A. Miller et al., *Challenging the Need for Deep Seabed Mining From the Perspective of Metal Demand, Biodiversity, Ecosystems Services, and Benefit Sharing*, 8 FRONTIERS MARINE SCI. 706161, at 2 (July 2021).

¹¹⁷ Holly J. Niner, et al., *Deep-Sea Mining With No Net Loss of Biodiversity—An Impossible Aim*, 5 FRONTIERS IN MARINE SCI. 53, at 9–10 (Mar. 2018).

B. The International Seabed Authority Faces Pressure to Authorize Deep Seabed Mining Despite Potential Conflicts with its Legal Authority

The governing body charged with deciding whether to allow DSM on the high seas is the ISA, a small, autonomous U.N.-affiliated agency based in Kingston, Jamaica comprised of 167 countries and the EU.¹¹⁸ The United States is the only major maritime power that does not hold ISA membership, having never ratified the U.N. Convention on the Law of the Sea (“UNCLOS”),¹¹⁹ and, instead, holds observer status.¹²⁰ The UNCLOS requires the ISA to affirmatively protect the marine environment and human life and to govern deep sea mineral exploitation for the benefit of all humankind.¹²¹ The ISA is developing a comprehensive Mining Code to regulate high seas mineral exploitation, but the Code is far from finished. Significant questions around liability, environmental risk, and sharing costs and benefits need further consideration before finalizing.¹²² Multiple groups have raised concerns regarding the ISA’s draft regulations, citing insufficient processes for enforcement, harm prevention and remediation, and cost and benefit sharing, among other things.¹²³ Despite these concerns, the country of Nauru has demanded the ISA finalize these regulations by June 2023, and it remains unclear whether the

¹¹⁸ *About ISA*, INT’L SEABED AUTH., <https://www.isa.org.jm/about-isa> (last visited Jan. 19, 2022).

¹¹⁹ Scott Borgerson & Thomas Pickering, *Climate Right for U.S. Joining Law of Sea Convention*, COUNCIL ON FOREIGN REL. (Dec. 22, 2009), <https://www.cfr.org/expert-brief/climate-right-us-joining-law-sea-convention>.

¹²⁰ *Observers*, INT’L SEABED AUTH., <https://www.isa.org.jm/observers> (last visited Jan. 19, 2022).

¹²¹ See U.N. Convention on the L. of the Sea, arts. 145, 146, Dec. 10, 1982, 1833 U.N.T.S. 397.

¹²² Antje Boetius & Matthias Haeckel, *Mind the seafloor*, 359 SCI. 34–36 (Jan. 5, 2018), <https://www.science.org/doi/epdf/10.1126/science.aap7301>.

¹²³ See, e.g., *African Group’s submission to the International Seabed Authority*, INT’L SEABED AUTH. (Sept. 2018), www.isa.org.jm/files/documents/EN/Regs/2018/Comments/AfricanGroup.pdf; *Commentary on “Draft Regulations on Exploitation of Mineral Resources in the Area”*, DEEP OCEAN STEWARDSHIP INITIATIVE (Nov. 2017), http://dosi-project.org/wp-content/uploads/2015/08/DOSI_Comment_on_ISA_Draft_Exploitation_Regulations_November_2017_Corrected.pdf.

ISA will be able to grant Nauru's request while fulfilling its legal remits.¹²⁴

C. Pacific Nations Have Already Led the Way on Opposing Deep Seabed Mining, and the U.S. Must Follow and Support

1. DSM Risks Threaten Native Hawaiian and Pacific Islander Rights

Despite how far the deep seabed is from human communities, the environmental and climate risks of DSM do, in fact, threaten human rights. As Guamanian legal scholar Julian Aguon has stated, most discussions of seabed mining are based on “an incorrect legal assumption . . . that because most DSM activity is designated for areas beyond national jurisdiction . . ., the rights of [I]ndigenous peoples, including those living in coastal states closest to proposed DSM sites, are simply not implicated.”¹²⁵ This fallacy ignores the fact that rights depend not on where an activity occurs, but where its effects are felt.

Indigenous Peoples of the Pacific Islands are likely to be disproportionately impacted by DSM given their proximity to areas of interest and their direct reliance upon and relationship with the ocean and its ecosystem services.¹²⁶ There is no scenario under present technological conditions where DSM in the Pacific would not gravely threaten the sovereignty and survival of the islands whose waters it would impact. The ISA has already granted sixteen licenses for polymetallic nodule exploration in the CCZ, with the licenses covering more than 1 million square kilometers.¹²⁷ Potential impacts of DSM on Native Hawaiians and Pacific Islanders include compromised food security, diminished livelihoods from contamination of fisheries and marine ecosystems, loss of ecotourism opportunities, and loss of culturally significant marine

¹²⁴ Catherine Blanchard, *Nauru and Deep-Sea Minerals Exploitation: A Legal Exploration of the 2-Year Rule*, NORWEGIAN CTR. FOR THE L. OF THE SEA BLOG (Sept. 17, 2021), <https://site.uit.no/nclos/2021/09/17/nauru-and-deep-sea-minerals-exploitation-a-legal-exploration-of-the-2-year-rule/>.

¹²⁵ Aguon & Hunter, *supra* note 97, at 7.

¹²⁶ Julie Hunter, et al., *Broadening Common Heritage: Addressing Gaps in the Deep Sea Mining Regulatory Regime*, HARV. ENV'T. L. REV. (Apr. 16, 2018), <https://harvardelr.com/2018/04/16/broadening-common-heritage/>.

¹²⁷ INT'L SEABED AUTH., CURRENT STATUS OF THE RESERVED AREAS WITH THE INTERNATIONAL SEABED AUTHORITY (2019), <https://www.isa.org.jm/files/files/documents/statusofreservedareas-01-2019-a.pdf>.

species.¹²⁸ Discharged metals will remain in water columns even longer than sediment, creating the risk of metals and toxins entering the human food chain through the mesopelagic ecosystems that form an important layer of ocean food webs.¹²⁹ No public information exists on the potential human health impacts of metal bioaccumulation from seabed mining plumes.¹³⁰ Given the importance of seafood to Pacific Islanders for consumption, culture, and commerce, this significant knowledge gap makes it impossible to regulate DSM in a way that protects human rights and livelihood.

2. Pacific Islands Have Already been Harmed by Exploratory Seabed Mining, and U.S. Communities Could also be Impacted by Mining at Industry Scale

The negative impacts of DSM on Indigenous Peoples are not abstract or hypothetical; harm has already been inflicted by the failed attempt at seabed mining by the Canadian company Nautilus Minerals in the waters of Papua New Guinea. The project, dubbed Solwara 1, was stopped before any minerals were extracted but not before it caused adverse impacts. Island residents reported the disappearance of the sharks whom they call to as part of their traditional cultural practice and means of obtaining food security.¹³¹ Residents also reported a decrease in dolphin numbers and an increase in the amount of dead fish and strange marine creatures washing up on their shores.¹³² With such disturbing results from exploratory

¹²⁸ ANDREW CHIN & KATELYN HARI, DEEP SEA MINING CAMPAIGN & MININGWATCH CAN., PREDICTING THE IMPACTS OF MINING OF DEEP SEA POLYMETALLIC NODULES IN THE PACIFIC OCEAN: A REVIEW OF SCIENTIFIC LITERATURE 5, 41, 43 (2020), https://mining-watch.ca/sites/default/files/nodule_mining_in_the_pacific_ocean.pdf.

¹²⁹ Jeffrey C. Drazen et al., *Opinion: Midwater ecosystems must be considered when evaluating environmental risks of deep-sea mining*, 117 PROC. NAT'L ACAD. SCI. 17455, 17457–58 (2020).

¹³⁰ CHIN & HARI, *supra* note 128, at 5, 43.

¹³¹ Kalolaine Fainu, 'Shark calling': locals claim ancient custom threatened by seabed mining, GUARDIAN (Sept. 30, 2021), <https://www.theguardian.com/world/2021/sep/30/sharks-hiding-locals-claim-deep-sea-mining-off-papua-new-guinea-has-stirred-up-trouble>.

¹³² See Marcy Trent Long & Sam Colombie, *Podcast: The damaging failure of seabed mining in Papua New Guinea*, CHINA DIALOGUE OCEAN (Nov. 15, 2019), <https://chinadialogueocean.net/11653-solwara-1-nautilus-seabed-mining-podcast/>; see also *Environmental safeguards being ignored for deep sea mining*, RNZ (Mar. 1, 2018), <https://www.rnz.co.nz/international/pacific-news/351529/environmental-safeguards-being-ignored-for-deep-sea-mining>.

mining alone, it is clear that Pacific Island environments, economies, and cultures could not withstand the effects of industry-scale operations.

Furthermore, it is currently impossible to guarantee that the impacts of DSM would be contained to the area mined, instead of extending to all Pacific Islands. Neither the ISA nor mining companies have offered any evidence of effective spatial management plans for protecting ecosystems or species.¹³³ Given the highly migratory nature of Pacific marine species, DSM anywhere in the Pacific increases the risk of toxic plumes and widespread harm, regardless of whether DSM occurs in national waters or in the high seas.

Finally, Pacific Island nations are already bearing a disproportionate burden from climate change, with sea levels rising, a lack of higher elevations to which to retreat, and a culture that is intimately connected to ocean and place—decreasing the desire or ability to relocate.¹³⁴ Indigenous Peoples who have stewarded Pacific Island environments for millennia are most likely to be impacted by DSM in the Pacific, given their direct reliance on and close relationship to the ocean. With more than 1.5 million square kilometers in the Pacific and Indian oceans already contracted for mineral exploration, Indigenous Peoples of the Pacific Islands are on the frontlines of yet another industrial goldrush that threatens their rights and sovereignty as foreign actors pursue profit at all costs.¹³⁵

3. Pacific Island Support for Moratorium is Strong and Growing

Despite aggressive courting from mining companies promising high profit and low risk, opposition to DSM has been growing steadily amongst Pacific Island nations. Starting in 2012, a diverse coalition began campaigning against the Solwara 1 project, and their opposition was key in ending the project before it reached industry-scale exploitation.¹³⁶ In 2019, the Prime Minister of Fiji called for a moratorium on deep-sea mining in national waters for the duration of the UN Decade of Ocean

¹³³ CHIN & HARI, *supra* note 128, at 5.

¹³⁴ Pac. Coastal & Marine Sci. Ctr., *Low-lying areas of tropical Pacific islands*, U.S. GEOLOGICAL SURV. (May 24, 2021), https://www.usgs.gov/centers/pacific-coastal-and-marine-science-center/science/low-lying-areas-tropical-pacific-islands?qt-science_center_objects=0#qt-science_center_objects.

¹³⁵ Bus. & Hum. Rts. Res. Ctr., *Deep sea mining: mineral exploration in the Pacific* (Mar. 2021), https://media.business-humanrights.org/media/documents/2021_TMT_deep_sea_mining.pdf.

¹³⁶ See, e.g., Ben Doherty, *Collapse of PNG deep-sea mining venture sparks calls for moratorium*, GUARDIAN (Sept. 15, 2019), www.theguardian.com/world/2019/sep/16/collapse-of-png-deep-sea-mining-venture-sparks-calls-for-moratorium.

Science, lasting until 2030.¹³⁷ The same year, the Prime Ministers of Vanuatu and Papua New Guinea adopted the same position, as did Indigenous Peoples, fishers, and civil society organizations across the Pacific Islands.¹³⁸ On International World Oceans Day—June 8, 2020—the Civil Society Forum of Tonga asked their government to follow suit and call for a ten-year moratorium on mining in both Tonga’s territorial waters and international waters.¹³⁹ Five Pacific civil society groups working against DSM developed a declaration called the Pacific Blue Line, which has been signed by over 100 organizations to date.¹⁴⁰

Of particular relevance to the U.S. government is the growing support for a moratorium from the U.S. territory of Guam and the state of Hawaii. Blue Ocean Law, a Guam-based international law firm founded by Julian Aguon, is leading the way in legal scholarship on the omission of human and Indigenous rights from decision-making frameworks, governing bodies, and laws concerning DSM.¹⁴¹ Senator Sabina Flores Perez of Guam introduced a resolution in November 2021 supporting a moratorium on DSM and calling on all Pacific leaders to do likewise.¹⁴² Two weeks later, a group of human rights activists and scientists from Hawaii and Guam sent a letter to the Biden Administration requesting U.S. support for a moratorium on DSM in both international waters and the United States’ own exclusive economic zone (“EEZ”).

While the risks of seabed mining are felt most heavily in the Pacific, there is worldwide support for a moratorium from various sectors:

¹³⁷ Nic Maclellan, *Fiji calls for sea-bed mining moratorium as Nautilus restructures*, PAPUA N. G. TODAY (Aug. 13, 2019), <https://news.pngfacts.com/2019/08/fiji-calls-for-sea-bed-mining.html>

¹³⁸ See Doherty, *supra* note 136; see also *RISE UP: A Blue Call to Action*, RISE UP FOR THE OCEAN, www.riseupfortheocean.org/ (last visited Dec. 17, 2021).

¹³⁹ Letter from Civil Society Forum of Tonga to Hon. Rev., Prime Minister’s Office (June 8, 2020), <https://miningwatch.ca/sites/default/files/lettertotongampseabedmining.pdf>.

¹⁴⁰ See *Drawing the Pacific Blue Line*, PAC. BLUE LINE, <https://www.pacificblueline.org/about> (last visited Jan. 19, 2022).

¹⁴¹ See *About Us*, BLUE OCEAN L., <https://www.blueoceanlaw.com/about> (last visited Jan. 19, 2022); see also Sarah Souli, ‘Our children’s lives on the line’: the ongoing battle for Guam, GUARDIAN (Aug. 7, 2020), <https://www.theguardian.com/world/2020/aug/08/our-childrens-lives-on-the-line-the-ongoing-battle-for-guam>.

¹⁴² Res. 210-36 (COR), 37th Guam Legis. (2021).

scientists,¹⁴³ fishing industries,¹⁴⁴ churches,¹⁴⁵ human rights activists,¹⁴⁶ conservationists,¹⁴⁷ international governing bodies,¹⁴⁸ and more.

D. Commitments to Sustainable Energy Supply Chain and Honoring Indigenous Peoples' Rights

1. DSM Cannot be Justified When There are Other Ways to Obtain the Metals Needed to Sustain Society and Transition to Renewable Energy

Two general arguments are used to justify authorization of industry-scale DSM under current conditions: (1) its impacts would be minimal; and/or (2) it is the only option to obtain the minerals we need for batteries and electronics.¹⁴⁹ The first argument is easily dispatched by existing evidence of significant risks of DSM and the lack of any demonstrated means for preventing or mitigating them, as discussed above. The second argument is also untenable given the multiple policy options available to more sustainably obtain important minerals.¹⁵⁰ These include: innovation in battery design to use materials other than deep-sea minerals, extension

¹⁴³ *Marine Expert Statement Calling for a Pause to Deep-Sea Mining*, DEEP-SEA MINING SCI. STATEMENT, <https://www.seabedminingsciencestatement.org/> (last visited Dec. 17, 2021).

¹⁴⁴ LONG DISTANCE ADVISORY COUNCIL, R-04-19/WG5, LDAC OPINION ON DEEP-SEA MINING (May 2019), https://ldac.eu/images/EN_LDAC_Advice_on_Deepsea_Mining_R.04.19.WG5_May2019.pdf.

¹⁴⁵ *Statement on Seabed Mining*, PAC. CONF. OF CHURCHES, <https://pacificconference-ofchurches.org/wp-content/uploads/2020/11/Seabed-Mining.pdf> (last visited Dec. 17, 2021).

¹⁴⁶ *About*, DEEP SEA MINING CAMPAIGN, <http://www.deepseaminingoutofourdepth.org/about/> (last visited Dec. 17, 2021).

¹⁴⁷ *Blue Manifesto – The Roadmap to a healthy ocean in 2030*, SEAS AT RISK, <https://seas-at-risk.org/blue-manifesto/roadmap/> (last visited Dec. 17, 2021).

¹⁴⁸ *069 - Protection of deep-ocean ecosystems and biodiversity through a moratorium on seabed mining*, IUCN WORLD CONSERVATION CONG. (Sept. 22, 2021), <https://www.iucncongress2020.org/motion/069>.

¹⁴⁹ See, e.g., Daniel Ackerman, *Deep-Sea Mining: How to Balance Need for Metals with Ecological Impacts*, SCI. AM. (Aug. 31, 2020), <https://www.scientificamerican.com/article/deep-sea-mining-how-to-balance-need-for-metals-with-ecological-impacts1>; see also James MacDonald, *The Potential Pros and Cons of Seabed Mining*, JSTOR DAILY (Aug. 29, 2019), <https://daily.jstor.org/the-potential-pros-and-cons-of-seabed-mining>.

¹⁵⁰ See DEEP SEA CONSERVATION COAL., DEEP-SEA MINING: WHAT ARE THE ALTERNATIVES? (July 2021), http://www.savethehighseas.org/wp-content/uploads/2021/07/DSCC_FactSheet9_DSM_Alternatives_4pp_14July_web.pdf.

of battery lifecycles through efficiency gains to reduce their resource-intensiveness, recycling and reuse of existing batteries to further reduce necessary inputs, and sourcing minerals from terrestrial operations that comply with best practices, such as those required by IRMA. Corporate commitments not to use DSM-derived materials illustrate the economic viability of foreclosing DSM as an option until important criteria can be met. Google, BMW, AB Volvo Group, and Samsung SDI all expressed support for a moratorium on DSM in March 2021, showing confidence in their ability to meet their material needs without the attendant risks of DSM.¹⁵¹ Most recently, Microsoft announced “a moratorium on using minerals sourced through deep seabed mining until the proper research and scientific studies have been completed” as part of its commitment to a sustainable supply chain.¹⁵²

2. Biden Administration Commitments and Existing U.S. Obligations

The Biden Administration has likewise committed to a sustainable energy supply chain, which, at the very least, requires compliance with the United States’ existing obligations under international and domestic instruments to protect Indigenous Peoples’ culture, lands, and development. The United States has ratified the International Convention on the Elimination of All Forms of Racial Discrimination (“ICERD”) and therefore must ensure that “no decisions directly relating to [Indigenous Peoples’] rights and interests are taken without their informed consent[.]”¹⁵³ In the context of DSM, this obligation prevents the United States from authorizing or supporting mining conducted without robust consultation and inclusion of all potentially impacted stakeholders in decision-making processes. President Biden also acknowledged in the first-ever presidential proclamation on Indigenous Peoples’ Day that the federal government has a “solemn obligation to lift up and invest in the

¹⁵¹ Helen Reid, *Google, BMW, AB Volvo, Samsung back environmental call for pause on deep-sea mining*, REUTERS (Mar. 31, 2021), www.reuters.com/business/sustainable-business/google-bmw-volvo-samsung-sdi-sign-up-wwf-call-temporary-ban-deep-sea-mining-2021-03-31/.

¹⁵² MICROSOFT, BUILDING A SUPPLY CHAIN WITH INTEGRITY, ACCOUNTABILITY & RESPECT 35 (2021), <https://query.prod.cms.rt.microsoft.com/cms/api/am/binary/RWO6Gn>.

¹⁵³ See BLUE OCEAN L. & THE PAC. NETWORK ON GLOBALISATION, RESOURCE ROULETTE: HOW DEEP SEA MINING AND INADEQUATE REGULATORY FRAMEWORKS IMPERIL THE PACIFIC AND ITS PEOPLES 52 (2018) (citing Comm. on the Elimination of Racial Discrimination, *Rights of indigenous peoples on Its Fifty-first session*, ¶4(d), U.N. Doc. A/52/18, annex V at 122 (1997)).

future of Indigenous people . . .”¹⁵⁴ The Administration reinstated and reinvigorated the White House Initiative on Asian Americans, Native Hawaiians, and Pacific Islanders, committing to “[a]dvancing climate and environmental justice for AA and NHPI communities who are particularly impacted by the climate crisis and are overburdened by environmental degradation[.]”¹⁵⁵ These commitments, along with the Administration’s executive orders on environmental justice, climate change, and tribal consultation, all require the United States to respect and support the position of Indigenous Peoples in the Pacific with respect to potential impacts of DSM.

As stated above, Pacific Island Indigenous Peoples have already made clear their positions against DSM. The United States must support these positions with all the relevant tools of its international and domestic law and policy, both due to the significant impact of our energy supply chain decisions as well as the history of U.S. exploitation of Pacific environments and violations of Indigenous rights, which must be answered for and not repeated. U.S. support for a moratorium is necessary to “break . . . the cycle of destructive, non-consensual experimentation historically carried out in the Pacific region, the calamitous consequences of which are still highly visible.”¹⁵⁶ To both demonstrate and provide this support, the Biden Administration must: (1) institute a moratorium on DSM anywhere in the U.S. EEZ; and (2) call on the ISA and its member states to issue a moratorium on DSM in the high seas until it is possible to meet the criteria of environmental justice, conservation, and good governance cited by the aforementioned IUCN Motion 069 and the Pacific Blue Line statement. These actions will ensure the United States honors its commitments and responsibly safeguards our most valuable public resources from grave and potentially permanent harm.

CONCLUSION

The Nation’s and the world’s transition to a clean energy economy will require profoundly different minerals than those used in the current fossil fuel economy. This transition has the potential to negatively impact

¹⁵⁴ Indigenous Peoples’ Day, 2021, 86 Fed. Reg. 57,307, 57,307 (Oct. 8, 2021).

¹⁵⁵ Press Release, The White House Briefing Room, FACT SHEET: President Biden Establishes the White House Initiative on Asian Americans, Native Hawaiians, and Pacific Islanders (May 28, 2021), <https://www.whitehouse.gov/briefing-room/statements-releases/2021/05/28/fact-sheet-president-biden-establishes-the-white-house-initiative-on-asian-americans-native-hawaiians-and-pacific-islanders/>.

¹⁵⁶ Aguon & Hunter, *supra* note 97, at 54.

Indigenous communities. We must try an immensely different approach to ensure that supply does not occur on the backs of Indigenous Peoples. By implementing the strategies discussed here, those impacts can be avoided or reduced. If there are projects that are deemed to be necessary—where the supply cannot be achieved by other means—then Indigenous communities must have an early and permanent seat in shaping those projects. Free, prior, and informed consent should be obtained from all impacted Indigenous communities before the first shovel of dirt is displaced. The use of Traditional Ecological Knowledge should be a key aspect of any project and impacts should be mitigated to the maximum extent practicable. Clear and defined solutions to mitigate the impact of clean energy initiatives, as discussed here, must be fully explored in partnership with Indigenous communities to ensure a prosperous and healthy future for all.