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ARTICLES

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Alex Ritchie
Executive Director

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Legal Considerations for Geothermal Applications in Texas

Clifton A. Squibb
Dallas, Texas

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I. INTRODUCTION

In recent history, geothermal energy has achieved little celebrity relative to other renewable energy sources and carbon-mitigating technologies. Owing largely to grassroots efforts, this is beginning to change.[1] Geothermal proponents emphasize that geothermal projects produce few, if any, carbon emissions while generating baseload energy—something significantly more valuable than variable power from solar and wind projects. Importantly, geothermal development leverages a deep body of expertise found within the oil and gas industry, offering both a competitive advantage and a pathway for absorbing industry talent as governmental mandates and programs threaten livelihoods. Investors and the federal government are demonstrating an incipient willingness to acknowledge the unique potential of geothermal energy.

With this long-awaited tailwind, the geothermal community is growing. In Texas and elsewhere, its proponents aspire to reposition the industry's place within the energy landscape from that of an afterthought to a heavyweight. In doing so, developers are introducing geothermal principles into a variety of applications. Although these projects often involve novel approaches and strategies, Texas developers benefit from a deep body of law built alongside more than a century of oil and gas development. This article examines how Texas law shapes the rights and obligations of geothermal developers within the context of emerging geothermal applications.

II. GEOTHERMAL APPLICATIONS

Generally, geothermal energy refers to the thermal energy distributed within the Earth's crust between constituent host rock and fluid located within its fractures and pores at temperatures above ambient levels.[2] It is considered renewable in the sense that it is practically inexhaustible: geothermal heat is continuously generated by the decay of radioactive elements deep within the Earth.[3] Mankind's use of geothermal energy at naturally occurring hot springs predates recorded history. For the modern geothermal industry, important early milestones include the installation of a district heating system in Boise, Idaho, in the 1890s and a dry-steam plant in Larderello, Italy, that began producing

[1] Nascent organizations include the Texas Geothermal Energy Alliance and Project Inerspace, each launched in 2022, joining other notable advocacy organizations such as ThinkGeoEnergy and Geothermal Rising.

[2] Mass. Inst. of Tech. (MIT), "The Future of Geothermal Energy: Impact of Enhanced Geothermal Systems (EGS) on the United States in the 21st Century," at 1-9 (2006).

[3] Silviu Livescu et al., "Geothermal and Electricity Production: Scalable Geothermal Concepts," in *The Future of Geothermal in Texas* 25, 26 (Jamie C. Beard & Bryant A. Jones eds., 2023); *see also* Robert P. Wright & C. Christopher Wilson, "Development of Geothermal Resources: The Heat Is On," *Wind, Solar and Renewables Inst.* (Univ. of Tex. Feb. 2011), at 1.

electricity in 1904.[4] During the twentieth century, geothermal heat and power projects spread to other places with naturally favorable conditions, including northern California (where the Geysers field is operated by Calpine Corporation), Iceland, Indonesia, New Zealand, the Philippines, and Turkey.[5] In recent years, the industry has focused on applying concepts and techniques from the oil and gas industry—utilizing data obtained in the course of oil and gas exploration—in an effort to make geothermal energy relevant on a vastly broader geographic scale. Some of the many existing and emerging applications for geothermal energy are below.

A. Direct Use

Direct-use geothermal applications utilize ground-sourced heat for residential, industrial, and other uses, including food processing, horticultural greenhouses, aquaculture, and ground-source heat-pump systems.

While many of these applications are narrow, many advocates believe ground-source heat pumps hold substantial decarbonization potential for heating and cooling within residential, commercial, and industrial real estate contexts. Unlike systems designed to extract heat at levels capable of power generation, ground-source heat pumps are predicated on the stability of temperatures in the shallow subsurface. Typically, these systems use fluid flowing through pipes or coiled tubing at shallow depths to absorb heat from the ground when the air is colder than the ground temperature and to deposit heat into the ground when the air is warmer than the ground temperature.[6] Where scarcity of surface area availability precludes trenching, heat-exchange systems may utilize a U-shaped vertical borehole system. On a larger scale, these designs may be integrated into a network to provide heating and cooling for large buildings and residential communities.[7] To achieve efficiencies in district and larger applications, developers may design deeper systems that optimally access heat based on the prevailing geothermal gradient[8] or may incorporate storage concepts discussed below.

B. Hydrothermal Electricity

Hydrothermal energy is the conventional mode of geothermal energy production. With hydrothermal projects, heat is extracted from an in situ reservoir. Conventional hydrothermal energy production is available only in isolated areas that feature the requisite combination of subsurface conditions. Generally, heat must exist at a feasible depth, abundant water must exist under pressure

[4] MIT, *supra* note 2, at 1-9.

[5] ThinkGeoEnergy, "Global Geothermal Power Update" (Jan. 2020).

[6] Sergio Kapusta et al., "Direct Use Applications: Decarbonization of Industrial Processes, and Heating and Cooling Scenarios," in *Future of Geothermal in Texas*, *supra* note 3, at 47, 49–50.

[7] *Id.* at 50.

[8] *Id.* at 49.

in the target reservoir, and the reservoir geology must include appropriate permeability and porosity.[9]

Where conditions are appropriate, subsurface temperature and pressure conditions may produce steam without a significant amount of water at the wellhead. This dry steam drives a turbine to generate electricity.[10] More commonly, water is produced at high pressure and temperature at a wellhead connected to a flash tank, where the fluid's exposure to lower pressure generates steam. As with a dry-steam system, the flash steam drives a turbine to generate electricity.

At lower prevailing subsurface reservoir temperatures, or with residue water from a flash-steam operation, hydrothermal energy is collectible using a binary cycle or organic Rankine cycle (ORC) plant.[11] These systems utilize a heat-exchange fluid with a lower boiling point.[12] The produced water heats the second fluid to boiling, creating vapor that then drives a turbine. In Texas, given the depth of basement igneous rock and the lower downhole temperatures in sedimentary formations, geothermally generated electricity is likely to occur through binary cycle plants.[13] Research and development efforts are underway in an effort to improve efficiencies of power generation—for example, through use of carbon dioxide in supercritical phase as a heat-exchange fluid and by introducing thermo-electric generators that would convert heat to electricity downhole.[14]

C. Closed-Loop Geothermal

Certain geothermal companies have focused recently on the possibility of generating electricity through closed-loop geothermal systems—so called because they are entirely circular and closed, neither injecting fluids into nor producing fluids from the rock surrounding the wellbore.[15] Unlike EGS (discussed below), these systems avoid any stigma of fracturing, and because they do not alter subsurface pressures, they avoid seismicity concerns. Without the availability of fractures, a closed-loop wellbore achieves significantly less two-dimensional surface contact with the rock on a linear-foot basis, limiting conduction and heat transfer into the wellbore.[16] To increase conduction, closed-loop designs frequently involve numerous long lateral wellbores, with each lateral connecting at its endpoint with a paired parallel lateral to create a loop, forming system resembling a radiator. Due to the quantity of drilling necessary and the challenge of drilling at the extremely high temperatures required to compensate for the system's limited conductivity, many commentators believe

[9] MIT, *supra* note 2, at 1-10.

[10] Rebecca Schulz & Silviu Livescu, "The Oil and Gas Industry Role: Technology Transfer, Development, Acceleration, and Scale," in *Future of Geothermal in Texas*, *supra* note 3, at 130, 139.

[11] *Id.*

[12] *Id.*; *see also* Livescu et al., *supra* note 3, at 39.

[13] Livescu et al., *supra* note 3, at 37.

[14] Schulz & Livescu, *supra* note 10, at 139.

[15] Livescu et al., *supra* note 3, at 32–33.

[16] *Id.* at 32.

closed-loop systems are not financially plausible absent significant cost reductions or technological breakthroughs.[17]

D. Enhanced Geothermal Systems

An enhanced geothermal system (EGS) replicates the conditions found in a conventional hydrothermal system.[18] An EGS design transforms the ubiquity of heat at depth into an asset by overcoming the absence of water, permeability, or porosity at depths where that heat is found. Advocates believe EGS promises to radically expand the availability of geothermal energy—in effect, enabling "geothermal anywhere."[19]

EGS designs typically call for complementary injection and production wells connected at heat-bearing depths through bottomhole fractures that enhance the permeability of the rock.[20] Fluid is injected down through an injection well into the fractured rock, where it absorbs heat as it migrates through the fractures into the production well.[21] The heated fluid is then pumped to surface and run through a plant to produce electricity. While the system forms a loop, it is not closed to the rock.

Directional or horizontal drilling and multi-stage fracturing—methods pioneered by oil and gas developers—can augment the efficacy of EGS.[22] Additionally, some hybrid designs combine closed-loop and EGS elements—for example, by combining downward bottomhole fractures to bringing heat to the well through convection with a separate closed-loop downhole heat-exchange system, either within a single well or multiple wells.[23]

E. Geothermal Storage

As costs of wind and solar energy have fallen, their average shares of our power supply have risen, increasing the public's reliance on them. Yet these energy sources are inherently variable, performing according to the whims and routines of the weather and the planet. A prolonged failure to produce power creates a vacuum, and even when they predictably generate supply at capacity, times of peak supply fail to align with peak demand. These factors create arbitrage opportunities for storage of energy.

Geothermal wells can be used for battery storage.[24] At times of peak renewable supply and lower prices, fluids are drawn from a cold well, and solar

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[17] Mark McClure, "Technical Barriers for Deep Closed-Loop Geothermal," *ResFrac Blog* (Mar. 21, 2023).

[18] MIT, *supra* note 2, at 1-10.

[19] Univ. of Tex. Bureau of Econ. Geology, "Geothermal Anywhere—Texas' Next Great Energy Opportunity," (July 15, 2021), https://www.beg.utexas.edu/articles/geothermal-anywhere-texas-next-great-energy-opportunity.

[20] Livescu et al., *supra* note 3, at 28–29; MIT, *supra* note 2, at 1-10.

[21] MIT, *supra* note 2, at 1-10.

[22] Livescu et al., *supra* note 3, at 31.

[23] *Id.* at 35.

[24] Sidney Green et al., "Geothermal Battery Energy Storage," 164 *Renewable Energy* 777 (Feb. 2021).

radiance or other renewable energy is used to heat those fluids, which are then injected into designated hot wells. At times of low renewable supply and higher prices, the system discharges: the heated fluids are produced, the resulting steam powers a turbine, and the fluids are injected into a cold well for later retrieval.[25] As the costs of lithium and other inputs for electrochemical batteries soar, the prospects for these geothermal aquifer or reservoir thermal energy storage systems appear more promising.

A similar approach provides for thermal storage for heating and cooling of facilities on a seasonal basis. This concept—a cousin of the ground-source heat-pump system—may feature subsurface storage systems in insulated layers using a large array of shallow closed boreholes or deeper open wells.[26] During the summer season, heated fluids can be stored subsurface, to be retrieved and used in winter. Conversely, fluids cooled during winter can be retrieved and used for cooling in summer.[27]

F. Oil and Gas Coproduction and Conversion

The long history of oil and gas production in Texas has yielded a wealth of data on downhole geology and temperatures across the state. In many locations, those temperatures are suitable for geothermal energy production. In areas where waterflood operations achieve a sufficient flow rate at elevated temperatures, the heat capacity of large quantities of produced water can generate meaningful power.[28] Other areas of the state include wells completed in or above large, heated, high-pressure sedimentary zones or aquifers with high natural porosity.[29] Brines produced alongside oil and gas from those depths may be capable of geothermal power generation, and abandoned wells reaching those depths may be convertible into geothermal injection or production wells.[30] Conversely, operators may be able to deepen wells currently drilled above geothermal target zones to secure geothermal power.

In some cases, these efforts may yield sufficient capacity to justify delivering power to the grid or to neighbors. In other cases, they may offset the costs of building transmission and reduce or eliminate the amount of electricity purchased from providers for pumping and other oilfield operations.[31] Previously drilled wells and existing infrastructure can substantially decrease the costs of achieving geothermal power generation.[32] Likewise, incidental production of

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[25] *Id.*

[26] S. Gehlin, "Borehole Thermal Energy Storage," in *Advances in Ground-Source Heat Pump Systems* 295 (Simon J. Rees ed., 2016).

[27] *Id.*

[28] Birol Dindoruk et al., "Other Geothermal Concepts with Unique Applications in Texas," in *Future of Geothermal in Texas*, *supra* note 3, at 61, 63; *see also* MIT, *supra* note 2, at 2-34.

[29] Dindoruk et al., *supra* note 28, at 63–65; MIT, *supra* note 2, at 2-34.

[30] Daniel Raimi et al., "Decommissioning Orphaned and Abandoned Oil and Gas Wells: New Estimates and Cost Drivers," 55 *Environ. Sci. & Techn.* 15, 10224 (2021).

[31] Dindoruk et al., *supra* note 28, at 63.

[32] MIT, *supra* note 2, at 2-30.

dissolved gas and other minerals from a geothermal well can enhance the economics of a geothermal operation.[33]

A financial boost from geothermal power may in many instances extend the life of an oil or gas well. By continuing production—or by converting non-producing oil and gas wells to geothermal—operators can avoid or defer plugging and abandonment expense. Further, at a time when methane emissions from marginal and abandoned wells are the object of scrutiny and activism, geothermal power production furnishes a beneficial use to blunt criticism. Prudent operators in the oilfield will consider these benefits and the availability of tax credits, in exploring whether to undertake geothermal operations. Various studies estimate that the energy resource base accessible from existing wells is quite large,[34] making them "significant targets for short and intermediate-term development."[35]

III. FOUNDATIONAL TEXAS LAW FOR GEOTHERMAL RIGHTS

A. Texas Geothermal Resources Act

1. 1975 Act

As a policy matter, Texas has declared that "the rapid and orderly development of geothermal energy and associated resources is in the interest of the people of the State of Texas."[36] To that end, nearly 50 years ago, Texas implemented the Geothermal Resources Act of 1975.[37] Generally, the Act establishes that "geothermal energy and associated resources" are to be developed in an efficient manner that avoids waste, with consideration afforded to the environment, protection of correlative rights, and conservation of natural resources.[38] Accordingly, this framework resembles that applicable to Texas regulation of oil and gas. Indeed, as with oil and gas,[39] the Act subjects the exploration, development, and production of geothermal energy and associated resources to the regulatory authority of the Texas Railroad Commission for the purpose of conservation and protection of correlative rights.[40] The Act also establishes procedures for the leasing and development of geothermal energy and associated resources on Permanent School Fund land.[41]

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[33] *Id.* at 2-31.

[34] S. Daniel Zafar & Bruce L. Cutright, "Texas' Geothermal Resources Base: A Raster-Integration Method for Estimating In-Place Geothermal Energy Resources Using ArcGIS," 50 *Geothermics* 148 (Apr. 2014); MIT, supra note 2, at 2-35.

[35] MIT, *supra* note 2, at 2-35.

[36] Tex. Nat. Res. Code § 141.002(1).

[37] *Id.* ch. 141.

[38] *Id.* § 141.002(2)–(3).

[39] *See generally id.* chs. 81–111.

[40] *Id.* § 141.011.

[41] *Id.* §§ 141.073–.079. Generally, this article addresses legal considerations applicable to geothermal development on private lands; it is not intended to examine legal issues relating to development or leasing of state lands, which are governed, in part, by Tex. Admin. Code tit. 31, pt. 1.

Under the Act, "geothermal energy and associated resources" has the following definition:

> (A) products of geothermal processes, embracing indigenous steam, hot water and hot brines, and geopressured water;
>
> (B) steam and other gasses, hot water and hot brines resulting from water, gas, or other fluids artificially introduced into geothermal formations;
>
> (C) heat or other associated energy found in geothermal formations; and
>
> (D) any by-product derived from them.[42]

Quite broadly, the above definition captures the ability to utilize heat and energy from all of the types of geothermal applications presented in Part II—those that capture heat and energy directly from indigenous fluids, directly from recycled fluids, directly from extraneous fluids sourced elsewhere and injected into the subsurface of the property, and indirectly through the medium of heat-exchange fluids and processes. Heat and energy harvested from an operation in which a formation has been fractured or stimulated appears to fall within the scope of the definition.

Notably, although the Act, when passed, defined "geothermal energy and associated resources," it did not squarely address to whom they belonged.[43] The Act specified that it was not intended to change the substantive law of the state[44] but elsewhere stated that geothermal energy and associated resources are to be "treated and produced as mineral resources."[45] This statement can be interpreted not as characterizing ownership[46] but rather as establishing the framework under which development occurs, consonant with the ensuing delegation of regulatory authority to the Railroad Commission. Regardless, confusion persisted, with some inferring that the Act characterized the resource as a constituent of the mineral estate.[47]

2. 2023 Amendments to the Act

The passage of Texas Senate Bill 785 introduced clarity to the Act's characterization of geothermal rights.[48] Effective June 18, 2023,[49] the Act was amended to supplement the definition of "geothermal energy and associated resources" and to clarify the state of the law as it pertains to ownership. First,

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[42] Tex. Nat. Res. Code § 141.003(4).

[43] A.W. Overbeck, "The Geopressured Geothermal Resources of Texas: A Report on Legal Ownership and Royalty Issues," at 6 (Univ. of Tex. at Austin Ctr. for Energy Studies Jan. 27, 1977) (noting that during hearings on the bill that became the Act, legislators declined a proposal to include a determination on ownership of the resource).

[44] Tex. Nat. Res. Code § 141.002(5).

[45] *Id.* § 141.002(4).

[46] Ben Sebree, "Who Owns Heat? Ownership of Geothermal Energy and Associated Resources Under Texas Law," in *Future of Geothermal in Texas*, *supra* note 3, at 333–34.

[47] *See* Wright & Wilson, *supra* note 3, at 18 (interpreting the Geothermal Resources Act as announcing that geothermal resources are mineral resources).

[48] S.B. 785, 88th Leg. (Tex. 2023).

[49] *See id.* § 4 (providing for effectiveness immediately at passage with a vote of two-thirds of all members elected to each house; having received such vote, the bill took effect on June 18, 2023).

the statute now specifies that oil, gas, products of oil or gas, and minerals produced from a geothermal formation are not "by-products" for purposes of the statute and are therefore not encompassed within the definition of "geothermal energy and associated resources."[50] Any element other than oil, gas, a product of oil or gas, or a mineral that is found in a geothermal formation and brought to the surface, "whether or not it is used in geothermal heat or pressure inducing generation," is a "by-product" and is therefore within the definition of "geothermal energy and associated resources."[51]

Second, the Act establishes that subsurface geothermal energy and associated resources are owned as real property by the landowner, or, where the surface estate and mineral estate have been severed, by the owner of the surface estate.[52] These property rights "entitle the owner . . . and the owner's lessee, heir, or assignee to drill for and produce the geothermal energy and associated resources."[53]

This ownership pronouncement does not apply if "otherwise expressly provided by a conveyance, contract, deed, reservation, exception, limitation, lease, or other binding obligation."[54] It also does not "apply to minerals dissolved in groundwater, including in hot brines" or "change existing law regarding: (A) oil, gas, or mineral extraction regardless of its heat or energy potential; (B) the rights of the dominant and servient estates; or (C) the ownership and use of groundwater."[55]

Notably, the Act continues to negate any intent to make any change in substantive law, professing a purpose of merely restating the law "in clearer terms to make it more accessible and understandable."[56] And, of course, constitutional protections limit the ability to of the government to deprive a citizen of his or her property.[57] Still, as discussed below, the amendment recognizing ownership of geothermal energy and associated resources in the owner of the surface estate appear to accurately reflect the body of Texas law.

3. Related Legislation

In addition to addressing ownership issues, Senate Bill 785 amends section 2703.056 of the Texas Insurance Code to allow a title insurance policy to include as an exception from coverage not only the mineral estate but also geothermal energy and resources.[58] In the same session, the legislature

[50] *Id.* § 2 (amending Tex. Nat. Res. Code § 141.003(5)).

[51] *Id.*

[52] *Id.* § 3 (adding Tex. Nat. Res. Code § 141.004(a)).

[53] *Id.* (adding Tex. Nat. Res. Code § 141.004(b)).

[54] *Id.* (adding Tex. Nat. Res. Code § 141.004(a)).

[55] *Id.* (adding Tex. Nat. Res. Code § 141.004(c)).

[56] Tex. Nat. Res. Code § 141.002(5).

[57] U.S. Const. art. V; Tex. Const. art. I, § 17; *see generally* Reagan Marble, "Produced Water: The Next 'Title' Wave of Litigation," *48th Annual Ernest E. Smith Oil, Gas and Mineral Institute* (Univ. of Tex. Sch. of Law 2022) (examining the constitutionality of 2019 amendments to Tex. Nat. Res. Code ch. 122 that purport to vest ownership of produced water in an oil and gas operator or its transferee).

[58] S.B. 785, *supra* note 48, § 1.

passed Senate Bill 786, which amends section 27.037 of the Texas Water Code to empower the Railroad Commission with regulatory authority over closed-loop geothermal wells.[59] In light of the classification of closed-loop geothermal wells as Class V injection wells, the amendment resolves the conflict between the general regulatory authority of the Texas Commission on Environmental Quality over Class V injection wells and the regulatory authority of the Railroad Commission over geothermal development.[60] Finally, the legislature passed Senate Bill 1210.[61] As discussed in Part IV.B.2 below, the bill amends section 89.047 of the Texas Natural Resources Code to facilitate the takeover of orphaned oil and gas wells for geothermal and energy-storage operations.[62]

4. Conflict with Produced Water Statute

As noted above, under chapter 141 of the Texas Natural Resources Code, where the surface estate and mineral estate have been severed, the "geothermal energy and associated resources" belong to the owner of the surface estate.[63] This geothermal estate includes "indigenous . . . hot water and hot brines" as well as "hot water and hot brines resulting from water, gas, or other fluids artificially introduced into geothermal formations."[64]

By contrast, under section 122.002 of the Texas Natural Resources Code, "fluid oil and gas waste," when "produced and used by or transferred to a person who takes possession of that waste for the purpose of treating the waste for a subsequent beneficial use . . . is considered to be the property of the person who takes possession of it" for that purpose.[65] The same section provides that the "treated product" of fluid oil and gas waste belongs to the party who treats it or who takes possession of it for disposal or beneficial use.[66] "Fluid oil and gas waste" is defined as "waste containing salt or other mineralized substances, brine, hydraulic fracturing fluid, flowback water, produced water, or other fluid that arises out of or is incidental to the drilling for or production of oil or gas."[67]

In *Cactus Water Services, LLC v. COG Operating, LLC*, the El Paso Court of Appeals recently held that produced water from operations under an oil and gas lease belonged to the oil and gas operator.[68] Although treatment technologies had made it a valuable commodity in the oilfield, the court characterized produced water as waste, rather than groundwater. The court rested its conclusion upon

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[59] S.B. 786, 88th Leg. (Tex. 2023).

[60] *Id.*

[61] S.B. 1210, 88th Leg. (Tex. 2023).

[62] *Id.*

[63] Tex. Nat. Res. Code § 141.004(a).

[64] *Id.* § 141.003(4)(A)–(B).

[65] Tex. Nat. Res. Code § 122.002(1).

[66] *Id.* § 122.002(2).

[67] *Id.* § 122.001(2).

[68] No. 08-22-00037-CV, 2023 WL 4846861 (Tex. App.—El Paso July 28, 2023, pet. filed).

> a legal framework distinguishing oil and gas waste from groundwater, making clear that produced water is categorized within the former, and placing the burden of its safe disposal on operators, and according to years of the common industry practice in which operators have processed, transported, and disposed of oil and gas waste.[69]

Within the context of mineral and geothermal coproduction, a conflict exists between chapter 141, on one hand—which regards hot water and hot brines as part of the geothermal estate—and section 122.002 and *Cactus*, on the other—which generally regard produced water as property of the mineral operator. A policy of encouraging coproduction may warrant future legislative effort to address the conflict. Until then, disputes between parties citing these authorities may be determined by the relationship between the dominant and servient estates.[70]

B. Assessing the Act's Ownership Pronouncement

Geothermal development involves groundwater (an incident of the surface estate), heat (a form of energy that does not qualify as a substance), and production of subsurface resources (an activity historically associated with oil, gas, and minerals). Because it combines these disparate attributes, commentators have noted that ownership of geothermal resources does not fall neatly into any well-settled property regime.[71]

Despite the validity of this observation, Texas jurisprudence resoundingly supports the legislative pronouncement that geothermal resources are not part of the mineral estate. First, the objective of geothermal production is to produce energy in the form of heat—which, while valuable, is not a substance. Under Texas law, minerals are substances.[72] Although geothermal heat, like a mineral, is a subsurface resource, it is not a substance, and categorizing a nonsubstance resource as a mineral is inappropriate.[73]

Second, geothermal energy is captured from convection of fluids and conduction between the underground rock and those fluids. These properties—fluids (other than oil and gas) and the subsurface rock—do not belong to the mineral estate. The estate remaining following a severance of minerals includes "not only the surface . . . but also the matrix of the underlying earth, i.e., the reservoir storage space."[74] In addition to groundwater,[75] this includes the geological structures[76] and "the mass of earth undergirding the surface,"[77]

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[69] *Id.* at *16.

[70] *See infra* Parts III.C, IV.C.

[71] *See generally* Overbeck, *supra* note 43.

[72] Moser v. U.S. Steel Corp., 676 S.W.2d 99, 102 (Tex. 1984) (defining the object of a severance of "minerals" to include "all substances within the ordinary and natural meaning of that word").

[73] Sebree, *supra* note 46, at 342.

[74] Humble Oil & Ref. Co. v. West, 508 S.W.2d 812, 815 (Tex. 1974).

[75] Edwards Aquifer Auth. v. Day, 369 S.W.3d 814, 831 (Tex. 2012); Sun Oil Co. v. Whitaker, 483 S.W.2d 808, 811 (Tex. 1972); Tex. Water Code § 36.002.

[76] *West*, 508 S.W.2d at 815; Myers-Woodward, LLC v. Underground Servs. Markham, LLC, No. 13-20-00172-CV, 2022 WL 2163857, at *11 (Tex. App.—Corpus Christi-Edinburg 2022, pet. filed).

which courts have determined include "all non-mineral 'molecules' of the land."[78] In fact, not even the mineral molecules themselves are absolutely vested in the owner of the mineral estate. Under the rule of capture, the mineral owner is entitled only to "a fair chance to recover the oil and gas" from its mineral estate.[79] These precedents leave little doubt that the right to develop geothermal energy cannot be part of the mineral estate.

Accordingly, the 2023 amendments to the Act appear to accurately capture the general rule that the right to explore for, produce, and enjoy geothermal energy belongs to the owner of the surface. The line separating the rights of a mineral owner and surface owner can, however, be blurred when one exercises its rights in a manner that affects or impairs the ability of the other to access or enjoy its rights. Those complications are discussed in more detail below. Consequently, for many geothermal applications, the recent Texas statutory pronouncement is not dispositive.

C. Severability Issues

1. Geothermal Resources as a Severable Subsurface Estate

The rule that geothermal resources belong to the surface estate is a general rule. In view of the severability of estates in minerals and groundwater,[80] there is little reason to doubt that an interest in geothermal resources—as a legal unit of ownership[81]—can be conveyed or reserved. The recent amendments to the Geothermal Resources Act reflect this principle, providing that subsurface geothermal resources are owned by the landowner "[e]xcept as otherwise expressly provided" in an instrument of title.[82]

2. Eligibility of Dominance Doctrine for Non-Mineral Subsurface Interests

When an estate in land is severed, the owner of the severed interest has the implied right to reasonable use of the surface.[83] This rule "is born of simple logic" and exists because the severed interest "would be wholly worthless if the grantee or reserver could not enter upon the land" to explore for and develop the severed estate.[84] Under a long line of cases, a severed mineral estate is

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[77] Lightning Oil Co. v. Anadarko E&P Onshore, LLC, 520 S.W.3d 39, 47 (Tex. 2017); Dunn-McCampbell Royalty Interest, Inc. v. Nat'l Park Serv., 630 F.3d 431, 442 (5th Cir. 2011).

[78] *Myers-Woodward*, 2022 WL 2163857, at *11; *Dunn-McCampbell*, 630 F.3d at 442.

[79] Coastal Oil & Gas Corp. v. Garza Energy Tr., 268 S.W.3d 1, 15 (Tex. 2008). More recently, adjudicating a trespass claim by a mineral lessee following an invasion of sour gas into the pore space in the subsurface of the lease, the Texas Supreme Court regarded the claim as one "for trespass to non-possessory property rights." Regency Field Servs., LLC v Swift Energy Operating, LLC, 622 S.W.3d 807, 816 (Tex. 2021).

[80] *Edwards Aquifer Auth.*, 369 S.W.3d at 831 (recognizing ownership of groundwater in place); Coyote Lake Ranch, LLC v. City of Lubbock, 498 S.W.3d 53 (Tex. 2016) (recognizing that an estate in water, like a mineral estate, is severable).

[81] Averyt v. Grande, Inc., 717 S.W.2d 891, 894 (Tex. 1986).

[82] S.B. 785, *supra* note 48, § 3 (adding Tex. Nat. Res. Code § 141.004(a)).

[83] *Coyote Lake Ranch*, 498 S.W.3d at 64.

[84] *Id.* at 60.

considered "dominant" in the sense that it is benefitted, and the burdened estate is considered "servient."[85] The terms do not imply superiority or inferiority.[86] In *Coyote Lake Ranch, LLC v. City of Lubbock*, where the groundwater estate in a large ranch had been conveyed to the City of Lubbock, the ranch owner argued that the dominance doctrine should not be extended to severances of groundwater. The Texas Supreme Court rejected the argument, explaining: "Though we have not used the word to describe a severed groundwater estate, the estate is dominant for the same reason a mineral estate is: it is benefitted by an implied right to the reasonable use of the surface."[87]

3. Terminological Strictures for Non-Mineral Subsurface Interests

The holding in *Coyote Lake Ranch* highlights a problem of terminological imprecision. Historically, as severance of mineral interests became commonplace, our legal vocabulary developed from a binary structure: the severed estate was regarded as the mineral estate, and the balance of the property was referred to as the surface estate. This "surface estate" reference is an understandable shorthand: in Texas, the utility of the subsurface is overwhelmingly a story about minerals, and, historically, the only other value of property was derived from its use at and upon the surface.

Due to this "resource blindness,"[88] members of the legal community generally describe non-mineral subsurface estates—for example, groundwater rights, pore-space or subsurface storage and sequestration rights, and rights in geothermal resources[89]—as being part of the surface estate. But as a general rule, non-mineral estates, like their mineral brethren, are readily severable. With recent innovations and economic forces drawing greater attention to their value, a marketplace for non-mineral subsurface rights is rapidly emerging. As more and more of these interests are severed in that marketplace and held as standalone interests in property, referring to them as part of the surface estate will make no more sense than referring to minerals as belonging to the surface estate.

4. Implications of Non-Mineral Subsurface Estate Dominance

Further, under *Coyote Lake Ranch*, a severed estate in a non-mineral resource is dominant.[90] That is, a severed interest in groundwater or geothermal resources, for example, is dominant vis-a-vis the balance of the property from which the interest derives. Logically, where the burdened estate includes the right to occupy and enjoy not only the property at and upon the surface but also an unsevered mineral estate attached to that surface interest, this rule produces an unusual outcome: an interest in groundwater or geothermal re-

[85] *Id.* at 64.

[86] *Id.*

[87] *Id.*

[88] Monika U. Ehrman, "Hidden Resources," 13 *U.C. Irvine L. Rev.* 564, 567 (2023).

[89] *Id.* at 581–88.

[90] *Coyote Lake Ranch*, 498 S.W.3d at 64.

sources that is dominant with respect to the balance of the property, including the minerals. Likewise, if the minerals are severed *after* the severance of an interest in groundwater or geothermal resources,[91] the rights of the severed mineral owner are subject to the rights of the previously severed interests in groundwater or geothermal resources. In that situation, the severed mineral estate—though dominant with respect to the estate from which it was severed—remains servient with respect to the severed groundwater or geothermal resources estates. In either scenario, if the interest in groundwater or geothermal resources is referred to using the prevailing legal vocabulary as part of the surface estate, the result is that a surface interest will be dominant and the mineral estate will be servient—precisely the opposite of the rule as presented in Texas case law.

The resolution to this problem could take different forms. In light of the strong public policy favoring mineral development in Texas, some might argue that the mineral estate should always be dominant as against severed non-mineral subsurface interests. As a policy matter, universal dominance of the mineral estate arguably undervalues competing uses whose economic and societal importance has risen rapidly in recent years.[92] Moreover, such a rule, while straightforward, is arguably arbitrary and unfair—it fails to take into account the relative values of the property interests, the fact that an owner of a severed mineral interest may acquire his or her interest subject to the severance of the non-mineral subsurface interest, and the fact that the severed non-mineral subsurface interests are property rights entitled to constitutional protection.[93] And although Texas policy supports mineral development, it also favors protection and development of non-mineral subsurface interests such as groundwater[94] and geothermal resources.[95]

As an alternative to a rule of mineral dominance, courts could apply *Coyote Lake Ranch* in future disputes to definitively establish that a severed non-mineral subsurface interest can, under certain circumstances, be dominant as against a mineral interest.[96] This result may require the legal community to abandon the simplistic surface-mineral dichotomy in favor of a more nuanced vocabulary. To adjudicate the rights of a dominant non-mineral subsurface interest and a servient mineral estate, courts could simply apply existing law to establish that the non-mineral subsurface interest has an implied right of rea-

[91] This scenario assumes that the party acquiring the mineral interest has notice of the outstanding severed interest in groundwater or geothermal resources and does not qualify as a bona fide purchaser. *See, e.g.*, Madison v. Gordon, 39 S.W.3d 604, 607 (Tex. 2001).

[92] Meredith A. Wegener, "Balancing Rights in a New Energy Era: Will the Mineral Estate's Dominance Continue?," 57 *Hous. L. Rev.* 1037, 1069–72 (2020).

[93] One proposal addressing these issues is the "fair opportunity doctrine." *See* Joseph A. Schremmer, "A Unifying Doctrine of Subsurface Property Rights," 46 *Harv. Envtl. L. Rev.* 525 (2022).

[94] Tex. Water Code ch. 36; *Edwards Aquifer Auth.*, 369 S.W.3d at 832–33.

[95] Tex. Nat. Res. Code § 141.002.

[96] A.L. Blount et al., "The Accommodation Doctrine in Light of Renewable Energy," *Oil, Gas and Energy Law* 4 (2023) (arguing that *Coyote Lake Ranch* "created a path to allow groundwater to be given a slight edge in future conflicts" and suggesting that "other renewable energy sources including water, wind, and solar could dominate in a conflict").

sonable use of the mineral estate, with the accommodation doctrine resolving disputes over conflicting uses.[97]

IV. Legal Concepts Applicable to Geothermal Applications

An undeniable asset of the emerging geothermal community is its creativity, which is borne out by the variety of applications that have been introduced or conceptualized, many of which are presented above. This diversity of operational designs implicates an assortment of legal issues and considerations under Texas law.

A. Trespass Issues Arising from Fracturing and Injection

1. Enhanced Geothermal Systems and Fracturing Operations

As discussed above, many EGS concepts borrow from oil and gas innovation by using fracturing to stimulate permeability, flow, and surface contact with the rock, improving the energy potential of a geothermal system. Yet engineers cannot tightly control the extent of the fractures, and in many cases fractures and the fluids and proppants injected to hold them open propagate across property lines, enabling drainage of resources from adjoining property.

In *Coastal Oil & Gas Corp. v. Garza Energy Trust*, the Texas Supreme Court held that hydraulic fracturing extending from an oil or gas well across a lease line does not result in an actionable trespass, reasoning that any injury suffered by the adjoining property owner is precluded by the rule of capture.[98] The court underscored the distinction between invasions at the surface and those far removed from the surface. Noting that a plane flying two miles above the surface is not a trespass, it explained: "The law of trespass need no more be the same two miles below the surface than two miles above."[99] In reaching the decision, the court cited numerous policy reasons why the rule of capture barred recovery for fracturing across property lines: the ability of the adjoining owner to protect itself by reciprocally drilling its own well; the usurpation of Railroad Commission regulatory authority that would result from allowing recourse for drainage from the practice; the poor ability of court systems to determine value of drained resources; the necessity of the practice for recovery of resources; and the absence of dissent regarding the practice within the industry.[100]

These policy reasons also support the case for denying a trespass claim when, for the purpose of geothermal energy production, fluid drains into a well from fractures extending beyond property lines. Accordingly, it is likely that courts will follow the reasoning of *Coastal* and allow production from EGS wells even when those producing wells include fractures that extend beyond property lines.[101]

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[97] *See infra* Part IV.D.

[98] 268 S.W.3d 1, 12–13 (Tex. 2008).

[99] *Id.* at 11.

[100] *Id.* at 14–17.

[101] Wright & Wilson, *supra* note 3, at 20.

However, unlike in the oil and gas context, an EGS operation may involve fracturing not only for drainage but also for injection. The standard EGS design contemplates fracturing to create pathways through which fluids pumped down into an injection well will migrate and pass into intersecting fractures connected to a producing well. Thus, in a doublet system with one injection well and one producing well, approximately half of the fracturing activity occurs for the direct purpose of injection, rather than purely for drainage. Does this distinction warrant a different rule than the one pronounced in *Coastal*? Arguably, no. Although fractures emanate from an injection well, to the extent they connect to a producing well (as designed), they are inextricably intertwined with the act of producing geothermal energy, and the rule of capture should apply.

Of course, some fluids pushed into fractures emanating from an injection well may not migrate to a point of intersection with the complementary fracture network. They may instead travel through a fracture to a point beyond the property line within adjoining property and then out into the subsurface mass in the adjoining property. Whether that event results in a trespass is fundamentally the same question as whether a trespass occurs when injected fluids migrate from an injection well into neighboring property—a question relevant not only to EGS in tight-rock formations, but also to any open geothermal system requiring injection for pressure and flow maintenance.

2. Migration of Injected Fluids into Neighboring Estate

Because circular geothermal systems can involve injection of fluids that migrate into adjoining subsurface property, prudent developers of these geothermal projects will evaluate the risk of trespass liability. In *FPL Farming Ltd. v. Environmental Processing Systems, L.C.*, the Texas Supreme Court left open the question of whether a neighbor alleging migration of a wastewater plume into its subsurface may have a claim for trespass.[102] In that case, the operator of an injection well argued that its regulatory permit precluded trespass liability for operations performed under the authority of that permit. Rejecting the operator's argument, the court held that a permit does not immunize an operator from trespass liability.[103] The court noted that a property owner faced with an invasion of subsurface fluids, unlike a property owner who may drill its own well to offset subsurface drainage from an adjoining well, does not have an obvious means by which to protect his or her interests.[104]

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[102] 351 S.W.3d 306, 314 (Tex. 2011).

[103] *Id.* The court distinguished *Railroad Commission of Texas v. Manziel*, 361 S.W.2d 560 (Tex. 1962), in which the court previously rejected a property owner's claim that trespass resulting from subsurface fluid migration warranted cancellation of an operator's permit for an enhanced oil recovery program. As explained by the court, *Manziel* did not address tort aspects of the operator's activity; it merely held that the alleged trespass was not grounds for cancellation of the permit. *FPL Farming*, 351 S.W.3d at 313.

[104] *Id.*; *see also* Schremmer, *supra* note 93, at 570 (observing that courts tend to regard intrusions as actionable "when self-help cannot rebalance the correlative relationship of the subsurface owners").

The court's silence on the issue in *FPL Farming* may concern geothermal operators intending to inject fluids as part of a geothermal project. Fortunately, *Lightning Oil Co. v. Anadarko E&P Onshore, LLC* offers guidance.[105] Broadly, *Lightning* indicates that the risk of trespass liability is primarily a function of the likelihood and magnitude of legal injury to adjoining property owners.[106] In *Lightning*, an oil and gas operator, Anadarko, obtained a surface and subsurface easement from a ranch owner whose interest was subject to an oil and gas lease held by a second operator, Lightning. At issue was whether Anadarko's plan of drilling through Lightning's lease to access its own leasehold estate would result in a trespass. As a preliminary matter, the Texas Supreme Court determined that Anadarko's physical occupation of the subsurface—without completing any segment of the wellbore to produce oil and gas from any point within the Lightning lease—was merely an exercise of surface rights derived from the ranch owner and did not constitute a trespass.[107] However, the court appeared to take seriously Lightning's claim that Anadarko's operation would necessarily remove some quantity of minerals by drilling and extracting the cuttings from the cylindrical volume of the wellbore within the Lightning lease. To the extent mineral molecules were embedded within those cuttings, the activity would unquestionably be considered a physical invasion and taking of Lightning's leasehold property right.

Nonetheless, the court found no trespass, stating that "ownership of property does not necessarily include the right to exclude *every* invasion or interference . . . ."[108] According to the court, "[w]hether the small amount of minerals lost through that process will support a trespass must, in the end, be answered by balancing the interests involved."[109] In performing this balancing test, the court first undertook a quantitative analysis and concluded that the Anadarko's drilling resulted in only a "small loss of minerals."[110] Next, the court evaluated "the interests of society and the interest of the oil and gas industry as a

[105] 520 S.W.3d 39 (Tex. 2017). In another subsurface migration case, the El Paso Court of Appeals reversed a no-evidence summary judgment in favor of the defendant, holding that improperly excluded testimony created material fact issues as to the causation and damages elements of the plaintiff's trespass claim. Iskandia Energy Operating, Inc. v. SWEPI LP, No. 08-22-00103-CV, 2023 Tex. App. LEXIS 8288 (Tex. App.—El Paso Oct. 31, 2023, no pet. h.). In a preface to its analysis, the court explained that *Lightning* should have guided the availability of the trespass claim but noted that the parties failed to address the role of the case in their arguments. *Id.* at *42.

[106] The Texas Supreme Court has noted a common-law distinction between the law of trespass when a claimant holds a possessory interest as opposed to a nonpossessory interest, such as a royalty or possibility of reverter. In the latter situation, no physical invasion occurs, and a claimant must show actual damages, rather than merely an invasion. *Coastal*, 268 S.W.3d at 10–11. However, in view of the explanation in *Coastal* that traditional trespass principles need not apply to invasions that occur miles beneath the surface, the actionability of a deep subsurface invasion against even a possessory interest absent actual damages is, at best, questionable.

[107] *See* discussion regarding subsurface ownership issues at Part III.B, *supra*.

[108] *Lightning*, 520 S.W.3d at 46.

[109] *Id.* at 50.

[110] *Id.* at 51.

whole"[111] and determined that the efficiencies achieved through off-lease drilling maximized recovery and minimized waste of oil and gas.[112]

Within a geothermal scenario in which injected fluids migrate to adjoining property, assessing exposure to a trespass claim requires a balancing under the principles of *Lightning*. Specifically, the damage to the individual adjoining property interest—which, in turn, is a function of the value of that interest—are evaluated relative to the interests of "the industry as a whole and society."[113]

Often, this risk will be low because the operation cannot reasonably be regarded as causing significant damage to the individual adjoining property owner. In many geothermal operations, water is produced to generate heat, and the produced water is then injected back into the formation in a condition substantially similar to that as it existed prior to being produced. The operator is not introducing fluids into the formation that are any more hazardous than those which existed in the formation before the operation. Therefore, the nature and composition of the migrating injected fluids likely do not pose a substantial trespass risk.

Moreover, in contrast to saltwater disposal and many storage operations, a core function of geothermal injection is pressure maintenance. In cases where the target zone consists of an aquifer or includes geopressured fluids in place prior to a geothermal operation, the absence of any material pressure change may mean that the injection and migration are not capable of causing measurable damage—for example, by interfering with operation of an oil or gas well on the adjoining property, or by forcing out fluids to a different depth in a manner that contaminates freshwater or washes out a zone prospective for oil and gas production.[114]

Even if an operation does introduce hazardous foreign fluids or pressure in a manner that materially alters conditions in adjoining property, courts must weigh the damage resulting from that interference against industrial and societal interests. Commentators have criticized this balancing-of-interests test as elevating the justifications for exceptions to common-law doctrines over the doctrines in a manner that precludes certainty and renders outcomes vulnerable to ideologies and policy preferences of individual judges.[115] Still, in cases where the value of the affected estate is minimal, if a geothermal operator can point to the public policy of promoting geothermal energy[116] and elicit judicial recognition of the interests of the geothermal industry and society in developing geothermal resources, a finding of trespass is unlikely.

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[111] *Id.*

[112] *Id.* at 50–51.

[113] *Id.* at 51.

[114] *See, e.g.*, Michael K. Reer, "Revisiting 'Waste,'" *49th Annual Ernest E. Smith Oil, Gas and Mineral Institute* (Univ. of Tex. Sch. of Law 2023).

[115] Schremmer, *supra* note 93, at 540.

[116] Tex. Nat. Res. Code § 141.002.

B. Usage of Existing Wellbores

1. Abandoned Wellbores and Equipment

The cost savings associated with utilizing existing wellbores and equipment may be essential to the economic viability of geothermal operations in a particular location. Consequently, geothermal developers considering retrofitting or utilizing existing wellbores must ensure that they have acquired the appropriate rights. When a well or equipment is not being actively used or possessed, the question of who holds those rights may require evaluating whether it is real or personal property.

Whether personalty has become a fixture so as to become part of the realty is determined primarily by the annexing party's intent and is generally a fact question.[117] Factors relevant to determining intent are the mode and sufficiency of the annexation, as well as the article's adaptation to the use and purpose of the realty.[118] Accordingly, the extent to which the article is affixed to and customized for the property influences its character as realty or personalty. In some cases, where trade fixtures have not been removed within a reasonable time, they may be considered abandoned and vested with the owner of the realty.[119] Often, the conduct of the operator and property owner and language allowing for removal of equipment may evidence an intent that affixed oilfield equipment remains personalty.[120] The paucity of cases on the subject matter poses a challenge for developers attempting to determine whether items such as installed casing and downhole equipment might qualify as personalty or realty.

Regardless, the calculation for a geothermal operator is easier if wellsite and downhole equipment are abandoned. Abandoned property qualifying as personalty is subject to "finders keepers law."[121] Unlike automatic reversion to a lessor upon termination of an oil and gas lease, "[t]itle to abandoned personalty vests in the first person lawfully reducing it to possession"[122] and "is no man's property until reduced to possession with the intent to acquire title."[123] Accordingly, a geothermal operator may acquire title to wellsite and downhole equipment consisting of abandoned personalty merely by reducing it to possession.

In contrast to abandoned personalty, the wellbores of abandoned wells and abandoned equipment qualifying as realty belong to the landowner upon termination of an oil and gas lease. When a geothermal operator acquires rights to develop geothermal resources by lease or conveyance from that landowner, the operator acquires rights analogous to those of a mineral owner

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[117] Logan vs. Mullis, 686 S.W.2d 605, 607–08 (Tex. 1985).

[118] *Id.*

[119] Terry v. Crosswy, 264 S.W. 718 (Tex. Civ. App.—Beaumont 1924, no writ).

[120] Vermillion v. Fidel, 256 S.W.2d 969, 972 (Tex. Civ. App.—Amarillo 1952, no writ).

[121] Trenolone v. Cook Expl. Co., 166 S.W.3d 495, 499 (Tex. App.—Texarkana 2005, no pet.).

[122] Pearson v. Black, 120 S.W.2d 1075, 1079 (Tex. Civ. App.—Eastland 1938, no writ); *see also Trenolone*, 166 S.W.3d at 500.

[123] *Trenolone*, 166 S.W.3d at 500–01 (quoting Gregg v. Caldwell-Guadalupe Pick-Up Stations, 286 S.W. 1083, 1084 (Tex. Comm'n App. 1926, holding approved)).

or an oil and gas lessee and may use so much of the premises as is reasonably necessary to develop the geothermal resources or to comply with the terms of the lease and effectuate its purpose.[124] To that end, abandoned wellbores and fixtures are subject to use by an operator for development of geothermal resources.

2. Orphaned Wells

Geothermal operators exploring the use of orphaned wells[125] may wish to avail themselves of a statutory procedure allowing for surface inspection and noninvasive testing. Under section 89.047(b)–(e) of the Texas Natural Resources Code, following an operator's nomination of a well, the Railroad Commission will authorize inspection and testing of the nominated for a 30-day period, during which the operator

> may visually inspect the well and all related equipment, tanks, and other facilities and may conduct noninvasive testing such as using a gauge to determine the pressure present at the wellhead but may not produce oil or gas from the well, reenter the well, pull tubing from or perform any other type of downhole work on the well, conduct a salvage operation on the well, or remove any tangible item from the well site.[126]

Subsection (f) then establishes a mechanism by which the nominor may be designated as operator of the well. Prior to the passage of Senate Bill 1210, the statute contemplated designation only for mineral operations.[127] Effective September 1, 2023,[128] the Railroad Commission "shall designate" a nominor as the orphaned well's operator if the nominor files a

> factually supported claim based on a recognized legal theory to a continuing possessory in . . . the geothermal energy and associated resources estate accessed by the well, as established by a current geothermal lease, a recorded deed conveying a fee interest in the geothermal estate or any other documentation of an interest in the geothermal estate.[129]

Ensuring that orphaned wells may be converted to emerging uses other than traditional geothermal production, the amended designation procedure is also available to a nominor filing a claim to "the geologic space accessed by the well for the purpose of an energy conservation well, as established by a recorded deed conveying a fee interest in the space accessed by the well or

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[124] Humble Oil & Ref. Co. v. Williams, 420 S.W.2d 133, 134 (Tex. 1967); *see* discussion at Part III.C.2, *supra*.

[125] An "orphaned well" is one "(A) for which the [Railroad Commission] has issued a permit; (B) for which production of oil or gas or another activity under the jurisdiction of the commission has not been reported to the commission for the preceding 12 months; and (C) whose operator's commission-approved organization report has lapsed." Tex. Nat. Res. Code § 89.047(a)(3).

[126] *Id.* § 89.047(e).

[127] S.B. 1210, *supra* note 61. Prior to amendment, the exclusive procedure for receiving designation as operator required filing a claim "to a continuing possessory right in the mineral estate accessed by the well, such as evidence of a current oil and gas lease or a recorded deed conveying a fee interest in the mineral estate." *Id.*; Tex. Nat. Res. Code § 89.047(f)(1)(A).

[128] S.B. 1210, *supra* note 61, § 3.

[129] *Id.* § 2; Tex. Nat. Res. Code § 89.047(f)(1)(B).

any other documentation of an interest in the space."[130] The amended statute defines "energy conservation well" as "a well used for the retention of energy that may be used to provide dispatchable generation of electricity for the power grid."[131] The breadth of this definition contemplates the kinds of geothermal storage operations described in Part II.B, as well as, perhaps, compressed-air storage and other applications.

3. Marginal and Inactive Non-Abandoned Wells

When a geothermal operator takes over a well that has not been abandoned by an oil and gas operator, the acquisition may take the form of a leasehold or wellbore assignment. A geothermal operator should be aware that these assignments can result in an assumption of liability for matters arising in connection with oil and gas operations on the well. To the extent the geothermal operator wishes to maintain the lease or establish a right to a coproduced stream of minerals and geothermal resources, this kind of assignment may make sense. Alternatively, the oil and gas operator might surrender the leasehold interest in the individual wells as part of a coordinated transaction in which the geothermal operator acquires rights from the owner of the mineral or non-mineral estate, as appropriate.

C. Reasonable Use and Consumption in Exercise of Rights by Owner of Dominant Estate

Proceeding from the view that an estate in a non-mineral subsurface resources is dominant as against the balance of the property—including an unsevered mineral estate[132]—it stands to reason that the owner of an interest in geothermal resources may, under the appropriate circumstances, use "such part and so much of the premises as is reasonably necessary" for development of geothermal resources on the property.[133] When the servient premises include minerals, and minerals are produced as part of the stream of fluids brought to the surface during geothermal operations, a dispute could arise over whether that production exceeds the operator's implied right to "use" the servient estate. Some geothermal operations may reinject produced minerals into the same zone in a form that does not compromise or imperil their future recovery. But when produced fluids contain natural gas released to the atmosphere, or when operations otherwise consume minerals or alter subsurface conditions in a manner that jeopardizes their future recoverability, the mineral owner may argue that the geothermal operator is wasting or consuming the servient estate, rather than merely using it.

Sun Oil Co. v. Whitaker involved a conflict over an oil and gas lessee's use of a water-supply well to produce freshwater for a waterflood operation.[134] De-

[130] S.B. 1210, *supra* note 61, § 2; Tex. Nat. Res. Code § 89.047(f)(1)(C).

[131] S.B. 1210, *supra* note 61, § 1; Tex. Nat. Res. Code § 89.047(a)(1-a).

[132] *See* discussion at Part III.C.4, *supra*.

[133] Sun Oil Co. v. Whitaker, 483 S.W.2d 808, 810 (Tex. 1972).

[134] *Id.* at 808.

spite the fact that the large quantities of water use endangered the groundwater supply needed for irrigation purposes, the Texas Supreme Court held that the lessee had "an implied right to waterflood because the waterflood operation [was] reasonably necessary to carry out the purposes of the lease."[135] The opinion does not undertake any conceptual distinction between freshwater use and freshwater waste or consumption. Presumably, some of the freshwater appropriated and injected by the lessee migrated to other property. Some of the water may have resurfaced as water produced with oil production, and perhaps that produced water was reinjected as part of the lessee's waterflood program. But to the extent that the water appropriated for waterflood operations remained recoverable to the landowner following initial injection, its utility had assuredly been compromised; in all probability, the character of the water had been altered by its injection into an oil-bearing formation and its production in commingled form. In the sense that the water appropriated by the lessee was transformed from freshwater to saltwater or brine, the freshwater was consumed or wasted. Even so, *Whitaker* held that the lessee's activities were reasonable use.

In *Guffey v. Stroud*, a dispute arose when the lessee of oil, but not gas, completed a well productive of gas, but not oil.[136] The Texas Supreme Court held for the holder of the gas rights, ruling that the oil lessee had no right to operate and produce from the gas well because the well, while productive of gas, was "a failure as an oil well."[137] But according to the court, "[t]he grant of the oil carried with it a grant of the way, surface, soil, water, gas and the like essential to the enjoyment of the actual grant of the oil."[138] Splitting from the judgment in a climactic scene penned by the Bard of Avon, the court rejected the notion that "all use of, or interference with, the gas in place was wrongful," stating, "[t]he rule in Shylock's case is not controlling."[139]

Thus, although Portia prevailed in her argument that Shylock's right was realizable only if a pound of flesh could be extracted without spilling a drop of blood, the oil lessee in *Guffey* was not barred from producing gas in association with oil. Just as the right to a pound of flesh includes "by necessary implication of law as much Christian blood as was necessary to be shed in the operation," a right to oil includes the right to "shed" a certain amount of gas and other attributes of the servient estate.[140] This conclusion aligns with the Texas Supreme Court's later recognition of "the fact that there is a certain amount of reasonable and necessary waste incident to the production of oil and gas" for which an operator is not liable.[141] And based on the court's disapproval of the Shakespearean rule, the implied right of reasonable use is not purely usufructuary. If a bond for flesh justifies spillage of blood, the developer of a dominant estate may waste or consume byproducts.

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[135] *Id.* at 811.

[136] 16 S.W.2d 527 (Tex. 1929).

[137] *Id.* at 528.

[138] *Id.*

[139] *Id.* (referencing William Shakespeare, *The Merchant of Venice*).

[140] *Id.*

[141] Eliff v. Texon Drilling Co., 210 S.W.2d 558, 562 (Tex. 1948).

These cases indicate that the reasonable-use doctrine does not necessarily preclude the owner of the dominant estate from using the servient estate in a manner that results in waste or consumption, as long as the use is otherwise reasonable. For geothermal operators seeking protection against claims that their operations waste or consume minerals and other attributes of the burdened premises, these cases offer a measure of protection.

D. Dominance and the Accommodation Doctrine

Even when use of the servient estate is not unreasonable, conflicts may arise between a geothermal operator and the rights of the owners of the balance of the land—particularly when they have competing uses or plans for the property. Texas courts rely on the accommodation doctrine to resolve these conflicts.

Although the owner of a dominant estate has an implied right of reasonable use, that use must be exercised with "due regard" for the servient estate.[142] The substance of that duty is found in the accommodation doctrine, which imposes limitations on the owner of the dominant estate when the servient estate is subject to an existing use of the servient estate. In that event, the owner of a dominant estate must accommodate the servient use if (1) the dominant estate owner's use completely precludes or substantially impairs the existing use, (2) there is no reasonable alternative method available to the owner of the servient estate by which the existing use can be continued, and (3) there are reasonable, customary, and accepted methods available to the dominant estate owner that will allow for development of the dominant estate while allowing for continuation of the existing servient use.[143]

1. Dominant Mineral Estate

Texas case law applying the accommodation doctrine focuses on the duty of the mineral owner or oil and gas lessee to accommodate existing surface uses. In *Lyle v. Midway Solar, LLC*, a solar developer constructed a solar facility under a lease covering land in which the mineral estate had previously been severed.[144] The owners of the mineral estate sued in trespass and breach-of-contract, arguing that the solar developer's array of facilities blanketing most of the property impaired their ability to develop the mineral estate, making the mineral estate less marketable. The El Paso Court of Appeals rejected the claims of the dominant mineral estate owners. In the words of the court, "[t]he rub . . . is that the mineral owners are not actively attempting to develop those minerals."[145] Although any action by the mineral owners was premature absent evidence of an attempt to develop or market the minerals, the court affirmed the applicability of the accommodation doctrine, explaining that if and when

[142] *Whitaker*, 483 S.W.2d at 810.

[143] Merriman v. XTO Energy, Inc., 407 S.W.3d 244, 249 (Tex. 2013).

[144] 618 S.W.3d 857 (Tex. App.—El Paso 2020, pet. denied).

[145] *Id.* at 862.

the mineral estate was developed, the solar developer "must yield to the degree mandated by the application of the accommodation doctrine."[146]

Similarly, in *Lightning*—where Anadarko planned to drilled through the subsurface of Lightning's leasehold estate—the court refused to grant relief based on "speculation" that the drilling and well structures would interfere with its right to develop.[147] Framing the accommodation doctrine as a "sound and workable basis for resolving conflicts," the Texas Supreme Court stated, "Lightning has advanced no reason that convinces us the doctrine will not be flexible enough to do so in the future."[148]

Under *Lyle* and *Lightning*, if geothermal resources are developed on land subject to an outstanding dominant mineral interest, interference with the ability to develop or market the mineral estate will not be actionable unless and until the mineral owner actually attempts to develop or market the minerals. Geothermal developers should prepare for the possibility that a dominant mineral estate owner may undertake marketing or development efforts that will generate a live conflict. In that event, the rights of the parties will be governed by the accommodation doctrine. But geothermal developers may also perform a business-risk analysis to evaluate the likelihood of mineral development in zones or depths targeted by a geothermal project. If a geothermal operation will not impact or will minimally impact zones prospective for mineral development, an outstanding dominant mineral estate may not be of concern.

2. Dominant Estate in Geothermal Resources

As discussed above, the right to develop geothermal resources may be dominant as against the balance of the property, including the mineral estate. In that scenario, if the land is subject to an existing use, the right to use the property for development of geothermal resources will be limited by the accommodation doctrine. If, for example, a geothermal developer wishes to conduct an operation that will completely preclude or substantially impair existing oil and gas production, and there is no reasonable alternative available to the oil and gas producer that will allow production to continue, then the geothermal developer will have to adopt any reasonable, customary, and accepted measures to accommodate the existing oil and gas production. Moreover, under *Lyle*, the mere existence of the oil and gas production is not an actionable interference with the right to develop geothermal resources absent genuine efforts to develop those resources.

3. Viability of Accommodation Doctrine to Resolve Claims to Control over Same Substance

A nettlesome problem arises if a geothermal developer produces and asserts control over fluids containing minerals that a mineral lessee wishes to produce—or, in reverse, if a mineral lessee produces fluids as a byproduct and

[146] *Id.* at 874.

[147] *Lightning*, 520 S.W.3d at 49.

[148] *Id.* at 50.

a geothermal developer wishes to utilize those fluids for generation of geothermal energy. Whenever the party seeking to exercise its rights has not taken genuine steps in pursuit of exploration or development, the requirement in *Lyle* and *Lightning* of a live conflict will weigh in favor of the existing use.

Parties pursuing development who clear that hurdle, however, will present a new test for the accommodation doctrine: If geothermal operations and mineral-development operations target the same substance, are reasonable and industry-accepted alternative methods available to the party carrying out the existing use that will permit development by the other party? And if not, does the party pursuing development have an alternative method of development by which the existing use can continue? Unlike the fact patterns prevalent in current case law describing conflicts between a landowner's use at the surface and an oil and gas operation surface,[149] rival claims to control of the same substance may require flexibility in the application of the accommodation doctrine to a degree not presently envisioned. Alternative methods could require coordination and sharing of control of produced substances under procedures that enable each party to realize the economic benefits of its estate.[150]

E. Coproduction of Minerals and Geothermal Resources

When minerals are produced in conjunction with geothermal resources, waste of the produced minerals is not inevitable. In fact, the ability to produce minerals alongside is widely viewed as an asset to the burgeoning geothermal industry. Revenues from coproduced minerals may enhance the economics of a geothermal project or even prove necessary for its economic viability. Conversely, coproduction of geothermal resources offers a means of improving the economics of existing oil and gas operations.[151] Lurking beneath the enticement of enhanced profitability, however, are numerous legal issues that oil and gas and geothermal operators alike should consider prior to coproduction operations. Fundamentally, these issues stem from divergent ownership of minerals and geothermal resources. While Texas law provides substantial guidance, coproduction presents novel questions that Texas courts will be called upon to address.

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[149] *See, e.g.*, Getty Oil Co. v. Jones, 470 S.W.2d 618 (Tex. 1971), Tarrant Cnty. Water Control & Improvement Dist. No. One v. Haupt, Inc., 854 S.W.2d 909 (Tex. 1993); *Merriman*, 407 S.W.3d 244.

[150] The Texas Supreme Court hinted at the possibility of such a conflict 50 years ago when rejecting the argument that saltwater should belong to the mineral estate due to its salt content. Robinson v. Robbins Petroleum Corp., 501 S.W.2d 865, 867 (Tex. 1973) ("We are not attracted to a rule that would classify water according to a mineral contained in solution. Water is never absolutely pure unless it is treated in a laboratory. It is the water with which these parties are concerned and not the dissolved salt. If a mineral in solution or suspension were of such value or character as to justify production of the water for the extraction and use of the mineral content, we would have a different case. The substance extracted might well be the property of the mineral owner, and he might be entitled to use the water for purposes of production of the mineral…In either case the water itself is an incident of surface ownership in the absence of specific conveyancing language to the contrary. And in our case the saline content has no consequence upon ownership.").

[151] *See* discussion at Part II.F, *supra*.

1. Use of Geothermal Resources by Mineral Operator

Because the Geothermal Resources Act generally establishes ownership of geothermal energy and associated resources in the owner of the surface, a mineral producer may wonder whether it has the right to coproduce geothermal energy under the authority of its mineral lease. The answer to this question has two dimensions: whether the implied right of reasonable use permits geothermal coproduction and to what extent the servient estate owner has recourse for excess geothermal coproduction.

a. Implied Right Includes Right to Geothermal Coproduction

As discussed above, a dominant mineral owner has an implied right to use as much of the servient estate and in such a manner as is reasonably necessary to extract and produce the minerals.[152] This "implied easement"[153] is broad. In *Whitaker*, it entitled the oil and gas lessee to extract large quantities of groundwater for a waterflood operation, which the court regarded as reasonably necessary for mineral development.[154] In other cases, it has allowed mineral owners or lessees the right of ingress and egress, the right to construct roads, the right to take materials from the surface to construct lease roads, the right to dispose of saltwater and drill cuttings, the right to construct and operate pipelines, the right to conduct seismographic tests, and the right to construct temporary housing for employees.[155] Courts have interpreted this right as authorizing a dominant mineral owner "to produce all the oil possible and to use every reasonable means to do so."[156] The case law, therefore, strongly supports the right of an oil and gas developer to generate geothermal energy to power operations.

b. *Robinson* Limitations on Use

The right of reasonable use is not unlimited. In addition to the accommodation doctrine[157] and the rule prohibiting negligence,[158] the servient estate's use generally must benefit the dominant estate. For example, in contrast to *Whitaker*, the lessee in *Robinson v. Robbins Petroleum Corp*. was obligated to pay damages for producing saltwater from a tract within a 221-acre lease for operations on a waterflood unit that spanned thousands of acres when, as a matter of title, the surface owner was not subject to the waterflood unit.[159] The Texas Supreme Court explained that "[n]othing . . . authorized the mineral owner to increase the burden on the surface estate for the benefit of additional

[152] *Williams*, 420 S.W.2d at 134; *Merriman*, 407 S.W.2d at 249.

[153] *Jones*, 470 S.W.2d at 622.

[154] *Whitaker*, 483 S.W.2d at 811.

[155] Austin Brister & Kevin M. Beiter, "Divided Surface and Mineral Estates," *Univ. of Tex. Sch. of Law Fundamentals of Oil, Gas and Mineral Law* 8–9 (Mar. 26, 2020).

[156] Miller v. Crown Cent. Petroleum Corp., 309 S.W.2d 876, 878 (Tex. Civ. App.—Eastland 1958, writ dism'd).

[157] *See supra* Part IV.D.

[158] *Eliff*, 210 S.W.2d 558.

[159] 501 S.W.2d 865 (Tex. 1973).

lands," and noted there was "no proof in the record before us now of the necessity for the waterflood operation to obtain production of oil from the lands embraced by the . . . lease."[160]

Interestingly, the *Robinson* court prescribed a method for the trial court to calculate damages on remand, indicating that the surface owner's damages would be based on the value of the proportion of saltwater used for oil production from non-lease lands.[161] This damages model entails that even if a portion of the saltwater was reasonably necessary for production from within the lease, the oil and gas lessee had no right to benefit from the additional saltwater. But the damages model implies that the saltwater had value to the surface owner, and the court apparently viewed the excess saltwater production as increasing the burden on the surface estate.

c. Incidental Excess Benefits from Use

In some circumstances, *Robinson* may compel a mineral operator to obtain an agreement with the owner of the geothermal estate compensating the owner for coproduction. But *Robinson* does not mean that such an agreement is invariably required. When some portion of an operator's use is reasonably necessary for development of the dominant estate, and the remaining portion of the use does not increase the landowner's burden or result in a quantifiable loss, *Robinson* does not assure a remedy for the burdened landowner.

This limit to *Robinson* prompts an interesting question for an oil and gas operator who implements geothermal coproduction to power operations: If those geothermal operations generate more power than is needed to develop the minerals within the burdened estate (and any unit to which it is subject),[162] may the oil and gas operator sell that power or use it to power operations on nearby properties? Stated differently, in contrast to the production of excess saltwater in *Robinson*, may excess coproduction of geothermal resources be considered reasonable use on the grounds that it is merely incidental? As a practical matter, right-sizing a geothermal coproduction operation to deliver precisely the output that satisfies onsite operation is difficult, if not impossible. Therefore, an operator's entitlement to the benefits of incidental excess coproduction is of strategic importance.

In *Miller v. Crown Central Petroleum Corp.*, a surface owner subject to oil and gas leases sought damages and an injunction related to a pipeline that carried saltwater across his tract.[163] The pipeline served not only the leased premises but also other unitized tracts. The court appeared to hold that the surface owner's rights were subject to the unitization, thereby subjecting the surface owner to the burden of a use benefiting other tracts. However, it indicated this fact was not essential to its holding, stating:

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[160] *Id.* at 867.

[161] *Id.* at 868.

[162] Delhi Gas Pipeline Corp. v. Dixon, 737 S.W.2d 96 (Tex. App.—Eastland 1987, writ denied); Key Operating & Equipment, Inc. v. Hegar, 435 S.W.3d 794 (Tex. 2014).

[163] 309 S.W.2d 876 (Tex. Civ. App.—Eastland 1958, writ dism'd).

> More oil is being produced from [the surface owner's] land as a result of piping the salt water across it. The lessee is certainly not deprived of the right to do so merely because it also has the effect of producing more oil from other tracts not included in the leases of [the surface owner's] tracts but included in said unit.[164]

The uncertain role of unitization in the court's reasoning leaves open the possibility that the pipeline, although benefitting other tracts, was permissible as part of a system that increased production on the burdened tract.

In *Key Operating & Equipment, Inc. v. Hegar*, an operator pooled its 12.5% leasehold interest in a portion of one tract with its interest in a portion of an adjoining tract. A new well was drilled upon the unit in the adjoining tract.[165] The operator then used a road traversing the tract in which it held the 12.5% leasehold interest to develop and produce from the adjoining well. Displeased with the sudden surge in road traffic, the surface owners claimed trespass, arguing that the road was being used for the benefit of production from the adjoining tract. But the pooled parts of the tracts "no longer maintained separate identities," and production from the well on the adjoining tract was constructively considered production from the burdened tract.[166] Under this reasoning, the Texas Supreme Court held that the use of the road across the burdened tract was effectively for the benefit of production from the burdened tract.[167]

One can imagine an alternate universe with slightly different facts—for example, the 12.5% interest in the road-burdened tract could have been pooled with only a portion of the mineral estate in the adjoining tract. Under those facts, the operator would have been allowed to develop the well on the adjoining tract, subject to the obligation to account to the owner of the unpooled interest in the adjoining tract under cotenancy law.[168] In that scenario, only a portion of the use of the surface of the burdened tract would have occurred for the benefit of the pooled interests—and thus constructively for the benefit of production from the burdened tract. The remaining portion of the use of the burdened tract would have occurred for the benefit of production from an unpooled interest in the adjoining tract. Yet, it stretches the imagination to envision the court reaching a different result.

If using the road to benefit production from the unpooled adjoining interest would indeed be permissible, one explanation is that the benefit to the unpooled interest is purely incidental. Under cotenancy principles, the operator has the right to conduct precisely the same operation—with the same impact on the road-burdened tract—as it would if there were no unpooled interest and therefore no cotenancy in the adjoining tract. By this logic, if the scope and magnitude of the coproduction operation are no greater than the scope and magnitude that are reasonably necessary for powering the onsite mineral op-

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[164] *Id.* at 878.

[165] 435 S.W.3d 794 (Tex. 2014).

[166] *Id.* at 799.

[167] *Id.* at 800.

[168] *See, e.g.*, Cox v. Davison, 397 S.W.2d 200 (Tex. 1965).

eration, a servient owner should not have a trespass claim against a mineral operator that generates excess coproduced geothermal resources.

This proposition finds support in *Cole v. Anadarko Petroleum Corp.*[169] In *Cole*, a landowner's excessive-use claims failed when a unit operator's activities at a central tank battery facility supported not only unit production but also non-unit production. According to the court, "the mere fact that incidental non-unit activities have taken place does not establish a cause of action absent evidence that these activities caused damage."[170] Under *Cole*, if the configuration of geothermal coproduction facilities is the same regardless of whether they generate excess energy, no damages arise from the configuration or physical footprint of the facilities even if they incidentally benefit other property.[171]

Of course, the configuration of facilities is distinguishable from production of excess geothermal energy.[172] Nonetheless, the logic of cases such as *Lightning* and *Lyle* may weaken a claim by the owner of the servient estate. Unless the servient estate owner can demonstrate quantifiable loss due to the excess coproduction or interference with an actual effort to develop or market the geothermal resources that are the subject of the excess coproduction, a claim for damages arising from incidental use is ill-fitting.

Indeed, for many coproduction scenarios, quantifiable loss may be difficult to establish. Arguably, if coproduction in connection with an oil and gas operation is the only economically viable means of accessing the geothermal resources, the geothermal resources hold no independent value—in which case the servient estate owner suffers no loss when they are developed alongside oil and gas. And under the holding in *Cole*, unavailability of damages precludes recourse for incidental excess geothermal coproduction. Its holding therefore provides a promising rationale for operators wishing to unlock the benefits of coproduction.

Cole does not expressly address the possibility of recovery by the owner of a burdened estate in assumpsit. Texas law permits "recovery under assumpsit for trespass" and provides that "an injured party may either recover for the actual injury, or under implied contract basis for the use and occupation of the land."[173] To the extent that assumpsit requires actionable trespass and injury,

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[169] 331 S.W.3d 30 (Tex. App.—Eastland 2010, pet. denied).

[170] *Id.* at 37.

[171] Clifton A. Squibb, "The Age of Allocation: The End of Pooling as We Know It?," 45 *Tex. Tech L. Rev.* 929, 936 (2013); Stephen K. Newton, "Issues of Excessive Surface Use in Multi-Lease Horizontal Development," 45 *Oil, Gas & Mineral Resources Law Sec. Rep. (State Bar of Texas) No. 1*, at 50 (Mar. 2021).

[172] Production of geothermal resources is not a consumption of property in the same manner as production and drainage of a finite and depletable resource; the resource is renewable, and subsurface heat available for a well will eventually recharge. However, during the practical economic lifespan of a well, its productivity may decline over time as the surrounding rock cools following heat transfer.

[173] Villarreal v. Grant Geophysical, Inc., 136 S.W.3d 265, 269 n.1 (Tex. App.—San Antonio 2004, pet. denied); *see also* Phillips Petroleum Co. v. Cowden, 241 F.2d 586, 592 (5th Cir. 1957) (explaining, "Texas belongs to the minority of states that permit a landowner to waive the trespass and sue in assumpsit for the reasonable value of the use and occupation").

the availability of recovery may be no greater in assumpsit than in trespass. Cases such as *Lightning*, *Lyle*, and *Cole* may therefore shield a coproducing operator from liability not only in trespass but also in assumpsit. Moreover, the recovery under assumpsit must be based on the "reasonable market value" of the use and occupation.[174] Importantly, the reasonable market value is "independent of the benefit . . . actually received from that use" by the occupying party.[175] Thus, the usefulness or profitability of coproduction to the operator has no relevance in assumpsit. Absent competition or a market for geothermal resources, the market value of the right to occupy the geothermal estate is likely nominal.

An action brought under a theory of unjust enrichment,[176] "a quasi-contractual doctrine that closely resembles assumpsit,"[177] faces similar obstacles. Arguably, coproduction does not unjustly enrich an operator when the coproduced resources are developed solely by the efforts of the owner of the dominant estate and are not otherwise economically recoverable by the owner of the servient estate. In short, the prospect of claims in assumpsit and unjust enrichment is not a formidable deterrent to coproduction.

Certainly, excess coproduced geothermal energy that is sold or used to power nearby operations will boost an oil and gas operator's revenue or decrease its costs. A largely untested question is whether the enhancement of profitability resulting from a dominant estate owner's use can justify that use: If a dominant use benefits other properties, but in so doing, renders the operations on the burdened property more profitable, then, arguably, the dominant use *does* benefit operations on the burdened estate. As noted above, courts have interpreted the implied-use doctrine as authorizing a dominant mineral owner "to produce all the oil possible and to use every reasonable means to do so."[178] If a mineral operator sells a portion of coproduced geothermal energy or uses it as a lower-cost alternative for powering nearby operations—and if those acts improve a mineral operator's income, thereby increasing the ultimate recovery and the life expectancy of the operation on the burdened property—then perhaps utilization of the excess coproduced geothermal energy is, in fact, reasonably necessary for development of the minerals. Although the damages model prescribed in *Robinson* suggests a landowner—at least one capable of demonstrating quantifiable loss—is entitled to compensation for

[174] *Villarreal*, 136 S.W.3d at 269 n.1; *Cowden*, 241 F.2d at 593.

[175] *Id.* For example, in *Galveston Wharf Co. v. Gulf, C. & S. F. R. Co.*, 10 S.W. 537 (Tex. 1889), when a railroad company inadvertently placed its track and facilities on the plaintiff's land, the value of the land in assumpsit was limited to the value for which it could have been leased absent the occupation. The special value and profitability of the occupied land to the occupant railroad company did not bear on the assumpsit value. For a discussion of these issues, see Ryan Clinton & Jad Davis, "Oil and Gas Damages," *State Bar of Tex. Damages in Civil Litigation Conference* (2015).

[176] *See, e.g.*, Phillips Petroleum Co. v. Texaco, Inc., 415 U.S. 125 (1974) (involving unjust enrichment claims by of natural-gas producer not compensated by gas purchaser for helium content of a delivered gas stream).

[177] Excess Underwriters at Lloyd's v. Frank's Casing Crew & Rental Tools, Inc., 246 S.W.3d 42, 50 (Tex. 2008).

[178] *Miller*, 309 S.W.2d at 878.

benefits from excess use that supports other lands, the theory that enhanced profitability might justify excess use was not before the court.

Regardless, absent an agreement with the burdened estate, the ratio of benefits derived from coproduction is relevant to coproduction's legitimacy. At a certain point, the financial return from an operator's use of the burdened estate may surpass the profitability of the operation ostensibly supported by the use. In those instances, continued development of the burdened estate might serve as a pretextual grip on the benefits derived from use of the servient estate; characterizing those benefits as "incidental" may not be appropriate.[179] Even if Texas courts adopt a forgiving posture toward dominant uses that produce excess benefits, the implied-use doctrine may reach its limit when a means becomes the end.

2. Use of Minerals by Geothermal Operator

Just as mineral operators might look to recover geothermal energy from the production stream, geothermal operators may capture hydrocarbons or other minerals from produced geothermal fluids. Those minerals can be sold or used as fuel, improving the economics of an operation. For coproducing geothermal operators, the foregoing considerations generally apply in reverse.

In many cases—including those where the mineral production incidentally exceeds the amount necessary to power onsite operations—coproduction will yield minerals in amounts that could not justify independent development. Although those minerals may have value when brought to the surface through coproduction, if independent development of those minerals would be economically irrational, production may not cause any measurable damage to the mineral owner. Likewise, if independent development of the minerals is not viable, the geothermal operator's interference with the right to develop the minerals causes no damage. And as discussed above, Texas cases have not squarely addressed whether an operator may claim reasonable use when excess coproduction indirectly furthers the dominant activity by enhancing profitability. Regardless of whether the doctrine of reasonable use might encompass excess benefits that enhance profitability, geothermal operators are more likely to exceed the right of implied use if the coproduced minerals have meaningful value independent of the coproduction, or if the benefits of coproduction eclipse the benefits arising from the dominant activity.

V. CONCLUSION

Steadfastly erected with the boom-and-bust rhythms of the oil and gas industry, Texas real property law is an imposing edifice. Its scope offers an emerging geothermal community an expansive rulebook and a level of visibility on legal issues that is without parallel in other jurisdictions. Yet, as these advantages lure development, innovative applications will test the state's established legal principles in new and unforeseen ways. In endeavoring to reshape

[179] *Cf. Cole*, 331 S.W.3d 30.

the energy landscape, a pioneering geothermal industry may compel the refinement and advancement of Texas jurisprudence.

Renewable Development on Federal Lands: The Quest for NEPA Efficiencies

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I. INTRODUCTION[*]

For the country to meet its climate goals and transition to a renewable-focused energy grid, development of new wind and solar facilities and transmission infrastructure will need to increase dramatically over the next decades.[1]

Federal onshore[2] lands will play an important role in meeting these development goals due to the significant amount of land at issue, the existence of "vast contiguous areas available for onshore renewable energy deployment," and the agency's multiple-use mandate.[3] Federal lands have significant potential for the development of solar and wind projects, and are also essential to the development of the transmission projects "critical to the feasibility of renewable energy projects proposed" both on federal and state and private lands."[4]

Recent actions by Congress and the Internal Revenue Service (IRS) have sought to incentivize the increased development of renewable energy on federal lands to effectively capture this potential, but have simultaneously recognized the difficulties and delays federal projects can face. At the end of 2020, the IRS issued Notice 2021-05 extending the period under which qualifying wind and solar projects must be placed in service to claim federal tax credits to ten years for renewable projects constructed on federal lands. The impetus for Notice 2021-05 and the tax-credit extension for federal projects was the agency's acknowledgment that renewable projects constructed on federal lands can take twice as long to complete as comparable projects constructed

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[1] *See, e.g.*, Veronica Penney, *Where Wind and Solar Power Need to Grow for America to Meet Its Goals*, N.Y. TIMES (May 28, 2021); Michael B. Gerrard, *Legal Pathways for A Massive Increase in Utility-Scale Renewable Generation Capacity*, 47 ENVTL. L. REP. NEWS & ANALYSIS 10591 (2017).

[2] The Department of the Interior, through the Bureau of Ocean Energy Management, also manages the development of offshore wind energy resources. Because of the unique procedural processes that apply to the development of these projects and the significant cost and time investment required, this paper focuses on the development of permitting efficiencies for onshore renewable energy projects.

[3] *See* Bureau of Land Mgmt. (BLM), *Report to Congress: Public Land Renewable Energy – Fiscal Year 2021*, 2, 6 (Mar. 2022) (BLM 2021 Report), https://www.blm.gov/sites/blm.gov/files/docs/2022-04/BLM%20Public%20Land%20Renewable%20Energy%20FY21%20Report%20to%20Congress%20v4%20508_0.pdf.

[4] *Id.* at 2.

on state or private lands.[5] At the same time the IRS issued Notice 2021-05, Congress passed the Energy Act of 2020 (2020 Energy Act).[6] The 2020 Energy Act contains provisions focused on expediting and increasing approval and development of both solar and wind projects on federal lands managed by the Bureau of Land Management (BLM) and the U.S. Forest Service. And the Act sets a specific target for the development of renewable projects on federal land—requiring the U.S. Department of the Interior to seek to permit at least 25 gigawatts (GW) of electricity from wind, solar, and geothermal projects by 2025.[7]

These legislative and administrative actions have triggered a renewed focus on efforts to prioritize the permitting of renewable energy and transmission projects on federal lands, and to create the permitting efficiencies necessary to achieve this goal. As BLM recently acknowledged, the "efficient deployment of renewable energy from our nation's public lands is crucial in achieving the Biden-Harris administration's goal of a carbon pollution-free power sector by 2035, as well as Congress' direction in the 2020 Energy Act to permit 25 gigawatts of solar, wind, and geothermal production on public lands no later than 2025."[8]

II. NEPA: EXISTING TOOLS FOR EFFICIENCY

The National Environmental Policy Act (NEPA) often receives a lion's share of the blame for why developing projects on federal lands is cumbersome, costly, and time consuming. IRS Notice 2021-05, for example, identified "the applicability of significantly more stringent permitting requirements" and "heightened environmental regulation (including, for example, the environmental analysis process carried out by the Director of the Bureau of Land Management)" as two of three reasons why federal onshore renewable projects take up to twice as long to permit and construct as projects developed on state and private land.[9]

NEPA's reputation is not underserved. NEPA can be difficult and costly to navigate. And delays in the federal review and approval process often conflict with the practical realities of private project development, such as limited construction seasons and the need to enter into binding procurement contracts far in advance of commencing construction activities.

But the purpose and intent of NEPA is "not to generate paperwork . . . but to foster excellent action."[10] The Council on Environmental Quality's (CEQ)

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[5] IRS, Notice 2021-05, *Beginning of Construction for Sections 45 and 48; Extension of Continuity Safe Harbor for Offshore Projects and Federal Land Projects* 9 (Dec. 31, 2020) (Notice 2021-05), https://www.irs.gov/pub/irs-drop/n-21-05.pdf.

[6] *See* Pub. L. No. 116-260, div. Z, 134 Stat. 1182, 2418.

[7] 43 U.S.C. § 3004(b).

[8] Press Release, BLM, *Bureau of Land Management Solicits Initial Public Input on Updating Regulations for Rights-of-Way and Renewable Energy* (Aug. 31, 2021) (Wind and Solar Press Release).

[9] Notice 2021-05, *supra* note 5, at 9.

[10] 40 C.F.R. § 1500.1(a).

NEPA regulations are "intended to ensure that Federal agencies conduct environmental reviews in a coordinated, consistent, predictable and timely manner, *and to reduce unnecessary burdens and delays*."[11] And CEQ's regulations, and agency-specific regulations and practices, contain tools built that fulfill the purpose and intent of the statute and when used effectively create needed efficiencies for federal land management agencies and project proponents. The below sections describe some of these existing tools and identify whether and how they are being used by the federal land-management agencies to foster the development of renewable energy on federal lands.

A. Programmatic Planning and Tiering

Tiering allows agencies to prepare site-specific environmental analyses and incorporate by reference the general discussions of broader, programmatic reviews, such as those contained in resource management plans (RMPs).[12] CEQ's regulations direct agencies to tier site-specific NEPA analyses in order "to eliminate repetitive discussions of the same issues, focus on the actual issues ripe for decision, and exclude from consideration issues already decided or not yet ripe at each level of environmental review."[13] Tiering is a fundamental tool for streamlining the NEPA process at the project level.

The effective use of programmatic land-use planning and tiering is arguably one of the most important factors supporting the widespread and efficient development of federal oil and gas resources over the last forty years. Since the passage of the 1976 Federal Land Policy and Management Act (FLPMA), BLM has consistently incorporated oil and gas leasing and development into federal RMPs. FLPMA identifies "mineral exploration and production" as one of the "principal or major uses" of federal lands, and the statute requires that the agency report to Congress all management decisions that exclude "principal or major uses" for two or more years on tracts of land 100,000 acres or more.[14] For this and other reasons, including Congress's delegation of authority to BLM to manage fluid mineral resources under the Mineral Leasing Act, BLM RMPs "generally include analysis of the effects of mineral leasing and make decisions regarding the availability of lands within the planning unit for mineral leasing."[15]

BLM's consistent efforts to incorporate fluid mineral leasing and development in land use plans have resulted in a situation where it is generally uncommon for BLM to prepare an environmental impact statement (EIS) to approve either a lease sale or an application for a permit to drill (APD).[16] At times,

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[11] *Id.* § 1500.1(b) (emphasis added).

[12] *Id.* § 1501.11.

[13] *Id.* § 1501.11(a).

[14] 43 U.S.C. §§ 1702(l), 1712(e)(2).

[15] Laura Lindley, *NEPA and Federal Land Use Planning: "Streamlining" and its Impact on Resource Management Decisions*, PUBLIC LAND LAW, REGULATION, AND MANAGEMENT 2-1 (Rocky Mt. Min. L. Fdn. 2003).

[16] *See* Pennaco Energy, Inc. v. U.S. Dep't of Interior, 377 F.3d 1147, 1151 (10th Cir. 2004) (describing "three-phase decision-making process" for federal oil and gas development).

this has resulted in average processing time frames for APDs as low as three months.[17] And BLM has specifically identified the effective use of programmatic analyses as one of factors that has allowed it to improve APD processing times.[18]

1. BLM Programmatic Planning Efforts for Renewable Energy Development

BLM has not ignored the need to facilitate the responsible development of renewable energy resources through programmatic planning efforts and has engaged in several efforts over the last ten to fifteen years to incorporate renewable energy development into its RMPs and other land use planning efforts.

The 2005 Wind PEIS. BLM finalized a programmatic EIS (PEIS) for wind energy development in 2005.[19] The record of decision (ROD) approved the implementation of a Wind Energy Development Program in 11 western states and amended 52 RMPs in nine states to specifically adopt the program.[20] A stated goal of the effort was to minimize the delays and costs associated with processing applications for wind energy projects "as a result of the emphasis on site-specific concerns during the project-level environmental analyses" and to create the "opportunity to tier future NEPA analyses from the Final Wind Energy PEIS."[21]

The 2012 Western Solar Plan. In 2012, BLM finalized a PEIS and ROD covering solar development on BLM lands in six western states: Arizona, California, Colorado, Nevada, New Mexico, and Utah (the "Western Solar Plan").[22] The Western Solar Plan ROD approved amendments to eighty-nine RMPs.[23] The Western Solar Plan identified three categories of land use allocations for utility-scale solar development within each RMP: exclusion areas, solar energy zones (SEZs), and variance areas.[24]

Right-of-way (ROW) exclusion areas are identified in the governing RMP as "not available for location of ROWs under any conditions."[25] The 2012 PEIS and

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[17] Gov't Accountability Office, *Oil and Gas Permitting: Actions Needed to Improve BLM's Review Process and Data System* 20 (Mar. 2020), https://www.gao.gov/assets/gao-20-329.pdf.

[18] *Id.* at 22; *see also* BLM, Report No. W-IN-BLM-0009-2003, *Audit of Oil and Gas Permitting Process* (Feb. 13, 2004) (recognizing that APD approval time was "significantly hampered by outdated land use plans," particularly in the Powder River Basin).

[19] *See* Notice of Availability of the Record of Decision for the Wind Energy Development Programmatic Environmental Impact Statement (PEIS) and Associated Land Use Plan Amendments, 71 Fed. Reg. 1768 (Jan. 11, 2006).

[20] *Id.*

[21] BLM, *Record of Decision: Implementation of Wind Energy Development Program and Associated Land Use Plan Amendments* 4 (Dec. 15, 2005), https://windeis.anl.gov/documents/docs/WindPEISROD.pdf.

[22] Press Release, U.S. Dep't of the Interior, *Obama Administration Approves Roadmap for Utility-Scale Solar Energy Development on Public Lands* (Oct. 12, 2012).

[23] BLM, *Approved Resource Management Plan Amendments/Record of Decision (ROD) for Solar Energy Development in Six Southwestern States* 27 (Oct. 2012) (2012 Solar ROD), https://solareis.anl.gov/documents/docs/Solar_PEIS_ROD.pdf.

[24] *Id.* at 27.

[25] *Id.* at 37.

ROD established 32 criteria for identifying exclusion areas not suitable for utility-scale solar development and identified approximately 78.6 million acres in the six states as solar energy exclusion areas.[26] On the other end of the spectrum, the 2012 PEIS and ROD established 17 SEZs covering approximately 285,000 acres of BLM lands where the agency intended to prioritize the processing of solar energy proposals.[27] BLM applied the following criteria for identifying the SEZs established in the 2012 PEIS and ROD: "locations where solar development is economically and technically feasible, where there is good potential for connecting new electricity-generating plants to the transmission distribution system, and where there is generally low resource conflict."[28] And finally, BLM categorized all lands not specifically established as an exclusion area or SEZ as a variance area. Variance areas are open to applications for solar ROWs, but the applicant must adhere to specific variance procedures and demonstrate that the proposal will avoid, minimize, or mitigate impacts to any sensitive resources within the project area.[29]

2016 Wind and Solar Rule. The BLM's 2016 Wind and Solar Rule attempted to build on the prior programmatic planning efforts from the 2005 Wind PEIS and 2012 Western Solar Plan.[30] The final rule authorized BLM to establish designated leasing areas (DLAs) where BLM could undertake a competitive leasing process for wind and solar leases, similar to the process used for fluid mineral leasing.[31] Like the SEZs established in the Western Solar Plan, the DLAs are intended to "represent areas that have been prescreened by the BLM and identified as having high energy generation potential, access to transmission (either existing or proposed), and low potential for conflicts with other resources."[32] BLM also established financial incentives to promote industry development in DLAs, including: (i) less frequent adjustments to rent and longer phase-ins for other fees; (ii) allowing standard bonds as opposed to bonds based on full reclamation costs; (iii) awarding leases in these areas through competitive processes; and (iv) streamlining the leasing process by, for example, granting applicants site control earlier.[33]

The Desert Renewable Energy Conservation Plan. The Desert Renewable Energy Conservation Plan (DRECP) was a significant multi-agency planning effort that covers approximately 22 million acres of private and federal land in

[26] *Id.* at 27.

[27] *Id.* at 27, 37.

[28] BLM, *Final Programmatic Environmental Impact Statement (PEIS) for Solar Energy Development in Six Southwestern States* 2–23 (July 2012) (2012 Solar PEIS), https://solareis.anl.gov/documents/fpeis/Solar_FPEIS_Volume_1.pdf.

[29] 2012 Solar ROD, *supra* note 23, at 43.

[30] Competitive Processes, Terms, and Conditions for Leasing Public Lands for Solar and Wind Energy Development and Technical Changes and Corrections, 81 Fed. Reg. 92,122, 92,125–26 (Dec. 19, 2016).

[31] *Id.* at 92,122–23.

[32] *Id.* at 92,122.

[33] *Id.* at 92,123–24.

California.[34] The DRECP covers approximately 10 million acres of BLM lands in seven California counties.[35] BLM began the planning process in 2010 and finalized the DREC in 2016.[36] The DRECP amended three existing BLM land use plans: the California Desert Conservation Area Plan, the Bishop RMP, and the Bakersfield RMP.[37] The DRECP established certain designated focus areas—similar to the SEZs established in the Western Solar Plan—within these plans where it intended to incentivize and prioritize solar development.[38]

a. BLM Planning: Successes and Failures

BLM's initial planning efforts were a step in the right direction, but to date, these efforts have not resulted in across-the-board reductions in review times for solar and wind projects on federal lands. While there are a number of reasons for these deployment impacts—including failure to allocate necessary resources to renewable energy planning during the Trump administration, inconsistent review timelines across BLM field offices, and trade and supply chain challenges specific to solar energy project inputs—the current administration has taken a number of steps to prioritize large-scale renewable energy development on federal lands.

Since the adoption of the Western Solar Plan, establishing SEZs, and the 2016 Wind and Solar Rule allowing the establishment of DLAs, the majority of federal solar projects have still been proposed and developed in variance areas.[39] And most utility-scale solar projects have required the preparation of an EIS.[40] In regard to wind energy, BLM has yet to designate any DLAs for wind energy development, and the majority of meaningful projects have also required preparation of an EIS.[41]

But BLM's efforts have also resulted in recent project approvals. Between December 2021 and January 2022, BLM approved the first three solar projects in the DRECP planning area: the Arica Solar Project, the Victory Pass Solar Project, and the Oberon Solar Project.[42] The three projects combined will generate

[34] BLM, Desert Renewable Energy Conservation Plan Record of Decision 1 (Sept. 2016), https://eplanning.blm.gov/public_projects/lup/66459/133460/163124/DRECP_BLM_LUPA_ROD.pdf.

[35] *Id.*

[36] *Id.* at 2.

[37] *Id.*

[38] *Id.* at 27–28, 39.

[39] *See, e.g.*, BLM List of Solar Energy ROWs on Public Lands as of 12/21/2021, https://www.blm.gov/sites/default/files/docs/2021-12/PROJECT%20LIST%20SOLAR_December%2020_2021.pdf.

[40] *Id.*

[41] BLM List of Wind Energy ROWs on Public Lands as of October 2021, https://www.blm.gov/sites/default/files/docs/2021-11/PROJECT%20LIST%20WIND_October%202021.pdf.

[42] *See* BLM, *Decision Record for Arica Solar Project and Victory Pass Solar Project* (Dec. 2021) (Arica and Victory Pass DR), https://eplanning.blm.gov/public_projects/1502789/200388120/20051825/250058008/Admin%20Draft%20Arica+VP%20Decision%20Record.pdf; BLM, *Decision Record for the Oberon Solar Project* (Jan. 2022) (Oberon DR), https://eplanning.blm.gov/public_projects/2001226/200478716/20053069/250059252/Oberon%20Decision%20Record%20Final%20Secretarial%20Approval_1.13.22_SIGNED_508.pdf.

approximately one GW of electricity from renewable energy.[43] BLM approved the Arica and Victory Pass Projects through a combined environmental assessment (EA) that took just over a year from scoping to decision record, and the NEPA process for the Oberon Solar Project took approximately 10 months from publication of the notice of intent until issuance of the final decision.[44] While these projects represent only a fraction of the development potential planned for under the DRECP (almost 9 GW), they demonstrate the potential permitting efficiencies that can be achieved through successful land use planning.

BLM's leasing efforts under the Western Solar Plan have had varied success.[45] But BLM has also held successful lease sales in recent years. Between 2020 and 2022, BLM awarded three leases for solar energy development within the Milford Flats South SEZ in Utah and the Brenda and Agua Caliente SEZs in Arizona.[46] Together, these leases include approximately 10,400 acres of federal land and have the potential to generate approximately 1,065 megawatts of electricity.[47]

b. BLM Next Steps

To meet the goals of the 2020 Energy Act and achieve the specific target of permitting at least 25 GW of new electricity from wind, solar, and geothermal projects on federal lands, BLM is currently undertaking efforts to encourage project development on federal lands and make the process more efficient. These efforts build on the prior rulemaking and planning efforts described above, with an aim to resolve the identified deficiencies in those programs, expand their reach, and incentivize industry participation. They are also timely: following the enactment of the Inflation Reduction Act in August 2022, industry analysts expect the solar utility-scale pipeline to reach about 45 GW annually by 2027, roughly triple the amount installed in 2022.[48]

Revised Western Solar Plan. On December 8, 2022, BLM published a notice of intent (NOI) to update the 2012 Western Solar Plan, and the underlying RMPs.[49] BLM is updating the Western Solar Plan as part of its strategy to implement the goals of the 2020 Energy Act, to cure identified issues with the

[43] *See* Press Release, U.S. Dep't of the Interior, *Interior Department Advances Three Solar Projects in California, Marking Significant Progress to Develop a Clean Energy Economy* (Dec. 21, 2021).

[44] Arica and Victory Pass DR, *supra* note 42, at 7–8; Oberon DR, *supra* note 42, at 8.

[45] *E.g.*, *BLM Should Re-Think Its Failed Solar Auction to Drive Innovation*, ENERGY CENTRAL (Dec. 13, 2013), https://energycentral.com/c/ec/blm-should-re-think-its-failed-solar-auction-drive-innovation.

[46] BLM, *Active Renewable Projects: Projects Approved (as of Dec. 8, 2022)*, https://www.blm.gov/programs/energy-and-minerals/renewable-energy/active-renewable-projects.

[47] *Id.*

[48] *See, e.g.*, Michelle Davis - Wood Mackenzie, *The US Solar Industry Awaits* (Dec. 13, 2022), https://www.woodmac.com/news/opinion/the-us-solar-industry-waits/.

[49] 87 Fed. Reg. 75,284 (Dec. 8, 2022).

prior plan, and to expand the plan's application to new states.[50] The NOI identifies six primary topics to be addressed in the planning effort:

1. Expanded Study Area. BLM is proposing to expand the Western Solar Plan to include BLM-managed lands in five additional western states not covered by the original plan: Idaho, Montana, Oregon, Washington, and Wyoming.[51]
2. Exclusion Criteria. As described above, the 2012 Western Solar Plan identified thirty-two exclusion criteria. Some of these criteria were based on perceived technological limitations at the time the plan was finalized, such as "exclusion criteria 1 (excluding development in locations with slopes greater than 5 percent) and 2 (excluding development where insolation values are below 6.5 kWh/m/day)."[52] But the record supporting these criteria is unclear. The slope limitation seems to be based on limitations specific to concentrating solar power (CSP) technology and a perception that for photovoltaic (PV) facilities construction is likely to be "more complex" on lands with slopes greater than 5%.[53] And the limitation on insolation values is based on a preemptive determination "to maximize the efficient use of BLM-administered lands . . . by reserving for other uses lands that are not ideal for solar energy development."[54] Rapid advancements in technology and a strong shift towards PV development and away from CSP, however, quickly made these technological exclusions obsolete. Since the passage of the Western Solar Plan, BLM has received continued interest for development in exclusion areas.[55] And the agency intends to review its exclusion area as part of the renewed planning effort with a focus "on resource management on BLM-administered lands rather than specifying technology-based criteria for solar development on public lands."[56]
3. Land Use Allocations. BLM is proposing to review the land use allocations established in the 2012 plan identifying areas as SEZs, variance areas, and exclusion areas.[57] This process is likely to represent an important bulk of the planning effort. As indicated, BLM's identification of SEZs and priority development areas in the 2012 plan has not translated to a significant level of interest in these areas. In fact, "since implementation of the Western Solar Plan, the majority of authorized solar developments on public land have occurred in variance areas, not

[50] *Id.* at 75,285.

[51] *Id.*

[52] *Id.*

[53] BLM, *Draft Programmatic Environmental Impact Statement (PEIS) for Solar Energy Development in Six Southwestern States* 3–4, 6, 10 (Dec. 2010), https://solareis.anl.gov/documents/dpeis/Solar_DPEIS_Chapter_3.pdf.

[54] 2012 Solar PEIS, *supra* note 28, at 2-73.

[55] 87 Fed. Reg. at 75,285.

[56] *Id.*

[57] *Id.* at 75,286.

SEZs."[58] And BLM continues to receive interest for development in areas allocated as exclusion areas.[59] An important component of this planning effort will be to properly identify land use allocations that can support project development and implementation.

4. Variance Process. Because the majority of ROW applications have occurred in variance areas, BLM is considering "modifications to the variance process to focus the review and improve efficiency," and also considering "whether the process should be included in the programmatic EIS or whether the variance procedures would more appropriately be effectuated by other means, such as through regulation or policy."[60]
5. Definition of Utility Scale. BLM is considering whether to revise the Western Solar Plan to apply to projects capable of generating less than 20 megawatts of electricity.[61]
6. Incentivizing Development in SEZs. BLM is considering the need to further incentivize development in the priority areas identified under the Western Solar Plan. BLM is requesting comments "on what additional incentives would facilitate faster and easier permitting in SEZs, improve and facilitate appropriate mitigation, and encourage solar energy development on suitable lands adjacent to SEZs."[62] Potential options could include additional rent and fee reductions and/or prioritized review.

Guidance on Variance Process for Solar Applications. BLM published new guidance on the process for permitting ROW applications in variance areas pending BLM's planning effort to update the 2012 Western Solar Plan.[63] As indicated, one of BLM's stated goals for the updated Western Solar Plan—and one of the material items for industry stakeholders—is to update the acreage previously categorized as variance areas to better reflect current resource conditions, solar potential, and other factors.

BLM's December guidance on processing ROW applications in variance areas underscores the importance of properly identifying variance and exclusion areas at the RMP level. The guidance, intended to provide clarity to project applicants and enhance the efficiency of the process, identifies an involved multi-stage screening process.[64]

To start the variance review process: (1) "the applicant must submit a complete variance application package"; and (2) "BLM must determine that the

[58] *Id.*

[59] *Id.* at 75,285.

[60] *Id.* at 75,286.

[61] *Id.*

[62] *Id.*

[63] BLM, IM 2023-015, *Variance Process for Solar Applications* (Dec. 2, 2022), https://www.blm.gov/policy/im-2023-015.

[64] *Id.*

application is a high or medium priority."[65] ROW applications in variance areas must include a proactive, comprehensive evaluation of the project's reasonably foreseeable impacts to socioeconomics, air quality, surface and groundwater resources, wildlife, vegetation and soil, and historic and cultural resources.[66] BLM's completeness determination is then based on the "sufficiency of the applicant's comprehensive evaluation of reasonably foreseeable effects and applicant-proposed specific mitigation measures."[67]

BLM's guidance requires that ROW applications in variance areas contain a fulsome cumulative-impact analysis, similar to what is required under NEPA, in order to pass initial screening. BLM anticipates that in a best-case scenario, the variance screening process will take six months.[68] If BLM determines the application is complete and it should proceed with processing, BLM will initiate the appropriate level of NEPA review at that time.[69] This means that most ROW applications in variance areas will require, at a minimum, six months, and more likely nine months to a year, before the NEPA process starts. If BLM can more accurately identify areas suitable for solar development and appropriately analyze and plan for that development at the RMP level—BLM could potentially process applications, complete the required NEPA review, and issue a final decision in the same amount of time currently estimated to simply process the application and make a determination to initiate NEPA.

Based on industry feedback, initial solar industry experience under the variance screening process is mixed, underscoring the need for further reforms, including updates to the land use allocations established in the Western Solar Plan.

Updated Wind and Solar Energy Rule. BLM initiated a proposed rulemaking to update the 2016 Wind and Solar Energy Rule. BLM initiated the effort in response to the 2020 Energy Act to "address enhancements to prioritizing and processing of applications for solar and wind rights-of-way grants or leases, update acreage rent and megawatt capacity fees, and consider rent and fee reductions for solar and wind energy authorizations."[70]

BLM began preliminary scoping in the summer and fall of 2021. The agency held a series of listening sessions for interested stakeholders and also solicited written input.[71] BLM published a proposed rule on June 16, 2023.[72] The proposed rule contains a few key proposals.

(1) Non-Competitive Leasing. The rule proposes to allow BLM the discretion to make public lands inside designated leasing areas available for

[65] *Id.*

[66] *Id.*

[67] *Id.*

[68] *Id.*

[69] *Id.*

[70] BLM 2021 Report, *supra* note 3, at 5.

[71] Wind and Solar Press Release, *supra* note 8.

[72] Rights-of-Way, Leasing, and Operations for Renewable Energy, 88 Fed. Reg. 39,726 (June 16, 2023).

"non-competitive" leasing by application.[73] The proposed change is intended to maximize interest in renewable energy leasing and to accelerate development of hundreds of thousands of acres of lands designated by the BLM. Those lands include approximately 285,000 acres identified in the 2012 Western Solar Plan and approximately 388,000 acres identified in the DRECP.[74]

(2) ROW Rents and Fees. BLM proposes to revise the methodology for calculating acreage rents to increase certainty for ROW holders. The land rental value would be set at the time the ROW is issued and then "multiplied by an encumbrance factor (which differentiates between solar and wind energy facilities) and an annual adjustment factor that accounts for changes in the value of the land over the lifetime of the ROW due to inflation and similar factors."[75] BLM also proposes to change the methodology for calculating the capacity fee, and to provide ROW holders with the choice to pay the "greater of the acreage rent or the capacity fee that would be due in a given year."[76]

(3) ROW Term. The proposed rule will extend the 30-year maximum to 50 years for solar and wind ROWs, further promoting predictability and continuity.[77]

The comment period for the proposed rule ended on August 15, 2023. BLM has not indicated when a final rule is expected.

2. Forest Service Programmatic Planning Efforts for Renewable Energy Development

Unlike BLM, the Forest Service has not engaged in any programmatic planning efforts to facilitate renewable energy development on national forests or national grasslands. And many Forest Plans are outdated and do not account for renewable energy development.

A 2013 study prepared for the Forest Service identified approximately 700,000 acres of National Forest System lands as potentially suitable for solar development and almost 3.5 million acres as potentially suitable for wind development.[78] But little progress has been made to approve and develop projects to capture this potential.

The Forest Service updated its manual and handbook to include specific policies and procedures for permitting wind facilities in 2011 (Forest Service

[73] *Id.* at 39,728.

[74] *Id.*

[75] *Id.* at 39,736.

[76] *Id.* at 39,738–40, 39,758.

[77] *Id.* at 39,729.

[78] U.S. Forest Serv., ANL/EVS-13/1, *Analysis of Renewable Energy Potential on U.S. National Forest Lands* ix (Dec. 2013), https://digital.library.unt.edu/ark:/67531/metadc871583/m2/1/high_res_d/1115595.pdf.

Wind Directives).[79] The Forest Service, however, has only approved one wind project since the adoption of the 2011 wind directives, representing the only wind project that has been permitted and developed on National Forest System lands.[80] The Forest Service approved that project, Deerfield Wind, in Green Mountain National Forest in Vermont in 2012.[81] But since the ROW application was submitted prior to the adoption of the directives, the project was not subject to the new directives, which means that to date the Forest Service has still yet to approve a wind project under the 2011 directives.[82]

Industry critiques about the Forest Service Wind Directives include concerns about the prescriptive nature of the directives and the lack of certainty in the process regarding competition. But one of the primary problems project proponents have encountered is conflicts with existing Forest Plans and the lack of a programmatic effort by the Forest Service to update these plans. Every project or activity authorized on National Forest System lands "must be consistent with the applicable plan components."[83] If a Forest Plan is outdated, or does not contemplate utility-scale renewable development, projects can be denied at the initial screening stage based on a perceived consistency issue. The Forest Service's planning regulations explicitly allow the Forest Service to issue a project-specific Forest Plan amendment when "a proposed project or activity would not be consistent with the applicable plan."[84] But not all Forests consistently exercise this authority. Meaning that until the agency, or individual Forests, undertake a concerted effort to identify suitable areas for renewable development and account for those areas in the governing Forest Plans, renewable development on National Forest System lands is likely to remain stagnated.

B. Categorical Exclusions

Categorical exclusions (CEs) are an essential component of the NEPA toolbox. They are the predominant method of NEPA compliance, and when used effectively they can help agencies significantly improve permitting efficiency and timing and reduce unnecessary administrative burden.[85]

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[79] Final Directives for Forest Service Wind Energy Special Use Authorizations, Forest Service Manual 2720, Forest Service Handbooks 2609.13 and 2709.11, 76 Fed. Reg. 47,354 (Aug. 4, 2011).

[80] U.S. Forest Serv., *Record of Decision: Proposed Deerfield Wind Project* (Jan. 3, 2012), *available at* https://www.fs.usda.gov/project/?project=7838&exp=overview.

[81] Press Release, U.S. Forest Serv., *U.S. Forest Service Approves Vermont Wind Power Facility* (Jan. 4, 2012).

[82] 70 Fed. Reg. 40,975 (July 8, 2005).

[83] 36 C.F.R. § 219.5(d).

[84] *Id.* § 219.15(c)(4).

[85] *See, e.g.*, National Environmental Policy Act (NEPA) Compliance, 85 Fed. Reg. 73,620, 73,623 (Nov. 19, 2020); BLM, *Report in Response to Secretarial Memorandum on Improving Planning and NEPA Processes and Secretarial Order 3355*, 1 (Sept. 27, 2017), https://wyoleg.gov/InterimCommittee/2019/09-201905168-04FinalReport-NEPAStreamlining.pdf; Council on Envtl. Quality, *Establishing, Applying, and Revising Categorical Exclusions under the National Environmental Policy Act* 2–3 (Nov. 23, 2010), https://ceq.doe.gov/docs/ceq-regulations-and-guidance/NEPA_CE_Guidance_Nov232010.pdf.

There are two types of CEs: regulatory and statutory. Regulatory CEs are the more common of the two—and are what most people think of when they think of CEs. CEQ's regulations direct agencies to "reduce excessive paperwork" by promulgating CEs "to define categories of actions that normally do not have a significant effect on the human environment and therefore do not require preparation of an [EIS]."[86] Regulatory CEs are not an exemption to NEPA. They are a method of complying with NEPA by identifying, through notice-and-comment rulemaking, "categories of actions that normally do not have a significant effect on the human environment, and therefore do not require preparation of an [EA] or [EIS]."[87] When applying a regulatory CE to a proposed project or activity, agencies must evaluate for the existence of extraordinary circumstances.[88] If an extraordinary circumstance exists, the project or activity may still require preparation of an EA or EIS.[89]

Statutory CEs are created by Congress, and for obvious reasons, are less common. Section 390 of the Energy Policy Act of 2005 established the most famous, and most relied upon, set of statutory CEs.

1. The Forest Service's 2020 CE Rules

The Forest Service's 2020 revisions to its NEPA regulations provide a recent example of an agency updating its NEPA regulations to add new categories of CEs.[90] Prior to the 2020 rule, the Forest Service had last updated its NEPA regulations in 2008. The Forest Service promulgated the new CEs to "increase efficiency in the Agency's environmental analysis and decision-making while meeting NEPA's requirements and fully honoring the Agency's environmental stewardship responsibilities."[91]

The Forest Service NEPA revisions established six new CEs and expanded the application of two existing CEs.[92] One focus of the new CEs was recreation special uses.[93] The agency chose the special use program as an area of focus because it created an opportunity "for increasing efficiency in the Agency's NEPA procedures in furtherance of producing efficient, effective, and high-quality land management decisions that will timely accomplish work on the ground consistent with its statutory mission and authorities and be more responsive to the public."[94]

As an example, the Forest Service promulgated a new CE (e)(22) for "the construction, reconstruction, and decommissioning or disposal of buildings, infrastructure, and other improvements at existing recreation sites, including

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[86] 40 C.F.R. § 1500.4(a).

[87] *Id.*

[88] *Id.* § 1501.4(b).

[89] *Id.* § 1501.4(b)(2).

[90] National Environmental Policy Act (NEPA) Compliance, 85 Fed. Reg. 73,620 (Nov. 19, 2020).

[91] *Id.* at 73,622.

[92] *Id.*

[93] *Id.*

[94] *Id.* at 73,624.

those managed under special use authorizations."[95] Recreation sites include campgrounds and camping areas, lodging resorts, day use areas, fishing sites, and ski areas.[96] The Forest Service estimates that it "provides access to roughly 29,700 recreation sites."[97] Hence, development proposals at special use recreation sites comprised a meaningful volume of the agency's NEPA review.[98] The agency relied on its "extensive experience predicting and evaluating the environmental effects of certain categories of action," and record of special use projects completed using an EA and finding of no significant impact (FONSI) to determine that when implemented with the appropriate best management practices and design features, the identified category of actions "normally do not have a significant effect on the human environment."[99]

The new and expanded CEs adopted by the Forest Service in 2020 demonstrate how the process is intended to work. By identifying a category of actions for which the agency has developed a sufficient record of project authorization and implementation demonstrating the projects do not normally result in a significant environmental effect—including through the use of appropriate mitigation measures—the agency can use CEs "to satisfy NEPA's requirements more efficiently by (a) focusing resources on proposals that may have significant environmental impacts and (b) reducing the resources spent analyzing proposals that generally do not have significant environmental effects."[100]

2. The Section 390 CEs

Section 390 of the Energy Policy Act of 2005 included new CEs applicable to federal oil and gas development.[101] The statutory CEs under the Energy Policy Act differ from regulatory CEs in that they are a creature of legislation and, therefore, "their application is governed by that statute" and not by NEPA.[102] Application of an Energy Policy Act CE does not require the agency to determine whether extraordinary circumstances are present.[103] If a proposed project fits into one of the Energy Policy Act CEs, it is "subject to a rebuttable pre-

[95] 36 C.F.R. § 220.6(e)(22).

[96] 85 Fed. Reg. at 73,631.

[97] *Id.* at 73,626.

[98] *See* U.S. Forest Serv., *Supporting Statement: Categorical Exclusions for Certain Special Uses, Infrastructure, and Restoration Projects* 45 (Oct. 23, 2020), https://web.archive.org/web/20210324050047/https://www.fs.fed.us/emc/nepa/revisions/includes/docs/NEPAFinalRule-SupportingStatement-20201023.pdf.

[99] *Id.* at 4, 45–48.

[100] *Id.* at 4.

[101] *See* 42 U.S.C. § 15942(b)(1)–(5).

[102] BLM, Handbook H-1790-1, National Environmental Policy Act Handbook § 4.1 (Rel. 1-1710, 01/30/2008) (BLM NEPA Handbook).

[103] *See* W. Energy All. v. Salazar, No. 10-CV-237F, 2011 WL 3738240, at *7 (D. Wyo. Aug. 12, 2011) (vacating BLM and Forest Service policies requiring review of extraordinary circumstances for Section 390 CEs); BLM, IM 2012-110 (Apr. 27, 2012) (directing BLM field offices not to conduct a review for extraordinary circumstances for Section 390 CEs), https://www.blm.gov/policy/im-2012-110.

sumption" that it is categorically excluded under NEPA.[104] The Energy Policy Act CEs are:

> (1) Individual surface disturbances of less than 5 acres so long as the total surface disturbance on the lease is not greater than 150 acres and site-specific analysis in a document prepared pursuant to NEPA has been previously completed.
>
> (2) Drilling an oil or gas well at a location or well pad site at which drilling has occurred previously within 5 years prior to the date of spudding the well.
>
> (3) Drilling an oil or gas well within a developed field for which an approved land use plan or any environmental document prepared pursuant to NEPA analyzed such drilling as a reasonably foreseeable activity, so long as such plan or document was approved within 5 years prior to the date of spudding the well.
>
> (4) Placement of a pipeline in an approved right-of-way corridor, so long as the corridor was approved within 5 years prior to the date of placement of the pipeline.
>
> (5) Maintenance of a minor activity, other than any construction or major renovation or a building or facility.[105]

The above CEs, established by Congress, have proved remarkably effective in implementing the purpose of the CEs—"to expedite oil and gas development within the United States."[106] While it is difficult to determine the exact number or percentage of APDs approved under the Section 390 CEs, it is reasonable to assume that the level of APDs processed since the enactment Section 390 would be materially less than the amount processed under the CEs.

3. Existing CEs for Renewable Energy Development

There is a current lack of effective CEs for renewable energy development on federal lands. BLM's regulatory CEs include categories for oil, gas, and geothermal energy, realty, rangeland management, and transportation.[107] Some of these CEs can be utilized to approve renewable energy, storage, or transmission projects.[108] But BLM has yet to engage in a rulemaking to develop CEs specific to renewable energy, storage, or transmission. The 2020 Energy Act also did not include any statutory CEs to help implement the goal of facilitating renewable energy development on federal lands.

The promulgation of effective CEs specific to renewable energy projects by BLM, or the passage of statutory CEs by Congress, is likely a necessary step if the government wants to meet its ambitious goals for renewable development on federal lands.

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[104] 42 U.S.C. § 15942(a)(1).

[105] *Id.* § 15942(b).

[106] *See W. Energy All. v. Salazar*, 2011 WL 3738240, at *2.

[107] BLM NEPA Handbook, *supra* note 98, Appendix 4.

[108] *See, e.g.*, BLM, *Decision Record for a Categorically Excluded Action*, DOI-BLM-CA-D060-2021-0044-CX (Oct. 14, 2021) (CE approving construction, operation, maintenance, and decommissioning of a 230 megawatt battery storage system to be co-located within the boundary of an already approved solar farm), https://eplanning.blm.gov/public_projects/2015886/200499173/20047932/250054115/2021.10.14_DSL%20BESS_Decision%20Record_508-FINAL.pdf.

C. Mitigated FONSIs

Project planning that uses siting and design criteria to avoid or minimize potential impacts inherently leads to more efficient permitting by supporting review and approval through and EA and FONSI. As project developers continue to gain experience, technologies advance, and potential resource impacts get increasingly identified—the ability of project proponents to work cooperatively with BLM and other agencies to identify strategies to avoid and minimize impacts should increase.

Projects that avoid significant impacts through siting, design criteria, and best management practices that are incorporated into the project, and required to be implemented as part of the approval, can be approved through an EA and FONSI. While closely related—and sometimes difficult to distinguish—this situation is slightly different than another NEPA tool, the mitigated FONSI.[109]

CEQ guidance, and current CEQ regulations, allow for and encourage agencies to account for an applicant's commitment to "mitigate significant environmental impacts" in its decision not to prepare an EIS and review and approve a project through an EA/FONSI.[110] Mitigation measures can be direct and designed to avoid the impact in the first place, or they can take the form of compensatory mitigation efforts to offset the impacts imposed by the project.[111] CEQ officially endorsed mitigated FONSIs in guidance in 2011.[112] Federal courts have consistently upheld their use.[113] And the CEQ regulations adopted in 2020 codified the use of mitigated FONSIs for the first time.[114]

Mitigated FONSIs simply provide another mechanism through which project proponents and agencies can find flexibility and efficiency, while working to achieve the mutual goal of minimizing potential resource impacts.

III. STATUTORY EFFORTS AT CREATING EFFICIENCIES

Congress is certainly not oblivious to the fact that the NEPA process often disincentivizes project proponents from pursuing development on federal lands. Over the past few years, Congress has passed legislation aimed at streamlining the NEPA process for infrastructure and energy projects.

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[109] *See* Atchafalaya Basinkeeper v. U.S. Army Corps of Eng'rs, 894 F.3d 692, 698 (5th Cir. 2018) (distinguishing FONSI based on determination that certain measures required to comply with Clean Water Act would result in project not having a significant impact versus a "'mitigated FONSI' mean[ing] that without mitigation, a project will have a 'significant' environmental impact").

[110] Final Guidance for Federal Departments and Agencies on the Appropriate Use of Mitigation and Monitoring and Clarifying the Appropriate Use of Mitigated Findings of No Significant Impact, 76 Fed. Reg. 3843 (Jan. 21, 2011); 40 C.F.R. § 1501.6(c).

[111] *See* BLM, Handbook H-1794-1, Mitigation, § 2.5 (Rel. 1-1783, 12/22/2016); 40 C.F.R. § 1508.1(s)(5) (defining mitigation to include "[c]ompensating for the impact by replacing or providing substitute resources or environments"); *see also* Friends of the Earth v. Hintz, 800 F.2d 822, 838 (9th Cir. 1986) (upholding mitigated FONSI based on off-site mitigation efforts).

[112] 76 Fed. Reg. at 3843.

[113] *See* Spiller v. White, 352 F.3d 235, 241 (5th Cir. 2003) (collecting cases).

[114] 40 C.F.R. § 1501.6(c).

A. 2015 Fixing America's Surface Transportation Act

On December 4, 2015, President Obama signed the Fixing America's Surface Transportation Act.[115] Congress intended Title 41 of the Act (FAST-41) to expedite the environmental permitting process for certain infrastructure construction projects by creating "a new governance structure, set of procedures, and funding authorities designed to improve the timeliness, predictability, and transparency of the Federal environmental review and authorization process."[116]

To qualify as a "covered project" under FAST-41, a proposed project must be within one of the nineteen recognized project sectors—one of which is renewable energy production—and must meet one of four categories of criteria identified in the statute. Renewable energy projects located on federal lands, not owned or under the jurisdiction of an Indian tribe, may qualify for coverage under either the "objective" or "discretionary" criteria.[117]

To meet the objective criteria, the project must: (1) be subject to NEPA; (2) be likely to require a total investment of more than $200 million; and (3) not qualify for "abbreviated authorization or environmental review processes" under any applicable law.[118] If a project meets these criteria, it automatically qualifies as a covered project under FAST-41.[119]

To meet the discretionary criteria, the project must: (1) be subject to NEPA and (2) be of a size and complexity that makes it likely to benefit from enhanced oversight and coordination.[120] Whether a proposed project is eligible for FAST-41 coverage under the discretionary criteria is determined by the Federal Permitting Improvement Steering Council (Permitting Council), the federal agency tasked with administering FAST-41 procedures.[121]

Once identified as a covered project, the executive director of the Permitting Council and the lead agency for the covered project manage the project's progress through the online and publicly available Permitting Dashboard.[122] The Permitting Dashboard contains major project documentation including: the project application, a description of any federal agency action materially affecting the project, the status of project-related litigation, and the established project timetable.[123] Acceptance by the facilitating agency (or lead agency as appropriate)[124] as a covered project and the executive director's

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[115] Pub. L. No. 114-94, 129 Stat. 1312 (2015) (codified at 42 U.S.C. §§ 4370m to 4370m-12).

[116] OMB & CEQ, M-17-14, Guidance to Federal Agencies Regarding the Environmental Review and Authorization Process for Infrastructure Projects § 1.1 (Jan. 13, 2017) (OMB and CEQ Infrastructure Project Guidance), https://www.permits.performance.gov/sites/permits.dot.gov/files/2019-10/Official%20Signed%20FAST-41%20Guidance%20M-17-14%202017-01-13.pdf.

[117] *Id.* § 3.1.

[118] 42 U.S.C. § 4370m(6)(A)(i).

[119] OMB and CEQ Infrastructure Project Guidance, *supra* note 112, § 3.1 n.69.

[120] 42 U.S.C. § 4370m(6)(A)(iv).

[121] *Id.*

[122] *Id.* § 4370m-2(b)(1).

[123] *See id.* § 4370m-2.

subsequent posting of the project on the Permitting Dashboard triggers a series of actions (with statutory timeframes) and begins the FAST-41 process.[125]

Coverage under FAST-41 provides infrastructure projects with the following benefits intended to help expedite federal permitting and review under NEPA:

1. Improved early consultation and coordination among government agencies.[126] Within 60 days of the project's entry on the Permitting Dashboard, the facilitating or lead agency for the project develops a Coordinated Project Plan (CPP) that identifies all coordinating and participating agencies and their appropriate project roles.[127] The CPP includes a permitting timetable that encompasses all federal and state permitting schedules.[128] To increase permitting efficiency, FAST-41 requires concurrent, rather than sequential, agency reviews.[129] The CPP timetable is intended to facilitate this effort.
2. Interagency timeline dispute resolution.[130] To avoid unnecessary and lengthy interagency project scheduling issues, FAST-41 includes interagency dispute resolution procedures.[131] If the participating agencies cannot agree to a prospective schedule when developing the CPP, the Executive Director will mediate all disputes.[132] And if a decision is not reached within 60 days, the OMB makes the final decision.[133]
3. Increased transparency and governmental accountability through project consultation and publication of project-specific timetables on the Permitting Dashboard.[134] The Permitting Dashboard allows the project sponsor to quickly view agencies' permitting progress throughout the life of the project. If an environmental review or authorization is delayed, agencies are required to update the schedule at least 30 days before the original anticipated completion date.[135] If there is a project delay greater than 150% (as compared to the original project timeta-

[124] The "facilitating agency" is "the agency that receives the initial notification from the project sponsor." *Id.* § 4370m(13). The "lead agency" under FAST-41 is the same agency as the "lead agency" tasked with the principal responsibility for preparation of an EIS under NEPA. *Id.* § 4370m(15); *see also* 40 C.F.R. § 1501.7. FAST-41 expands the "lead agency" responsibilities to include the preparation of an EA in addition to the preparation of an EIS. Once the lead agency is established, the lead agency assumes the responsibilities of the facilitating agency. 42 U.S.C. § 4370m-2(5).

[125] 42 U.S.C. § 4370m-2(c).

[126] OMB and CEQ Infrastructure Project Guidance, *supra* note 112, § 3.8.

[127] 42 U.S.C. § 4370m-2(c)(1).

[128] *Id.* § 4370m-2(c)(2).

[129] *Id.* § 4370m-4(a); OMB and CEQ Infrastructure Project Guidance, *supra* note 112, § 3.8.

[130] 42 U.S.C. § 4370m-2(c)(2)(C); OMB and CEQ Infrastructure Project Guidance, *supra* note 112, § 3.8.

[131] OMB and CEQ Infrastructure Project Guidance, *supra* note 112, § 6.1.

[132] 42 U.S.C. § 4370m-2(c)(2)(C).

[133] *Id.*

[134] *Id.* § 4370m-4(a); OMB and CEQ Infrastructure Project Guidance, *supra* note 112, § 3.8.

[135] 42 U.S.C. § 4370m-2(c)(2)(D)(ii).

ble), the delay must be reported to Congress.[136] This high level of oversight, and mandatory reporting for missed deadlines, is intended to incentivize adherence to project schedules and early coordination to address any timeline deviations.[137]

4. Enhanced legal protections for project approvals. FAST-41 removes covered projects from the application of the general six-year statute of limitations under 28 U.S.C. § 2401 and establishes a separate two-year statute of limitations for legal challenges to permit approvals for covered projects.[138] The statute also codifies an exhaustion requirement, only allowing legal challenges where a party submitted a related comment during the project's environmental review.[139]
5. Recommended two-year timeline for EIS completion. FAST-41 directs the Permitting Council to develop recommended performance schedules for completing environmental reviews for covered projects.[140] The recommended performance schedules are to be based on a review of timelines for covered projects completed over the prior two years, and other relevant data.[141] But the statute directs the Permitting Council "to develop recommended performance schedules . . . of not more than 2 years."[142]

FAST-41 is still in its infancy and the ultimate success of the Act's provisions aimed at streamlining the environmental review process for covered projects remains uncertain. The Permitting Council's 2020 report on recommended performance schedules indicated that there were only 16 covered projects completed under FAST-41 prior to 2019.[143] The Permitting Council estimated the average time for EIS completion for renewable energy projects that would have qualified as covered projects, but that had not been processed under FAST-41, as 2.3 years.[144] Because the Permitting Council has yet to publish updated performance schedules based on more recent data, it is difficult to tell whether the statute has helped improve upon this baseline. As additional projects complete the FAST-41 process, data on average completion times will become more accurate, and greater efficiencies may be revealed.

Renewable energy production is also the fastest growing and may soon become the dominant industry sector for FAST-41 covered projects, although the vast majority of the renewable projects applying for and receiving coverage under the statute are offshore wind energy projects, which suggests the stat-

[136] *Id.* § 4370m-2(c)(2)(D)(iii).

[137] OMB and CEQ Infrastructure Project Guidance, *supra* note 112, § 3.8.

[138] 42 U.S.C. § 4370m-6(a)(1)(A).

[139] *Id.* § 4370m-6(a)(1)(B).

[140] *Id.* § 4370m-1(c)(1)(C).

[141] *Id.* § 4370m-1(c)(1)(C)(ii)–(iii).

[142] *Id.* § 4370m-1(c)(1)(C)(ii)(II)(aa).

[143] *Recommended Performance Schedules for 2020 for Environmental Reviews and Authorizations* 4 (Apr. 6, 2020), https://www.permits.performance.gov/sites/permits.dot.gov/files/2020-04/FPISCRecommendedPerformanceSchedules2020_04062020.pdf.

[144] *Id.* at 8.

ute could be skewed toward providing greater benefit to the largest and most complex projects. In December 2022, the Permitting Council reported 26 FAST-41 covered projects undergoing active review.[145] Offshore wind accounted for 15 of these projects, solar accounted for one, and onshore wind accounted for one.[146] Electricity transmission accounted for another four active FAST-41 projects.[147]

B. The 2020 Energy Act

On December 27, 2020, President Trump signed the 2021 Consolidated Appropriations Act, including the 2020 Energy Act.[148] The 2020 Energy Act introduced new, aggressive federal permitting goals and requirements to advance solar and wind development projects on BLM and Forest Service lands. As described in the Introduction, this includes a requirement that the Secretary of the Interior permit at least 25 GW of electricity from renewable energy projects by 2025.[149] To meet this ambitious goal, BLM has recently taken several steps to expedite and prioritize permitting of these projects on public lands. These steps include offering certain financial incentives, updating existing regulations, improving interagency cooperation efforts, and gathering underlying project siting information for solar and wind projects.

Improving Regulatory Incentives and Processes. The 2020 Energy Act provides the Secretary of the Interior with greater discretion to reduce federal rental rates and other fees for solar and wind projects on federal lands.[150] In May 2022, BLM updated its Right-of-Way Manual[151] to significantly reduce average acreage rental rates and megawatt fees for solar and wind projects in certain areas.[152] BLM stated the adjustments are necessary to "bolster favorable financial conditions . . . for existing and new wind and solar projects on public land . . . and attract new environmentally responsible projects on public lands."[153] The updates also more accurately reflect industry rates on comparable private lands. On average, BLM expects annual rents and fees for solar and wind projects to decrease by over 50%.[154]

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[145] Fed. Permitting Improvement Steering Council, *Quarterly Agency Performance Report: Fiscal Q4 2022 (July-Sept.)* 8 (Dec. 16, 2022), https://www.permits.performance.gov/sites/permits.dot.gov/files/2022-12/FY22Q4%20Quarterly%20Agency%20Performance%20Report%20FINAL.pdf.

[146] *Id.*

[147] *Id.*

[148] 2021 Consolidated Appropriations Act, Pub. L. No. 116-260, 134 Stat. 1182 (2020).

[149] 43 U.S.C. § 3004(b).

[150] *Id.* § 3003.

[151] BLM, Manual of Rights-of-Way (2022).

[152] MS-2806, Ch. 6. Rent and Fee Reductions for Solar and Wind Energy Development Authorizations (May 26, 2022), https://www.blm.gov/sites/default/files/docs/2022-05/MS-2806%20rel%202-307%20Chapter%206.pdf.

[153] *Id.*

[154] Press Release, BLM, *Department of the Interior Announces Steps to Increase Clean Energy Development on Public Lands* (May 31, 2022).

As a corollary to providing enhanced financial incentives for developing projects on federal lands, BLM is updating its regulations to enhance permitting efficiencies for these projects. As described in Section II.A.1.ii above, BLM initiated a rulemaking process to update its 2016 Wind and Solar Rule to include new measures to prioritize and efficiently process applications for solar and wind ROW grants or leases.[155] And BLM is in the early stages of updating the 2012 Western Solar Plan to better account for solar development at the RMP level.[156]

Increased Agency Coordination. The 2020 Energy Act created a National Renewable Energy Coordination Office (RECO) responsible for establishing and implementing a program to improve federal permit coordination for projects on federal lands.[157] So far, BLM has created five field-office RECOs and a national RECO to manage permitting processes on public lands.[158] "BLM also plans to establish individual state RECOs within the Arizona, California, and Nevada State Offices, as well as a regional RECO to support program work across Colorado, New Mexico, Utah, and Wyoming."[159] Each RECO will be staffed with qualified personnel from different environmental regulatory agencies to utilize each agency's particular expertise and increase interagency coordination and decision making for renewable energy projects on federal lands.[160] The 2020 Energy Act grants the Secretary of Interior the authority to expend or transfer funds among these environmental agencies as necessary to "facilitate the coordination and processing of eligible project permits on Federal land under the Renewable Energy Coordination Offices."[161]

To further encourage interagency permitting coordination, the 2020 Energy Act also required the Secretary of Interior to enter into a memorandum of understanding (MOU) with federal and state regulators.[162] On January 6, 2022, the Secretary of the Interior entered into an MOU with the Secretary of Agriculture, the EPA Administrator, the Secretary of Defense, and state governors.[163] Under the MOU, the Participating Agencies intend to prioritize permitting coordination for all proposed wind, solar, or geothermal project on "covered lands" and to review and "expedite decision making."[164] The Participating Agencies have also agreed to provide staff for each field-level RECO to support permit

[155] BLM 2021 Report, *supra* note 3, at 5.

[156] 87 Fed. Reg. 75,284 (Dec. 8, 2022).

[157] 43 U.S.C. § 3102(a).

[158] Mem. of Understanding Between U.S. Dep't of the Interior & U.S. Dep't of Agric., U.S. Dep't of Defense, U.S. Dep't of Energy, U.S. Envtl. Protection Agency to Improve Public Land Renewable Energy Project Permit Coordination § III (Jan. 6, 2022) (Energy Act MOU), https://www.doi.gov/sites/doi.gov/files/mou-esb46-04208-pub-land-renewable-energy-proj-permit-coord-doi-usda-dod-epa-doe-2022-01-06.pdf.

[159] BLM 2021 Report, *supra* note 3, at 6.

[160] 43 U.S.C. § 3002(c).

[161] *Id.* § 3002(e).

[162] *Id.* § 3002(a)-(b).

[163] *See generally* Energy Act MOU, *supra* note 154; 43 U.S.C. § 3002(b)(1).

[164] Energy Act MOU, *supra* note 154, §§ V.5, VI.A.

review required by each agency and to providing baseline environmental data to evaluate eligible projects.[165]

Annual Reporting. The 2020 Energy Act requires the Secretary of the Interior to prepare an annual report to Congress that includes: "(A) projections for renewable energy production and capacity installations; and (B) a description of any problems relating to leasing, permitting, siting, or production."[166]

In its 2021 Annual Report, BLM emphasized recent strategic agreements to further solar, wind, and geothermal energy development on public lands. BLM is currently developing an interagency agreement with the U.S. Fish and Wildlife Service (FWS), which would include a transfer of funding to FWS for the increased support staff necessary to facilitate regulatory reviews and permitting for renewable energy projects.[167] BLM is also working with the National Renewable Energy Laboratory on developing site assessments to inform BLM's future solar energy planning efforts on public lands.[168]

After entering into the MOU on January 6, 2022, the Participating Agencies agreed to coordinate and provide input on the Secretary of Interior's future annual reports to Congress. Future annual reports will include:

1. Projections for renewable energy production and capacity installations on covered lands; and
2. A description of any problems relating to leasing, permitting, siting, or production of eligible projects, including, but not limited to:
    a. Problems with staffing expertise, capacity, and competing workload priorities;
    b. Proponent delays in providing necessary information;
    c. Out-dated land use plans;
    d. Problems with the variance process approval;
    e. Federal agency reviews; and
    f. Incomplete resource data.[169]

These reports should hopefully provide valuable reflection on current successes while illuminating future pathways forward for BLM and the other Participating Agencies.

C. Inflation Reduction Act and Permitting Reform Legislation

On July 13, 2021, West Virginia Democratic Senator Joe Manchin cosponsored the Federal Permitting Reform and Jobs Act to improve and streamline the federal permitting process for both renewable energy and traditional fossil fuel infrastructure projects.[170] A primary focus of the bill was to

[165] *Id.* § V.

[166] 43 U.S.C. § 3002(f)(1).

[167] BLM 2021 Report, *supra* note 3, at 4.

[168] *Id.*

[169] Energy Act MOU, *supra* note 154, § IX.B; 43 U.S.C. § 3002(f)(2).

[170] Fed. Permitting Reform & Jobs Act, S. 2324, 117th Cong. (1st Sess. 2021).

amend FAST-41 provisions for increased permitting efficiency and to extend FAST-41 applicability to a greater number of projects.[171]

In fall 2022, Senate Democrats began to consider certain aspects of Manchin's permitting reform proposal as permitting reform was negotiated between Senate Democratic leadership and the White House as a condition for the passage of the Inflation Reduction Act.[172] While the Inflation Reduction Act did not include Manchin's proposals,[173] the Senate Democratic caucus remained divided over provisions related to the interstate natural gas Mountain Valley Pipeline and modifications to NEPA review processes.[174]

Senator Manchin eventually voted to approve the Inflation Reduction Act after securing a commitment from Leader Schumer, Speaker Pelosi, and President Biden that any new permitting reform legislation he proposed would pass before the end of the 2022 fiscal year.[175] Manchin incorporated many of his permitting reform provisions into an amendment to the 2023 National Defense Authorization Act entitled the Energy Independence and Security Act of 2022. The Energy Independence and Security Act of 2022 included the following major provisions:

(1) Directed the President to designate and prioritize 25 energy infrastructure projects of "strategic national importance."[176] The proposal required an exact number of projects from each of the following energy sectors: four mining projects, six renewable energy projects, five fossil fuel or biofuel projects, two electric transmission line projects, two carbon capture projects, and one clean hydrogen project.[177]

(2) Established maximum timelines for federal agency permitting reviews, including two years for NEPA reviews of major projects and one year for lower-impact projects.[178]

(3) Implemented increased legal protections for energy infrastructure projects by setting a statute of limitations of 150 days for court challenges to permit actions[179] and establishing a deadline of 180 days for lower state courts to act on federal vacatur or remand of a permit.[180]

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[171] *Id.*

[172] Kevin Freking, *Democratic Lawmakers Are Divided over Sen. Manchin's Energy Proposal*, ASSOCIATED PRESS (Sept. 10, 2022), https://www.pbs.org/newshour/politics/democratic-lawmakers-are-divided-over-sen-manchins-energy-proposal.

[173] Kellie Lunney, *Defense Policy Bill Excludes Manchin Energy Permitting Changes*, BLOOMBERG (Dec. 6, 2022), https://about.bgov.com/news/defense-policy-bill-excludes-manchin-energy-permitting-changes/.

[174] Freking, *supra* note 168.

[175] *Id.*

[176] Energy Indep. & Sec. Act of 2022, ELT22557 OPR, 117th Cong. 46–47 (2d Sess. 2022).

[177] *Id.* at 19.

[178] *Id.*

[179] *Id.* at 35.

[180] *Id.* at 34.

(4) Extended FAST-41 procedures and Permitting Council authority to additional projects.[181]

(5) Required all relevant federal agencies to authorize permits associated with the Mountain Valley Pipeline natural gas pipeline project.[182] After permit approval, the Mountain Valley Pipeline project would be shielded from further judicial review.[183]

The Energy Independence and Security Act of 2022 again failed to garner enough votes. However, following Republicans winning the majority in the U.S. House of Representatives after the November 2022 elections, permitting reform may once again be considered in the 118th Congress. Former Speaker of the House Kevin McCarthy had pledged to include permitting reforms as part of a broader energy package in 2023, and this remains a priority for the GOP caucus under Speaker Mike Johnson.

D. Fiscal Responsibility Act

President Biden signed the bipartisan Fiscal Responsibility Act (FRA) on June 3, 2023.[184] As part of the compromise reached by legislators, the FRA codifies several reforms to NEPA, many of which were originally proposed and adopted as part of CEQ's 2020 NEPA regulations adopted during the Trump administration.[185]

The FRA NEPA amendments contain three primary provisions that could prove helpful to the more efficient review of renewable energy projects under NEPA.

(1) The FRA NEPA amendments require agencies to consider "any negative environmental impacts of *not* implementing the proposed agency action in the case of a no action alternative."[186] This new requirement will emphasize the potentially adverse consequences of not implementing a proposed action, including in the case of a proposed renewable energy project, the greenhouse gas emissions associated with a continued reliance on fossil-fuel based energy source.

(2) The FRA codifies the time and page limits originally adopted in CEQ's 2020 regulations, and that Senator Manchin proposed be adopted in the Energy Independence and Security Act of 2022. The FRA NEPA amendments establish a presumptive two-year time limit for agencies to complete an EIS, and a presumptive one-year time limit to complete EAs.[187] If the agency determines it cannot meet the deadline, it can extend the deadline, "in consultation with the applicant," to provide "only

[181] *Id.* at 58–60.

[182] *Id.* at 86–91.

[183] *Id.* at 90–91.

[184] Pub. L. No. 118-5, 137 Stat. 110 (2023).

[185] Pub. L. No. 118-5, Div. C, Title III.

[186] 42 U.S.C. § 4332(C)(iii).

[187] *Id.* § 4336a(g)(1)(A), (B).

so much additional time as is necessary" to complete the agency's review.[188] The FRA also provides a right to judicial review of an agency's failure to comply with the presumptive deadlines.[189]

(3) The FRA NEPA amendments establish a five-year period under which agencies may tier to and rely on a programmatic analysis "for which judicial review was available . . . without additional review of the analysis in the programmatic environmental document, unless there are substantial new circumstances or information about the significance of adverse effects that bear on the analysis."[190] This amendment is likely intended to address the recent issue of climate change litigation precluding BLM's ability to tier to fairly recent RMPs or other programmatic analyses when approving leasing or development of federal oil and gas. But the amendment could also help renewable energy development. Resource issues evolve quickly, and a major disincentive to undertaking the programmatic planning efforts that could help facilitate development approvals is a concern that those plans may be subject to litigation based on new or novel arguments under NEPA that did not exist at the time the plan was finalized.

IV. CONCLUSION

Effective and efficient permitting of renewable energy projects on federal lands requires a concurrent, multi-prong approach: (1) the timely and efficient review of applicant-driven applications under current land use plans; and (2) long-term, programmatic land use planning to support future development and allow effective tiering at the project level.

Renewable energy development presents some unique challenges for federal land management agencies. An obvious issue is the continued need for transmission buildout to support the generation on federal lands in the West. Because needed transmission infrastructure is not present in all developable areas, land use plans need to forecast and account for this future development.

But there are existing tools and mechanism the agencies and project proponents can implement: increased and consistent staffing and training across field offices, reliance on applicant-prepared EAs and EISs, and thoughtful mitigation—just to name a few.

Long-term, programmatic land use planning will also need to play a role. As described, the consideration of fluid mineral development in BLM and Forest Service land use plans has been critical to the development of those resources. If the government wants to prioritize renewable energy development on federal lands, it will need to undertake similar efforts.

And Congress too will likely need to continue to act. The Mineral Leasing Act of 1920 and the Federal Onshore Oil and Gas Leasing Reform Act of 1987

[188] *Id.* § 4336a(g)(2).

[189] *Id.* § 4336a(3).

[190] *Id.* § 4336b(1).

are examples of Congress incentivizing and facilitating a specific type of development based upon perceived priorities at those times. Those statutes provide oil and gas, and other fluid minerals, with a status different than other multiple uses under FLPMA. The 2020 Energy Act directs the Department of the Interior to make renewable energy development a goal, but to truly realize this goal, further congressional action identifying it as a priority use of federal lands is likely needed.

Highly Competitive Markets for Lithium Producers and the Role of the Lithium Triangle

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I. INTRODUCTION

A. Climate Change and the Need for an Energy Transition

The urgency facing the world in addressing climate change was underscored again in a March 2023 major new report by the Intergovernmental Panel on Climate Change (IPCC).[1] Among other key findings, the report stated with high confidence that "[h]uman activities, principally through emissions of greenhouse gases, have unequivocally caused global warming, with global surface temperature reaching 1.1°C above 1850-1900 in 2011-2020."[2]

The report

> offers the most comprehensive understanding to date of ways in which the planet is changing. It says that global average temperatures are estimated to rise 1.5 degrees Celsius (2.7 degrees Fahrenheit) above preindustrial levels sometime around "the first half of the 2030s," as humans continue to burn coal, oil and natural gas.[3]

The 1.5 degrees Celsius number holds special meaning since nearly every world country agreed in the 2015 Paris Climate Agreement to "pursue efforts" to limit global warming to that number.[4]

However, the energy transition—moving from fossil fuels to renewable energy—will not happen without "a decades-long investment in technologies [including] batteries."[5]

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[1] IPCC, "AR6 Synthesis Report: Climate Change 2023," https://www.ipcc.ch/report/ar6/syr/.

[2] IPCC, "AR6 Synthesis Report: Climate Change 2023, Summary for Policymakers," at 4, https://report.ipcc.ch/ar6syr/pdf/IPCC_AR6_SYR_SPM.pdf.

[3] Brad Plummer, "Climate Change Is Speeding Toward Catastrophe. The Next Decade Is Crucial, U.N. Panel Says," *N.Y. Times* (Mar. 21, 2023).

[4] *Id.*

[5] Morgan D. Bazilian & Gregory Brew, "The Missing Minerals," *Foreign Affairs* (Jan. 6, 2023).

B. The Importance of Lithium in the Energy Transition

The Paris-based International Energy Agency (IEA), in response to the growing demand for clean energy, has stated: "Supplies of critical minerals essential for clean energy technologies like electric vehicles and [wind energy] need to pick up sharply over the coming decades to meet the world's climate goals, creating potential energy security hazards that governments must act now to address."[6] The silvery and soft metal known as lithium is one of these minerals, thus leading to the conclusion that it "is at the center of the energy transition."[7] The reason is lithium's role in energy storage: specifically, the production of lithium-ion batteries depends on the availability of lithium.[8]

The Economist magazine has described lithium as a "green metal"[9] because of its use in batteries. Meanwhile, an energy commentator has said: "As the impacts of climate change ripple across the globe, lithium's importance as a strategic mineral will increase exponentially to become an essential component for the clean energy system of the future."[10] Put simply, lithium-ion batteries are "crucial to electrified transport systems and utility-scale energy storage systems for renewable electricity."[11]

The importance of rechargeable batteries as a fundamental element of the energy transition is well accepted. "As countries around the world make efforts to shift towards greener economies, they need rechargeable batteries," Luis Felipe López-Calva, UN Assistant General Secretary and UNDP Regional Director for Latin America and the Caribbean, has observed.[12] Another energy expert has said:

> [O]ne technology that is vitally important to unlocking a clean energy future: the battery. Batteries will help store electricity from solar panels and wind turbines. Batteries will help improve the reliability, versatility, and efficiency of the electrical grid. And batteries will power a new generation of zero-emissions vehicles, from cares to bicycles to airplanes.[13]

Moreover, a recent article in the journal Energies, has said:

> [T]he lithium-ion battery market is growing at a rapid pace. The trend is that it will continue to grow significantly in the coming years, with light electric vehicles as the main

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[6] Press Release, Int'l Energy Agency, "Clean Energy Demand for Critical Minerals Set to Soar as the World Pursues Net Zero Goals" (May 5, 2021).

[7] Luis Felipe López-Calva, "Lithium in Latin America: A New Quest for 'El Dorado'?," *UNDP Latin America and the Caribbean Blog* (May 26, 2022), https://www.undp.org/latin-america/blog/graph-for-thought/lithium-latin-america-new-quest-el-dorado.

[8] John D. Graham et al., "Lithium in the Green Energy Transition: The Quest for Both Sustainability and Security," 13 *Sustainability* 11274 (2021).

[9] "The Transition to Clean Energy Will Mint New Commodity Superpowers," *The Economist* (Mar. 26, 2022).

[10] Ryan C. Berg & T. Andrew Sady-Kennedy, "South America's Lithium Triangle: Opportunities for the Biden Administration," *Ctr. for Strategic & Int'l Studies* (Aug. 17, 2021), https://www.csis.org/analysis/south-americas-lithium-triangle-opportunities-biden-administration.

[11] Graham et al., *supra* note 8.

[12] López-Calva, *supra* note 7.

[13] James Morton Turner, CHARGED: A HISTORY OF BATTERIES AND LESSONS FOR A CLEAN ENERGY FUTURE (2022).

> drive of this revolution. By 2030, it is estimated that a total of 10.5 TWh of [lithium-ion batteries] will be placed on the market, and electric vehicles will represent 77% of the total installed lithium-ion batteries globally.[14]

The U.S. Federal Consortium for Advanced Batteries has written, "Lithium-ion batteries are pervasive in our society. Current and projected demand is dominated by electric vehicles (EVs), but lithium-ion batteries are also ubiquitous in . . . stationary storage for the electric grid."[15]

However, while lithium-rich countries may have high expectations that lithium l might "be an important driver of growth in the years to come" and the equivalent to a modern-day "white gold," the reality is that lithium extraction is difficult.[16] In this regard, several cautionary observations are particularly worth bearing in mind in the context of Latin America:

1. Most of the profit of the lithium industry comes from a long value chain that creates lithium batteries. Countries that just extract and export lithium are likely to have limited potential gains. . . . Latin American countries would need to significantly invest in R&D to keep larger parts of the value chain at home and be able to derive significant profits.
2. Mining and producing battery-grade lithium carbonate requires important investments. Recent estimates from lithium experts at Roskill [have] estimated that the marginal costs of producing refined lithium of both carbonate and hydroxide would range between $6,000-$8,000/t through to 2036.
3. There are important environmental and social costs of lithium production. Most of Latin American production comes from brines within fragile ecosystems. Lithium mining from salt brines in South America is associated with concerns of contaminating local water basins. . . . Many of these areas are inhabited by indigenous communities who depend on water for their main economic activities.
4. The pool of countries and places with identified resources is rapidly expanding. High prices are creating incentives to find new lithium resources.[17]

Meanwhile, despite the continuing development of sodium-based batteries, "it is likely that lithium will remain the metal of choice for the foreseeable future [because] requirements are relatively independent of specific battery composition."[18]

In closing these initial comments one other concept is worth noting: Saad Rahim of the trading firm Trafigura has said that the world's shift to clean fuels is "less an energy transition than a commodity transition."[19]

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[14] Maria Cecília Costa Lima et al., "Economic Aspects for Recycling of Used Lithium-Ion Batteries from Electric Vehicles," 15 *Energies* 2203 (2022).

[15] U.S. Fed. Consortium for Advanced Batteries, "Executive Summary: National Blueprint for Lithium Batteries 2021–2030" (June 2021), https://www.energy.gov/sites/default/files/2021-06/FCAB%20National%20Blueprint%20Lithium%20Batteries%200621_0.pdf.

[16] López-Calva, *supra* note 7.

[17] *Id.*

[18] Dolf Gielen & Martina Lyons, "Critical Materials for the Energy Transition: Lithium," International Renewable Energy Agency, Technical Paper 1/2022, at 6, https://www.irena.org/-/media/Irena/Files/Technical-papers/IRENA_Critical_Materials_Lithium_2022.pdf?rev=acb7d0a37ec748758054920dc82dbc0a.

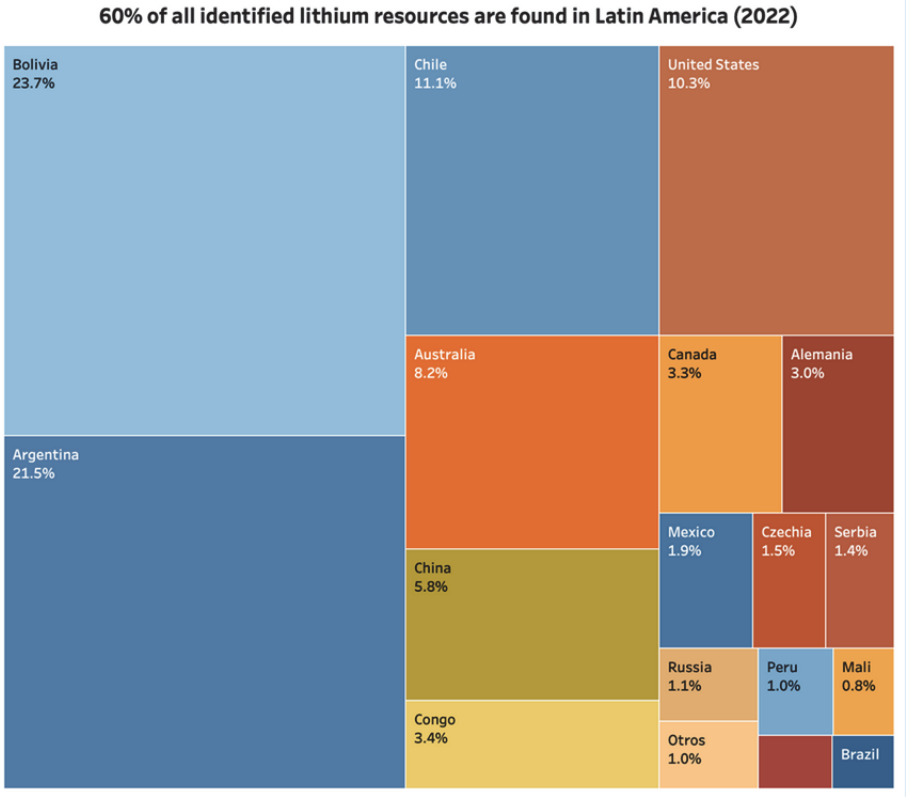
[19] "The Transition to Clean Energy Will Mint New Commodity Superpowers," *The Economist* (Mar. 26, 2022).

C. The Lithium Triangle: The "Key" to the Energy Transition

The triangle countries—Argentina, Bolivia and Chile—have been referred to as the "Saudi Arabia" of lithium.[20] In this regard, recent data published by the U.S. Geological Survey (USGS) estimates that nearly 60% (see Figure 1) of the world's lithium resources are located in three Latin American countries.[21] That led the World Economic Forum in January 2023 to conclude that "Latin America is key to the global energy transition."[22]

However, because the lithium industry's profits largely "come from a lengthy value chain that creates batteries . . . Latin American countries will need to make bigger investments to localize more of the value chain in order to derive significant profits," according to the World Economic Forum.[23]

Figure 1.



USGS, Mineral Commodity Summaries 2022

[20] Florencia Heredia et al., "The Importance of Lithium for Achieving a Low-Carbon Future: Overview of the Lithium Extraction in the 'Lithium Triangle,'" 38 *J. of Energy & Nat. Resources L.* 213, 222 (2020).

[21] USGS, "Mineral Commodity Summaries 2022," at 101.

[22] World Econ. F., "Lithium: Here's Why Latin America Is Key to the Global Energy Transition" (Jan. 10, 2023), https://www.weforum.org/agenda/2023/01/lithium-latin-america-energy-transition/.

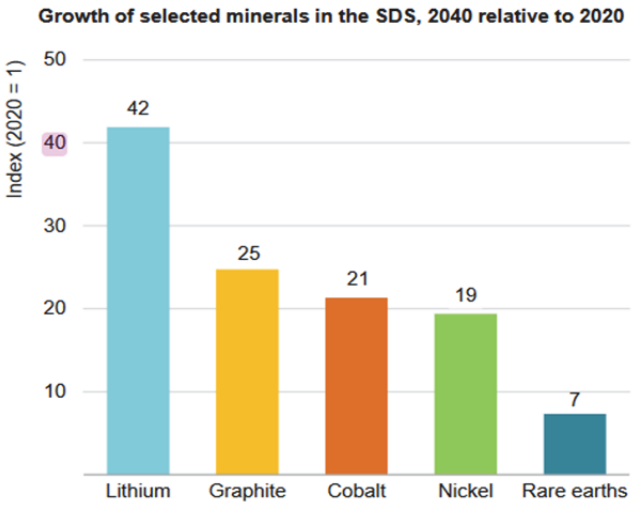
[23] *Id.*

II. PROJECTIONS ON THE INCREASING DEMAND FOR LITHIUM

There are a multitude of projections regarding the increasing demand, but one that deserves special attention is published by the IEA. According to an IEA projection published in 2022, the demand for lithium batteries will increase 10-fold between 2020 and 2030, largely because of the increasing electric vehicle demand.[24] In 2020, 34% of lithium demand was attributed to electric vehicles, but by 2030 that number should increase to 75%.[25]

In another IEA report published in 2021, the organization projected that assuming climate change remains a key global issue, demand for lithium in 2040 might be as much as 40 times higher than in the early 2020s (see Figure 2).[26]

Figure 2.



III. THE COMPETITIVE GLOBAL MARKET (OUTSIDE THE LITHIUM TRIANGLE)

A. Rapidly Expanding Market

The places and countries having identified resources is expanding quickly with the primary driver being an increase in prices. For example, the USGS estimates that "identified lithium resources went from 53 million tons in 2018 to 89 million tons in 2022, an increase of 41% in only 5 years."[27] In addition, the lithium recycling sector is growing with about 25 firms in Canada, Europe, and the U.S. planning to recycle batteries.[28] The following discussions will consider what is happening in several key countries.

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[24] Gielen & Lyons, *supra* note 18, at 6.

[25] *Id.*

[26] Int'l Energy Agency, "The Role of Critical Minerals in Clean Energy Transitions," at 9 (May 5, 2021).

[27] López-Calva, *supra* note 7.

[28] *Id.*

B. Australia

The Australian government's "Australia's Identified Mineral Resources 2022"[29] report said: "Our modern nation faces the challenge of resourcing the technologies needed to address climate change and the rapid transition to a net-zero economy . . . . In 2021, Australia's critical minerals sector gained momentum as show by strong growth in lithium production (up 38%) . . . ."[30] The report went on to note: "In 2021, Australia was the source of more than 50% of global lithium supply . . . ."[31] Madeleine King, MP and Ministers for Resources and Northern Australia, said:

> Our lithium sector is going from strength to strength as global demand surges with the uptake of electric vehicles. [Australia] currently [produces] more than 50 percent of the world's lithium from Western Australian mines and our position will grow with the opening of the Finniss lithium mine in the Northern Territory in addition to new value-added products from new lithium refineries.[32]

The Australian government will over four years invest $50.5 million to create the Australian Critical Minerals Research and Development Hub to promote the country's critical minerals potential.[33]

Meanwhile, companies are looking to refine lithium in Australia "in an effort to reduce shipping waste and develop new supply chains that bypass China."[34] According to Ross Gregory, New Electric Partners consultancy, creating Australian-based processing facilities like a sulfate hub and spreading the cost would bring efficiency to the entire supply chain.[35] "The new processing facilities will bring more technical knowledge locally of chemically manufacturing and help the country advance along the lithium supply chain," Gregory said.[36]

In addition, one Australian lithium producer Mineral Resources has said that the U.S. Inflation Reduction Act legislation "had incentivized US companies to buy up Australian lithium and other battery minerals while investing downstream processing elsewhere."[37] Australian Prime Minister Anthony Albanese said in February that "he wanted Australia to move all the way downstream from mining to battery manufacturing" but Mineral Resources president Chris Ellison said "that dream was fading fast because of the IRA and similar incentives being offered in Europe and other jurisdictions."[38]

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[29] Australian Government: Geoscience Australia, "Australia's Identified Mineral Resources 2022," https://www.ga.gov.au/digital-publication/aimr2022.

[30] *Id.*

[31] *Id.*

[32] *Id.*

[33] *Id.*

[34] Yusuf Khan, "Lithium Industry Looks to Australia for Refining, Not Just Mining," *Wall St. J. Pro Sustainable Bus.* (Feb. 21, 2023).

[35] *Id.*

[36] *Id.*

[37] Brad Thompson, "Chris Ellison Says Australia's Lithium Industry at Risk," *Fin. Rev.* (Mar. 29, 2023).

[38] *Id.*

C. Canada

While Canada has not historically produced lithium, it is estimated to have about 2.5% of the known global deposits.[39] However, when the La Corne, Quebec, lithium mine opens in 2023 it will be the "only functional lithium concentrate mine in North America and position Quebec as a Canadian lithium leader."[40] While there is some skepticism about the mine—it has changed hands four times in 10 years and has experience "serious and damaging spills"—in September 2022 Quebec Premier François Legault said: "We have lithium in Quebec, and it's important to take advantage of it."[41]

The Canadian province of Alberta is also anxious to get into the lithium business. According to Invest in Canada, "Alberta has significant lithium resources and is poised to compete in the global market," adding,

> Alberta is ready to capitalize on the growing demand for lithium. The province's oil fields hold large deposits of lithium in subsurface brine, which has long been overlooked as industrial waste from oil field operations. Now technologies known as direct lithium extraction (DLE) are being developed to access Alberta's lithium-brine potential in many of the same reservoirs as Alberta's existing oil and gas resources.[42]

The province is also promoting its "potential to be an important global supplier of lithium and its end products, which include batteries."[43] Canadian energy experts Rudiger Tscherning of the University of Calgary Law School and Brady Chapman have noted that "Western Canada is ripe with opportunity to commercialize a more sustainable lithium extraction industry from subsurface brines."[44]

The Canadian federal government has also indicated interested in creating battery-grade lithium in Canada and to add to the domestic EV battery supply chain. In November 2022, the government announced a $27 million contribution to E3 Lithium Ltd., which will support the firm's $87 million project for the construction of a demonstration plant specializing in lithium production. "This facility will be the first step toward a full-scale lithium production plant that will produce up to 20,000 tonnes of battery-grade lithium," the government said.[45]

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[39] Kate McKenna, "A New Mine Could Position Quebec as a Lithium Leader, but Its Rocky Past Worries Locals," *CBC News* (Nov. 15, 2022).

[40] *Id.*

[41] *Id.*

[42] Invest in Canada, "Alberta's Lithium Supply Chain Offers New Investment Opportunities," https://www.investcanada.ca/blog/albertas-lithium-supply-chain-offers-new-investment-opportunities.

[43] *Id.*

[44] Rudiger Tscherning & Brady Chapman, "Navigating the Emerging Lithium Rush: Lithium Extraction from Brines for Clean-Tech Battery Storage Technologies," 39 *J. of Energy & Nat. Resources L.* 13, 17 (2020).

[45] News Release, Gov't of Can., "Government of Canada Invests in E3 Lithium to Advance Canada's EV Battery Production" (Nov. 28, 2022).

D. China

Despite having large reserves of lithium and a small amount of production, China imports significantly more lithium that is produced domestically. Recently, more than 80% of the lithium consumed in China is imported with most of that percentage being from Australia.[46] In this regard, rather than focusing on lithium mining, "Chinese companies, supported by Chinese banks and the central government, have purchased substantial interests in major lithium mines of Australia, South America, and Africa."[47]

Meanwhile, more than half the world's processing capacity for mined lithium currently takes place in China[48] and nearly 75% of the world's batteries are produced in China.[49] "This is consistent with the country's industrial policy, China 2025, which seeks to emphasize those parts of the industrial supply chain that have high value-added and a limited environmental impact."[50] And yet, the *Financial Times* reported in late 2022 that "[t]he US and Europe can cut their dependence on China for electric vehicles batteries through more than $160 billion in new capital expenditure by 2030" according to a Golden Sachs estimate.[51]

E. European Union

In September 2022, European Commission President Ursula von der Leyen said in her State of the Union 2022 address: "Lithium and rare earths will soon be more important than oil and gas . . . . We will identify strategic projects all along the supply chain, from extraction to refining, from processing to recycling."[52]

In following up on her statement, in March 2023, the European Commission proposed a European Critical Minerals Act[53] for consideration by the Council of Ministers and the European Parliament and issued a Communication titled "A secure and sustainable supply of critical raw materials in support of the twin transition."[54] In the accompanying Communication the Commission explained that "[t]he EU has embarked on an ambitious industrial transformation to achieve a green and digital transition," and noted that the demand for lithium is forecasted to increase by "11 times by 2030 and 17 times by 2050."[55]

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[46] Graham et al., *supra* note 8.

[47] *Id.*

[48] Gielen & Lyons, *supra* note 18, at 6.

[49] Edward White & Leo Lewis, "West Could End Reliance on Chinese Batteries by 2030, Says Goldman Sachs," *Fin. Times* (Nov. 21, 2022).

[50] Graham et al., *supra* note 8.

[51] White & Lewis, *supra* note 49.

[52] *See* https://ec.europa.eu/commission/presscorner/api/files/document/print/ov/speech_22_5493/SPEECH_22_5493_OV.pdf.

[53] *See* https://single-market-economy.ec.europa.eu/publications/european-critical-raw-materials-act_en.

[54] *See* https://circabc.europa.eu/rest/download/7ce37e41-1d9a-4f96-a24b-4f89207700bf.

[55] *Id.*

In the Communication, the Commission committed to proposing "in 2024 the inclusion of waste codes for Lithium-ion batteries and intermediate waste streams . . . under the European List of Waste to ensure their proper recycling within the EU."[56]

The European Union has estimated that its demand by 2050 for lithium will be 57 times today's demand.[57]

Europe and the European Union in particular intend to expand renewable energy capacity meaning that

> building out the lithium supply chain will be vital . . . . Lithium mining projects in Germany and Portugal have emerged, although the permitting process can be complex, particularly if there is local opposition. A prime example is Rio Tinto PLC's $2.4 billion Jadar lithium project in Serbia, which was scrapped in early 2022 after local protests.[58]

Independent energy consultant Jeff Amrish said, "Mining in Europe will not significantly contribute to meeting Europe's demand for critical minerals this decade as it takes 10-15 years to reach commercial production capacity from a mine from the moment a resource discovery is made."[59] As a consequence, Amrish said, European firms will most likely work with "more mining-friendly" jurisdictions such as Australia or Canada in meeting demands for lithium.[60]

Meanwhile, the European EV industry is concerned that the EU might classify lithium as a toxic substance. It has been reported that

> Europe's nascent batter companies are warning that investor may be drawn away from the continent to the US where the IRA has created strong incentives to establish supply chains in the country. If lithium is labeled toxic, those handling it would be subject to extras safety measures, adding millions in extra costs for prospective lithium refiners and battery markers in Europe, expenses that are absent in the US, China, and the UK.[61]

It is worth nothing that in 2021 the EU signed an agreement with Canada that has resulted in EU investments involving lithium in the North American country, and in December 2022 the EU concluded negotiations on the exiting EU-Chile Association Agreement to provide the EU "better access to sustainable investment in critical raw materials such as lithium, while supporting Chile in developing its green economy."[62]

Finally, *The Economist Magazine* had some words of warning for the EU regarding its consideration of European firms departing the continent for the U.S. to take advantage of U.S. green subsidies. "Europe worries that America's largess may cause domestic jobs and industries to flee across the Atlantic," a recent *Economist* editorial said.[63]

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[56] *Id.*

[57] Charlie Cooper et al., "China Leaves EU Playing Catchup in Race for Raw Materials," *EnergyWire* (Mar. 14, 2023).

[58] Khan, *supra* note 34.

[59] *Id.*

[60] *Id.*

[61] Yusuf Khan, "EU Delays Labeling Lithium Toxic as Concerns from EV Industry Mount," *Wall St. J. PRO* (Dec. 12, 2022).

[62] *See* https://circabc.europa.eu/rest/download/7ce37e41-1d9a-4f96-a24b-4f89207700bf.

[63] "Leader: How the EU Should Respond to American Subsidies," *Economist* (Mar. 23, 2023).

> True, the handouts may encourage some firms to bring forward some investments in America. But that is a boon to Europe, not a threat. Europe has a large and well-rooted green industry; battery firms and carmakers would be foolish to abandon as big a market as the EU. If America turbocharges the green transition, European firms and customers will benefit from cheaper technology and a greater choice of suppliers.

F. Mexico

In January 2023, the USGS estimated that Mexico has 1.7 million tons of identified lithium resources, ranking it the country with the 12th most resources.[64] In response to the amount of lithium in the country, Mexican President Andrés Manuel López Obrador in September 2022 announced the formation of Lithium for Mexico (LitioMX), a government-owned company that will be "dedicated to the exploitation and use of Mexican lithium."[65]

Subsequently, in mid-February 2023, the Mexican president signed a presidential decree ordering the state energy ministry "to take the actions necessary to carry out" the process of nationalizing the country's lithium reserves.[66] "[Let's make] the nation be the owner of this strategic mineral," President López Obrador said, adding, "What we are doing now . . . is to nationalize lithium so that it cannot be exploited by foreigners from Russia, China, or the United States."[67]

The decree included the statement that "the rights and obligations of the holders of mining concessions in force that are within the lithium mining reserve zone remain safe."[68] More than 10 foreign mining companies hold active mining concession involving lithium. However, the president said all of them will be subject to review.[69]

Fernando Quesada, an attorney familiar with mining in Mexico, said, "It's counterintuitive to declare (lithium) as reserved for the state, but that the concessions already granted will be respected."[70]

As of February 2023, LitioMx CEO Pablo Taddei Arriola said that negotiations were underway "with companies throughout the value chain to establish public-private partnerships."[71] He also said that negotiations were underway with firms "that already have concessions in the country, with the aim of forming a common front."[72] The Mexican treasury has estimated that the mining of lithium plus "the attraction of the value chain in Sonora" might be worth as

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[64] USGS, "Mineral Commodity Summaries" (Jan. 2023).

[65] "LitioMx Is Formally Constituted," *MexicoNow* (Sept. 23, 2022), https://mexico-now.com/litiomx-is-formally-constituted/

[66] Reuters, "Mexico's Lopez Obrador Orders Ministry to Step Up Lithium Nationalization," *Reuters* (Feb. 18, 2023).

[67] *Id.*

[68] *Id.*

[69] *Id.*

[70] Carolina Pulice, "Analysis: Decree Adds to Doubts About Mexican Lithium Industry's Future," *Reuters* (Feb. 24, 2023).

[71] Arturo Solis, "Mexico's State-Owned Lithium Company Is Negotiating Partnerships With Private Firms," *Bloomberg Línea* (Feb. 9, 2023).

[72] *Id.*

much as $600 billion.[73] Arriola said that LitioMx's "partnerships with the private sector will be based on the stewardship of the Mexican state to prevent profits from lithium from going to other countries . . . in addition to guaranteeing technology transfer and the hiring of personnel in the region where there is a lithium project."[74]

Meanwhile, the governor of Nuevo León, said in March 2023, that Tesla company officials had told him that the company, which has already announced plans to build a factory near Monterrey, "could grow to me the company's largest, producing not only cars, but also batteries."[75] As *The New York Times* reported, "Tesla's plans in Mexico could help make the country a central player in the development of lithium and lithium-ion batteries in the Western Hemisphere."[76]

G. United States

The August 2022 passage by the U.S. Congress and signing into law by President Joe Biden of the Inflation Reduction Act (IRA)[77] will mean enormous subsidies and tax benefits for "localizing battery supply chains and fueling the uptake of EVs" in the United States.[78] The IRA will introduce $270 billion "in the form of tax credits into supply chains tied to electric vehicles and clean energy. As envisioned, the EV tax credits are geared toward battery materials and components from North America or countries with a US free-trade agreement."[79] (As a backdrop for the IRA, the U.S. "produces a pittance of most . . . critical minerals and refines even less."[80])

On the last day of March 2023, the Biden administration published its long-awaited proposed rule that implements the portion of the IRA that provides federal tax credits for EV purchases.[81] While the proposed rule initially applies a maximum $7,500 tax credit to fewer EVs, soon more EVs will become eligible.[82] According to a senior U.S. Treasury official,

> [t]he critical minerals and battery components requirements will reduce the number of electric vehicles currently eligible for the full credit in the short term, in order to create incentives to bring supply chains and manufacturing to the United States. However, we believe these requirements will significantly increase the number of vehicles made and

[73] *Id.*

[74] *Id.*

[75] Jack Ewing & Clifford Krauss, "Tesla Could Start Making Cars in Mexico Next Year, Governor Says," *N.Y. Times* (Mar. 3, 2023).

[76] *Id.*

[77] HR 5376 – Inflation Reduction Act of 2022.

[78] White & Lewis, *supra* note 49.

[79] Hannah Northey, "Biden Admin Makes EV Battery Mineral Deal with Japan," *GreenWire* (Mar. 28, 2023).

[80] Bazilian & Brew, *supra* note 5.

[81] Section 30D New Clean Vehicle Credit, 88 Fed. Reg. 23,370 (Apr. 17, 2023).

[82] Hannah Northey & Timothy Cama, "Biden Admin Curbs EVs Elibile for Tax Credits," *GreenWire* (Mar. 31, 2023).

> sold in the US over the next decade as new investment and American production come online.[83]

Under the proposed rule,

> a car becomes eligible for half of the credit if at least 40 percent of the critical minerals in an EV battery are extracted or processed in the U.S. or a country that has as a free-trade agreement with the U.S[84], or recycled in North America. To receive the other half of the credit, 50 percent of EV battery components must be manufactured or assembled in North America.
>
> Also, eligible EVs must have batteries that do not contain critical minerals extracted, processed or recycled by a "foreign entity of concern," or contain components manufactured by those entities. That requirement kicks in for battery components in January and minerals the following year.[85]

One key issue remaining to be clarified is what is a "foreign entity of concern." The final rule is likely to be published mid-2023.

The Treasury Department said other countries might be added, a reference that likely applies to the European Union which is currently exploring a potential agreement on EVs with the United States (see "H." below). In late March the Biden administration announced an agreement with Japan that strengthened the critical minerals, including lithium, supply chains between the countries.[86] The agreement reflected once again the administration's efforts to move away from Chinese control of minerals such as lithium.[87]

The agreement was key for Japan since it does not have a free-trade agreement with America.[88] U.S. Trade Representative Karen Tai said the agreement "is proof of President Biden's commitment to building resilient and secure supply chains . . . . This is a welcome moment as the United States continues to work with our allies and partners to strengthen supply chains for critical minerals, including through the Inflation Reduction Act."[89]

While the Treasury hopes that the rule will promote domestic minding, senior Biden administration officials said that the larger goal is to "reshore" and "friendly-shore" supply chains, which includes processing minerals like lithium.[90] But the question remains about how quickly U.S. industry can scale up. A

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[83] *Id.*

[84] Those countries are: Australia, Bahrain, Canada, Chile, Colombia, Costa Rica, Dominican Republic, El Salvador, Guatemala, Honduras, Israel, Jordan, South Korea, Mexico, Morocco, Nicaragua, Oman, Panama, Peru, and Singapore. U.S. Treas. Dep't, "White Paper: Anticipated Direction of Forthcoming Proposed Guidelines on Critical Mineral and Battery Component Value Calculations for the New Clean Vehicle Credit" (Dec. 29, 2023), https://home.treasury.gov/system/files/136/30DWhite-Paper.pdf.

[85] Northey & Cama, *supra* note 82.

[86] Agreement Between the Government of the United States of America and the Government of Japan on Strengthening Critical Minerals Supply Chains (Mar. 28, 2023), https://ustr.gov/sites/default/files/2023-03/US%20Japan%20Critical%20Minerals%20Agreement%20Text%20March%202023.pdf.

[87] Northey, *supra* note 79.

[88] *Id.*

[89] Press Release, Office of the U.S. Trade Representative, "United States and Japan Sign Critical Minerals Agreement" (Mar. 28, 2023).

[90] Hannah Northey & David Ferris, "Big Questions Loom Around EV Tax Guidance," *GreenWire* (Mar. 31, 2023).

$1.3 billion lithium processing plant is planned for South Carolina, but as Ian Lange of the Colorado School of Mines has pointed out, permitting and building processing plants can be controversial.[91] Until U.S.-based plants are in place, it is likely that demand will grow for resources from countries that permit mines more quickly and require high social and environment standards such as Australia and Canada, Lange predicted.[92]

When considering mining, an energy export at the Colorado School of Mines, has argued that in order to enhance mining capacity, "[t]he United States should streamline the permitting process for new mines. There is . . . only one active lithium mind in the United States and some 17,000 prospecting claims, or permits to search for economically exploitable mineral deposits."[93]

In conclusion, it has been suggested that "[t]he White House perceives the problems of climate change and energy security as bound up in the new reality of great-power competition, with China as the clear antagonist."[94]

H. European Union and United States

In the background, but hardly on the sidelines of the global clean energy discussion is the tenuous relationship between the European Union and the United States when it comes to key underlying approaches to clean energy.

On February 1, 2023, the European Commission set out its proposal for "A Green Deal Industrial Plan for the Net-Zero Age."[95] Among the key initiatives that it committed to developing was a Critical Raw Materials Club (CRC), aimed at working with "like-minded partners . . . to deliver on a secure, sustainable and affordable global supply of raw materials essential to our green and digital transition with a competitive and diversified industrial base."[96] As envisioned by the Commission, "the Club will develop principles to bring together raw material 'consumers' and resource-reach countries and foster cooperation to allow resource-rich countries to move up the value chain."[97]

The CRC proposal came in the wake of the August 2022 passage of the U.S. Inflation Reduction Act, a measure that "infuriated officials in Europe, who were annoyed that climate provisions, particularly related to electric vehicles, were protectionist and disadvantaged European carmakers."[98]

In early March 2023, Biden and von der Leyen began negotiations "over the critical minerals used in electric vehicles amid concerns of a potential trade war triggered by the Biden administration's signature clean energy legisla-

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[91] *Id.*

[92] *Id.*

[93] Bazilian & Brew, *supra* note 5.

[94] *Id.*

[95] *See* https://commission.europa.eu/system/files/2023-02/COM_2023_62_2_EN_ACT_A%20Green%20Deal%20Industrial%20Plan%20for%20the%20Net-Zero%20Age.pdf.

[96] *See id.* at 19.

[97] *See id.*

[98] Suzanne Lynch, "Why Ursula von der Leyen Matters to Biden," *Politico* (Mar. 10, 2023).

tion."[99] The two presidents discussed a new trade agreement that "would help European companies qualify for more tax credits being offered in the United States."[100]

"The goal is to have an agreement on critical raw materials that have been sourced or processed in the European Union, that these strategic supply chains are able to access the American market as if they've been sourced in the United States," the European Commission president said after the meeting,[101] adding that the agreement would ensure that critical raw materials sourced or processed in the EU will allow cars access to U.S. markets "as if they had been sourced in the United States."[102]

However, it could take consider time before a deal over critical minerals is in place. "European officials said they would need to seek a mandate from their members states to negotiate a trade deal on their behalf and submit the deal to the states for their approval," according to *The New York Times*. "The Biden administration could have a more straightforward process, issuing such an agreement with an executive order."[103]

In a joint statement issued by the two presidents following the meeting, the pair said,

> The United State and the European Union are committed to addressing the climate crisis, accelerating the global clean energy economy, and building resilient, secure, and diversified clean energy supply chains. Both parties recognize that these objectives are at the heat of the U.S. Inflation Reduction Act and the EU Green Deal Industrial Plan. By building and strengthening our own clear energy industrial bases and investing in the industries of the future, the United States and the European Union will create good-paying jobs and spark virtuous cycles of innovation that drive down costs for clean energy technologies in the global market, making those technologies more affordable and advancing a global just energy transition that will leave no community behind.[104]

In the run-up to the early March meeting, a White House official said the US wanted to ensure "that the EU and US don't work at 'cross purposes' as they deploy incentives for clean energy development."[105]

Agreement was reached after the early March meeting that,

> the United States and the European Commission announced the launch of the Clean Energy Incentives Dialogue to coordinate our respective incentive programs so that they are mutually reinforcing. . . . The Clean Energy Incentives Dialogue will become a part of the EU-U.S. Trade and Technology Council where it will also facilitate information sharing on non-market policies and practice of third parties—such as those employed by the

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[99] Ana Swanson et al., "Biden and E.U. Leader Seek Common Ground on Trade and Ukraine," *N.Y. Times* (Mar. 10, 2023).

[100] *Id.*

[101] *Id.*

[102] Hannah Northey, "Biden Makes Oval Office Pitch on Critical Minerals," *E&ENews PM* (Mar. 10, 2023).

[103] Swanson et al., *supra* note 99.

[104] The White House, "Joint Statement by President Biden and President von der Leyen" (Mar. 10, 2023).

[105] Sara Schonhardt & Hannah Northey, "US, EU to Negotiate Critical Minerals Agreement," *ClimateWire* (Mar. 10, 2023).

People's Republic of China—to serve as the basis for joint or parallel action and coordinated advocacy on these issues in multilateral or other fora.[106]

IV. Other Key Metrics in Figures: Sales of Electric Vehicles and Lithium Processing

Two final figures illustrate two additional key concepts in the overall context of lithium. The first, Figure 3, illustrates the forecasted growth in sales of electric vehicles.

Figure 3.[107]

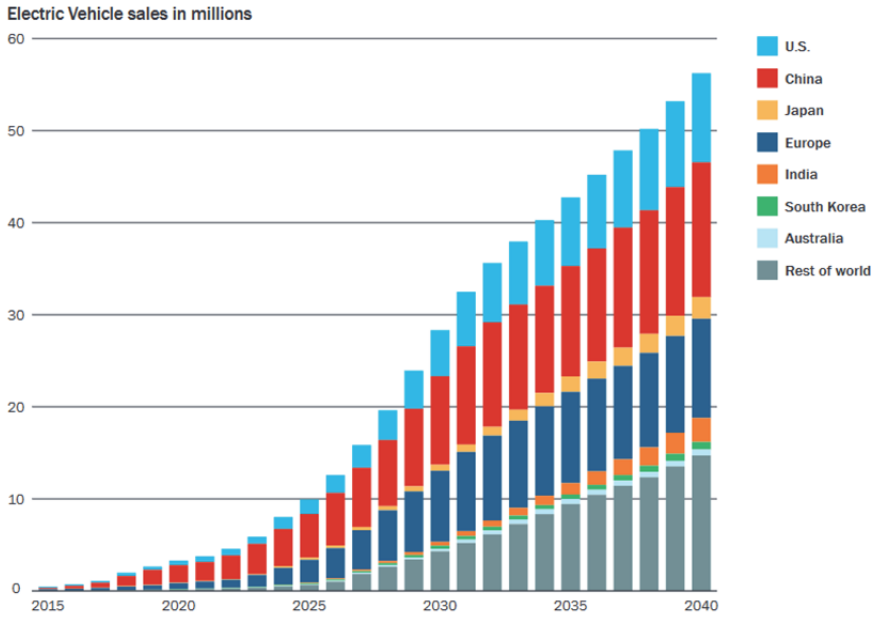


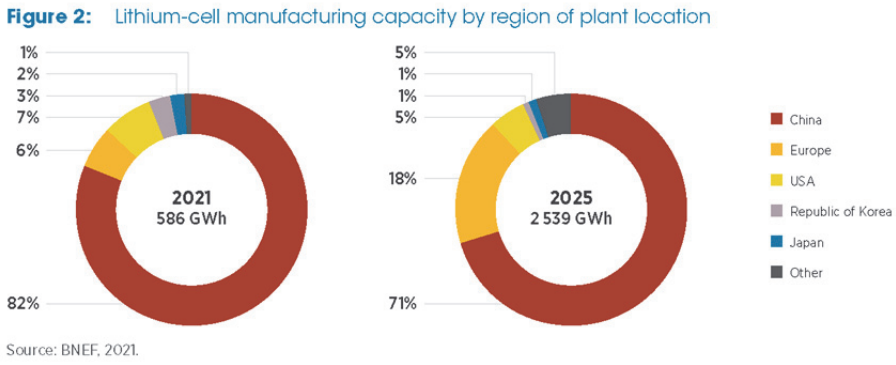
FIGURE 1. Annual Sales of Passenger EVs (Battery Electric Vehicles (BEVs) and Plug-in Hybrid Electric Vehicles (PHEVs)).
Source: BloombergNEF Long-Term Electric Vehicle Outlook 2019.[16]

The second, Figure 4, shows how China currently dominates the rest of the world in lithium-cell manufacturing.

[106] The White House, *supra* note 104.

[107] National Blueprint for Lithium Batteries 2021-2030, *supra* note 15, at 11.

Figure 4.[108]



V. KEY ISSUES IN THE LITHIUM TRIANGLE

A. Current Supplies of Lithium and Available Deposits in the Lithium Triangle

1. Argentina

Argentina is one of the few countries in a position to consolidate major reserves of lithium. According to the USGS, Argentina's lithium resources could be one of the largest worldwide, at 19.3 million tons and 2 million tons in reserves. Salars in Argentina are distributed in the provinces of Salta, Jujuy, and Catamarca (the Puna Region). Currently, there are only two salars in production: Salar de Olaroz (Jujuy); and Salar del Hombre Muerto (Salta and Catamarca). There are also indications of hard rock lithium reserves in other provinces of the country, e.g., La Rioja.

Lithium extraction is regulated under national, provincial, and local regulations. Extraction of this mineral is very recent, with the first operational mine (in terms of extraction) commencing approximately 20 years ago. Despite this, it has attracted investments for quite a long time due to the low-cost salar brine extraction and its regulatory framework in comparison with other countries within the region.

2. Bolivia

Bolivia holds estimated 21 million tons of lithium salt lakes' reserves, considered the largest in the world, the most important of which are located at Uyuni Salt Lake in the Andean region of Potosi, and in less proportions at Pastos Grande, also in the Potosi area, and in Coipasa, at the Oruro's Andean region bordering with Chile, which are yet to be fully and properly exploited. These reserves could produce an estimated 20% of world lithium.[109]

The country's efforts to develop its very large reserves, found in those various salt lakes to supply increasing global demands, has a long history of some progress with no little difficulties in various fronts: economic, political,

[108] Gielen & Lyons, *supra* note 18, at 10.

[109] https://lithiumcongress.com › bolivia-con-la-mayor-reserva.

environmental, and technological.[110] This runs in parallel to substantial progress in Argentina and Chile, having all in Australia the major front exporting competitive runner internationally.[111] Energy transition counts with the Lithium Triangle as one of its main actors playing a diversity of roles.[112]

A general challenge is worth looking at from a Chinese perspective, given its fundamental role of importer mainly of lithium carbonate for its very large industrial structure.[113] In this regard a recent development was the announcement from a China source about the formation of a certain front by Chinese importers for control of international prices.[114] On the Triangle side, comments and announcements have been made on probable conversations for a certain "OPEP" lithium triangle (even to include Mexico), an initiative which seems quite difficult to attain given the complexity of the market in general, competition, varying country policies, new technological developments and challenges, diverse industrialization. In the case of the Triangle, a March 2023 public speech by the Bolivian President Arce, when he proposed an agenda of seven points for conversations with Chile, merited a negative reaction from the latter's government in two points, one of them which was a proposal for multilateral cooperation for lithium development.[115]

3. Chile

According to the USGS 2023 Annual Publication of "Lithium Statistics and Information," in 2022, Chile's estimated lithium production reached 39,000 metric tons, representing 30% of the world lithium production and making Chile the second largest lithium producer in the world. The national production is based in the exploitation of lithium brine and currently concentrated in the mining works of two companies: SQM and Albemarle, both with operations in Atacama's salt flat. The above-mentioned publication also indicates that the Chilean reserves reached 9.3 million tons of lithium (35.7% of the world reserves). However, the Chilean Commission of Copper (Cochilco) estimates that the Chilean lithium reserves are12,699,000 tons.[116] Regarding resources, the USGS estimates that Chile holds 11 million tons of lithium, representing 11.2% of the world resources.

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[110] For further background, see Fernando Aguirre B.'s article at *Journal of Energy and Natural Resources Law* (Taylor & Francis) – Registry 1301877.

[111] https://www.paginasiete.bo/economia/australia-tiene-la-mayor-fuente-de-litio-del-mundo-esta-es-la-diferencia-con-la-extraccion-de-bolivia-argentina-y-chile-HI5192801.

[112] https://www.paginasiete.bo/gente/la-transicion-energetica-y-el-litio-los-salares-altoandinos-en-disputa-CB6461062.

[113] https://www.globaltimes.cn/page/202212/1281930.shtml?wbraid=ClAKCQiA_6yfBhC2ARI_AGxqRzxpgO74Pf-ao4Vshnybb7tFoTADVLpnpy5Aelki9_9-ok3_UvFAxbilBnfl_0wdl-wmlPJsfgctKvbrGgIPgw.

[114] Siyi Liu & Dominique Patton, "Chinese Lithium Producers Set Price Floor as Demand Evaporates," *Reuters* (Mar. 31, 2023).

[115] Chile Disagrees. *See* https://www.paginasiete.bo.

[116] Cochilco. 2021. El Mercado de Litio. Desarrollo reciente y proyecciones al 2030.

The main lithium deposits are located in the Atacama salt flat and the Maricunga salt flat. Twenty-one additional deposits have been detected that contain measured and/or potential lithium resources.

B. Regulations: Has It Worked; Does It Need to Be Revised or Reshaped?

1. Argentina

Lithium as a mineral—and consequently its extraction and development of lithium projects—is regulated as any other mining activity of other type of minerals and therefore subject to the general Argentine mining and environmental legal framework. This meaning that Argentina lacks a specific regulation for the development of lithium projects. Provisions of the Argentine Mining Code (AMC) and procedural provincial regulations apply to lithium and the granting of concessions, being lithium a first category mineral. Note that the National Congress enacts the substantive mining legislation (as the AMC), while the provinces are empowered to regulate the procedures related to it (which cannot conflict with substantive legislation) and enact complementary regulation, which includes all environmental matters. Municipal governments have jurisdiction in regulation-related issues. Therefore, the mining industry is mainly regulated by the AMC, as amended, which governs the rights, obligations and procedures regarding the exploration, exploitation and use of mineral substances. The AMC sets forth the legal framework that rules the relationship between the state and those who develop any kind of mining activities (through an exploration permit or a mining concession).[117]

As mentioned, the provinces own the natural resources existing within their territories, although they are not allowed to exploit such resources directly. Therefore, provinces must grant mining rights to those individuals/legal entities interested in mining exploration and exploitation, the so called right of "mining property" by means of a legal concession.[118] Once a mining concession is granted, the title holder owns all the mineral deposits within the boundaries of the property, whatever the mineral substance contained therein. From a different standpoint the categories of mineral substances foreseen by the AMC can be summarized as follows: (i) those that belong to the States and not to the surface landowner (i.e., mines corresponding to the first and second categories); and (ii) those that belong to the owner of the surface land in which they are located. Please note that lithium deposits are considered substances

[117] In Argentina, the AMC provides for two types of mining rights—exploration permits and mining concessions—both of which are granted on a first-come, first-served basis. Exploration permits are exclusive authorizations to explore a certain area during a limited period and to the extent provided by the AMC, while mining concessions grant the title holder the right to conduct further exploration works after a discovery has taken place, and to exploit all mineral deposits within the boundaries of the mine. Mining concessions are not subject to a life term and, therefore, to the extent the title holder does not incur in any of the concession termination events set forth in the AMC, the concession will last until the mineral reserves are exhausted.

[118] Please note that the original public domain preexists the mining property granted, coexists during the concession and subsists, still remains and continues even after the concession becomes void.

of the first category, subject to concession to be granted by the relevant province to third parties.

Given the very particular nature of lithium in salars, there are many technical hydrogeological aspects related to its extraction which need to be considered in a specific way. As described above, lithium mining activity is regulated by the provisions of the AMC which was enacted in 1886 being a code designed to regulate primary metalliferous mining projects, therefore when applied to the lithium mining activities some gaps are encountered. In this sense, the Argentine government has been anticipating discussions towards the analysis of potential specific regulation that could encompass all the above mentioned aspects. This is indeed a work in progress and due to its complexity will take considerable time.

This process will require specific technical knowledge from the government at all levels. It also anticipates, firstly, the interaction between future developments and current plans for infrastructure development; and the economic and production agendas of the provinces involved.

Also necessary for discussion is the role and scope of interaction to be played by public provincial mining companies and their participation in lithium projects—for example, in the case of Jujuy, lithium is considered a strategic mineral and this fact has several implications. Recently, the province of La Rioja enacted pieces of regulation declaring lithium a strategic mineral.

The best laws and regulations, when considering their application and enforcement, have proven to be those where consensus among all stakeholders is reached (or at least taken into account during the process). In this regard—and especially considering the many technical aspects that relate to the operation of lithium mines—in order to assure environmental protection and balance of the hydrogeological conditions, as well as other ESG concerns, a thorough assessment should be made. Similar regimes, such as those in the United States and Chile, could be worth taking into account in terms of guidelines and comparative experience mostly at the technical and regulatory levels. It is to be expected that governments, communities, and industry players work together effectively in order to develop certain general guidelines relating to the lithium sector especially considering that Argentina is a federal country. Within these guidelines as a general framework, specific protocols for each province and more specifically for each particular salar and its operation, could be developed. This could be a way to integrate general parameters with the situation of each project taking into consideration the relevant aspects and issues at stake.

2. Bolivia

If one looks at today's Bolivian regulatory framework, very important changes are taken place. Apart from continuing its projects already in place, which have generated criticism (various pilot plants and diverse infrastructure, including a pilot lithium plant and the expectation of the operation of a recently concluded other at Uyuni based on extraction of brine by way of old evaporation ponds technology, a very common technology elsewhere), the policy has

moved drastically in terms of political management and technological challenges.[119]

On April 2017 a new lithium production state company, replacing prior entities, was created under the name of *Yacimientos de Litio Bolivianos* (YLB), entrusted, amongst a number of other products, to develop and produce lithium carbonate, with a 100% state participation. Further semi-industrialization and industrialization processes could be made by means of association agreements with private companies counting with a majority state participation. One contract signed on October 2018 with ACI, a German company, was canceled in November 2019, due to protests of civic organizations in Potosi (where Uyuni Salt Lake is located) and a conflicting political situation.[120]

On April 30, 2021, YLB launched a First International Invitation to 10 specialized international companies for purposes of evaluating a new technology described as Direct Extraction of Lithium (DEL) to produce lithium carbonate, for implementation at the three main salt lakes. Testing having proceeded, YLB, after evaluation, chose six of the companies as being technically and legally qualified to participate in a negotiating stage, first one of which negotiation concluded with the signing of an initial Agreement (*Convenio*) in January 2023 with the CATL BRUNP & CMOC group of companies from China, currently being implemented.[121] Social and political debate accompanies this new policy.[122]

3. Chile

Lithium was originally considered a free concessional mineral or non-reserved substance until Decree Law No. 2,886 of 1979, which declared lithium as a reserved mineral substance in favor of the State, and not subject to mining concessions. Decree Law No. 2,886 of the 1979 reserve declaration was upheld by the enactment of the 1980 Chilean Constitution, and subsequently incorporated in the Organic Constitutional Mining Law No. 18,907 of January 21, 1982, and the current Mining Code, enacted on December 14, 1983.

The ways to exploit lithium established by Chilean Constitution are:

a. by the State of Chile or any of the state-owned companies (i.e., Codelco or ENAMI);

b. through the granting of an administrative concession by the Chilean Ministry of Mining; or

c. through the execution of a lithium special operation contract (hereinafter, "CEOL") with the Chilean Ministry of Mining. Law establishes the concept of "special operation contracts", by means of which a contractor enters into an agreement with the State and is required to perform the exploration and exploitation of a reserved mineral resource

[119] https://twitter.com/rimaypampa/status/1617612746778112000?t=UVN8R3wEoYiw8m76XIXSwA&s=08.

[120] https://www.pv-magazine-latam.com ›2019/11/04.

[121] https://www.mhe.gob.bo › 2023/01/20.

[122] https://www.lostiempos.com › actualidad › economía.

within a certain geographical area. A CEOL is a special operation contracts specifically for lithium. The execution of a CEOL shall comply with the requirements and conditions that the President of the Republic of Chile establishes, for each case, by supreme decree.

Moreover, the Chilean law recognizes mining concessions that are excluded from the declaration of reserve to the State (the "Pre-1979 Metallic or Lithium Mining Concessions"), which means that the owners of these mining concessions can explore or exploit such mineral directly by themselves:

i. those mining concessions which were granted over lithium or any other metallic substance according to the Mining Code of 1932, that are still in force, whose survey/measurement minute was registered by November 14, 1979, and whose mining exploitation claim was registered before January 1, 1979; and

ii. those mining concessions over lithium or any other metallic substance according to the Mining Code of 1932, which were being processed before the relevant Court, as long as these concessions had been originated by mining exploitation claims and registered before January 1, 1979.

Therefore, if an entity holds a pre-1979 Metallic or Lithium Mining Concession, it is not necessary to obtain an administrative concession or execute a CEOL to exploit lithium.

The operations of SQM and Albemarle in Atacama's salt flat are based on the exploitation of pre-1979 Metallic or Lithium Mining Concessions, by means of agreements entered into with the public entity Corporación de Fomento de la Producción (CORFO), the current and original owner of these mining concessions.

Although Chile is currently the second largest lithium producer in the world, the estimations indicate that our country would lose this position if the State does not promote new exploration and/or exploitation projects within the territory that increase the national production.

The experts propose the following recommendations to boost exploration and/or exploitation lithium projects:

a. To promote CEOLs as the main way to explore and/or exploit lithium within the territory, considering the participation of private entities. We estimate as a convenient policy the reservation of lithium in favor of the Chilean State, and view the CEOL the best option to promote lithium projects. Nevertheless, there is no systematic and general legislation or regulations on CEOL for lithium. The only regulation ever dictated consists of specific decrees issued by the Chilean Ministry of Mining regarding two public bidding procedures for the exploitation of lithium and the granting of a CEOL in the Atacama Region. It is advisable to set a general regulation for CEOLs that establishes basic terms and conditions while safeguarding the discretion of the Chilean State to entered into these agreements.

b. To include salt flats as a place where it is imperative to obtain the authorization of the President of the Republic in order to perform mining works. Prior to this authorization, it shall be necessary to obtain a favorable report issued by the public entity in charge of salt flats management.
c. To permit the holder of a lithium exploitation authorization to impose mining easements according to article 120 of the Mining Code over surface lands and third parties' mining concessions, facilitating the convenient and comfortable exploration and/or exploitation of lithium.
d. On the occasion of lithium exploitation in a salt flat, to expressly establish the obligation of the holder of a lithium exploitation authorization to deliver those extracted mineral substances other than lithium to the holder of the relevant exploitation mining concession (currently it is an implicit obligation). In such case, the costs of the extraction and separation of these mineral substances will be charged to the latter.

C. Investment and Investors: What Can They Anticipate?

1. Argentina

Argentina offers an undeniable opportunity for the lithium sector, still many challenges must be faced by investors in order to develop and operate a lithium project, ranging from technical aspects of brine extraction and its legal regulation to social and human rights aspects, which all need to be addressed by the specific public policies. Views on the regulation, necessary infrastructure and allocation of water as another crucial natural resource will play an enormous role in the way the lithium industry develops. This will certainly be the area of greatest demand and consultation with communities.[123]

ESG aspects of investments are clearly playing an increasing role in this field. As the dynamics of the lithium industry unfold at the international level, the Argentinean governments both at the national and relevant provincial ones will have to keep updated on trends and views and work towards facilitating a reliable and comprehensive legal and technical framework for investors. As in all mining projects, deciding a long term investment in a foreign country requires certain degree of stability and clarity on rules. Undoubtedly a real challenge in a new developing industry with such degree of relevance in the energy transition.

2. Bolivia

On investments and investors, understanding these mainly as Direct Investments, the policies that Bolivia pursued have not precisely constituted incentives for them. Over history, two contracts which had been signed in quite different political scenarios, one in 1992 (liberal) with Lithco (today FMV Lithium Corporation for 40 years) and one with the above German group ACISA

[123] For more reference in relation to the specific challenges, please refer to Heredia et al., *supra* note 20.

(2018 for 70 years) (socialist), did not progress mainly because of civil corporate resistance in the Potosi region and political criticism.[124] The new policy of implementing the DLE technology, if proven effective, has opened an approach which will require proper clarifications on the legal framework, which is not composed only by the Mining Law of 2014 and the law of creation of LBI, but also by the Investment Law (No. 516 of April 4, 2014), the Law of Public Companies (No. 466 of December 26, 2013) and the Arbitration Law No. 708 of June 25, 2015).

3. Chile

Chile is an economy open to the world. It has received and welcomed foreign investors, especially in sectors that require a large amount of financial resources, such as mining. The exploration, exploitation, and processing of lithium are areas where state-private integration is encouraged. In that context, the investors must consider the following circumstances in case of developing a lithium mining project in Chile:

A. Permits and approvals for a private entity to explore and exploit a lithium project in Chile for the exploitation of lithium:
   a. For projects where the lithium is extracted from pre-1979 Metallic and Lithium Mining Concessions:
      i) an authorization granted by the Chilean Nuclear Energy Commission (CCHEN). This State agency has understood its role, perhaps beyond the original idea of the Law that created CCHEN, as an entity that grants authorizations to produce a certain amount of lithium for a determined period of time;
      ii) environmental approvals. Law No. 19,300 of 1994 on General Bases of the Environment establishes that "mining development projects" (except for the small ones) must be submitted to the Environmental Impact Assessment System and obtain an Environmental Approval Resolution before their construction; and
      iii) surface rights. Since mining concessions, administrative concessions and CEOLs deal with mineral substances, which are different from the surface land where they are located, it will be necessary to have a legal title over the surface land to access and install the facilities for the exploration, exploitation, and processing of minerals. If it is not possible to voluntarily agree with the surface property owner to grant an authorization or execute an agreement to access and use the land necessary for the development of the project, the holder of the mining concession is entitled to file a claim for a judicial

[124] Historia del extractivismo del litio en Bolivia El movimiento; https://www.redalyc.org › journal › movil; WGI Daza·2017.

easement before Ordinary Courts, upon payment of the damages.

b. For projects that do not hold a pre-1979 Metallic or Lithium Mining Concession, that is, projects on areas covered by post-1979 mining concessions where lithium was discovered:
   i) an administrative concession or a CEOL executed with the Ministry of Mining of Chile. As there is no regulation on the administrative concession or CEOL; it is difficult to anticipate for how long or how much lithium the exploitation will be authorized/granted. There is only one precedent of CEOL, granted to a State owned company for more than 30 years as of the start of commercial production.
   ii) an authorization granted by CCHEN;
   iii) environmental approvals;
   iv) surface rights; and
   v) in spite the fact that this is not a mandatory requirement, it is preferable to own or hold a legal title over mining concessions comprising the same area of the CEOL.

D. Battery Manufacturing, Industrialization: Can They Be Accomplished in the Lithium Triangle's Countries?

1. Argentina

There is a widespread notion in Latin America that the region has been historically a mere provider of raw materials to developed countries and such has undermined its own development. In this sense, there is a clear trend mostly from the civil society demanding that Argentina, Bolivia and Chile should not be only providers of the raw materials for the energy transition, but also taking a more primarily role and to foster manufacturing of batteries. As of today, this has been materialized by means of different initiatives, encouraged by the states. In this regard, stances are divided between those (i) who believe that battery manufacturing is possible and even competitive in the Triangle States; and (ii) those who consider these initiatives are hard to achieve due to several factors which include lack of technical resources and/or know-how; and lack of access to those other elements needed for the manufacturing of batteries.

In the case of Argentina, and for the past years, there has been an intention of the Argentinean government to enact a piece of legislation which regulates electromobility, among other matters. In 2021 the current administration announced the submission before the National Congress of a bill of law which creates a Support Program for Electromobility, setting forth certain incentives and benefits to foster private investment to develop the industrialization and manufacturing of lithium and EV within the country. In accordance with Section 2 of such Bill of Law, the purpose of such program is "to encourage the development of electromobility, in order to accelerate the transition to a low-carbon economy and ensure sustainable technological progress. The creation,

design, development, production, construction, assembly, manufacturing of items, components and elements of electric vehicles will be promoted, as well as all the accessory processes, such as prototype design, patents and industrial designs."

Considering that this bill of law is still subject to the legislative process, it remains to be seen the support scheme to foster electromobility, however this should be considered as a first step.

More recently, in February 2023 the governors of the provinces of Catamarca, Salta, and Jujuy announced the need that the mining companies to allocate a percentage of their production for the industrialisation of batteries within the national territory. No specific pieces of legislation have been enacted yet.

2. Bolivia

Some basic level of pre-industrialization has been attained in Bolivia by way of a pilot plant for production of lithium carbonate (grade 99.5%). A similar plant waiting its prompt conclusion will follow. There is a processing plant for a variety of chemical cathodic material (Pilot Plant for Cathodic Materials).[125] A basic Lithium Batteries Plant has been implemented with some production. However current political administration expects that the DLE technology will pave the way for more relevant and real industrialization processes, overcoming the difficulties and deficiencies so far encountered[126] mainly dealing with technological challenges (amongst them complex composition of local brine and improper performance of water evaporation pools) and certainly costs.

3. Chile

As pointed out before, there has been an old Latin-American aspiration of adding value to the chain of production, and understanding that the only way to add value is producing batteries. In Chile, the government offered such possibility and the battery producers have preferred to bring the mineral to their countries and produce the batteries there in a cheaper way. So, there are cases where the value is added through the investigation of new technologies to produce more and better lithium carbonate, and not necessarily to produce batteries. Currently, the main exportable lithium product is lithium carbonate (87% of total exports between 2010 and 2021), followed by lithium hydroxide (10% of total exports in the same period). Regarding the latter, SQM aims to increase the production to meet the growing world demand.

Anyway, the Chilean State established as a national policy the promotion of public-private partnerships that generate value-added lithium products. In accordance with this objective, the Chilean State made an agreement with

[125] El futuro incierto de los materiales catódicos "made in Bolivia"; https://erbol.com.bo › opinion › el-futuro-incierto-de-los-.

[126] La industrialización del litio en Bolivia y la participación social; https://www.debates indigenas.org › notas › 160-industri.

SQM and Albemarle to offer up to 25% of their lithium products to specialized producers established in Chile. These specialized producers must be previously determined by CORFO, and produce value-added products such as lithium cathodes, lithium battery components, among others.

VI. Conclusions

The energy transition and the need for increasing lithium availability provide the "The Lithium Triangle" countries a unique opportunity to develop research and economic growth for the region. The degree of development of the lithium sector, however, is quite different when comparing the three countries, with Chile already at the forefront of lithium production for many years. This notwithstanding, with such a dynamic and strategic relevance of lithium as a critical mineral, it will not be surprising that Argentina and Bolivia are quickly developing a considerable number of lithium projects. Several challenges are shown ahead. As extraction from brine salars begins to multiply, technical aspects related to hydrological and chemical issues will become crucial and thus regulations will need to be revised, adapted, and created. Environmental and social aspects will also play significant roles as they have in the mining sector. Additionally, there are also geopolitical and strategic implications related to this mineral and its role in the energy transition. In this respect, the role of governments and their effective actions will need to be at the level of this complex scenario.

Without question, the triangle countries are the upstream "leaders." However, efforts by the countries to "move up the value chain" will require traversing steep learning and investment curves.

The international community will be monitoring with much interest the developments in "The Lithium Triangle," and it remains to be seen how these countries can take advantage of the unparalleled opportunity that the geology has given to the region.

Critical Issues Associated with Leasing and Developing Federal Minerals in Southeast New Mexico

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One of the most prolific oil-producing regions of the world straddles the boundary of Texas and New Mexico. On the New Mexico side of the border, the United States owns approximately one-third of the surface and mineral estates.[1] The significant federal ownership requires oil and gas operators to plan for and manage their operations differently than in Texas or than on state and private lands in New Mexico.

The Foundation has an incredible wealth of scholarship on the complexities of developing federal oil and gas leases and operating on federal lands, and this paper will not attempt to replicate or synthesize these materials. Instead, this paper is aimed at those who are attempting to understand how to develop oil and gas on federal lands in southeast New Mexico, such as operators contemplating expansion into New Mexico, or Texas business units simply trying to decipher what their New Mexico counterparts are saying. Therefore, this paper will provide an overview of some basic rules of developing on lands and minerals managed by the Bureau of Land Management (BLM) in southeast New Mexico and will attempt to identify regulatory potholes for the unwary.[2] This paper will also reference existing Foundation scholarship that provides a more comprehensive analysis of a particular issue.

This paper is organized from the perspective of an operator attempting to plan development—starting with BLM's land use plans, proceeding to the leasing process, then addressing approvals of applications for permits to drill (APDs) and special status species considerations, and concluding with an overview of oil and gas lease administration.[3]

I. GROUND RULES

An operator attempting to understand oil and gas development in southeast New Mexico must first become familiar with BLM, the Office of Natural Resources Revenue (ONRR), federal environmental laws, and the fundamental terms of federal oil and gas leases.

[1] BLM, *Draft Resource Management Plan and Environmental Impact Statement, Carlsbad Field Office, Pecos District, New Mexico* 3-71 to -72 (2018).

[2] Because this paper attempts to provide general rules applicable to development in southeast New Mexico, it only focuses on surface and minerals managed by BLM. It does not address development on Forest Service lands, lands held in trust by the U.S. Department of the Interior for tribes or allottees, or lands managed by other federal agencies such as the National Park Service or U.S. Army Corps of Engineers.

[3] Development on federal lands involves an alphabet soup of abbreviations and acronyms. Appendix A lists common abbreviations and acronyms.

A. BLM in a Nutshell

BLM is one of several bureaus within the U.S. Department of the Interior. Other bureaus and offices within the Department of the Interior that are relevant to federal onshore oil and gas development include ONRR, the Bureau of Indian Affairs (BIA), and the U.S. Geological Survey (USGS).

BLM has two functions relevant to onshore federal oil and gas development. First, BLM is a land management agency. It manages the "public lands," which include both federally owned surface and mineral estates.[4] "Public lands" do not include lands administered or managed by other federal agencies, such as the National Park Service, Forest Service, Bureau of Reclamation, or the U.S. Army Corps of Engineers.[5] Second, BLM administers federal onshore oil and gas leases, including federal oil and gas leases authorized by other federal agencies such as the Forest Service and BIA. USGS historically administered federal oil and gas leases, and BLM assumed this function in 1983.[6]

BLM has a decentralized structure relative to other agencies. BLM currently is headquartered in Washington, D.C.[7] BLM has state offices that report to the Washington Office, district offices that report to the state offices, and field offices that report to the district offices.[8] The New Mexico State Office administers public lands and minerals in New Mexico, Oklahoma, Texas, and Kansas.[9] Southeast New Mexico is within BLM's Pecos District and managed by the Carlsbad and Roswell Field Offices.[10]

B. ONRR in a Nutshell

ONRR collects and accounts for royalties on federal minerals, including federal oil and gas. Like BLM, ONRR is a bureau within the Department of the Interior. ONRR was created in 2010; it assumed royalty administration from the Mineral Management Service (MMS), which assumed royalty administration functions from the USGS.[11]

ONRR is headquartered in Denver.[12] Although ONRR has some field offices, most correspondence related to royalties on federal oil and gas production

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[4] 43 U.S.C. § 1702(e).

[5] *See id.*

[6] Secretarial Order No. 3087 (Dec. 3, 1982), and Amendment No. 1 (Feb. 7, 1983), 48 Fed. Reg. 8983 (Mar. 2, 1983); Secretarial Order No. 3071, 47 Fed. Reg. 4751 (Feb. 2, 1982).

[7] In 2020, the Secretary of the Interior moved BLM's headquarters from Washington, D.C., to Grand Junction, Colorado. *See* Secretarial Order No. 3382, *Establishment of the Bureau of Land Management's Headquarters in Grand Junction, Colorado* (Aug. 10, 2020). In 2021, the Secretary returned BLM's headquarters to Washington, D.C. *See* Press Release, U.S. Dep't of the Interior, "Secretary Haaland Outlines Next Steps to Rebuild Bureau of Land Management" (Sept. 17, 2021).

[8] U.S. Dep't of the Interior, Departmental Manual pt. 135, ch. 5 (May 15, 2019).

[9] *See id.*

[10] *BLM Pecos District Office*, https://www.blm.gov/office/pecos-district-office (last visited Feb. 8, 2023).

[11] Secretarial Order No. 3306 (Sept. 30, 2010); Secretarial Order No. 3071, 47 Fed. Reg. 4751 (Feb. 2, 1982).

[12] *About ONRR*, https://onrr.gov/about (last visited May 18, 2023).

from southeast New Mexico comes from the Denver office. ONRR has delegated certain audit and investigatory functions to the New Mexico Taxation and Revenue Department, Oil and Gas Bureau.[13]

C. Relevant Environmental Laws at 30,000 Feet

All federal agencies are subject to the requirements of the National Environmental Policy Act (NEPA), National Historic Preservation Act (NHPA), and Endangered Species Act (ESA) when making decisions;[14] thus, BLM must comply with this trio of statutes when leasing and approving oil and gas development.[15]

NEPA and the NHPA impose procedural requirements on BLM. NEPA and its implementing regulations require federal agencies to prepare an environmental impact statement (EIS) or an environmental assessment (EA) analyzing the environmental effects of their actions, unless an action is categorically excluded from such analysis.[16] The NHPA requires federal agencies to take into account the effects of their actions on historic properties.[17] By contrast, the ESA imposes both substantive and procedural obligations on BLM. It requires BLM to consult with the U.S. Fish and Wildlife Service (FWS) to insure BLM decisions are "not likely to jeopardize the continued existence" of a listed species or "result in the destruction or adverse modification" of designated critical habitat of listed species.[18]

Whereas NEPA, the NHPA, and ESA apply to all federal agencies, the Federal Land Policy and Management Act (FLPMA) uniquely applies to BLM.[19] FLPMA is considered BLM's organic act and directs the agency to manage the public lands for "multiple use and sustained yield."[20] Most significant for oil and gas operators, it requires BLM to prepare land management plans that allocate which lands will be open or closed to oil and gas leasing and under what terms.[21] FLPMA also authorizes BLM to issue rights-of-way over federal lands.[22]

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[13] 83 Fed. Reg. 56,873 (Nov. 14, 2018); *see generally* 30 C.F.R. pt. 1227.

[14] 42 U.S.C. § 4332(C); 54 U.S.C. § 306101; 16 U.S.C. §§ 1531–1544.

[15] *See generally* 1 *Law of Federal Oil and Gas Leases* § 2.13 (2023); Dawn Meidinger & Marc Marra, "Permitting Energy and Minerals Projects on Public Lands," *Young Natural Resources Lawyers and Landmen Institute* 9-1 (Rocky Mt. Min. L. Fdn. 2020).

[16] *See generally* 42 U.S.C. § 4332(C); 40 C.F.R. pt. 1500.

[17] 54 U.S.C. § 306108.

[18] 16 U.S.C. § 1536(a)(2).

[19] 43 U.S.C. §§ 1701–1708.

[20] *Id.* § 1701(a)(7).

[21] *Id.* § 1712; *see* 43 C.F.R. pt. 1600.

[22] 43 U.S.C. §§ 1761–1772.

D. Fundamental Terms of Federal Oil and Gas Leases

The Mineral Leasing Act of 1920, as amended (MLA), establishes the terms of federal oil and gas leases.[23] A company seeking to acquire existing federal oil and gas leases should not assume that all leases are uniform or have the same terms.[24] Leases issued before the MLA amendments in the Federal Onshore Oil and Gas Leasing Reform Act of 1987 (Reform Act) require particular attention because these are subject to different terms than leases issued after 1987.[25] For example, pre-Reform Act leases may be subject to variable royalty rates, rather than fixed royalty rates.[26]

Leases issued after the Reform Act are slightly more standard. Between 1987 and 2020, onshore leases were issued with a 12½% royalty rate and rentals of $1.50 per acre for a lease's first five years and $2 per acre after then.[27] A handful of leases issued in 2022 are subject to an 18¾% royalty rate.[28] Leases issued after August 16, 2022 are subject to a 16⅔% royalty rate and rentals of $3 per acre for a lease's first two years, $5 per acre for a lease's third through eighth years, and $15 per acre for every year thereafter.[29]

After 1987, leases were first offered though a competitive leasing process and, if a lease did not receive the minimum bid, then could be leased noncompetitively.[30] In the Inflation Reduction Act of 2022, Congress eliminated noncompetitive leasing.[31] Therefore, all new federal oil and gas leases must be issued following a competitive bidding process.

II. WHERE CAN I DO WHAT? THE EFFECTS OF BLM LAND USE PLANS

When an operator is contemplating or planning for development on federal lands, the operator should first consult BLM's land use plans, which are also known as "resource management plans" or "RMPs." RMPs outline the general rules of developing federal lands or minerals in a particular region by outlining *where* development may occur and under *what terms*. All BLM authorizations,

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[23] 30 U.S.C. §§ 181–196, 221–237. The MLA authorizes oil and gas leasing of public domain lands. *See, e.g.*, 43 C.F.R. § 3100.0-3(a). Lands acquired by the United States may be leased in accordance with the Mineral Leasing Act for Acquired Lands. *See* 30 U.S.C. §§ 351–360.

[24] For a history of amendments to the MLA affecting the terms of federal oil and gas leases, see 1 *Law of Federal Oil and Gas Leases* § 2.06 (2023); Lewis C. Cox, Jr., "The Roadmap to Administering Federal Oil and Gas Leases," 38 *Rocky Mt. Min. L. Inst.* 20-1 (1992).

[25] These changes are due both to statutory amendments and to BLM's revisions to its regulations following the Reform Act.

[26] 53 Fed. Reg. 22,814 (June 17, 1988). For a summary of changes, see Phillip R. Clark, "The Federal Onshore Oil and Gas Leasing Reform Act of 1987: Christmas Present or Pandora's Box?," 34 *Rocky Mt. Min. L. Inst.* 18-1 (1988); Thomas L. Sansonetti & William R. Murray, "A Primer on the Federal Onshore Oil and Gas Leasing Reform Act of 1987 and Its Regulations," 25 *Land & Water L. Rev.* 375 (1990).

[27] 43 C.F.R. §§ 3103.3-1(a)(1), 3103.3-3(a) (1989–2016).

[28] *See, e.g.*, BLM New Mexico State Office, Notice of Competitive Oil and Gas Internet Lease Sale (Apr. 18, 2022).

[29] 30 U.S.C. § 226(b)(1)(A), (d). These amounts are fixed until 2032. *See id.*

[30] 1 *Law of Federal Oil and Gas Leases* § 2.06 (2023).

[31] Pub. L. No. 117-69, § 50262, 136 Stat. 1818, 2056.

including issuances of leases, approvals of APDs, and grants of rights-of-way, must conform to the governing land use plan.[32] Operators planning development on federal lands should be aware of the decisions made in BLM's RMPs, the effect of these decisions, and BLM's processes for amending and revising RMPs.

Southeast New Mexico is subject to a patchwork of RMPs. In the Carlsbad Field Office, lands are subject to a 1988 RMP that BLM has amended twice – once in 1997 for oil and gas leasing and development and again in 2008 to address special status species (the dunes sagebrush lizard, formerly known as the sand dune lizard, and the lesser prairie-chicken).[33] In 2018, BLM released a draft RMP that would supersede these existing plans but has not finalized it.[34] The Roswell Field Office is managed in accordance with a 1997 RMP that BLM amended in 2008 to account for special species.[35] These RMPs are available on BLM's National NEPA Register (also known as "E-Planning").[36] Given that more oil and gas development occurs in the area managed by the Carlsbad Field Office than in the area managed by the Roswell Field Office, this paper provides examples that reference the RMPs relevant to the Carlsbad Field Office.

A. Decisions Made in Land Use Plans

RMPs make a host of decisions related to management of a variety of resources. A developer should consult the Record of Decision (ROD) for the governing RMP to answer the following essential questions:

- Where will BLM issue new oil and gas leases?
- What limitations will BLM attach to new leases?
- What limitations will BLM attach to an APD?
- Where will BLM grant rights-of-way across federal lands?
- What areas are designated for special management?

Lands open or closed to new leasing. In an RMP, BLM designates areas as open or closed to new leasing.[37] These decisions are usually described in the

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[32] 43 C.F.R. § 1610.5-3.

[33] BLM, *Record of Decision, Carlsbad Resource Management Plan* (1988); BLM, *Carlsbad Approved Resource Management Plan Amendment and Record of Decision* (1997); BLM, *Special Status Species Record of Decision and Approved Resource Management Plan Amendment* (2008).

[34] BLM, *Draft Resource Management Plan and Environmental Impact Statement Carlsbad Field Office, Pecos District, New Mexico* (2018).

[35] BLM, *Approved Resource Management Plan for the Roswell Resource Area* (1997); BLM, *Special Status Species Record of Decision and Approved Resource Management Plan Amendment* (2008).

[36] *BLM National NEPA Register*, https://eplanning.blm.gov/eplanning-ui/home (last accessed Feb. 8, 2023).

[37] *E.g.*, BLM, *Carlsbad Approved Resource Management Plan Amendment and Record of Decision* at 5, 9; BLM, *Special Status Species Record of Decision and Approved Resource Management Plan Amendment*, Map 2; BLM, *Draft Resource Management Plan and Environmental Impact Statement Carlsbad Field Office, Pecos District, New Mexico*, Maps 2-13 to 2-17.

"minerals" or "fluid minerals" decisions in an RMP. RMPs include maps identifying areas open and closed to leasing[38]—consult these maps to determine how the RMP treats an area of interest.

Lease stipulations. Where lands are open to new leasing, RMPs identify any stipulations that apply.[39] RMPs generally include maps that identify areas subject to "no surface occupancy" or "NSO" stipulations, timing limitation stipulations, and controlled use stipulations.[40] NSO stipulations prohibit surface use of a lease.[41] Timing limitation stipulations restrict surface use of a lease only during specified times.[42] Controlled surface use stipulations can impose various restrictions on surface use of a lease;[43] for example, the Special Status Species Amendment to the Carlsbad RMP imposes a controlled surface use stipulation on leases in lesser prairie-chicken and dunes sage-brush lizard habitat that requires the submission of a surface use plan of operations.[44] RMPs will also identify when or under which circumstances BLM will grant exceptions to lease stipulations.[45]

Conditions of approval (COAs). RMPs will identify a list of conditions of approval that BLM may attach to APDs, as appropriate.[46] Whether BLM will attach a particular COA often depends on the site-specific conditions associated with the lands to be developed. For example, a particular COA may apply in or near a species' habitat.

Right-of-way avoidance and exclusion areas. Federal oil and gas leases are not accompanied by rights of access across off-lease public lands. Therefore, developers should examine RMPs to determine whether and where they can obtain rights-of-way to access their leases. RMPs will identify areas where

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[38] *See id.* Sometimes maps included in RMPs are not at a scale, or lack the detail, to determine the management decisions that apply to a particular parcel of land. Often, BLM will provide GIS shapefiles of RMP maps on the internet or upon request.

[39] *E.g.*, BLM, *Draft Resource Management Plan and Environmental Impact Statement Carlsbad Field Office, Pecos District, New Mexico* app. C.

[40] *Compare* BLM, *Special Status Species Record of Decision and Approved Resource Management Plan Amendment* at 7–14 (describing NSO and timing limitation stipulations that apply in habitat management areas) *with id.* Map 1 (map of habitat areas); *compare* BLM, *Carlsbad Approved Resource Management Plan Amendment and Record of Decision* at 6–8 *with id.* at 5; *see* BLM, *Draft Resource Management Plan and Environmental Impact Statement Carlsbad Field Office, Pecos District, New Mexico* at 2-26 to 2-28, Maps 2-13 to 2-17.

[41] Particularly, BLM defines a NSO stipulation as "[a] stipulation in which use or occupancy of the land surface for fluid mineral exploration or development is prohibited to protect identified resource values." BLM, *Draft Resource Management Plan and Environmental Impact Statement Carlsbad Field Office, Pecos District, New Mexico* at Glossary-xiv.

[42] BLM defines a timing limitation stipulation as "[a] stipulation that prohibits surface use during specified time periods to protect identified resource values." *Id.*

[43] BLM defines a controlled surface use stipulation as "[a] stipulation in which use and occupancy is allowed (unless restricted by another stipulation), but identified resources values require special operational constraints that may modify the lease rights." *Id.*

[44] BLM, *Special Status Species Record of Decision and Approved Resource Management Plan Amendment*, app. 2 at AP2-9.

[45] *E.g.*, *id.* at 9.

[46] *Id.* app. 1; BLM, *Carlsbad Approved Resource Management Plan Amendment and Record of Decision*, app. 2; BLM, *Draft Resource Management Plan and Environmental Impact Statement Carlsbad Field Office, Pecos District, New Mexico*, app. O.

BLM will avoid granting rights-of-way to protect sensitive resources, which are known as right-of-way "avoidance areas."[47] RMPs also identify areas where BLM will not grant discretionary rights-of-way, which are known as right-of-way "exclusion areas."[48]

Special designations. In RMPs, BLM will designate areas for special management. These areas can include, for example, Areas of Critical Environmental Concern (ACECs) and special recreation management areas.[49] BLM has discretion to impose a variety of management measures in these areas, including closing an area to future oil and gas leasing, designating an area a right-of-way avoidance or exclusion area, or imposing protective stipulations on new oil and gas leases.

B. Valid Existing Rights

BLM's land management decisions under FLPMA, which include decisions in RMPs, are subject to "valid existing rights."[50] The Solicitor of the Interior has defined "valid existing rights" as "those rights short of vested rights that are immune from denial or extinguishment by the exercise of secretarial discretion."[51] At a minimum, FLMPA's recognition of valid existing rights prevents BLM adopting measures in RMPs that would deny a lessee's right to develop an existing oil and gas lease. But although BLM cannot prevent a lessee from developing an existing oil and gas lease, the Interior Board of Land Appeals (IBLA) has held that BLM may impose additional stipulations on existing leases that derive from land use plans.[52]

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[47] BLM has defined an "avoidance area" as "environmentally sensitive area where rights-of-way would be granted only in cases where there is a prevailing need and no practical alternative location exists, and then only with appropriate provisions to protect the sensitive environmental components." BLM, *Draft Resource Management Plan and Environmental Impact Statement Carlsbad Field Office, Pecos District, New Mexico* at Glossary-ii.

[48] BLM has defined "exclusion areas" as "[a]reas where future rights-of-way may be granted only when mandated by law." *Id.* at Glossary-v.

[49] *See* 43 U.S.C. § 1702(a) (area of critical environmental concern); BLM Handbook H-1601-1 – Land Use Planning Handbook Glossary-7 (Rel. 1-1693 Mar. 11, 2005) (special recreation management area).

[50] 43 U.S.C. § 1701 note ("All actions by the Secretary concerned under this Act shall be subject to valid existing rights."). RMPs acknowledge this limitation. *See, e.g.*, BLM, *Draft Resource Management Plan and Environmental Impact Statement Carlsbad Field Office, Pecos District, New Mexico* 1-14 (2018) ("The RMP will recognize valid existing rights."); BLM, *Special Status Species Record of Decision and Approved Resource Management Plan Amendment* 1-5 (2008) ("The amendment will recognize valid existing rights related to the use of public land."); BLM, *Record of Decision, Carlsbad Resource Management Plan* 2 (1988) ("Decisions in the Resource Management Plan do not repeal valid existing rights on public lands.").

[51] Solicitor's Op. No. M-36910, 88 Interior Dec. 909, 912 (1981); *see also* Penroc Oil Corp., 84 IBLA 36, 43 (1984).

[52] Yates Petroleum Corp., 176 IBLA 144 (2008).

C. BLM Land Use Plan Revisions and Amendments

BLM can amend and periodically revises its RMPs.[53] For example, BLM has amended the Carlsbad RMP twice, once for management of oil and gas resources and one for management of sensitive species, and proposed to revise the RMP in 2018.[54]

Operators should pay close attention to ongoing RMP amendment and revisions processes.[55] BLM will publish a draft RMP and draft EIS with alternatives that propose various management measures.[56] Operators should examine draft RMPs to identify proposed management measures that may affect their ongoing or future development plans. For example, operators should examine draft RMPs for any areas proposed to be closed for leasing, areas proposed for right-of-way avoidance or exclusion, proposed leasing stipulations, and areas proposed for special management; operators should compare these proposals to their leaseholds or planned areas of expansion. Operators will have the opportunity to submit comments supporting their preferred alternatives or explaining to BLM why certain alternatives or management measures are problematic.[57]

After BLM publishes a draft RMP, it will then publish a proposed RMP.[58] Members of the public who participated in prior stages of the planning process have the opportunity to file protests on the proposed RMP.[59] Operators should pay attention to RMP amendments and revisions and submit public comments throughout the process to ensure their rights are preserved.

The Carlsbad Field Office is in the midst of a protracted RMP revision process. In 2010, BLM announced its intent to prepare a new RMP for the Carlsbad Field Office.[60] Eight years later, in 2018, BLM released a draft RMP and draft EIS for the Carlsbad Field Office.[61] Since then, BLM has not released a

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[53] 43 C.F.R. §§ 1610.5-5 (amendment), 1610.5-6 (revision).

[54] BLM, *Carlsbad Approved RMP Amendment and Record of Decision* (1997); BLM, *Special Status Species Record of Decision and Approved RMP Amendment* (2008); BLM, *Draft Resource Management Plan and Environmental Impact Statement Carlsbad Field Office, Pecos District, New Mexico* (2018).

[55] For detailed discussions of BLM's land use planning process, see Veronica Larvie, "Nuts and Bolts of Federal Land Use Planning in Infrastructure Siting, Access, Permitting, and Development of Energy Projects," *Energy Development: Access, Siting, Permitting, and Delivery on Public Lands* 2-1 (Rocky Mt. Min. L. Fdn. 2009); Denise A. Dragoo, "Compliance with Land Use Planning and NEPA Prior to Issuance of Federal Oil and Gas Leases," *Regulation and Development of Coalbed Methane* 15A-1 (Rocky Mt. Min. L. Fdn. 2002); Scott W. Hardt, "Federal Land-Use Planning and Its Impact on Resource Management Decisions," *Public Land Law II* 4-1 (Rocky Mt. Min. L. Fdn. 1997).

[56] 43 C.F.R. §§ 1610.2(f), 1610.5-5, 1610.5-6.

[57] *Id.* § 1610.2(e).

[58] *Id.* § 1610.5-1(a).

[59] *Id.* § 1610.5-2(a).

[60] 75 Fed. Reg. 32,962 (June 10, 2010) (notice of intent).

[61] BLM, *Draft Resource Management Plan and Environmental Impact Statement Carlsbad Field Office, Pecos District, New Mexico* (2008); *see* 83 Fed. Reg. 38,167 (Aug. 3, 2018) (notice of availability).

proposed RMP, and its National NEPA Register reflects the status of the RMP as "paused."[62]

III. Obtaining Federal Oil and Gas Leases

An oil and gas lease is necessary for the exploration and development of federal oil and gas resources. Operators in southeast New Mexico must recognize when a federal oil and gas lease is necessary for development, understand how new federal leases can be obtained, appreciate risks posed by litigation over new federal oil and gas leasing, and determine how to acquire interests in existing oil and gas leases via assignment or transfer.

A. When Is a Federal Oil and Gas Lease Required?

A federal oil and gas lease is required to drill through and produce oil and gas from a federally owned mineral estate.[63] Without a lease, drilling into and producing from the federal mineral estate results in mineral trespass.[64] An oil and gas lease is not required for a well to drill through, but not produce from, federally owned minerals.[65]

B. How Do I Acquire a New Federal Oil and Gas Lease?

New federal oil and gas leases are only available through competitive leasing, held via online auction.[66] Operators initiate the process to lease federal lands by submitting expressions of interest to BLM identifying the lands they want leased, together with a $5 per acre fee.[67] BLM accepts expressions of interest electronically through its National Fluid Lease Sale System.[68]

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[62] BLM National NEPA Register, "Carlsbad Resource Management Plan Revision," https://eplanning.blm.gov/eplanning-ui/project/64444/510 (last visited May 24, 2023).

[63] BLM Instruction Memorandum No. 2020-028 (June 10, 2020).

[64] *Id.*; *see* Kathleen C. Schroder & William C. Lambert, "Permitting and Trespass Issues Associated with Horizontal Development on Federal Lands and Minerals," 62 *Rocky Mt. Min. L. Inst.* 12-1, 12-3 to 12-4 (2016). When the United States owns less than 100% of the federal mineral estate in a tract, whether a federal lease is required to drill into and produce oil and gas from the tract depends on state law. *See* BLM Instruction Memorandum No. 2020-028.

[65] BLM Instruction Memorandum No. 2020-028. BLM calls these wells "traversing wells." *See id.* BLM has pointedly observed that although these wells do not require a federal oil and gas lease, at "common law, a traversing well bore is a trespass, just not a mineral trespass." *Id.*

[66] 30 U.S.C. § 226(b)(1)(A), (C); 30 C.F.R. § 3120.5-1. Prior to passage of the Inflation Reduction Act in 2022, federal lands could be offered for noncompetitive lease if the lands had been offered for competitive sale but had not received the minimum bid. *See* 30 U.S.C. § 226(c) (2016). The Inflation Reduction Act eliminated noncompetitive leasing. Pub. L. No. 117-169, § 50262(e), 136 Stat. 1818, 2057 (2022); *see also* BLM Instruction Memorandum No. 2023-008, *Impacts of the Inflation Reduction Act of 2022 (Pub. L. No. 117-169) to the Oil and Natural Gas Leasing Program* (Nov. 21, 2022).

[67] 30 U.S.C. § 226(q)(2)(A); BLM Instruction Memorandum No. 2023-10, *Oil and Gas Leasing – Land Use Planning and Lease Parcel Reviews* (Nov. 21, 2022). In July 2023, BLM proposed to revise its regulations governing its leasing process. *See* 88 Fed. Reg. 47,562 (July 24, 2023).

[68] BLM, *Important Information About Nominations*, https://nflss.blm.gov/importantinfo (last visited May 22, 2023).

Operators should anticipate a long period between nomination of a parcel for lease and actual leasing, for several reasons. First, BLM requires an extensive internal review and public engagement process before it will offer nominated parcels for lease. When BLM receives an expression of interest, BLM internally reviews parcels and holds a public scoping period.[69] BLM then prepares documentation to comply with NEPA, usually in the form of an environmental assessment.[70] BLM next allows for a 30-day public review of and comment on the NEPA document.[71] At least 45 days before the lease sale, BLM then publishes a Notice of Competitive Sale listing all of the parcels to be offered for lease, together with stipulations attached to the leases.[72] The notice triggers a 30-day public protest period.[73] This process requires approximately nine months from start to finish. For example, in February 2023, BLM conducted public scoping for a lease sale to be held in the fourth quarter of 2023.[74]

Second, even after BLM holds a competitive sale, BLM may not promptly issue the sold leases. Although the MLA directs BLM to issue leases within 60 days of receiving the full bonus bid and first year's rental, BLM does not necessary issue leases within this timeframe.[75]

Third, operators should expect delays between nomination of a parcel for lease and actual lease issuance because BLM has not held oil and gas lease sales regularly since 2020. The MLA directs BLM to hold lease sales "at least quarterly" in each state "where eligible lands are available."[76] During the Biden administration, however, BLM halted quarterly sales.[77] In New Mexico, the BLM State Office did not hold lease sales in 2021, held one lease sale in 2022, and has proposed to hold two lease sales in 2023.[78] The infrequent sales, coupled with the lengthy review process, means that operators must build in long timeframes to obtain new federal leases.

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[69] BLM Instruction Memorandum No. 2023-10, *Oil and Gas Leasing – Land Use Planning and Lease Parcel Reviews* § II(C), (E) (Nov. 21, 2022).

[70] *Id.* § II(E).

[71] *Id.*

[72] *Id.* § III(A); *accord* 30 U.S.C. § 226(f); 43 C.F.R. § 3120.4-2.

[73] BLM Instruction Memorandum No. 2023-10, *Oil and Gas Leasing – Land Use Planning and Lease Parcel Reviews* § III(B) (Nov. 21, 2022). BLM need not resolve protests prior to a scheduled lease sale but must resolve a protest before it can issue a lease. *Id.*

[74] Press Release, BLM, *Bureau of Land Management New Mexico Seeks Feedback on Proposed Oil and Gas Lease Sale* (Feb. 17, 2023).

[75] 30 U.S.C. § 226(a)(1)(A); W. Energy All. v. Salazar, No. 10-cv-0226, 2011 WL 3737520 (D. Wyo. June 29, 2011).

[76] 30 U.S.C. § 226(b)(1).

[77] *See* Exec. Order No. 14,008 of Jan. 27, 2021, § 208, 86 Fed. Reg. 7619, 7624–25 (Feb. 1, 2021) (directing the Secretary of the Interior to "pause" new oil and gas leases on public lands); *see generally* Mark S. Barron, "The Future of Oil and Gas Leasing in the Second Century of the Mineral Leasing Act," *Public Land Law, Regulation, and Management* 6A-1 (Found. for Nat. Resources & Energy L. 2022).

[78] BLM, *New Mexico Oil and Gas Lease Sales*, https://www.blm.gov/programs/energy-and-minerals/oil-and-gas/leasing/regional-lease-sales/new-mexico (last visited May 14, 2023).

Prior to acquiring federal oil and gas leases, operators should familiarize themselves, and ensure they are in compliance, with the qualifications and limitations applicable to federal oil and gas lessees.[79]

C. Citizen Challenges to Federal Oil and Gas Leases

Issuance of an oil and gas lease is an agency action subject to review under the Administrative Procedure Act (APA).[80] A member of the public adversely impacted by issuance of a federal oil and gas lease may challenge BLM's decision to issue the lease, by filing either an administrative appeal with the IBLA or a lawsuit in federal court.[81] Environmental nongovernmental organizations (ENGOs) often file lawsuits challenging all leases that a BLM State Office sold at a given lease sale. These lawsuits generally allege that BLM did not comply with NEPA or FLPMA, or both, prior to issuing the leases.[82] Frequently, ENGOs challenge the adequacy of BLM's analysis of the impacts of future development of the leases on global climate change.[83] If the ENGOs succeed in a challenge, or if BLM enters into a settlement agreement to resolve the litigation, the court or BLM may suspend the challenged oil and gas leases while BLM prepares additional NEPA analysis.[84] In some circumstances, courts have vacated BLM's decision to issue oil and gas leases, thus effectively cancelling the leases.[85]

When planning their development, operators should recognize the possibility that recently acquired federal oil and gas leases may be subject to judicial challenge and, further, may be suspended or vacated. Importantly, because the statute of limitations to challenge BLM's compliance with NEPA or FLPMA is six years,[86] a lawsuit may challenge leases issued years prior. These lawsuits are brought against BLM as the defendant, and often neither the plaintiff nor BLM notifies lessees that their leases have been challenged. Therefore, operators should be on alert for news of lease sale litigation, either through local

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[79] *See* 1 *Law of Federal Oil and Gas Leases* ch. 4 (2023).

[80] *See* 5 U.S.C. § 702. For a court's recent interpretation of "available" and "eligible" lands, see *North Dakota v. U.S. Dep't of Interior*, No. 1:21-cv-00148 (D.N.D. Mar. 27, 2023).

[81] 30 U.S.C. § 226-2; 43 C.F.R. § 4.410(a).

[82] *See, e.g.*, Complaint for Declaratory Judgment and Injunctive Relief, WildEarth Guardians v. Bernhardt, No. 1:20-cv-00056 (D.D.C. Jan. 9, 2020) (challenging September 2016 and December 2018 New Mexico lease sales).

[83] *Id.*

[84] *E.g.*, Motion for Voluntary Dismissal, WildEarth Guardians v. Bernhardt, No. 1:20-cv-00056 (D.D.C. Mar. 4, 2022) (Stipulated Settlement attached as Exhibit 1).

[85] *E.g.*, Mont. Wildlife Fed'n v. Bernhardt, No. CV-18-69-GF-BMM, 2020 U.S. Dist. LEXIS 90571 (D. Mont. May 22, 2020); W. Watersheds Project v. Zinke, No. 1:18-CV-00187-REB, 2020 U.S. Dist. LEXIS 85203 (D. Idaho May 12, 2020). For a discussion of judicial decisions vacating federal oil and gas leases and the issues they present, see Andrew Emrich & Angela Franklin, "Hey, That's My Lease! Vacatur as a Remedy Under the National Environmental Policy Act," 68 *Nat. Resources & Energy L. Inst.* 31-1 (2022).

[86] 28 U.S.C. § 2401(a); *see generally, e.g.*, San Luis Valley Ecosystem Council v. U.S. Bureau of Land Mgmt., No. 14-cv-00680-RM, 2015 U.S. Dist. LEXIS 79870, at *14 (D. Colo. June 19, 2015).

papers or trade associations. An operator may intervene in litigation to defend its interest in the lease.[87]

D. Assignments and Transfers of Rights in Federal Oil and Gas Leases

An alternative to acquiring a new lease is to acquire an interest in an existing oil and gas lease via assignment or transfer. BLM approves two types of conveyances of interests in federal oil and gas leases: assignments of record title interests and transfers of operating rights. "Record title" is an interest in a lease "which includes the obligation to pay rent, and the rights to assign and relinquish the lease."[88] "Operating right" is an "interest created out of a lease authorizing the holder of that right to enter upon the leased lands to conduct drilling and related operations, including production of oil or gas from such lands in accordance with the terms of the lease."[89] Operating rights are also known as working interest.[90] Via regulation, BLM recognizes, but does not approve, overriding royalty interests and production payments.[91] Notably, BLM does not approve assignments or transfers of wellbore interests.[92]

BLM's records, rather than private assignments or those recorded in county records, determine past and present owners of record title interests and operating rights.[93] Therefore, an assignment or transfer must be filed with, and approved by, BLM in order for it to be effective with respect to BLM.

BLM has precise rules governing the effect of assignments and transfers of liability for leasehold obligations, including plugging and abandonment and reclamation liabilities.[94] Upon BLM's approval of an assignment or transfer, an assignor or transferor remains responsible for lease obligations that accrued before the approval date, including plugging wells and abandoning facilities that the assignor or transferor drilled, installed, or used before the effective date of the assignment or transfer.[95] The assignee of record title agrees to assume responsibility "to plug and abandon all wells which are no longer capable of producing, reclaim the lease site, and remedy all environmental problems in existence and that a purchaser exercising reasonable diligence should have known at the time."[96] The transferee of operating rights agrees to "plug and abandon all unplugged wells, reclaim the lease site, and remedy all environ-

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[87] W. Watersheds Project v. Haaland, 22 F.4th 828 (2022).

[88] 43 C.F.R. § 3100.0-5(c).

[89] *Id.* § 3100.0-5(d).

[90] *Id.*

[91] *Id.* § 3106.1(b).

[92] Correspondence on file with author.

[93] *E.g.*, Monahan v. U.S. Dep't of Interior, No. 05-8068, 2007 WL 2993577, at *6 (10th Cir. Oct. 15, 2007); Monahan v. U.S. Dep't of Interior, No. 04-CV-205-J, 2005 WL 8146103, at *8 (D. Wyo. May 17, 2005); Petroleum, Inc., 161 IBLA 194 (2004); Ralph G. Abbott, 115 IBLA 343 (1990); Devon Energy Corp., 145 IBLA 136 (1998).

[94] *See* 43 C.F.R. §§ 3106.7-2, 3106.7-6; BLM Instruction Memorandum No. 2021-039, *Orphaned Well Identification, Prioritization, and Plugging and Reclamation* (July 13, 2021).

[95] 43 C.F.R. § 3106.7-2.

[96] *Id.* § 3106.7-6(a).

mental problems in existence and that a purchaser exercising reasonable diligence should have known at the time [it] receive[s] the transfer."[97]

BLM has issued guidance outlining the order in which it will seek leasehold responsibilities from present and prior record title interests and operating rights owners.[98] The Federal Oil and Gas Royalty Management Act, as amended, allocates royalty liability between record title interest and operating rights owners.[99] Operators acquiring interests in federal leases should inform themselves of, and plan for, the leasehold obligations they assume.

IV. Developing Federal Oil and Gas Leases: Applications for Permits to Drill

Once an operator obtains a federal oil and gas lease, BLM must approve an APD before the operator may drill into, and produce from, the lease.[100] Additionally, BLM must approve an APD before a lessee can begin surface disturbing activities on a federal lease.[101] BLM may assess penalties, and order shutdown of operations, when a lessee drills into its federal lease with the intent to produce from it without an approved APD.[102] Once approved, APDs are valid for two years and may be renewed for a maximum of another two years.[103]

Detailed requirements attach to submission of an APD, and this paper will not attempt to synthesize them. Rather, the authorities governing submission of an APD are described below, together with discussion of BLM's timelines for consideration of APDs, associated environmental reviews, BLM's review of APDs for wells drilled from off-lease pads on nonfederal lands, and current litigation over APD approvals.[104]

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[97] *Id.* § 3106.7-6(b).

[98] BLM Instruction Memorandum No. 2021-039, *Orphaned Well Identification, Prioritization, and Plugging and Reclamation*, Attachment 1 (July 13, 2021).

[99] *See* 30 U.S.C. § 1712(a). It provides: "The person owning operating rights in a lease shall be primarily liable for its pro rata share of payment obligations under the lease. If the person owning the legal record title in a lease is other than the operating rights owner, the person owning the legal record title shall be secondarily liable for its pro rata share of such payment obligations under the lease." *Id.*

[100] 43 C.F.R. § 3162.3-1(c); EnerVest, Ltd. v. Jewell, No. 2:16-cv-01256-DN, 2016 U.S. Dist. LEXIS 180483, at *8 (D. Utah Dec. 30, 2016).

[101] *Id.*

[102] 30 U.S.C. § 1719(a); 43 C.F.R. § 3163.1(a)(3), (b)(2); *see* BLM Permanent Instruction Memorandum No. 2016-001, *Drilling Without Approval (DWOA)* (Sept. 30, 2016).

[103] Onshore Order No. 1, Approval of Operations, § III.G, 72 Fed. Reg. 10,308, 10,335 (Mar. 7, 2007); BLM Instruction Memorandum No. 2023-011, *Approved Application for Permit to Drill Extensions* (Nov. 18, 2022).

[104] For a detailed discussion of BLM's requirements for APDs, see 1 *Law of Federal Oil and Gas Leases* § 16.04 (2023); *see also* BLM, *The Gold Book: Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development* ch. 3 (4th ed. 2007).

A. Requirements for an APD

BLM's Onshore Order No. 1 sets forth the information that an APD must contain.[105] Notably, BLM requires an onsite inspection of proposed well pads, access roads, flowline routes, and any associated right-of-way before BLM will consider an APD to be complete.[106] Additionally, an operator must submit a fee with every APD; in fiscal year 2024, this fee is $12,155.[107]

B. Timelines for BLM's Consideration of APDs

Congress has established rigid timelines for BLM to process and approve APDs.[108] Initially, within 10 days after receiving an APD, BLM must notify the applicant that the APD is complete or that information is missing; if information is missing, BLM's notice must specify the missing information.[109] Then, once an APD is complete, BLM has 30 days to either approve the APD, if NEPA and other procedural requirements have been met, or defer a decision on the APD and provide the applicant with notice that specifies (a) any steps the applicant can take for the APD to be issued, and (b) a list of actions BLM must take to comply with applicable laws, together with timelines and deadlines for completing such actions.[110] If BLM fails to issue such a notice, it lacks discretion to deny an APD.[111]

If BLM defers a decision on an APD, the applicant has two years to complete all requirements identified by BLM, including providing information necessary for BLM to complete NEPA analysis.[112] Once the applicant completes these requirements, BLM has 10 days to make a decision on an APD unless compliance with NEPA or similar laws still must be completed.[113]

C. Environmental Compliance for APDs

BLM's approval of APDs requires compliance with NEPA, the NHPA, and ESA. BLM's approaches to complying with NEPA and the NHPA in southeast New Mexico are described in this section. BLM's obligations under the ESA are described in the section addressing special status species later in this paper.

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[105] Onshore Order No. 1, Approval of Operations, 72 Fed. Reg. 10,308 (Mar. 7, 2007); *see also* 43 C.F.R. § 3162.3-1. BLM amended Onshore Order No. 1 in 2017 to require electronic filing of APDs. *See* 82 Fed. Reg. 2906 (Jan. 10, 2017).

[106] 72 Fed. Reg. at 10,329–30.

[107] 88 Fed. Reg. 66,695, 66,697 (Sept. 28, 2023).

[108] 30 U.S.C. § 226(p).

[109] *Id.* § 226(p)(1).

[110] *Id.* § 226(p)(2).

[111] EnerVest, Ltd. v. Jewell, No. 2:16-cv-01256-DN, 2016 U.S. Dist. LEXIS 180483, at *8 (D. Utah Dec. 30, 2016); Brigham Oil & Gas, LP, 181 IBLA 282, 287 (2011).

[112] 30 U.S.C. § 226(p)(3).

[113] *Id.*

1. NEPA Compliance

In the Permian Basin, BLM generally uses EAs, categorical exclusions (CXs), and Determinations of NEPA Adequacy (DNAs) to satisfy its NEPA obligations when approving APDs.[114] EAs assess the environmental impacts of a proposed action, when the effects of the action are not significant and thus do not warrant preparation of an EIS.[115] After an EA is prepared, BLM will issue a Finding of No Significant Impact (FONSI) and Decision Record approving the action.[116]

BLM can use two other mechanisms to satisfy its NEPA obligations: CXs and DNAs. BLM has issued internal guidance encouraging the use of these mechanisms when approving APDs.[117]

In the Energy Policy Act of 2005, Congress established five statutory CXs that specifically apply to development of federal oil and gas leases—i.e., five circumstances that normally do not have significant effects on the human environment.[118] These circumstances are:

1. Individual surface disturbances of less than five acres so long as the total surface disturbance on the lease is not greater than 150 acres and site-specific analysis in a document prepared pursuant to the NEPA has been previously completed.
2. Drilling an oil and gas well at a location or well pad site at which drilling has occurred within five years prior to the date of spudding the well.
3. Drilling an oil or gas well within a developed field for which an approved land use plan or any environmental document prepared pursuant to NEPA analyzed drilling as a reasonably foreseeable activity, so long as such plan or document was approved within five years prior to the date of spudding the well.
4. Placement of a pipeline in an approved right-of-way corridor, so long as the corridor was approved within five years prior to the date of placement of the pipeline.
5. Maintenance of a minor activity, other than any construction or major renovation of a building or facility.[119]

If a proposed action, including an APD, satisfies the criteria in one of the five CXs, BLM may issue a decision approving the action.[120]

By contrast, DNAs are findings by BLM that existing NEPA analysis adequately analyzes a proposed action.[121] When BLM utilizes a DNA, it also pre-

[114] *See BLM National NEPA Register*, https://eplanning.blm.gov/eplanning-ui/home (last visited May 17, 2023) (filtered by "New Mexico," "Carlsbad," "Fluid Minerals," and "2022 and 2023"); *see generally* 40 C.F.R. § 1508.1(d), (h) (defining "categorical exclusion" and "environmental assessment"); U.S. Dep't of the Interior, Departmental Manual pt. 516, ch. 11 § 11.6 (Dec. 10, 2020).

[115] *See* 40 C.F.R. § 1508.1(h); 43 C.F.R. § 46.300.

[116] BLM Handbook H-1790-1, *National Environmental Policy Act* §§ 8.4.2, 8.5 (Rel. 1-1710 Jan. 30, 2008).

[117] BLM Information Bulletin No. 2018-061, *NEPA Efficiencies for Oil and Gas Development* (June 6, 2018).

[118] 42 U.S.C. § 15942; BLM Handbook H-1790-1, *National Environmental Policy Act* app. 2; *see generally* 40 C.F.R. § 1508.1(d) (definition of categorical exclusion).

[119] BLM Handbook H-1790-1, *National Environmental Policy Act* app. 2.

[120] *Id.* § 4.1, app. 2.

[121] *Id.* § 5.1; U.S. Dep't of the Interior, Departmental Manual pt. 516 ch. 11 § 11.6 (Dec. 10, 2020).

pares a FONSI and Decision Record for the proposed action.[122] Both DNAs and CXs promote efficiencies in NEPA analysis.

2. NHPA Compliance

Section 106 of the NHPA requires federal agencies to "take into account" the effect of their actions, known as "undertakings," on "historic properties."[123] "Historic properties" are resources or sites eligible for inclusion on the National Register of Historic Places.[124] An agency's obligations under the NHPA are independent of its obligations under NEPA; therefore, an agency must fulfill its obligations under the NHPA even when the agency can apply a CX to comply with NEPA.[125]

To meet its NHPA obligations when approving APDs, BLM will require operators to complete a Class III cultural resources survey (i.e., a walking survey) of areas of proposed surface disturbance.[126] If a cultural resource is discovered through the survey, BLM will consult with the State Historic Preservation Officer (SHPO). BLM and the SHPO have negotiated and established statewide procedures to comply with the NHPA, including procedures for consultation.[127] If after consultation BLM determines that the cultural resource qualifies as a historic property, BLM must avoid, minimize, and mitigate adverse effects to it in accordance with the procedures negotiated by SHPO.[128] If the historic property is of significance to Tribes, BLM will consult with such Tribes.[129]

For a certain region of southeast New Mexico, BLM has developed a programmatic agreement that streamlines NHPA compliance. The programmatic agreement allows for participating operators to contribute to a mitigation fund in lieu of conducting cultural surveys on federal and private surface.[130] Participation is optional. Operators should consult the programmatic agreement to determine whether their projects are eligible and, if so, evaluate whether participation would be worthwhile.

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[122] BLM Handbook H-1790-1, *National Environmental Policy Act* § 5.1.4 (Rel. 1-1710 Jan. 30, 2008).

[123] 54 U.S.C. § 306108. For an overview of the section 106 process, see, e.g., Stan N. Harris, "Cultural Resource Permitting: The Intersection Between NHPA and NEPA," *Advanced Public Land Law – The Continuing Challenge of Managing for Multiple Use* 8-1 (Rocky Mt. Min. L. Fdn. 2017).

[124] 36 C.F.R. § 800.16(l)(1).

[125] *See generally* BLM Instruction Memorandum No. 2012-108, *Coordinating National Historic Preservation Act and National Environmental Policy Act Compliance* (Apr. 27, 2012).

[126] *See* State Protocol between the New Mexico BLM and the New Mexico State Historic Preservation Officer Regarding the Manner in which BLM Will Meet Its Responsibilities under the National Historic Preservation Act in New Mexico § IV(B), app. B (2014).

[127] *See id.* § 1.

[128] *See id.*; *see generally* 36 C.F.R. pt. 800.

[129] Consultation follows the procedures at 36 C.F.R. part 800. Notably, BLM's trust responsibilities to tribes may impose an obligation to consult that is independent of the NHPA. *See, e.g.*, Exec. Order No. 13175 of November 6, 2000, 65 Fed. Reg. 67,249 (Nov. 9, 2000).

[130] *See* BLM Carlsbad Field Office, *Permian Basin Programmatic Agreement Fact Sheet*, https://www.blm.gov/sites/default/files/Permian%20Basin%20PA%20Fact%20Sheet%20January%202019%20to%20December%202019.pdf.

D. Evaluating APDs for Fee/Fee/Fed Wells

Federal wells drilled from off-lease well pads on nonfederal lands are called "fee/fee/fed wells."[131] BLM's evaluation of APDs for fee/fee/fed wells differs from BLM's typical review of APDs in several notable respects.

First, BLM has taken the position that its land use planning authority does not extend to fee/fee/fed wells.[132] When approving APDs for fee/fee/fed wells, BLM will not apply surface management measures set forth in its RMPs, such as timing limitations and reclamation requirements, to the APDs.[133] Second, to comply with NEPA, the NHPA, and ESA, BLM only examines the impacts that result from BLM's approval of the fee/fee/fed well.[134] BLM has issued guidance detailing how BLM should evaluate wells with preexisting surface disturbance and wells with new surface disturbance.[135] Finally, BLM will not require a surface use plan of operations, onsite inspection, or bond to reclaim surface impacts as part of an APD submission.[136]

E. Current APD Controversies

Like oil and gas leases, BLM's approval of an APD is a final agency action subject to review under the APA.[137] Although lawsuits by ENGOs have largely targeted BLM's issuance of new oil and gas leases, ENGOs also have pursued litigation challenging APD approvals in New Mexico. Recently, a high-profile lawsuit challenged more than 4,000 APDs approved during the Biden administration, many of which were approved by the Carlsbad Field Office.[138] The lawsuit particularly took aim at the climate change impacts of the APD approvals, alleging that BLM did not adequately examine the cumulative impacts on climate change or impacts on environmental justice and that the APD approvals violate the ESA and FLPMA.[139] Although other oil and gas-producing

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[131] BLM Permanent Instruction Memorandum No. 2018-014, *Directional Drilling into Federal Mineral Estate from Well Pads on Non-Federal Locations* (June 12, 2018).

[132] *Id.* ("Neither the Federal Land Policy and Management Act (FLPMA) nor the [Mineral Leasing Act] provide the BLM with authority to require mitigation of surface disturbances on non-Federal lands, and NEPA's procedural requirements do not expand or extend the BLM's authority beyond that provided in those statutes."). BLM's position is the subject of ongoing litigation. *See* Amended Complaint, Powder River Basin Res. Council v. U.S. Dep't of the Interior, No. 1:22-cv-02696 (D.D.C. Dec. 14, 2022).

[133] BLM Permanent Instruction Memorandum No. 2018-014 ("Management actions in an RMP meant for the protection of Federal surface resources should not be applied to a Fee/Fee/Fed APD unless, and only to the extent that, activities authorized under the APD will impact Federal lands.").

[134] *Id.*

[135] *Id.*

[136] *Id.* BLM will require a bond to address downhole concerns. *Id.*

[137] 5 U.S.C. § 706(2)(A); *see* Diné Citizens Against Ruining Our Env't v. Bernhardt, 923 F.3d 831, 839 (10th Cir. 2019).

[138] Amended Complaint for Declaratory Judgment and Injunctive Relief, *Ctr. for Biological Diversity v. U.S. Dep't of the Interior*, No. 1:22-cv-1716 (D.D.C. filed Sept. 12, 2022); Memorandum Opinion, Ctr. for Biological Diversity v. U.S. Dep't of the Interior, No. 1:22-cv-1716, 2023 WL 7182041 (D.D.C. Nov. 1, 2023) (dismissing challenge because plaintiffs failed to demonstrate standing).

[139] *See id.*

states have seen relatively few challenges to APDs, such challenges are not new to New Mexico, where APDs issued in the San Juan Basin have been the subject of ongoing litigation.[140] Approval of APDs may prompt additional lawsuits in the future.

V. SPECIAL STATUS SPECIES AND THEIR IMPACTS ON OIL AND GAS DEVELOPMENT

Southeast New Mexico is home to three notable special status species: the lesser prairie-chicken, dunes sagebrush lizard, and Texas hornshell mussel. The species enjoy management under the ESA or by BLM, or both, which affect where and how oil and gas development may occur.

A. Special Status Species Management

Species listed as threatened or endangered under the ESA receive significant protections. The ESA and its implementing regulations prohibit take of listed species, including take "that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity" ("incidental take").[141] Unauthorized incidental take of listed species can result in civil and criminal penalties.[142]

Land users can obtain permits that authorize take of listed species.[143] Incidental take permits authorize incidental take of listed species and require preparation of habitat conservation plans (HCP).[144] Enhancement of survival permits authorize incidental take of listed species; FWS will issue an enhancement of survival permit for unlisted, candidate species upon preparation of a candidate conservation agreement with assurances (CCAA).[145] In a CCAA, property owners commit to conservation measures to benefit candidate species and receive assurances from FWS that they will not be required to undertake additional measures or be subject to additional land use restrictions to

[140] *See* Diné Citizens Against Ruining Our Envt. v. Haaland, 59 F.4th 1016 (10th Cir. 2023); Diné Citizens Against Ruining Our Envt. v. Bernhardt, 923 F.3d 831 (10th Cir. 2019); Diné Citizens Against Ruining Our Env't v. Jewell, 839 F.3d 1276 (10th Cir. 2016).

[141] 16 U.S.C. § 1538(a)(2); 50 C.F.R. §§ 17.21(c), 17.31(a). The ESA defines "take" to mean "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." 16 U.S.C. § 1532(19). "Harm" is defined by regulation as "an act which actually kills or injures wildlife," including "significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering." 50 C.F.R. § 17.3. "Harass" is defined by regulation as "an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering." *Id.*

[142] 16 U.S.C. § 1540; 88 Fed. Reg. 5796 (Jan. 30, 2023) (inflation adjustments to civil penalties).

[143] 16 U.S.C. § 1539(a); 50 C.F.R. §§ 17.22, 17.32. For a comparison of these permits, see David Zippin & Kathleen C. Schroder, "Complex Permits Under Section 10 of the Endangered Species Act," *Endangered Species Act: Current & Emerging Issues Affecting Resource Development* 4-1 (Rocky Mt. Min. L. Fdn. 2015).

[144] 16 U.S.C. § 1539(a)(1)(B); 50 C.F.R. §§ 17.22(b)(2), 17.32(b)(2); FWS Habitat Conservation Planning and Incidental Take Permit Processing Handbook (2016).

[145] 16 U.S.C. § 1539(a)(1)(B); 50 C.F.R. §§ 17.22(d), 17.32(d); Candidate Conservation Agreement with Assurances Policy, 81 Fed. Reg. 95,164–65 (Dec. 27, 2016).

benefit the species, even if new information indicates that additional or revised conservation measures are needed for the species.[146]

Additionally, section 7 of the ESA obligates federal agencies to consult with FWS to ensure that their actions and authorizations are not likely to jeopardize the continued existence of a listed species or destroy or adversely modify critical habitat.[147] Consultation can be informal or formal, depending on the potential of the proposed action to affect a listed species or its critical habitat.[148] Formal consultation results in FWS's issuance of a biological opinion, which includes an "incidental take statement" that authorizes any incidental take that results from the approved action.[149] FWS also may enter into candidate conservation agreements (CCA) with federal agencies to adopt management measures for species that are not yet listed under the ESA.[150] CCAs are similar to CCAAs but do not carry the same regulatory assurances.[151]

Through FLPMA, BLM enjoys broad authority to manage the public lands for the benefit of both listed and unlisted species.[152] BLM regularly adopts management measures in its RMPs to protect special status species and their habitat.[153]

B. Special Status Species of Southeast New Mexico

1. Lesser Prairie-Chicken

The lesser prairie-chicken exists in New Mexico, Texas, Kansas, Oklahoma, and Colorado.[154] In 2014, FWS listed the lesser prairie-chicken as threatened, but a court set aside that listing decision the following year.[155] In 2022, FWS listed the lesser prairie-chicken again, and this listing decision took effect in March 2023.[156] In west Texas and southeast New Mexico, FWS has designated a distinct population segment of the lesser prairie-chicken and listed it as endangered under the ESA.[157] FWS designated a second distinct population

[146] 81 Fed. Reg. at 95,164.

[147] 16 U.S.C. § 1536(a)(2).

[148] 50 U.S.C. §§ 402.13, 402.14.

[149] 16 U.S.C. § 1536(b); 50 U.S.C. § 402.14(h).

[150] *See* Amelia Orton-Palmer, "Candidate Conservation Agreements and Candidate Conservation Agreements with Assurances under the ESA," *Federal Regulation of Cultural Resources, Wildlife, & Waters of the U.S.* 9-1 (Rocky Mt. Min. L. Fdn. 2012).

[151] *Id.*

[152] *See* 43 U.S.C. § 1701(a)(8); BLM Manual 6840 – Special Status Species Management (Rel. 6-125 Dec. 12, 2008).

[153] *See* BLM Handbook H-1061-1 – Land Use Planning, app. C at 6–8 (Rel. 1-1693 Mar. 11, 2005); *see also, e.g.*, BLM, *Special Status Species Record of Decision and Approved Resource Management Plan Amendment*; Candidate Conservation Agreement for the Lesser Prairie-Chicken (*Tympanuchus pallidicinctus*) and Sand Dune Lizard (*Sceloporus arenicolus*).

[154] 87 Fed. Reg. 72,674, 72,674 (Nov. 25, 2022).

[155] 79 Fed. Reg. 19,973 (Apr. 10, 2014); Permian Basin Petroleum Ass'n v. Dep't of the Interior, 127 F. Supp. 3d 700 (W.D. Tex. 2015).

[156] 87 Fed. Reg. at 72,674; 88 Fed. Reg. 4087 (Jan. 24, 2023).

[157] *Id.*; *see* 16 U.S.C. § 1532(16) (defining "species" to include a "distinct population segment of any species of vertebrate fish or wildlife which inbreeds when mature").

segment outside of west Texas and southeast New Mexico, which FWS listed as threatened under the ESA.[158] FWS has not proposed or designated critical habitat for the species.

Multiple conservation plans exist to protect the lesser prairie-chicken. On nonfederal lands in New Mexico, FWS has entered into two CCAAs and issued associated enhancement of survival permits, which became effective when the species was listed.[159] One of these CCAAs adopts conservation measures for both the lesser prairie-chicken and the dunes sagebrush lizard in an area confined to New Mexico.[160] Prior to listing, operators could enroll their lands in either of these CCAAs and commit to implement management measures to protect the species;[161] however, now that the lesser prairie-chicken is listed, enrollment in these CCAAs has closed. Additionally, FWS has approved an HCP specific to oil and gas development, and issued an associated incidental take permit, for the lesser prairie-chicken that applies throughout the species' range.[162] Operators may participate in this HCP and receive the associated incidental take authorization on nonfederal lands.

Additional protections exist on federal lands that benefit the species. In 2008, BLM amended the Carlsbad and Roswell RMPs to adopt management measures specific to the lesser prairie-chicken and dunes sagebrush lizard.[163] Additionally, BLM and FWS entered into a CCA for the lesser prairie-chicken and dunes sagebrush lizard in 2008;[164] oil and gas operators can enroll in this CCA and commit to management measures to benefit the species. As part of the CCA, BLM and FWS engaged in the section 7 conference process;[165] they produced a conference opinion to be converted into a biological opinion when the lesser prairie-chicken or dunes sagebrush lizard was listed.[166] For operators enrolled in the CCA, this biological opinion will authorize incidental take resulting from activities undertaken in accordance with the agreement.[167] Like

[158] 87 Fed. Reg. at 72,674.

[159] *See* Candidate Conservation Agreement with Assurances for the Lesser Prairie-Chicken (*Tympanuchus pallidicinctus*) and Sand Dune Lizard (*Sceloporus arenicolus*) (2008); Western Ass'n of Fish and Wildlife Agencies, The Lesser Prairie-Chicken Range-wide Conservation Plan (2013). For a discussion of these CCAAs, see Frank Lupo, "Learning from the Implementation of Candidate Conservation Agreements with Assurances," *Endangered Species and Other Wildlife* 8A-1 (Rocky Mt. Min. L. Fdn. 2019).

[160] *See* Candidate Conservation Agreement with Assurances for the Lesser Prairie-Chicken (*Tympanuchus pallidicinctus*) and Sand Dune Lizard (*Sceloporus arenicolus*) (2008).

[161] *See id.*

[162] Oil and Gas Habitat Conservation Plan for the Lesser Prairie-Chicken (2022).

[163] BLM, *Special Status Species Record of Decision and Approved Resource Management Plan Amendment* (2008).

[164] *See* Candidate Conservation Agreement for the Lesser Prairie-Chicken (*Tympanuchus pallidicinctus*) and Sand Dune Lizard (*Sceloporus arenicolus*) (2008).

[165] *Id.* at 7; *see generally* 50 C.F.R. § 402.10.

[166] *See* Candidate Conservation Agreement for the Lesser Prairie-Chicken (*Tympanuchus pallidicinctus*) and Sand Dune Lizard (*Sceloporus arenicolus*) (2008).

[167] *See id.*

the CCAA on nonfederal lands, enrollment in this agreement closed when the species was listed.[168]

2. Dunes Sagebrush Lizard

The dunes sagebrush lizard, formerly known as the sand dune lizard, currently is not listed under the ESA; however, in July 2023, FWS proposed to list this species as endangered.[169] Because the dunes sagebrush lizard's range overlaps with the lesser prairie-chicken's range in southeast New Mexico, it shares conservation benefits afforded by BLM's RMP amendment, the CCA on federal lands, and the CCAA on nonfederal lands.[170]

3. Texas Hornshell Mussel

The Texas hornshell mussel is a freshwater mussel that exists in the Black River in southeast New Mexico. FWS listed the species as endangered in 2018 and proposed to designate critical habitat for it in 2021.[171] A CCA that applies on federal lands, a CCAA that applies on state lands, and a CCAA that applies on private lands have been developed for oil and gas and other activities.[172] These conservation agreements largely require avoidance of activities in portions of the Black and Delaware Rivers and their 100-year floodplains.

C. Limitations on Oil and Gas Development Resulting from Lesser Prairie-Chicken Management in Southeast New Mexico

Of the special status species in southeast New Mexico, the lesser prairie-chicken poses the most significant challenge to operators because of its broad range and status as endangered. This species presents two particular risks to oil and gas operations: unauthorized take, and delay resulting from section 7 consultation.[173]

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[168] *See id.*

[169] 88 Fed. Reg. 42,661 (July 3, 2023). Notably, FWS proposed the species for listing as endangered in 2010 but withdrew the proposed listing rule in 2012. 77 Fed. Reg. 36,871 (June 19, 2012); 75 Fed. Reg. 77,801 (Dec. 14, 2010).

[170] *See* BLM, *Special Status Species Record of Decision and Approved Resource Management Plan Amendment*; Candidate Conservation Agreement for the Lesser Prairie-Chicken (*Tympanuchus pallidicinctus*) and Sand Dune Lizard (*Sceloporus arenicolus*); Candidate Conservation Agreement with Assurances for the Lesser Prairie-Chicken (*Tympanuchus pallidicinctus*) and Sand Dune Lizard (*Sceloporus arenicolus*).

[171] 83 Fed. Reg. 5720 (Feb. 9, 2018); 86 Fed. Reg. 30,888 (June 10, 2021).

[172] Candidate Conservation Agreement for Texas Hornshell Mussel (*Popenaias popeii*) and Other Covered Species, Developed Cooperatively by U.S. Fish and Wildlife Service – Southwest Region, The Center of Excellence (CEHMM) (2017); Candidate Conservation Agreement with Assurances for Texas Hornshell Mussel (*Popenaias popeii*) and Other Covered Species, New Mexico Commissioner of Public Lands and U.S. Fish and Wildlife Service (2017); Candidate Conservation Agreement with Assurances for Texas Hornshell Mussel (*Popenaias popeii*) and Other Covered Species, Developed Cooperatively by U.S. Fish and Wildlife Service – Southwest Region, The Center of Excellence (CEHMM) (2017).

[173] Voluntary agreements and permits authorizing incidental take present their own considerations for oil and gas operators. For discussion of these issues, see Jim Farrell et al., "Planning For

1. Unauthorized Take of Lesser Prairie-Chicken

As a practical matter, many operators in southeast New Mexico have enrolled their leaseholds in at least one of the CCAAs that apply on nonfederal lands. These operators will enjoy the incidental take authorizations from the permits that accompany these agreements. Operators that have not enrolled their leaseholds in a CCAA or the HCP, however, risk unauthorized incidental take of lesser prairie-chicken.

FWS has identified the following actions associated with oil and gas development as having a potential to result in incidental take of lesser prairie-chicken:

> Actions that would result in the unauthorized destruction or alteration of the species' habitat. Such activities could include, but are not limited to, the removal of native shrub or herbaceous vegetation by any means for any infrastructure construction project[.]
>
> * * * * *
>
> Actions that would result in lesser prairie-chicken avoidance of an area during one or more seasonal periods. Such activities could include, but are not limited to, the construction of vertical structures such as power lines, . . . infrastructure to support energy development, roads, and other anthropogenic features; . . . and activities such as well drilling, operation, and maintenance, which would entail significant human presence, noise, and infrastructure.[174]

Operators that are not enrolled in a conservation plan should confer with a wildlife biologist to assess whether, based on the location of their operations, their activities present a risk of incidental take. Operators facing a risk of incidental take should participate in an HCP to obtain incidental take authorization.

2. Delays Resulting from Section 7 Consultation

BLM authorizations, including approvals of APDs and grants of rights-of-way, trigger section 7 consultation with FWS. Section 7 consultation can take two forms—informal or formal consultation[175]—depending on the likelihood the authorization will affect the species, but both forms of consultation can lead to project delays.

Operators that enrolled in the CCA on federal lands prior to listing and are implementing that agreement should not experience delays from section 7 consultation, because BLM and FWS conferred regarding the CCA before the lesser prairie-chicken was listed. Operators that did not enroll in the CCA prior to listing, however, will encounter delays if BLM must consult with FWS on individual APDs, rights-of-way, and other authorizations on a case-by-case basis.

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and Funding Conservation and Compliance: Endangered Species Act Issues Unique to the Oil & Gas Industry," *Endangered Species Act: Current & Emerging Issues Affecting Resource Development* 11-1 (Rocky Mt. Min. L. Fdn. 2015); Bret A. Sumner & Nicole M. Blevins, "Legal and Policy Considerations for Voluntary Conservation Programs for Range-Wide Species Involving Private Lands and Minerals," *Endangered Species and Other Wildlife* 8B-1 (Rocky Mt. Min. L. Fdn. 2019).

[174] 87 Fed. Reg. 72,674, 72,748 (Nov. 25, 2022).

[175] 50 C.F.R. §§ 402.13, 402.14.

VI. ADMINISTRATION OF FEDERAL OIL AND GAS LEASES

Federal oil and gas leases are subject to statutory and regulatory requirements related to their administration, many of which do not have analogous counterparts in fee leases.[176] Operators of, and holders of interests in, federal oil and gas leases should educate themselves on these requirements, particularly those requirements necessary to maintain federal oil and gas leases. This paper will highlight three components of federal oil and gas lease administration—communitization agreements, federal units, and suspensions.

A. Communitization Agreements & Federal Units

State oil and gas conservation commissions such as the New Mexico Oil Conservation Division cannot order pooling of federal oil and gas leases or commit federal oil and gas leases to a drilling or spacing unit. The MLA requires the Secretary of the Interior, through BLM, to voluntarily commit federal oil and gas leases to a state pooling or spacing unit through a process known as "communitization."[177] Communitization agreements are often known as "CAs" or "comm agreements." Communitization has two significant consequences for federal oil and gas leases. First, operations and production on one communitized tract will be deemed to occur on all communitized tracts, thus extending all communitized federal leases.[178] Second and similarly, production from one communitized tract will be allocated to all tracts in the communitized area.[179]

BLM has developed a standard communitization agreement that it, the operator, and all record title and working interest owners in federal leases must execute.[180] Generally, the boundaries of a communitized area will be consistent with the boundaries of a state drilling or spacing unit.[181]

Although the communitization process is largely straightforward,[182] it can create challenges. First, operators should timely submit communitization agreements to BLM. BLM often includes a condition of approval on APDs requiring submission of a communitization agreement at least 90 days before

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[176] *See* 1 *Law of Federal Oil and Gas Leases* chs. 10, 12, 14 (2023). For a comprehensive but partly outdated overview of administering federal oil and gas leases, see Cox, Jr., *supra* note 24. BLM has proposed to revise its regulations that affect administration of federal oil and gas leases. *See* 88 Fed. Reg. 47,562 (July 24, 2023).

[177] 30 U.S.C. § 226(m); 43 C.F.R. § 3105.2-2.

[178] 30 U.S.C. § 226(m); 43 C.F.R. § 3105.2-2 ("Operations or production under such an agreement shall be deemed to be operations or production as to each lease committed thereto.").

[179] BLM Manual 3160-9 – Communitization app. 1, Model Form of a Federal Communitization Agreement § 5 (Rel. 3-215 July 7, 1988).

[180] BLM Manual 3160-9 – Communitization app. 1.

[181] *See* Gene R. & Mary J. Hilton, 187 IBLA 1, 7–8 (2015). *But see* Kirkpatrick Oil & Gas Co., 15 IBLA 216, 81 Interior Dec. 162 (1974) (declining to adopt state spacing when evidence demonstrated it would not provide for optimum drainage of a field).

[182] For an overview of the communitization process, see BLM Manual 3160-9 – Communitization; Angela L. Franklin & Mark L. Burghardt, "Communitization Agreements in the 21st Century," *Federal Onshore Oil & Gas Pooling and Unitization* 12-1 (Rocky Mt. Min. L. Fdn. 2014); Gene R. & Mary J. Hilton, 187 IBLA 1 (2015).

the anticipated date of first production.[183] Additionally, if communitization is intended to extend a federal lease nearing the end of its primary term, a complete communitization agreement must be submitted to BLM before expiration of the primary term to extend the lease.[184]

Second, operators should pay attention to unleased federal lands within an area that is communitized or proposed to be communitized. Section 5 of BLM's form CA agreement provides that operators must escrow all proceeds attributable to an unleased tract until the tract is leased.[185] In practice, however, BLM establishes an unleased lands account and requires the operator pay ONRR compensatory royalty[186]; with respect to the remaining proceeds, BLM further allows the operator to recoup drilling costs from the proceeds that must be turned over the new lessee. Given recent delays in leasing, however, revenue may accrue for some time, which the operator must then turn over to a new lessee. Operators with unleased acreage in their communitized areas should consider approaching BLM and inquiring whether BLM would be willing to modify Section 5 to address this issue.

Finally, communitization agreements should not be confused with federal units. The MLA allows the consolidation of numerous federal and nonfederal oil and gas leases into "units" for purposes such as exploration or secondary recovery.[187] Federal units can be considerably larger than state spacing units or communitization agreements.[188] Although federal units can allow for efficient development of a large area, they are complex and technical to administer.[189]

To avoid confusion when working BLM, operators should be precise when referring to a "unit"—refer instead to a "state pooling and spacing unit" (or applicable state term), a "communitization agreement," or a "federal exploratory

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[183] *See* BLM Instruction Memorandum No. 2015-124, *Re-engineered Communitization Agreement Approval Process* (July 17, 2015).

[184] 43 C.F.R. § 3105.2-3(a).

[185] BLM Manual 3160-9 – Communitization § .11.H.1 (Rel. 3-215 July 7, 1988).

[186] Franklin & Burghardt, *supra* note 182, at 12-19; BLM Instruction Memorandum No. 2011-050, *Procedures to Establish Unleased Lands Accounts on Unleased Leasable Lands within a Unit or a Communitization Agreement* (Jan. 20, 2011).

[187] 30 U.S.C. § 226(m); 43 C.F.R. pt. 3180.

[188] BLM guidance provides that units necessitating one unit obligation well should not exceed 25,000 acres. Larger units may necessitate additional unit obligation wells. *See* BLM Draft Handbook H-3180-1 – Unitization (Exploratory) § II.B. BLM released this draft handbook in 1992 and has neither finalized it nor released updated guidance. *See* BLM Instruction Memorandum No. 93-66, *Interim Guidance on Oil and Gas Units Administration* (Nov. 20, 1992).

[189] In New Mexico, federal units are administered and approved by the New Mexico State Office, rather than field offices. For information on exploratory units, see Frederick M. MacDonald, "Preparing and Finalizing the Unit Agreement: Making Sure Your Exploratory Ducks Are in a Row," *Federal Onshore Pooling & Unitization* 3-1 (Rocky Mt. Min. L. Fdn. 2014); Gregory J. Nibert et al., "Adapting Federal Units and Unit Operating Agreements to Account for Horizontal Development," *Horizontal Oil & Gas Development* 10B-1 (Rocky Mt. Min. L. Fdn. 2012); and Laura Lindley, "The Life Cycle of a Federal Unit," *Onshore Pooling and Unitization* 14-1 (Rocky Mt. Min. L. Fdn. 1997). For information on secondary recovery and other units, see Craig Newman, "Unitization for EOR Projects Involving Federal Lands," *Enhanced Oil Recovery: Legal Framework for Sustainable Management of Mature Oil Fields* 4-1 (Rocky Mt. Min. L. Fdn. 2015); and Kurt M. Petersen, "Unconventional Units," *Federal Onshore Oil and Gas Pooling and Unitization* 19-1 (Rocky Mt. Min. L. Fdn. 1990).

unit." Otherwise, BLM may construe a reference to a "unit" to mean any one of these distinct mechanisms.[190]

B. Suspensions

BLM may grant two different types of suspensions of federal oil and gas leases: suspensions of operations *and* production, and suspensions of operations *or* production. Although BLM has authority to order a suspension, in practice BLM requires operators to apply for suspensions.[191] Suspensions must be submitted before expiration or termination of a lease.[192]

"Suspensions of operations and production," also known as "Section 39 suspensions," will suspend both operations and production obligations under a lease.[193] A suspension of operations and production will toll the lease term and add the period of suspension to the term of the lease.[194] Suspensions of operations and production will also toll the obligation to pay rental or royalty, as applicable.[195] BLM may grant suspensions of operations and production when "in the interest of conservation of natural resources."[196] These circumstances include, but are not limited to, when BLM's actions or inactions prevent a lessee from developing its lease. Common justifications for suspensions of operations and production include delays associated with APD processing, NEPA analysis, and litigation over leasing decisions.[197]

Suspensions of operations or production, also known as "Section 17 suspensions," will suspend either operations or production obligations under a lease, but not both.[198] BLM may grant suspensions of operations or production when a lessee is prevented from producing from the lease by reason of force majeure.[199]

BLM recently issued updated guidance addressing suspensions.[200] Notably for operators, this guidance addressed suspension requests filed late in a lease's primary term. This guidance advised that "BLM should not grant a suspension for a lease where the applicant cites, as the basis for the suspension,

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[190] *See, e.g.*, *Gene R. & Mary J. Hilton*, 187 IBLA at 8 n.4 ("Communitization is often inappropriately conflated with unitization, which is the consolidation of leaseholds covering a common source to conduct unified development for an efficient extraction of hydrocarbons.").

[191] *See* 43 C.F.R. § 3103.4-4(a). For application procedures, see BLM Manual 3160-10 – Suspension of Operations and/or Production § .31 (Rel. 3-150 Mar. 13, 1987). For a comprehensive discussion of suspensions, see Robert C. Mathes & Timothy R. Canon II, "Staying Alive: Navigating the Complexities of Federal Oil and Gas Lease Extensions, Terminations, Cancellations, and Suspensions," 61 *Rocky Mt. Min. L. Inst.* 28-1 (2015).

[192] BLM Manual 3160-10 – Suspension of Operations and/or Production § .31.B.2.

[193] 30 U.S.C. § 209; 43 C.F.R. § 3103.4-4.

[194] 43 C.F.R. § 3103.4-4(b); BLM Instruction Memorandum No. 2023-012, *Suspensions of Operations and/or Production* (Nov. 18, 2022).

[195] 43 C.F.R. § 3103.4-4(d); BLM Instruction Memorandum No. 2023-012.

[196] 30 U.S.C. § 209.

[197] *See* BLM Manual 3160-10 – Suspension of Operations and/or Production § .21.B.

[198] BLM Instruction Memorandum No. 2023-012.

[199] *Id.*; 43 C.F.R. § 3103.4-4(a).

[200] BLM Instruction Memorandum No. 2023-012.

a pending APD filed less than 90 days prior to the expiration date of the lease" unless the timing of the APD "reflects an exercise of due care and diligence on the part of the operator."[201] Additionally, the guidance advised that "APD and related requests for suspensions are generally not timely filed where a lease contains timing restrictions, such as wildlife protection stipulations, and the APD and related suspension request did not account for the stipulations."[202] In light of this guidance, operators should take care to file APDs and suspension requests with sufficient time remaining on a lease's primary term to avoid denial of a suspension request.

VII. Measurement and Royalties

Royalty is due on all production "removed or sold" from a federal oil and gas lease.[203] As a result, production may be used on a lease without incurring a royalty obligation.[204] When gas is flared on a lease, production that is "unavoidably lost" does not incur a royalty obligation.[205]

BLM has complex rules for measuring production.[206] All measurement of federal oil and gas that affects the volume or quality of production on which royalty is owed must occur at "facility measurement points" that meet rigid measurement requirements.[207] Measurement must occur within the boundaries of a lease, communitized area, or unit participating area unless BLM approves off-lease measurement.[208] Moreover, production must be measured before it is commingled with production from a different lease, communitized area, or unit participating area.[209]

Production is reported, and royalty is reported and paid, to ONRR. Royalty is due on the last day of the month following the month of production.[210] ONRR has extremely complex rules regarding production valuation and royalty reporting,[211] as well as broad authority to impose significant penalties for incorrect reporting and payment.[212] Operators should entrust federal production report-

[201] *Id.*

[202] *Id.*

[203] 30 U.S.C. § 226(b)(1)(A).

[204] For regulations governing on-lease use of production, see 43 C.F.R. pt. 3170, subpt. 3178.

[205] BLM's management of flared gas is in flux. Currently, Notice to Lessees and Operators of Onshore Federal and Indian Oil and Gas Leases 4A, Royalty or Compensation for Oil and Gas Lost (Jan. 1, 1980) (NTL 4A), governs whether flared gas is royalty-bearing; however, NTL 4A does not control this determination for all prior periods. Last year, BLM proposed a rule addressing flared gas that it has not finalized. *See* 87 Fed. Reg. 73,588 (Nov. 30, 2022).

[206] For a comprehensive discussion of these requirements, see Kathleen C. Schroder, "Bureau of Land Management Rules Affecting Royalty Reporting and Payment," *Federal and Indian Oil & Gas Royalty Valuation and Management* 4-1 (Rocky Mt. Min. L. Fdn. 2018).

[207] 43 C.F.R. §§ 3170.3, 3173.12, 3173.13; *see id.* pt. 3170, subpts. 3174, 3175.

[208] *Id.* §§ 3173.12(a), 3173.22, 3173.23.

[209] *Id.* §§ 3173.14, 3173.15.

[210] 30 C.F.R. § 1218.50.

[211] *See id.* pt. 1206, subpts. C, D.

[212] *See id.* pt. 1241.

ing, and royalty reporting and payment, to individuals who are well trained in ONRR's regulatory requirements.

VIII. Conclusion

Leasing and development of federal oil and gas leases is a complex undertaking. Operators that educate themselves on regulatory requirements and navigate regulatory hurdles set themselves up to successfully develop federal oil and gas resources in southeast New Mexico.

Appendix A: Common Abbreviations and Acronyms

ACEC	Area of Critical Environmental Concern
APA	Administrative Procedure Act
APD	Application for permit to drill
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
CA or "comm agreement"	Communitization agreement
CCA	Candidate conservation agreement
CCAA	Candidate conservation agreement with assurances
CSU	Controlled surface use
COA	Condition of approval
CX	Categorical exclusion
DNA	Determination of NEPA Adequacy
DOI	U.S. Department of the Interior
EA	Environmental assessment
EIS	Environmental impact statement
ENGO	Environmental nongovernmental organization
ESA	Endangered Species Act
FLPMA	Federal Land Policy and Management Act
FONSI	Finding of No Significant Impact
FWS	U.S. Fish and Wildlife Service
HCP	Habitat conservation plan
IBLA	Interior Board of Land Appeals
MLA	Mineral Leasing Act of 1920, as amended
MMS	Minerals Management Service
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NSO	No surface occupancy
ONRR	Office of Natural Resources Revenue
RMP	Resource management plan
ROD	Record of Decision
SHPO	State Historic Preservation Officer
USGS	U.S. Geological Survey

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Part II — Reprints

Subsurface Property Issues in Recent Litigation

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I. INTRODUCTION

It is a sign of the times that one might dedicate an article like this one to recent litigation in the field of "subsurface property." References to "subsurface property" in the case law are few and far between before the 1980s. Yet today, several reported cases each year turn on some "subsurface property" issue. Increasing use of the phrase seems to evidence the growing perception that the deep subsurface holds economic value beyond just the mineral substances that are found within it. More and more, the geologic rock structures that contain minerals are seen as independently useful, especially for their storage capacity for purposes unrelated to mineral extraction. Geologic storage capacity is also understood to be finite and, in some places, even scarce.[1] These changing perceptions seem to be exerting a pressure on landowners and leaseholders that compels them to litigate over the use of subsurface geology—in particular the "pore space" within geologic formations—as never before.[2]

Likely lurking behind these evolving perceptions of the value of non-mineral subsurface resources is a technology that has not yet, itself, spawned any reported litigation: carbon dioxide sequestration, or "storage." Carbon se-

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[1] *See* Joseph A. Schremmer, *Pore Space Property*, 2021 UTAH L. REV. 1, 58–61 (2021).

[2] Pore space refers to void spaces within subsurface rock formations that give sedimentary rocks their characteristic porosity. *Id.* at 2.

questration is the injection of supercritical carbon dioxide (usually captured from the emissions of a powerplant or other industrial source) into the pore space of deep subsurface strata for permanent retention.[3] Landowners in some states appear eager to preserve their underlying pore space for sale or lease to a sequestration project, or for other purposes perhaps not yet conceived. The possibility of a better deal for their pore space in the future is a powerful incentive for landowners to take issue with a mineral lessee's occupying the pore space with low-value produced water—especially when the landowner is not compensated for this use.

Regardless of what is motivating the growth in "subsurface property" disputes, there have been several notable cases of late. The issues addressed in the reported opinions tend to coalesce around a handful of related subtopics. Each of these subtopics has also been, to varying degrees, the subject of prior academic scholarship. The first of these subtopics concerns title to various elements of the earth's subsurface. This is the "who owns the pore space" question, but applied more broadly to things like artificially created caverns. Two recent cases on this important issue are taken up in Part II. The second set of issues follows logically from the first: putting aside who owns title to subsurface resources, what is the scope of the title holder's property rights and what duties does the holder owe to others with rights in the same resource? Issues about the scope of subsurface property rights often arise in conflicts between neighboring owners over their use of a common reservoir. The most important cases in recent years, however, raise the scope question in the context of regulatory takings challenges to state actions limiting the use of subsurface property. Two such cases are treated in Part III.

The next two sets of issues are closely related. Because title to pore space generally rests with the surface estate (more on this, *infra*, in Part II), surface estate owners increasingly are demanding compensation use and occupation of their pore space by mineral developers under state surface damage acts. The degree to which a landowner enjoys a remedy for use of its pore space depends on the breadth of the right granted under the relevant statute. Courts in different states have interpreted their states' surface damage acts for this purpose, as discussed fully in Part IV. The final set of issues pertains to the remedies available to aggrieved subsurface property owners. Part V discusses recent decisions concerning the remedies for claims brought under a surface damage act and for common law claims of subsurface nuisance and trespass.

Not discussed at any length here are recent decisions in two ongoing class action cases involving claims for compensation based on the unconsented use of pore space for natural gas storage. Both decisions relate to motions for class certification. While both opinions prove interesting and instructive regarding the requirements for class certification, neither deals with the legal merits of the plaintiffs' claims for compensation for storage of natural gas in their pore space. Consequently, neither sheds much light on the substantive issues surrounding subsurface property. In *Laudato v. EQT Corporation*, the 3rd

[3] INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, WORKING GROUP III CONTRIBUTION TO THE SIXTH ASSESSMENT REPORT OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE at 11-35 (2022), https://report.ipcc.ch/ar6wg3/pdf/IPCC_AR6_WGIII_FinalDraft_FullReport.pd.

Circuit Court of Appeals reversed the district court's order granting class certification on the grounds that the order failed to describe the class and that the improper class certification placed inappropriate pressure on the defendant to settle the claims.[4] In *Parsons v. Columbia Gas Transmission LLC*, the district court denied the plaintiffs' motion for class certification because the plaintiffs failed to establish most of the requirements for class certification under Rule 23, including commonality and typicality.[5] At a high level, the plaintiffs' proposed class failed because each individual claimant would need to establish title to the rights to store natural gas in its respective tract of land within the defendant's gas storage facility. This would require "extensive individualize title questions related to each unique property."[6]

II. TITLE TO RESOURCES IN THE SUBSURFACE

After occupying the minds of scholars for many years, the question of who owns what elements in the subsurface has become one of the more straightforward subsurface property issues in recent litigation. At this juncture, it is accurate to say that jurisdictions generally recognize that in split-estate lands, in which the surface and minerals are held in separate titles, the surface estate holds title over the surface, all subsurface geological structures, and all subsurface pore space and the fluid contents thereof that are not property of the mineral estate. The mineral estate holds title only to the minerals defined in the terms of the organic grant or reservation. Yet, as the first of the two recent cases discussed in this Part demonstrates, the question of which estate owns title to certain elements of the subsurface may not always be susceptible of easy answers.

A. Ownership of Artificially Created Salt Caverns

Myers-Woodward, LLC v. Underground Services Markham, LLC centered on which of the surface estate and a severed mineral interest in salt owned title to a salt cavern created by the mineral owner's "brine mining" process.[7] The mineral owner, which had used the salt cavern to store oil and gas produced from other lands, sought a declaratory judgment that as owner of the salt it also owned "the exclusive and sole right to store oil, gas, and other gasses or liquids in [the] cave space."[8] The surface owner countered that the mineral estate "owns only the salt" and that they, the surface estate owners, own "the fee simple absolute (including all geologic structures in the subsurface)," and sought a declaratory judgment that the mineral owner did not have the right to use the land "for storage of hydrocarbons or other products or substances."[9]

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[4] 23 F.4th 256 (3rd Cir. 2022).

[5] No. 2:19-cv-00649; 2:20-cv-00279, 2022 U.S. Dist. LEXIS 178910, 2022 WL 4809492 (S.D. W. Va. Sept. 30, 2022).

[6] *Id.* at *29–30.

[7] 13-20-00172-CV, 2022 WL 2163857, 2022 Tex. App. LEXIS 4082 (Tex. App. June 16, 2022).

[8] *Id.* at 3–4.

[9] *Id.* at *5–6.

On cross motions for summary judgment, the trial court declared that the mineral owner "is the owner of the subsurface caverns created by its salt mining activities on the Subject Tract."[10] The trial court relied on a 1991 Texas Court of Appeals case, *Mapco, Inc. v. Carter*, holding that the mineral estate owned title to a similar artificially created salt cavern.[11]

The Court of Appeals reversed, citing familiar authorities for the proposition that "[t]he surface overlying a leased mineral estate is the surface owner's property, and those ownership rights include the geological structures beneath the surface."[12] The court declined to follow *Mapco*, because, in its words, *Mapco* cited no authority. *Myers-Woodward* held instead that artificial salt caverns are property of the surface estate.[13] The parties filed a petition for review in the Texas Supreme Court in January 2023, giving the high court the opportunity to resolve the conflict in its Court of Appeals between *Mapco* and *Myers-Woodward*.

If the Texas Supreme Court grants review, it will be taking on a more difficult question than the Court of Appeals seemed to realize or admit. Doubtless, absent contrary language in the granting instrument, the grantor of a severed mineral interest in oil and gas retains the surface estate consisting of title to the surface, subsurface geologic structures, and even subsurface pore space. But *Myers-Woodward* presents a somewhat different question. It asks whether the grantee of an interest in a salt mass—not oil and gas—holds title to caverns artificially emptied out by the process of producing the salt. That is the particular question addressed in *Mapco*, and it is a different question than who owns the structures and naturally occurring pore space in the subsurface.

Given this, the Court of Appeals dealt too hastily with *Mapco*. It was not accurate to say that *Mapco* failed to cite authority for its conclusion about mineral ownership of subsurface caverns. In fact, it cited, among other sources, *Central Kentucky Natural Gas Co. v. Smallwood*.[14] That case did not involve an artificial subsurface salt cavern, but it did hold that "the mineral rather than the surface owner is entitled to the rental or royalty accruing under a gas storage lease."[15] *Smallwood* reached this conclusion by analogizing to cases holding that the grant of hard-rock minerals confers on the grantee "the exclusive right of possession of the whole space occupied by the layer containing the minerals, and after the minerals are taken out, is entitled to the en-

[10] *Id.* at *6–7. The parties also moved for summary judgment on other claims involving the calculation of royalty owed to the surface owner for salt production. Those portions of the opinion are not discussed here.

[11] 808 S.W.2d 262, 277–78 (Tex. App. 1991).

[12] *Myers-Woodward*, 2022 Tex. App. LEXIS 4082 at *27–28 (quoting XTO Energy Inc. v. Goodwin, 584 S.W.3d 481, 487 (Tex. App. 2017) (citing Humble Oil & Ref'g Co. v. West, 508 S.W.2d 812, 815 (Tex. 1974); Dunn-McCampbell Royalty Interest, Inc. v. Nat'l Park Serv., 630 F.3d 431, 442 (5th Cir. 2011); Brown v. Humble Oil & Ref'g Co., 83 S.W.2d 935, 940 (Tex. 1935))).

[13] *Id.*

[14] *Mapco*, 808 S.W.2d at 277 (citing Cent. Ky. Natural Gas Co. v. Smallwood, 252 S.W.2d 866 (Ky. Ct. App. 1952).

[15] 252 S.W.2d 866, 869 (Ky. Ct. App. 1952), *overruled in part,* Tex. Am. Energy Corpo. v. Citizens Fidelity Bank & Tr. Co., 736 S.W.2d 25 (Ky. 1987).

tire and exclusive use of that space for all purposes."[16] This has been dubbed the "English rule."[17]

There may be reasons to doubt the persuasiveness of *Smallwood*. Before extending the English rule to storage rights in naturally occurring pore space, the court itself acknowledged that American courts generally had not followed the English rule that the grantee of hard rock minerals owns the void space remaining after mineral is removed.[18] Additionally, the Kentucky Supreme Court subsequently overruled portions of *Smallwood* (and other cases) suggesting that natural gas injected for subsurface storage becomes unowned and subject to the rule of capture.[19] Although this subsequent authority does not overrule the particular holding in *Smallwood* that the mineral estate owns the void space remaining in depleted reservoirs, it casts doubt on whether courts in Kentucky would follow *Smallwood* in the future.

The opinion in *Mapco* also fails to inspire much confidence in the proposition. The court's reasoning borders on conclusory. In two separate parts of an extended and oddly organized opinion, *Mapco* defends the proposition on these grounds:

- "The Texas rule is that [a severed] interest in minerals is an interest in real property. Thus, the fee mineral owners retain a property ownership, right and interest after the underground storage facility—here, a cavern—had been created."[20]
- "Texas has recognized the right of the owner of a severed mineral estate to its fee ownership of the minerals in place, coupled with the right to enter upon the surface owner's property in order to explore for, and produce, the minerals. Thus, under well-recognized, decisional law, the continued ownership interest in the mineral estate in an underground storage facility is acknowledged and harmonious with the decisional law of our state."[21]

In both instances, the conclusion is not justified by the premise. In the first, the mere fact that Texas classifies a severed mineral interest as real property does not compel the conclusion that the mineral estate holds title to a subsurface cavern for gas storage purposes. The error is to mistake the classification of the property interest (as real property) for the scope of the property interest (as including title to subsurface caverns). The second statement makes a similar mistake. It leaps to the ultimate conclusion from the fact that a mineral estate in Texas law is a fee estate and that it includes rights to use the servient surface estate for purposes reasonably necessary and convenient for enjoying the minerals. It does not follow from ownership theory or the implied surface-use easement that Texas law recognizes subsurface caverns to be part of a mineral estate.

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[16] *Id.* at 868 (citing Bowser v. Maclean, 17 Eng. Rul. Cas. 452; Batten Pool v. Kennedy, 1 Ch. 256, 76 L.J. Ch. N.S. 162).

[17] *See* 1 PATRICK H. MARTIN & BRUCE M. KRAMER, WILLIAMS & MEYERS, OIL & GAS LAW § 222.

[18] *Smallwood*, 252 S.W.2d at 868 (citing 36 Am. Jur., at 403-404, § 181; Lillibridge v. Lackawanna Coal Co., 143 Pa. 293, 22 A. 1035, 13 L.R.A. 627; Robinson v. Wheeling Steel & Iron Co., 99 W.Va. 435, 129 S.E. 311).

[19] Tex. Am. Energy Corpo. v. Citizens Fidelity Bank & Tr. Co., 736 S.W.2d 25, 28 (Ky. 1987).

[20] Mapco, Inc. v. Carter, 808 S.W.2d 262, 274 (Tex. App. 1991).

[21] *Id.* at 277–78.

A severed mineral interest certainly enjoys rights to use a subsurface cavern for purposes that are reasonably necessary and convenient to the exercise of its mineral rights—even if title to the cavern is held in the surface estate. The mineral estate's easement in the subsurface cavern is not, however, the same thing as title to the subsurface cavern.[22] The two concepts should not be confused. In *Myers-Woodward*, the mineral owner had used the subsurface cavern to store natural gas produced on other lands and for no purpose related to development of its mineral interest in the land itself. For this to be permissible, the mineral owner's estate must hold title to the cavern, not merely an easement in it.

Although *Mapco* itself provides no persuasive reason for the proposition that the mineral estate owns subsurface caverns created by its mining processes, it would be foolish, as the court did in *Myers-Woodward*, to dismiss the proposition out of hand. The English cases granting title to subsurface caverns to the mineral estate have two salient features: they involve interests in hard rock minerals, and the void spaces at issue were not naturally occurring, but instead were created by the mineral owner's mining operations.[23] *Myers-Woodward* involves these same kinds of facts. In this, *Myers-Woodward* bears enough resemblance to the English hard-rock cases to raise the difficult question of whether, in this particular context, Texas law follows the English or the American rule about ownership of caverns resulting from mining.

B. Lienability of Surface Estate by Subsurface Contractor

A related matter is the scope of a lienor's rights in split-estate land when its lien attaches in a mineral interest. In the court's own language, *Anderson Excavating, LLC v. Weiss World L.P.* presented "a novel issue of Pennsylvania law: whether an unpaid contractor can impose a mechanics' lien on a surface owner's property interest when the unpaid contractor's outstanding debt stems from a contract with, and work performed for, the owner of a *subsurface* property interest."[24] The Federal Court for the Western District of Pennsylvania held in the negative, granting the surface owner's motion to dismiss and affirming the separateness of split mineral and surface estates.

Pennsylvania's mechanics' lien statute provides for a lien in "every improvement and the estate or title of the owner in the property."[25] The court reasoned that the statute was not intended to modify the common law, which "clearly establishes that the owner of subsurface rights holds an estate that is distinct from the owner of the surface rights."[26] Moreover, the common law right of the subsurface estate holder to use the surface estate to access the subsurface constitutes a limited easement and not, as required by the statute,

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[22] *See infra*, Part II.B.

[23] *See, e.g.*, Bowser v. Maclean, 17 Eng. Rul. Cas. 452; Batten Pool v. Kennedy, 1 Ch. 256, 76 L.J. Ch. N.S. 162.

[24] 638 F. Supp. 3d 525, 528 (W.D. Pa. 2022).

[25] 49 PA. STAT. ANN. § 1301(a).

[26] *Anderson Excavating*, 638 F. Supp. 3d at 533.

an estate in or title to the surface estate.[27] In consequence of the common law's treatment of surface and subsurface estates as separate and distinct, the contractor of the owner of a subsurface estate cannot, without more, lien the separate property of the owner of the surface estate.[28]

III. SCOPE AND EXTENT OF SUBSURFACE PROPERTY RIGHTS

Separate and apart from the question of which estate holds title to particular subsurface resources is the matter of the extent of subsurface property rights, regardless in which estate those rights are titled. Put another way, what rights and privileges does an owner enjoy, and what duties does it owe to others, in subsurface property? While the correlative rights and duties of ownership of oil and gas in a common reservoir are well understood, comparatively little has been written on the rights and duties attending ownership of pore space in a subsurface reservoir. The growing importance of pore space for produced water disposal and, potentially, carbon sequestration is drawing parties into litigation and leading state legislatures to enact new schemes of pore space regulation. The resulting cases help define the extent of subsurface property rights in pore space.

This Part discusses two regulatory takings challenges to state-level attempts to regulate the use of pore space for fluid disposal.[29] In the first case, the North Dakota legislature adopted a statute precluding surface estate owners from demanding compensation for the use of pore space for oil and gas—an attempt to promote the use of pore space for fluid injection. The state action in the second case was an order suspending an injection well permit intended to curtail fluid disposal that might induce earthquakes. To determine whether the regulation at issue effected a compensable taking, the court in each case examined the extent of property rights in pore space.

Before discussing the cases, however, it is helpful to review at a high level what we already know about the scope of subsurface property rights. In essence, all subsurface resources that are geologically interconnected, including oil and gas as well as pore space, are nonexclusive in nature.[30] One owner's use of such a resource necessarily impacts the ability of other owners to exploit it. This physical reality shapes the scope of the property right that may be claimed in such a thing. The property right cannot entitle its owner to exclusive possession of the thing, since the thing is physically incapable of that kind of control. Instead, the owner enjoys only an opportunity to use and enjoy the thing, which is coupled with a correlative duty not to use it in a manner that would unfairly impinge on another's correlative rights in the resource.[31]

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[27] *Id.*

[28] *Id.*

[29] For an overview of regulatory takings challenges in the oil and gas and mineral law context, see Joseph A. Schremmer, *Crystal Gazing: Foretelling the Next Decade in Oil and Gas Law*, 66 ROCKY MTN. MIN. L. INST. 5-1, § 5.06 (2020).

[30] Joseph A. Schremmer, *Getting Past Possession: Subsurface Property Disputes as Nuisances*, 95 WASH. L. REV. 315 (2020).

[31] Schremmer, *supra* note 1, at 7–11.

In essence, therefore, the property interest in subsurface reservoirs is correlative in nature and gives each correlative rights holder a fair opportunity to use or enjoy a share of the storage capacity of the reservoir or its hydrocarbon contents.[32] Synthesizing the various cases in oil and gas law touching on the correlative rights of reservoir owners, one can articulate the following test for when the actions of one wrongfully infringes on the rights of another. I call the test the "fair opportunity" doctrine, and it consists of three basic elements: (1) an act by the defendant that (2) causes a physical invasion of the plaintiff's property boundaries and (3) damages the plaintiff either by (a) harming its ongoing subsurface activities or (b) depriving it of a fair opportunity to use the subsurface or produce its contents, unless the defendant has made a fair, reasonable, and nondiscriminatory offer to participate in the activity.[33] Keep these attributes of a subsurface property interest in mind as we review the following cases.

A. The Right to Exclude Subsurface Invasions

In one of the most anticipated subsurface property decisions in some years, the North Dakota Supreme Court, in *Northwest Landowners Association v. State of North Dakota*, partially invalidated two state statutes precluding surface owners from demanding compensation for occupation of their pore space by fluid injection.[34] Senate Bill 2344 amended three existing statutes and enacted a new one, all relating to the use of pore space.[35] The legislation added the following subsection to section 38-08-25 of the North Dakota Century Code:

> Notwithstanding any other provision of law, a person conducting unit operations for enhanced oil recovery, utilization of carbon dioxide for enhanced recovery of oil, gas, and other minerals, disposal operations, or any other operation authorized by the commission under this chapter may utilize subsurface geologic formations in the state for such operations or any other permissible purpose under this chapter. *Any other provision of law may not be construed to entitle the owner of a subsurface geologic formation to prohibit or demand payment for the use of the subsurface geologic formation for unit operations* for enhanced oil recovery, utilization of carbon dioxide for enhanced recovery of oil, gas, and other minerals, disposal operations, *or any other operation conducted under this chapter*.[36]

The statute further defines "subsurface geologic formation" as "any cavity or void, whether natural or artificially created."[37]

S.B. 2344 also amended the definition of "land" under the state's Damage Compensation Act, which generally requires mineral developers to compen-

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[32] Joseph A. Schremmer, *A Unifying Doctrine of Subsurface Property Rights*, 46 HARV. ENVTL. L. REV. 525, 560–63 (2022).

[33] *Id.* at 525.

[34] 978 N.W.2d 679 (N.D. 2022).

[35] *Id.* at 685. The bill amended N.D. CENT. CODE §§ 38-08-25, 38-11.1-01 & 38-11.1-03, and enacted § 47-31-09.

[36] *Nw. Landowners Ass'n*, 978 N.W.2d at 685–86 (quoting N.D. CENT. CODE § 38-08-25(5)) (emphasis added).

[37] *Id.*

sate the surface owner for damage caused to the land in mineral production. The amended definition specifically excluded pore space.[38] The legislature adopted this amended definition of land in the wake of the North Dakota Supreme Court's decision in *Mosser v. Denbury Resources, Inc.*, interpreting "land" in the Damage Compensation Act to include pore space.[39] It would appear from S.B. 2344 that the legislature intended to disapprove of the *Mosser* decision that the Act was intended to cover occupation of pore space with injected produced water.

Finally, the legislation enacted a new statute, section 47-31-09(1), providing that "[i]njection or migration of substances into pore space for disposal operations, for secondary or tertiary oil recovery operations, or otherwise to facilitate production of oil, gas, or other minerals is not unlawful and, by itself, does not constitute trespass, nuisance, or other tort."[40]

The Northwest Landowners Association brought a facial challenge to the constitutionality of S.B. 2344, arguing that by "strip[ping] landowners of their right to possess and use the pore space within their lands" the law constituted a *per se* taking of private property under *Loretto v. Teleprompter Manhattan CATV Corp.*[41] On cross motions for summary judgment, the district court found that S.B. 2344 indeed effected a *Loretto* taking, because it required landowners to suffer a permanent physical invasion of their pore space. As a remedy, the district court enjoined enforcement of the legislation.[42]

Briefly, the 5th Amendment of the United States Constitution prohibits the "taking of private property" unless it is for a "public use" and "just compensation" is paid to the property owner. This protection applies to the actions of states through the 14th Amendment.[43] State law defines what constitutes "private property" for purposes of the applying the constitutional prohibition, but federal constitutional law defines what actions by the state constitutes a "taking" of the property.[44] Constitutional precedents recognize two kinds of *per se* takings. *Loretto* takings, of the kind alleged in this case, occur when government action requires a property owner to suffer a physical invasion of the property.[45] *Lucas* takings, in contrast, occur when government regulation of property would deprive it of any economic use or value.[46] When government action is neither a *per se Loretto* or *Lucas* taking, courts apply a balancing test to determine if the action "goes too far" in restricting the owner's property rights, under *Penn Central Transportation Co. v. New York City*.[47]

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[38] *Id.* at 686 (citing N.D. CENT. CODE § 38-11.1-03).

[39] 898 N.W.2d 406, 414 (2017).

[40] *Id.*

[41] *Id.*

[42] *Id.* at 686–87, 690–91 (citing Loretto v. Teleprompter Manhattan CATV Corp. 458 U.S. 419 (1982)). The district court held that the legislation violated both the federal and state constitutions' takings clauses under the *Loretto* rule.

[43] *Id.* at 688.

[44] *Id.* at 689.

[45] *Id.* at 690 (citing Loretto v. Teleprompter Manhattan CATV Corp. 458 U.S. 419 (1982)).

[46] *Id.* (citing Lucas v. S.C. Coastal Council, 505 U.S. 1003 (1992)).

[47] *Id.* at 691 (citing Penn Cent. Transp. Co. v. New York City, 438 U.S. 104 (1978)).

The court held each of the above provisions of S.B. 2344 unconstitutional under the *per se* test of *Loretto*. Its analysis begins by establishing, correctly so, that landowners generally hold title to subsurface pore space.[48] The opinion then concludes that S.B. 2344 is a *per se* taking under *Loretto* because "[i]t allows third-party oil and gas operators to physically invade a landowner's property by injecting substances into the landowner's pore space."[49] This conclusion rests on the premise that the "landowner's right to exclude" is "one of the most treasured rights of property ownership."[50]

The court's analysis is flawed. It skipped an essential step in applying *Loretto* by failing to consider whether the property interest at stake—the landowner's interest in pore space—as it is defined under state law, entitles the owner to the right to exclude physical invasions. The court's logic only holds if a landowner's property interest in pore space includes the right to exclude—which the court assumes it does, without any citation or consideration at all.[51] However, if the court had bothered to consider the scope of pore space property rights, it would have discovered that the matter is far from settled.

Landowners, in fact, lack anything like the right of exclusive possession over their pore space that they enjoy over the surface of their land. The property interest at stake in the *Loretto* case was ordinary ownership of the surface of land, which unquestionably entitles the owner to exclusive possession.[52] But the interest at issue in *Northwest Landowners Association* is in interest in *sub*surface property. As I have argued elsewhere, property rights in pore space are not exclusive or possessory rights.[53] They do not entitle the holder to exclusive physical possession of the property. Rather, pore space property rights are nonexclusive and correlative in nature, much like property rights in oil and gas reservoirs are correlative.[54] This is the true essence of subsurface property rights, even in states (like North Dakota) that classify oil and gas interests as corporeal real property. *Loretto* ought to apply only when the property interest at stake entitles its owner to exclude physical invasions. That is not the case with property in the pore space of a common geologic reservoir.

Furthermore, landowners of pore space in tracts of land where a mineral estate has been severed lack the common law right to exclude the mineral estate from using and occupying the pore space for purposes of developing the minerals. The court acknowledged as much, yet in the next breath described S.B. 2344 as "eliminating the right to exclude."[55] In truth, S.B. 2344 merely amended state law to preclude claims by landowners for compensation for the use of pore space for produced water disposal. It did not grant mineral devel-

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[48] *Id.* at 689–90.

[49] *Id.* at 691.

[50] *Id.* (quoting Cedar Point Nursery v. Hassid, 141 S. Ct. 2063, 2072, 2074 (2021)) (internal quotations marks omitted).

[51] *Id.* at 692.

[52] Loretto v. Teleprompter Manhattan CATV Corp., 458 U.S. 419, 423 (1982) (involving a regulation requiring the owner of a building to install a cable on the building).

[53] *See generally* Schremmer, *supra* note 30.

[54] Schremmer, *supra* note 1, at 7–11.

[55] *Nw. Landowners Ass'n*, 978 N.W.2d at 692.

opers a right to physically invade pore space. That right preexisted in common law by virtue of the mineral estate's implied easement for surface use. The right to receive compensation for pore space use under the Damage Compensation Act certainly did not amount to a right to exclude; in fact, it was premised on the lack of such right.[56]

Also troubling is the court's holding that S.B. 2344's amendment to exclude pore space from the meaning of "land" under the Damage Compensation Act.[57] The legislature's decision to amend the Act appears to have been made in response to the North Dakota Supreme Court's decision in *Mosser v. Denbury Resources, Inc.* The court held in *Mosser* that the word "land" in as used in the Damage Compensation Act includes subsurface pore space and thus that the Act requires compensation be paid to landowners for the injection of wastewater produced from the premises or a unit embracing the premises.[58] S.B. 2344 represents the legislature's disapproval and repudiation of *Mosser*'s holding in this regard. The court's decision in *Northwestern Landowners Association* to invalidate this provision of S.B. 2344 deprives the legislature of its rightful authority to amend its own statute, which it perceived to have been misinterpreted by the judiciary, undermining the principle of legislative supremacy.

Additionally, the court rejected the state's argument that S.B. 2344 was a valid exercise of the police power. Blinded by its inability to conceive of pore space property as nonexclusive or correlative, the court refused to consider the police power argument because "[i]t is inappropriate to treat cases involving physical takings as controlling precedents for the evaluation of a claim that there has been a 'regulatory taking,' and vice versa."[59] In other words, since the plaintiffs challenged the law as a *Loretto* taking, the court felt itself precluded from considering whether the law may be a valid exercise of police power regulation of property, since regulation that would effect a physical invasion is *per se* unconstitutional. Of course, the flaw in this reasoning is that *Loretto* ought not apply to pore space property, which inherently does not include the right to exclude.

Contrary to the court's position, the police power certainly may justify state regulation of the use of pore space in common geologic reservoirs. The police power has long been held to authorize a state to regulate, adjust, and balance correlative rights in common or semicommons property. Consider oil and gas conservation regulation. Since *Ohio Oil Co. v. Indiana* (1900), it has been well-established that a state's police power regulation of common reservoirs of oil

[56] It should be noted that S.B. 2344 could have applied to injections of wastewater produced from lands outside of the surface estate or an authorized unit burdening the servient estate. The effect of its application under these circumstances may have been to deprive surface estate owner of an action in trespass. *Id.* at 693. Without explaining how the potential for an unconstitutional application renders the entire statute facially invalid, the court held that "the dominant mineral estate principle does not save S.B. 2344 from this takings claim." *Id.*

[57] *Id.* at 694–95.

[58] 898 N.W.2d 406, 414 (N.D. 2017).

[59] *Nw. Landowners Ass'n*, 978 N.W.2d at 694 (quoting Horne v. Dep't of Agric., 576 U.S. 351, 361 (2015)).

and gas is valid when intended to protect the correlative rights of the various owners with interests in the reservoir.[60] This is true even when the regulation limits or restricts the rights of property owners to use their share of the common reservoir. As the *Ohio Oil* court explained:

> But there is a co-equal right in them all to take from a common source of supply, the two substances which in the nature of things are united, though separate. It follows from the essence of their right and from the situation of the things, as to which it can be exerted, that the use by one of his power to seek to convert a part of the common fund to actual possession may result in an undue proportion being attributed to one of the possessors of the right, to the detriment of the others, or by waste by one or more, to the annihilation of the rights of the remainder. Hence it is that the legislative power, from the peculiar nature of the right and the objects upon which it is to be exerted, can be manifested for the purpose of protecting all the collective owners, by securing a just distribution, to arise from the enjoyment by them, of their privilege to reduce to possession, and to reach the like end by preventing waste.[61]

Ironically, North Dakota's Damage Compensation Act (the very same statute which S.B. 2344 attempted to amend) was upheld under the state's police power. In *Murphy v. Amoco Production Co.*, an oil and gas lessee asserted that the Act, which required it to pay compensation to the owner of the surface estate for uses that would have been privileged under the common law, was unconstitutional under several provisions including the 5th Amendment takings clause.[62] The court wrote, "[W]here different persons have incompatible interests in the same property, the state can legitimately exercise its police power to protect the interest that matters most to the public welfare, even at the cost of an uncompensated destruction of other interests."[63] Thus, the legislature had the power to regulate the correlative relationship between the surface estate and a severed mineral estate with regard to the latter's implied easement for surface use. It was incoherent for the *Northwester Landowners Association* court to hold that the legislature lacked the power to amend a statute that it was justified in enacting in the first place under the police power—even more so, given that the amendment would have narrowed the scope of the statute's reach.

In short, states certainly may exercise their police power to protect and order correlative rights in pore space in interconnected geologic formations—a point that I have argued more fully in recent work.[64] The *Northwestern Landowners Association* court's holding to the contrary is misguided. That is not to suggest, however, that the particular manner in which the North Dakota legislature exercised its police power in S.B. 2344 was, itself, valid. To resolve that question would return us, again, to the scope of a landowner's correlative rights in pore space. In essence, the property right entitles its holder to only a fair opportunity to use and enjoy the porosity in the common reservoir for ben-

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[60] 177 U.S. 190 (1900).

[61] *Id.* at 209–10.

[62] 729 F.2d 552 (8th Cir. 1984).

[63] *Id.* at 555.

[64] *See* Joseph A. Schremmer, *Subsurface Trespass: Private Remedies and Public Regulation*, 101 NEB. L. REV. 1005, 1069–79 (2023).

eficial, non-wasteful purposes.[65] One must consider whether the particular regulation at issue legitimately orders or protects the correlative fair opportunity rights of all owners of pore space in the common reservoir.[66]

B. The Right to Inject

State ex rel. AWMS Water Solution., LLC v. Mertz arose from an order of the Ohio Department of Natural Resources, Division of Oil and Gas Resources Management, requiring AWMS Water Solutions, LLC to shut-in two saltwater disposal wells following two earthquakes in area.[67] After unsuccessfully challenging the suspension orders, the operator filed this suit alleging an unconstitutional taking of its property in the injection permits, as well as its underlying saltwater disposal lease, injection wells, and ancillary equipment.[68] The operator grounded its takings claim in the assertion that the suspension orders had deprived it of economically viable uses of its property. The state denied the claim, and the issue on appeal reduced to whether the operator could demonstrate any cognizable property interest in its lease, permit, or wells for injection purposes entitling it to protections under the 5th Amendment's takings clause.[69]

The court held that the operator's disposal lease did not confer a cognizable property interest to inject wastewater, because the right to inject was conditioned on obtaining an injection permit. In this view, "[t]he lease represented a gamble," which gave the operator only a "unilateral expectation" of being permitted by the state to inject.[70] This is not the "legitimate claim of entitlement' necessary for a cognizable property interest" under the 5th Amendment.[71] Applying this same logic, the court concluded that the operator also lacked a cognizable property interest in its injection well and related equipment, since these could only be used pursuant to a state-issued injection permit.[72]

In adjudicating the operator's claim to a cognizable property interest in its injection permits, the court focused on whether the permits bore "the traditional hallmarks of property," focusing mainly on three: (i) whether the permits were transferrable, (ii) whether they entitled the operator to the right to exclude, and (iii) whether the right to inject preexisted, or exists independently, of the regulatory scheme under which the operator claimed the permits.[73]

The operator's claim failed on each ground. The court disposed easily of the first ground because the terms of the permits themselves precluded their

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[65] Schremmer, *supra* note 32, at 560–63.

[66] Schremmer, *supra* note 64, at 1052–62.

[67] 2022-Ohio-4571, ¶¶ 2–5 (Ohio Ct. App. 2022).

[68] *Id.* ¶¶ 4–5.

[69] *Id.* ¶ 43. Curiously, as the court noted, this preliminary legal point had not come up at any prior stage in this protracted litigation. *Id.* ¶ 46.

[70] *Id.* ¶ 55.

[71] *Id.*

[72] *Id.* ¶¶ 57–59.

[73] *See id.* ¶¶ 70–75.

transfer or alienation.[74] As to the second "hallmark of property," the right to exclude, the court's reasoning contrasts starkly with that of *Northwestern Landowners Association*.[75] First, the court found that the operator's injection permits "did not give it the right to exclude others from the injection-well industry or confer upon it a discrete segment of the injection industry."[76] More to the point, the court recognized that the operator' disposal lease could not have granted it the right to "universally exclude wastewater that might migrate from other wells onto its leased property."[77] In support of this critical point, the court cited *Chance v. BP Chemicals, Inc.*, in which the Ohio Supreme Court held that landowners lack a claim for subsurface trespass for injectate that migrates into pore space beneath their land, absent a showing of some resulting physical damage or interference with their use of the land.[78]

Finally, the court considered whether the right to inject wastewater into the subsurface for permanent disposal exists independently of the state's permitting scheme. Remarkably, the court declared that "injection cannot be viewed as a traditional property interest under state law or an otherwise common-law right."[79] It justified this statement on the basis that wastewater injection requires a prior permit from the state under the federal Underground Injection Control program. In the court's words, the landowner's or leaseholder's ability to inject "is fundamentally dependent upon statutory compliance with the Division's oversight."[80] Consequently, the operator's permits for injection did not constitute property interests for 5th Amendment takings purposes.

The court's denial of a common law right to inject is all the more remarkable because the injection of brine for disposal actually predates the federal Underground Injection Control program under the Safe Drinking Water Act.[81] Nevertheless, it is true that all wastewater injection—as well as injection of carbon dioxide for sequestration and injection for secondary and enhanced oil and gas recovery—is now prohibited without an Underground Injection Control permit.[82]The upshot, then, of *Mertz* is that the right to inject fluids pursuant to a state-issued permit is not a property right for constitutional purposes. This is in part because the field is so highly regulated, but also because subsurface injection rights are not exclusive in nature. Instead, they are subject to reasonable police power regulation.

When the question is removed from the constitutional context, the owner of a subsurface geologic reservoir has the right (conditioned on obtaining nec-

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[74] *Id.* ¶ 80.

[75] *See supra*, Part III.A.

[76] *Id.* ¶ 89.

[77] *Id.* ¶ 93.

[78] *Id.* ¶¶ 91–92 (citing 670 N.E.2d 985 (Ohio 1996)).

[79] *Id.* ¶ 100.

[80] *Id.* ¶ 101.

[81] *See* Envtl. Prot. Agency, *General Information about Injection Wells* (last updated Aug. 2, 2022), https://www.epa.gov/uic/general-information-about-injection-wells#:~:text=In%20some%20formations%20injection%20enhanced,industrial%20wastes%20into%20deep%20wells (noting that widespread use of injection wells for brine disposal began in the 1930s).

[82] 42 U.S.C. § 300h(b)(1)(A)–(B).

essary permits) to use that reservoir to inject and store fluids like wastewater or carbon dioxide. That right, however, is nonexclusive, or correlative. It is the right to an opportunity, fairly exercised, to occupy a share of the storage capacity of the common reservoir. The state may regulate these correlative rights to order and protect them within reason, even if that regulation would limit their use or even permit physical occupation of the pore space.

IV. SURFACE DAMAGE ACTS AND PORE SPACE

Several oil and gas producing states have enacted legislation requiring mineral developers to compensate landowners for damaging or destroying their land in the process of mineral development. These enactments go by various names, but I will call them, generically, "surface damage acts." Much has been written about the purpose and effects of surface damage acts, and the reader is referred to those sources for a basic primer.[83] In principle, where a surface damage act applies, it modifies the common law relationship between split estates in the same tract of land, *i.e.*, where a mineral interest is held in separate title as a "mineral estate" from fee title in the balance of the land, or the "surface estate." While the surface estate typically holds title to the pore space, the mineral estate enjoys an easement in all elements of the surface estate, including subsurface pore space, for the purpose of using and enjoying the minerals.[84]

In exercising its easement rights, the mineral tenant (i.e., holder of present rights in the mineral estate) owes no compensation to the surface tenant, although it may be liable for excessive user or negligent use of the surface estate's property.[85] Under an applicable surface damage act, the mineral tenant is required to compensate the plaintiff for any resulting damage to the surface estate, even if it would otherwise have been within the mineral estate's easement and, at common law, *damnum absque injuria*.[86] The question has arisen in multiple states, of late, whether surface damage acts require mineral developers to pay compensation to landowners for occupying pore space with injected produced saltwater, even when it does no damage to the subsurface. As the following sections detail, the answer lies in the language of each statute.

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[83] *See generally* Ronald W. Polston, *Redefining the Relationship Between the Surface Owner and the Mineral Developer*, 12 ENERGY & MIN. L. INST. 22-1 (1991); John S. Lowe, *The Easement of the Mineral Estate for Surface Use: An Analysis of Its Rationale, Status, and Prospects*, 39 ROCKY MT. MIN. L. INST. 4-1 (1993); Michelle Andrea Wenzel, *The Model Surface Use and Mineral Development Accommodation Act: Easy Easements for Mining Interests*, 42 AM. U. L. REV. 607 (1993).

[84] The subsurface property issues that exist between split estates largely differ from those that arise between neighboring owners in a common subsurface reservoir. Thus, the fair opportunity doctrine does not apply. For my discussion of what rules apply between split estates, and how they relate to the fair opportunity doctrine, see Joseph A. Schremmer, *The Concurrent Use of Land for Carbon Sequestration and Mineral Development*, 75 BAYLOR L. REV. __ (forthcoming 2023).

[85] Bruce M. Kramer, *The Legal Framework for Analyzing Multiple Surface Use Issues*, 44 ROCKY MTN. MIN. L. FDN. J. 273, 2774 (2007).

[86] 1 MARTIN & KRAMER, *supra* note 17 § 218.8; Marland Oil Co. v. Hubbard, 34 P.2d 278 (Okla. 1934), *overruled in part*, Pure Oil Co. v. Chisholm, 75 P.2d 464 (Okla. 1936).

A. No Compensation for Mere Use of Pore Space

In *Brown v. Continental Resources, Inc.*, lessors under an oil and gas lease sued the lessee for damages under South Dakota's surface damage act for use of the lessor's pore space to inject fluid to repressurize the producing field.[87] The act entitles surface owners to compensation for three categories of loss: "[1] loss of agricultural production, [2] lost land value, and [3] lost value of improvements caused by mineral development."[88] Without addressing whether the statute applies to subsurface elements of the surface estate, the court affirmed the district court's entry of summary judgment for the lessee. It so held because the use of pore space is not one of the categories of compensable loss enumerated in the act.[89] The court declined to find an implied right to compensation for lost use based on the broad pronouncements of public policy and purpose in the act's "legislative findings" and "purpose" sections. While the language of these sections may be reviewed to interpret operative sections of the act that are ambiguous, they are irrelevant to the interpretation of an operative section that is clear and unambiguous.

The *Brown* court found support for its interpretation in the 2011 Montana Supreme Court's decision in *Burlington Resources Oil & Gas Co. v. Lang & Sons Inc.*[90] That court also found that use of pore space is not one of the categories of compensable surface damage identified by Montana's surface damage act.[91] But, *Burlington Resources* opened the door to claims for lost pore space value, such as where pore space is "degraded, damaged, or otherwise consumed."[92] The statute does not require compensation for the mere use of or occupation of pore space without proof of these other elements. The district court in *Brown* also seemed to indicate that the plaintiffs might have a claim under the statute if they had alleged some *damage to* the pore space or groundwater resources, or otherwise demonstrated that the mineral developer's use of their pore space decreased the land's value.[93] The mere use or occupation of pore space, however, could not sustain a claim for compensation under South Dakota's or Montana's statutes.

B. Mere Use Held Compensable

Compensation for mere use or occupation of a landowner's pore space is required under North Dakota's Damage Compensation Act. The long-running litigation in *Continental Resources, Inc. v. Fisher (Fisher II)* involves just such a claim.[94] The plaintiffs own the surface estate in a tract of land subject to a

[87] 5:18-CV-05048-KES, 2021 U.S. Dist. LEXIS 252396, 2021 WL 6755489 (D.S.D. Dec. 29, 2021), *aff'd*, No. 22-1230, 58 F.4th 1023 (8th Cir. Jan. 27, 2023).

[88] *Id.* at *5 (quoting S.D. COD. L. § 45-5A-4) (modifications in original).

[89] *Id.* at *5–7.

[90] 259 P.3d 766 (Mont. 2011).

[91] *Id.* at 771.

[92] *Id.*

[93] Brown v. Cont'l Res., Inc., 5:18-CV-05048-KES, 2021 U.S. Dist. LEXIS 252396, 2021 WL 6755489, at *8-9 (D.S.D. Dec. 29, 2021).

[94] 1:18-cv-181, 2021 U.S. Dist. LEXIS 227504, 2021 WL 5567303 (D.N.D. Nov. 29, 2021).

unitized oil and gas lease operated by the defendant. The defendant drilled a saltwater disposal well on the plaintiff's land to benefit unit operations.[95] Plaintiffs sued alleging, *inter alia*, entitlement to compensation under the Act for use of their pore space to store the injected saltwater.[96]

North Dakota's Act provides, in section 38-11.1-04, that mineral developers must compensate the surface tenant for "lost land value, lost use of and access to the surface owner's land, and lost value of improvements caused by drilling operations."[97] In prior litigation, *Fisher I*, the district court interpreted this provision to allow compensation for "damage to *or use of* the surface owner's land," including "the pore space."[98] This interpretation was compelled by the North Dakota Supreme Court's affirmative answers to two certified questions *Mosser v. Denbury Resources, Inc.*[99] First, in response to the second certified question, *Mosser* concluded that the Act's definition of "land" includes pore space.[100] Second, in response to certified questions three through six, the court explained that compensation under the Act "is not limited to a diminution in market value of the owner of the surface estate's interest and includes a surface owner's lost use of and access to a surface owner's pore space at some time in the future regardless of the surface owner's current use or future plan for use of the pore space."[101] Thus, contrary to the holdings in *Brown* and *Burlington Resources*, compensation is due under the North Dakota Act merely for using or occupying a landowner's pore space.

The parties in *Fisher I* subsequently stipulated to dismiss without prejudice the plaintiffs' claim for use of their pore space, permitting the plaintiffs to pursue the claim if and when the defendant chose to operate its saltwater disposal well. Subsequent, the defendant instituted the lawsuit in *Fisher II*, declaring its intent to commence operating the well.[102] The primary issues in *Fisher II* related to the calculation of compensation for use of the plaintiffs' pore space. The court's discussion of these issues is taken up in the next Part.

V. REMEDIES FOR SUBSURFACE INVASIONS

Downstream of all the foregoing is the subtopic of remedies for violating a title holder's subsurface property rights. While the remedies subtopic has received less attention from scholars, remedies are an integral part of the system of subsurface property rights, and understanding remedies is essential both to planning activities to develop the subsurface and to resolving disputes among subsurface property holders when they arise.[103]A private law remedy is

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[95] *Id.* at *2.

[96] *Id.*

[97] N.D. CENT. CODE § 38-11.1-04.

[98] *Fisher I*, 2021 U.S. Dist. LEXIS 227504 at *7 (quoting 2015 U.S. Dist. LEXIS 189453, 2015 WL 11400124 (D.N.D. Oct. 8, 2015)) (emphasis added) (internal quotation marks omitted).

[99] 898 N.W.2d 406 (N.D. 2017).

[100] *Id.* at 412.

[101] *Id.* at 417.

[102] *Fisher I*, 2015 U.S. Dist. LEXIS 189453, at *8–10.

[103] *See generally* Schremmer, *supra* note 64, at 1007–10.

merely the continuation, in a substituted form, of the private right that was infringed. Blackstone described the purpose of remedies as "redress[ing] the party injured, by either restoring to him his right, if possible; or by giving him an equivalent."[104]

Accordingly, the nature and scope of subsurface property rights delimit the scope of the remedies that should be awarded for their infringement. As discussed above,[105] the nature of subsurface property is correlative, rather than exclusive. The right to a fair opportunity to use a common resource entails a correlative duty not to interfere with the fair opportunity of other right holders to use the resource. A breach of this duty is an interference with another's opportunity to use the resources in a common pool. Consequently, the claim for vindicating a subsurface property right sounds in nuisance, and nuisance remedies are available for a successful claim.[106] This is true even when the claim is denominated as a "subsurface trespass," because subsurface trespass functions like nuisance.[107] Even the common law rule granting enhanced damages for a bad faith trespass and conversion fits with and can be understood as an application of the rules governing nuisance remedies.[108]

The above principles govern common law claims for interference with subsurface property rights. Where a statutory right of compensation applies, such as a surface damage act, the terms of the statute may dictate how compensation is to be determined. However, courts frequently resort to common law remedies for property torts like nuisance in fashioning awards of compensation under statutes. An example of this is discussed below in section A.

A. DAMAGES FOR USE OF PORE SPACE UNDER SURFACE DAMAGE ACT

Having established in *Fisher I* that the plaintiff surface owners may be entitled to compensation under North Dakota's Damage Compensation Act for the defendant lessee's use of pore space to store injected produced water, the principal questions in *Fisher II* centered on calculating the amount of the compensation.[109] The *Fisher* plaintiffs sought compensation for both saltwater injected into their land to date and for future injections.[110] Based on *Mosser*, the plaintiffs sought to calculate the compensation due for past and future injections of saltwater based on a per-barrel fee.[111] To establish the per-barrel fee, the district court permitted the plaintiffs to offer evidence of fees paid for disposal in the locality, including disposal of water produced from outside of the unit.[112] The plaintiffs offered their own testimony and that of a local disposal

[104] 4 WILLIAM BLACKSTONE, COMMENTARIES *7.

[105] *See supra*, Part III.

[106] Schremmer, *supra* note 64, at 1026–28.

[107] *Id.*

[108] *Id.* at 1035–36.

[109] 1:18-cv-181, 2021 U.S. Dist. LEXIS 227504, 2021 WL 5567303, at *7 (D.N.D. Nov. 29, 2021).

[110] *Id.* at *34.

[111] *Id.* at *45–46; Mosser v. Denbury Res., Inc., 898 N.W.2d 406, 416 (N.D. 2017).

[112] *Fisher II*, 2021 U.S. Dist. LEXIS 227504, at *54.

well operator as to the market value for disposal fees, and also proffered evidence of the fees charged by North Dakota for disposal on state lands.[113]

To support the plaintiff's claim for damages for future compensation, an expert witness for the plaintiffs projected a range of estimates of saltwater injections for ten years. A second expert calculated the market value of compensation for future injections by multiplying these injection estimates by a per-barrel injection fee and discounting the net present value of the payment stream.[114] These estimates were based on a number of assumptions, including the future price of oil, the economic life of the producing formation, the projected operational life of the injection well, and the capacity of the aquifer for retaining injection saltwater.[115] The projections did not account for the economic impact of the defendant's payment of a per-barrel fee for injecting into the well or the likelihood (based on other evidence) that the well would be shut down in the relatively near future.[116]

On motion for summary judgment, the defendant asserted the plaintiffs' future damages projections were unduly speculative. The plaintiffs countered that it would be unjust to preclude their recovery for future injections on that basis. The court sided with the defendant and barred the plaintiffs' claim for future compensation, noting "As for Fishers' fairness concern, this can be dealt with by allowing Fishers to bring successive actions for future injections resulting in additional loss of use of pore space, and limiting this action to recovery of compensation for past saltwater injections."[117] The court further concluded that the plaintiffs could not recover for pore space that had not yet been occupied, at least not until the plaintiffs had been denied a permit to use the pore space by the state Industrial Commission due to the defendant's ongoing injection into the same aquifer.[118]

After limiting the plaintiffs' recovery only to barrels of saltwater injected into their pore space as of the date of trial, and recognizing that defendant "should not get a free pass from having to pay compensation for additional pore space it occupies in the future," the court acknowledged the plaintiffs' predicament if the defendant were to continue injecting. The opinion expressly notes that it would be appropriate for the plaintiffs to bring successive actions, from time to time, to recover compensation for additional saltwater injected in the future.[119] As discussed below,[120] the court's award of past damages and recognition of the plaintiffs' right to bring successive future actions as the injection continues is fully consistent nuisance law's rules for temporary damages.

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[113] *Id.* at *46.

[114] *Id.* at *35.

[115] *Id.* at *36.

[116] *Id.* at *37.

[117] *Id.* at *38–39.

[118] *Id.* at *41.

[119] *Id.* at *42–43.

[120] *See infra*, Part V.B.

The alternative remedy to successive actions for past damages would be an injunction prohibiting future injections. The parties did not raise the equitable alternative, however. Even if the plaintiff had sought injunction, courts often decline to enjoin injection operations that are authorized by a state-issued permit.[121] Under nuisance principles, it is appropriate to award temporary damages to a plaintiff suffering from an abatable condition. Certainly, the continuous injection of saltwater into a disposal well is abatable and, if a nuisance, would support an award of temporary damages. However, in cases where the court declines to enjoin the continuing, abatable nuisance because it is conducted under a state-issued permit, plaintiffs are often entitled to permanent damages. Permanent damages compensate the past, present, *and future* losses sustained from a continuing (permanent) nuisance. Permanent damages are often justified in such cases because they avoid the hardship that an injunction may impose on the defendant's otherwise lawful and permitted operations, while at the same time compensating the plaintiff fully for its past and inevitable future losses.[122]

B. Remedies for Subsurface Nuisances

The recovery of future damages was also at issue in *Colt Energy, Inc. v. Southern Star Central Gas Pipeline*.[123] Plaintiffs sued defendant alleging nuisance and other claims arising out of natural gas migrating from defendant's gas storage field into plaintiffs' oil leases and precluding further oil production. The storage gas increased the pressure in the plaintiffs' wellbores and interfered with the plaintiffs' ability to produce oil. Storage gas was alleged to have started negatively impacting the plaintiffs' oil production in 2006, although the only specific evidence pointing to the presence of storage gas under the plaintiffs' lease related to a much later period beginning in 2017. Plaintiffs contended that a well blew out on one of its leases in November 2017 and that testing on that same lease revealed abnormally high downhole pressures in March 2019.[124] The defendant moved for summary judgment, asserting a lack of evidence that storage gas was present under the plaintiffs' leases and of any recoverable damages. Finding that the offered evidence could only establish the presence of storage gas under the lease that experienced the blowout, the court granted judgment as to the plaintiffs' other leases.[125]

The court also granted judgment on the basis that the plaintiffs failed to offer any evidence of recoverable damages. In their response to the defendant's motion for summary judgment, the plaintiffs clarified that their claim was for temporary damages for a temporary nuisance, specifically for damages accruing during the two years prior to filing the complaint.[126] Conceptually, a

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[121] *See* Schremmer, *supra* note 64, at 1044–48 (citing Railroad Comm'n v. Manziel, 361 S.W.2d 560, 568–69 (Tex. 1962); Tidewater Oil Co. v. Jackson, 320 F.2d 157, 163 (10th Cir. 1963)).

[122] *Id.* (citing Tidewater Oil Co. v. Jackson, 320 F.2d 157, 164 (10th Cir. 1963)).

[123] 2022 U.S. Dist. LEXIS 78546, 2022 WL 1288482 (D. Kan. Apr. 29, 2022).

[124] *Id.* at *4.

[125] *Id.* at *12.

[126] *Id.* at *4.

temporary nuisance is one that is reasonably abatable. Most courts focus on whether the *cause* of the injury is abatable, rather than whether the injury itself is abatable.[127] Where an alleged nuisance is abatable, the wrong does not permanently deprive the plaintiff of its rightful use of the subsurface reservoir, and so warrants a remedy for only the period during which the right was infringed. Thus, the legal remedy for a temporary nuisance is temporary damages, which comprise the value of what was lost to the plaintiff during the period of the interference. Temporary damages are often calculated based on lost profits or the lost value of the plaintiff's share of oil or gas wrongfully drained or destroyed. Temporary damages may also include the plaintiff's costs in repairing or restoring the damaged property and may even include the costs of drilling replacement wells.[128] It is not proper to award permanent damages for a temporary nuisance. Permanent damages embrace the total loss of value to the plaintiff's property, past, present and prospective, as a result of the defendant's nuisance. Permanent damages, which include prospective loss of value, are appropriate where the nuisance is not reasonably abatable—where it will continue into the future.[129]

The plaintiffs in *Colt Energy* alleged a temporary (abatable) nuisance but only proffered evidence of permanent damages. Through an expert witness, the plaintiffs established that the total value of the reserves under the plaintiffs' oil and gas leases that could not be produced equaled approximately $7.7 million.[130] The pretrial order acknowledged that this total represented "the economic loss, past, present, and future, resulting from the continuing nuisance created by the presence of high-pressure storage gas."[131] Finding that this evidence established only permanent damages, the court held that the plaintiffs' claim for temporary nuisance could not succeed.

Ordinarily, even if a plaintiff cannot establish evidence of recoverable temporary damages for a continuing, abatable nuisance, an equitable injunction against the continuation of the nuisance may be available in equity. The plaintiffs in this case, however, failed to identify any evidence that the alleged storage gas migration could reasonably be abated.[132] Moreover, the court pointed out, to award the plaintiffs both permanent damages and an injunction against future continuation of the nuisance would give them a double recovery, since permanent damages reflect the lost value of the plaintiffs' property due to future maintenance of the nuisance.[133] On this basis, the court held that the plaintiffs failed to demonstrate any evidence to support the recovery of damages or the issuance of injunctive relief, and granted summary judgment to the defendant accordingly.

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[127] 58 AM. JUR. 2D *Nuisances* § 230; Schremmer, *supra* note 64, at 1029–30. *Contra* Briscoe v. Harper Oil Co., 702 P.2d 33, 36 (Okla. 1985) (adopting the minority approach).

[128] Schremmer, *supra* note 64, at 1029–35; Jameson v. Ethyl Corp., 609 S.W.2d 346, 351 (Ark. 1980); Apache Corp. v. Moore, 891 S.W.2d 671, 680 (Tex. App. 1994).

[129] Greyhound Leasing & Fin. Corp. v. Joiner City Unit, 444 F.2d 439, 445 (10th Cir. 1971).

[130] *Colt Energy*, 2022 U.S. Dist. LEXIS 78546, at *13.

[131] *Id.* at *14.

[132] *Id.* at *14–15.

[133] *Id.* at *15.

Why would the plaintiffs have alleged a temporary nuisance without proof of temporary damages or abatability? Presumably, in the court's words, "to absolve themselves of any statute-of-limitations issues."[134] The statute of limitations for a permanent nuisance, which would support recovery of permanent damages, accrues from the first date the nuisance occurs. Since the plaintiffs alleged the nuisance commenced as early as 2006, their claim for permanent damages was barred by the statute of limitations. Claims for temporary nuisance, on the other hand, accrue continually as the nuisance continues. However, while limiting their claim to temporary damages avoided the limitations problem, it also narrowed the remedies available to the plaintiffs to past (temporary) damages, including repair and remediation costs, and prohibitory injunction. This would have required proof that the nuisance was abatable in fact. Of course, if the nuisance could not reasonably be abated, then the nuisance was not temporary in nature and plaintiffs' temporary damages claim would fail for that reason. The district court's order and opinion were affirmed by the 10th Circuit Court of Appeals.[135]

C. Remedies for Subsurface Trespasses

Tera, LLC v. Rice Drilling D, LLC involved an appeal of a $40 million jury verdict on the plaintiff's bad faith trespass claim against defendants who drilled and produced wells into deep formations leased by the plaintiff.[136] The plaintiff was lessor under oil and gas leases held by the defendants. The leases covered only the Marcellas Shale and Utica Shale formations, and the lessor expressly retained title to all minerals below the base of the Utica Shale.[137] Nevertheless, the defendants completed six wells in the Point Pleasant formation, which the court held was a distinct formation reserved by the plaintiff under the terms of its lease with defendants.[138]

The first relevant issue on appeal was whether the defendants' trespass, by drilling and producing a deeper formation that their lease allowed, was conducted in bad faith. A person trespasses in bad faith when he "commits the trespass willfully, and with the knowledge that he is invading the rights of another, or under such circumstances as to charge him with knowledge of the character of his act."[139] The measure of damages for a bad faith trespass is enhanced from the ordinary measure. Ordinarily, the measure of damages for trespass and conversion of minerals is the market value of the minerals less the reasonable costs incurred in their production and transportation. When the trespass is conducted in bad faith, the measure of damages is enhanced. It becomes the market value of the minerals "at the mouth of the mine," that is, "without any deduction for the cost of labor and other expenses incurred and

[134] *Id.*

[135] 2023 WL 512689 (10th Cir. Aug. 10, 2023).

[136] 2023-Ohio-273 (Ohio Ct. App. 2023).

[137] *Id.* ¶¶ 9–12.

[138] *Id.* ¶¶ 11–12, 51–52.

[139] *Id.* ¶ 53.

transporting them to that point."[140] Ohio law places the burden on the trespasser to prove, by a preponderance of the evidence, that he acted in good faith.[141] Here, the court concluded that the defendants trespassed in bad faith because the depth limitation in their leases were clear and unambiguous, yet they violated them anyway.[142]

In addition to challenging the trial court's judgment that they trespassed in bad faith, the defendants also asserted that the trial court erred in failing to instruct the jury that damages must be measured based on local price indices for natural gas. The jury instruction read as follows: "Damages for a willful trespass are measured by the market value of the oil and gas unlawfully produced at the time of removal, and are calculated without any deductions for any cost or expense."[143] The defendant's expert testified that local indices more accurately reflect the price of gas at the wellhead of the defendants' wells than does the NYMEX price, which the jury applied to determine the plaintiff's damages. Applying a local index price instead of NYMEX would have reduced the damages by more than $500,000 per well per year.[144]

The court declined to hold that the defendants' theory of the case was impaired by the trial court's refusal to grant the desired instruction. It explained that the doctrine imposing damages on a bad faith trespasser measured by the price of the production "at the mouth of the mine" or "at the wellhead" means only that the price of the commodity in place is not to be reduced by production or transportation costs.[145] The doctrine does not require that the sales price applied to amounts produced in a bad faith trespass must be based on local indices. Consequently, the court affirmed the trial court's instruction and the jury's award based on the NYMEX price rather than a local index price.

From there, the court reviewed several challenges to the sufficiency of the evidence supporting the jury's calculation of enhanced damages. The defendants asserted that future damages are not available in this case as a matter of law because the plaintiff did not show that the gas in the ground had been irreparably harmed, rendered inaccessible, or destroyed by virtue of the defendant's wells.[146] Considering expert testimony from both sides, the Court of Appeals upheld the jury's verdict. The court held that the plaintiff's expert testimony provided a sufficient basis for concluding that the remaining gas in the Point Pleasant formation was rendered inaccessible by defendants' wells.[147] The "decline curve analysis established, within a reasonable degree of scientific certainty, that the majority of the gas has been removed from the Point Pleasant, and that the remaining gas has been rendered inaccessible by Rice

[140] *Id.* (citing Brady v. Stafford, 152 N.E. 188 (Ohio 1926)).

[141] *Id.* ¶ 55. The rules for damages for bad faith trespass and conversion are consistent with the principles of nuisance remedies. Schremmer, *supra* note 64, 1048–52.

[142] *Id.* ¶¶ 56–58.

[143] *Id.* ¶ 120.

[144] *Id.* ¶ 121.

[145] *Id.* ¶ 127.

[146] *Id.* ¶ 66.

[147] *Id.* ¶ 100–01.

Drilling to anyone other than Rice Drilling."[148] Based on this, the expert opined that the residual gas was inaccessible "because it would be economically unfeasible for another gas company to drill a new well, at a cost of $10 million, based on the then-current price of natural gas and the amount of gas that remains in the Point Pleasant."[149] Furthermore, he testified that no further wells could be drilled to produce the remaining gas because of the extensive hydraulic fracturing of the defendants' wells and the state's 800-foot offset requirement between wells.[150] This testimony was sufficient to support the jury's award of damages for future production—essentially treating the trespass as permanent in nature.

The court also upheld the jury's calculation of those damages on the basis of the plaintiff's expert testimony. Despite conflicting testimony offered by the defendant, the court held that the plaintiff's expert testimony provided substantial competent evidence to support the jury's determination that 90% of the gas produced by defendant's trespassing wells was from the plaintiff's formation.[151] It also concluded that the decline curve projected by the plaintiff's expert established within a reasonable degree of scientific certainty the amount of reserves remaining to be produced from the formation.[152] Finally, the discount factor that the expert applied to estimate the present value of the future cash flows from production of the remaining gas, pv-10, was determined to be reasonable.[153] The decision is on appeal to the Ohio Supreme Court as of this writing.[154]

VI. Conclusion

In all likelihood, the growth in subsurface property litigation will continue apace into the foreseeable future, raising and resolving novel issues about ownership of subsurface property. One hopes that the lawyers and judges (and legislators) who face these novel issues in the coming years appreciate their role in jurisprudential history. It will be an experience of the kind, though not of the same magnitude, that was shared by the lawyers and judges who first fashioned an "oil and gas law" from the stuff of property, contract, and tort.

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[148] *Id.* ¶ 100.
[149] *Id.* ¶ 83.
[150] *Id.* ¶ 81.
[151] *Id.* ¶ 100.
[152] *Id.*
[153] *Id.* ¶ 86.
[154] 2023-Ohio-427 (Ohio June 6, 2023).

FIRST IN TIME: THE PLACE OF TRIBES IN GOVERNING THE COLORADO RIVER SYSTEM*

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ABSTRACT

Native Americans are the first inhabitants of the Colorado River Basin and have relied on its water and other resources since time immemorial. However, tribes were not involved in shaping the Colorado River Compact and its governing institutions, and they have faced uphill battles to secure, protect, and develop their water rights—including the ability to acquire access to clean water for their members. This article begins by explaining the historic role of tribes in governing the Colorado River system. It then reviews ongoing efforts to better integrate tribal needs, interests, and priorities into management decisions, and to support opportunities for more meaningful engagement of tribes in collaborative problem-solving and decision-making. Finally, the article provides a roadmap for the future role of tribes in governing the Colorado River system. The negotiation and implementation of the post-2026 management framework presents an important inflection point in the history of the basin to enhance the capacity of tribes and to reform the architecture of governance.

INTRODUCTION

The Colorado River system is facing a crisis. For more than two decades, the basin has faced the driest period on record due to drought and climate change.[1] The two largest reservoirs in the United States, Lake Mead and Lake

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[1] Request for Input on Post-2026 Colorado River Reservoir Strategies, 87 Fed. Reg. 37884, 37885 (Jun. 24, 2022) (The Bureau of Reclamation states, "[t]he Colorado River Basin provides essential water supplies to approximately 40 million people, nearly 5.5 million acres of agricultural lands, and habitat for ecological resources across the Southwestern United States and Northwestern Mexico. The limited water supplies of the Colorado River are declining, and the Colorado River Basin is currently experiencing a prolonged period of drought and record-low runoff conditions resulting in historically low reservoir levels at Lake Powell and Lake Mead. The period from 2000 through 2022 is the driest 23-year period in more than a century and one of the driest periods in the last 1,200 years. Absent a change in hydrologic conditions, water use patterns, or both, Colorado River reservoirs will continue to decline to critically low elevations threatening essential water

Powell, are at record low levels.[2] The water supply for more than 40 million people is at risk, along with the ability to generate hydropower.[3] Endangered species and other environmental values are also at risk, and the future looks to be at least as dry as the past two decades.[4]

Despite two deadlines imposed by the U.S. Department of the Interior in 2022, the seven basin states have not yet reached consensus on a plan to cut nearly one-third of current water use.[5] While this effort to craft a short-term plan is a work in progress, water managers are also preparing to renegotiate water allocation agreements put in place in 2007 and 2019 and to produce a long-term water management plan by the end of 2026.

These challenges—or opportunities if you prefer—come at a notable moment in the history of the basin. The 100th anniversary of the Colorado River Compact was recognized in 2022. It is widely considered the cornerstone of the legal and institutional arrangements governing use of the Colorado River system. It is also based on overoptimistic estimates of the river's flows, which makes the fundamental question of how to better align water supply and demand that much harder.[6]

The confluence of these hydrologic and policy imperatives compels water managers to consider a variety of approaches to conserve and share whatever water is available in the basin. Some researchers and leaders in the basin have called for renegotiating the 1922 Compact,[7] while others have called for

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supplies across nine states in the United States and [Mexico] . . . it is foreseeable that without appropriate responsive actions and under a continuation of recent hydrologic trends, major Colorado River reservoirs could continue to decline to "dead pool"—elevations at which water cannot be regularly released from a reservoir—in coming years). *See also* Jonathan T. Overpeck & Bradley Udall, *Climate Change and the Aridification of North America*, 117 PROC. NAT'L ACAD. SCIS. 11856, 11856 (2020); *see generally* BUREAU OF RECLAMATION, COLORADO RIVER BASIN WATER SUPPLY AND DEMAND STUDY (2012), [hereinafter *Bureau of Reclamation Colorado River Basin Study*].

[2] Request for Input on Post-2026 Colorado River Reservoir Strategies, 87 Fed. Reg. at 37885.

[3] *Id.*

[4] *Id. See also,* John Fleck & Brad Udall, *Managing Colorado River Risk*, 372 SCI. 885, 885 (2021).

[5] Christopher Flavelle, *As the Colorado River Shrinks, Washington Prepares to Spread the Pain*, N.Y. TIMES, Jan. 27, 2023, https://www.nytimes.com/2023/01/27/climate/colorado-river-biden-cuts.html. Six of the basin states offered a consensus-based modeling alternative as one framework for making cuts. *See* Letter from Colorado River Basin State Representatives of Arizona, Colorado, Nevada, New Mexico, Utah, and Wyoming to Assistant Sec'y Tanya Trujillo, U.S. Dep't of the Interior & Commissioner Camille Touton, U.S. Bureau Reclamation (Jan. 31, 2023), https://perma.cc/U4CY-UKW5; *see also* Zach Budryk, *Six Colorado River States Submit Alternative to Federal Cuts*, HILL (Jan. 30, 2023), https://perma.cc/B3KS-A5BD. Meanwhile, California, the largest water user in the basin, offered its own modeling alternative. *See* Letter from Chairman JB Hamby, Colo. River Bd. of Cal., to Deputy Sec'y Tommy Beaudreau, U.S. Dep't of the Interior, et al. (Jan. 31, 2023) https://perma.cc/R76P-BX34; *see also* Zach Budryk, *California Submits Separate Colorado River Usage Plan*, HILL, Feb. 1, 2023, https://perma.cc/DV4H-3BC4.

[6] ERIC KUHN & JOHN FLECK, SCIENCE BE DAMMED: HOW IGNORING INCONVENIENT SCIENCE DRAINED THE COLORADO RIVER 7–14, 215–21 (2021).

[7] *Id.* at 220–21; s*ee also* Ian James, *With Severe Drought, An Urgent Call to Rework the Colorado River's Defining Pact*, L.A. TIMES, May 19, 2022, https://perma.cc/WSL5-AN2Z.

scrapping it entirely.[8] Other commentators have also weighed in to suggest strategies to support sustainable water use.[9] As these events unfold, Native American Tribes throughout the basin continue their efforts to secure and develop water rights, and to play a meaningful role in shaping future management of the river system.[10] Twenty-two of the thirty federally recognized tribes in the Colorado River Basin collectively have recognized rights to use 3.2 million acre-feet of river system water annually, or approximately 22%–26% of the basin's average annual water supply.[11] In addition, twelve tribes have unresolved water rights claims, which will likely increase the overall volume of tribal water rights in the basin to about 30% of average annual water supply.[12]

Tribal rights are generally senior to state law-based water rights.[13] However, many tribes have not been able to fully develop their rights due to a combi-

[8] *See, e.g.,* Daniel Craig McCool, *As Climate Change Parches Southwest, Here's a Better Way to Share Water from the Shrinking Colorado River*, CONVERSATION (Nov. 17, 2021), https://perma.cc/U5G7-CPSV.

[9] *See, e.g.,* Margaret Garcia & Elizabeth Koebele, Opinion, *No More Band-Aids: How to Make the Colorado River Sustainable for the Long Term*, ARIZ. CENT., Dec. 26, 2022, https://perma.cc/8ULU-HDX2.

[10] There is no single convention regarding the use of the terms "tribe", "Native American", and "Indian". The word "Indian" is used in this article in direct quotations and in reference to federal and state law and policy consistent with usage in the field of practice known as "Indian Law." The words "Native American" or "Native" are used here in reference to one or more individual members of Tribes. The word "tribe" is used here in reference to distinct political communities of Native Americans.

[11] WATER & TRIBES INITIATIVE, POLICY BRIEF NO. 4: THE STATUS OF TRIBAL WATER RIGHTS IN THE COLORADO RIVER BASIN 1, 1 n.2 (2021), ("Colorado River Basin tribes currently hold water rights to 3,214,088 acre-feet of Colorado River system water annually. This figure is equivalent to nearly 26% of the mean annual flows of 12.44 maf at Lees Ferry from 2000–2018, and nearly 22% of the mean annual flows of 14.76 maf at Lees Ferry from 1906–2018. Adding the outstanding or unresolved tribal claims based on current information, tribes in the Basin may have rights to a total of 3,824,888 acre-feet or more than 30% of the mean annual flows of 12.44 maf at Lees Ferry from 2000–2018, and more than 26% of the mean annual flows of 14.76 maf at Lees Ferry from 1906–2018"). *See generally* HOMA SALEHABADI ET AL., CTR. FOR COLO. RIVER STUD., WHITE PAPER NO. 4: THE FUTURE HYDROLOGY OF THE COLORADO RIVER BASIN (2020). Assuming the quantity of tribal water rights remains constant and river flows decrease, tribes' percentage share of the available water will continue to grow.

[12] WATER & TRIBES INITIATIVE, *supra* note 11, at *1, 1 n.2.*

[13] COLO. RIVER BASIN TEN TRIBES PARTNERSHIP, TRIBAL WATER STUDY REPORT 2-1–2 [hereinafter TRIBAL WATER STUDY] (footnotes omitted) ("Federal Indian reserved water rights generally have one of two priority dates: date of reservation or time immemorial. Where the reserved rights are necessary to fulfill purposes created by the establishing document, the priority date is the date of establishment of the reservation. If, however, water is reserved so a tribe can continue its aboriginal uses, such water may have a time immemorial priority date . . . Federal Indian reserved water rights are defined primarily by federal common law. Indian "[r]eserved water rights are 'federal water rights' and 'are not dependent upon state law or state procedures.' Although federal Indian reserved water rights are often adjudicated in state courts, state courts must apply federal law. These rights differ from state water rights in several respects. Water rights based on state law are largely fixed by the date and quantity of the landowner's initial use or appropriation of water. Laws of the western states (and the federal Reclamation laws) also require the "beneficial use" of water (for example, for mining, irrigation, domestic, municipal, industrial, power production, stock watering, wildlife preservation, and recreation) and typically require the water to be diverted from its source. Failure to use the water for a period of time could result in loss of the right under state forfeiture or abandonment laws. Conversely, federal Indian reserved water rights are quantified based on what is needed to accomplish the reservation's purposes, including past, present, and

nation of infrastructure limitations, funding needs, and political and regulatory constraints.[14] Federal funding and support for the construction of water infrastructure to serve tribal communities has long suffered from underinvestment, especially when compared to many off-reservation, non-tribal communities.[15] Multiple tribes in the basin lack basic access to clean water.

Given that current water use already exceeds reliable supplies, and future flows look bleak, the integration of tribes' development plans with existing and prospective non-Indian water use is a highly consequential issue for the basin's future. The ongoing efforts to reduce water use through conservation and other strategies stand in potential tension with tribes' plans to fully use their water rights to satisfy cultural, economic, environmental, and other interests.[16] For much of the past century, however, tribes have been largely excluded from policy dialogues, planning, and decision-making, and tribes' needs and interests have often been only marginally considered in those efforts.[17]

Given the significance of tribal water rights in the allocation and use of an increasingly scarce water supply—not to mention the historic inequities imposed on tribes—it is imperative that Tribes play a meaningful role in developing and implementing the post-2026 management framework. Fortunately, the basin community seems increasingly willing to recognize this aspiration[18]—over the past several years, federal and state officials, along with water users and other stakeholders, have taken steps to better integrate tribes into planning and decision-making processes.[19] While this is a positive trend, there is still considerable work to be done to establish permanent structures for shared decision-making among the federal government, the basin states, and tribes, and to enhance tribes' capacity to participate in those efforts. Ultimate-

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future uses, not on initial or current use of water. These rights may be used for any lawful purpose on the reservation. Federal Indian reserved water rights also cannot be lost because of non-use under state-law concepts such as abandonment and forfeiture.")

[14] For a partial explanation of this issue, see HEATHER TANANA ET AL., UNIVERSAL ACCESS TO CLEAN WATER FOR TRIBES IN THE COLORADO RIVER BASIN 12–20, 44–46 (2021). *See also* Jessie Blaeser, et al., *Tribes in the Colorado River Basin are Fighting for their Water. States Wish They Wouldn't*, GRIST (Nov. 16, 2022), https://perma.cc/4F6S-BMHA.

[15] *See generally* TANANA, ET AL., *supra* note 14 (providing an overview of current federal water infrastructure programs for tribes, including shortcomings and suggestions for improvement).

[16] *See* TRIBAL WATER STUDY, *supra* note 13, at 5.0–5.11 (explaining how the listed tribes currently use water and how they intend to develop their reserved water rights).

[17] *See, e.g.,* Colorado River Compact, Art. VII (1922) (The sole mention of tribes in the Compact is Article VII, which consists of one sentence: "Nothing in this compact shall be construed as affecting the obligations of the United States of America to Indian tribes.").

[18] In the course of completing over one hundred interviews with tribal and other basin leaders in 2019, the Water & Tribes Initiative (WTI)—a collaborative partnership designed to facilitate connections among tribes and other leaders, build trust and understanding, and create opportunities to explore shared interests and take collaborative action—found that quantification and development of tribal water rights consistently ranked among the top issues basin stakeholders identified as needing to be addressed in developing the next management framework for the Colorado River system. WATER & TRIBES INITIATIVE, TOWARD A SENSE OF THE BASIN: DESIGNING A COLLABORATIVE PROCESS TO DEVELOP THE NEXT SET OF GUIDELINES FOR THE COLORADO RIVER SYSTEM 19–21, 40–41 (2020).

[19] JOHN FLECK, WATER IS FOR FIGHTING OVER AND OTHER MYTHS ABOUT WATER IN THE WEST 7–11, 194–201 (2019) (explaining the "network" of stakeholders and the "collaborative culture" that has emerged in the basin over the past three decades).

ly, no sustainable solution to managing water scarcity in the basin is possible without full, meaningful engagement by and with tribes.

To better understand the past, present, and potential future role of tribes in governing the Colorado River system, this article begins by surveying the legal and sociopolitical status of tribes prior to the Colorado River Compact's drafting in 1922. It then reviews the role of tribes in river system governance over the past 100 years. The article concludes by offering a roadmap to enhance the role of tribes in formulating and implementing policies that will govern the river system moving forward.

I. FIRST IN TIME: THE PLACE OF NATIVE AMERICANS IN THE COLORADO RIVER BASIN

A. Indian Law and Policy: 1787–1934

The fact that there were still tribes whose rights needed to be addressed in the Compact is a testament to tribes' tenacity and resilience in the face of the United States' long-standing program to dispossess them of their lands and diminish if not wholly eliminate their status as discrete political entities.

From the earliest days of the American republic, federal and state policy focused on acquiring Indian lands, by purchase if possible but otherwise by force.[20] Congress and the Supreme Court occasionally recognized tribes' rights to be free from state interference in their affairs,[21] but this principle was far more often acknowledged in theory than realized in practice.[22] Moreover, the

[20] C.G. CALLOWAY, THE INDIAN WORLD OF GEORGE WASHINGTON: THE FIRST PRESIDENT, THE FIRST AMERICANS, AND THE BIRTH OF THE NATION 321–45 (2018); *see also* Letter from George Washington to James Duane (Sep. 7, 1783), https://perma.cc/N8Z8-TTGU ("[P]olicy and economy [sic] point very strongly to the expediency of being upon good terms with the Indians, and the propriety of purchasing their Lands in preference to attempting to drive them by force of arms out of their Country.").

[21] C.G. CALLOWAY, *supra* note 20, at 340–41 (describing the initial passage of the Indian Non-Intercourse Act (INA) in 1790 and some of the subsequent enactments. Currently codified at 25 U.S.C. § 177, the INA prohibits the "purchase, grant, lease, or other conveyance of lands, or of any title or claim thereto, from any Indian nation or tribe of Indians" without the express consent of Congress). *See also* Worcester v. Georgia, 31 U.S. 515, 519 (1832) ("The treaties and laws of the United States contemplate the Indian territory as completely separated from that of the States; and provide that all intercourse with them shall be carried on exclusively by the Government of the Union.").

[22] Upon hearing of Chief Justice John Marshall's opinion in *Worcester*, President Andrew Jackson is reputed to have declared: "Marshall has made his decision; now let him enforce it." Though the quotation itself is now considered likely apocryphal, the sentiment underlying it certain reflects Jackson's attitude toward tribal sovereignty. After first championing the Indian Removal Act of 1830 (Pub. L. 21-148, 4 Stat. 111), his administration later sent federal troops to effectuate the State of Georgia's longstanding effort to eject the Muscogee (Creek) and Cherokee peoples from their ancestral lands, an endeavor that became the Trail of Tears. *See* CLAUDIO SAUNT, UNWORTHY REPUBLIC: THE DISPOSSESSION OF NATIVE AMERICANS AND THE ROAD TO INDIAN TERRITORY 249–54, 275–82 (2020). The Ninth Circuit Court of Appeals aptly put it in a 1956 case: "The numerous sanctimonious expressions to be found in the acts of Congress, the statements of public officials, and the opinions of courts respecting the generous and protective spirit which the United States properly feels toward its Indian wards, and the high standards for fair dealing required of the United States in controlling Indian affairs, are but demonstrations of a gross national hypocrisy." United States v. Ahtanum Irrigation Dist., 236 F.2d 321, 338 (9th Cir. 1956) (citations omitted).

Supreme Court held in the early nineteenth century that tribes only continue to possess whatever attributes of sovereignty are not inconsistent with their status as "domestic dependent nations."[23] This legal fiction situates tribes as sovereign entities that are neither states nor foreign countries in their relationship to the United States.[24] As such, tribes did not enjoy constitutional protections from federal power, such as those afforded to states under the 10th Amendment to the United States Constitution, nor the legal right to stand as equals with the United States. Nonetheless, for nearly the first century of its history, the United States continued prior colonizers' practices of negotiating with tribes for land cessions.[25] Indeed, by 1869, the U.S government had entered into or recognized 375 treaties with tribes.[26] Particularly as the nineteenth century unfolded, these treaties commonly came to involve cessions of significant portions of tribes' aboriginal territory, with tribes retaining smaller territories as homelands—what we know now as "reservations"[27]—in exchange for promises of protection and material support from the United States.[28]

As non-Indians continued to move westward in the nineteenth century, however, the federal government faced increasing pressure to break up even these diminished tribal homelands. In a rider attached to the Indian Appropriations Act of 1871, Congress brought the treaty-making era to an end, declaring that no tribe thereafter was to be recognized as an "independent nation" capable of a sovereign-to-sovereign relationship with the United States.[29] This express repudiation of even the principles of tribal sovereignty articulated by Chief Justice Marshall in *Worcester v. Georgia*[30] made clear that federal power would now be exercised exclusively to supplant rather than support the role of tribes as sovereigns.[31] Sixteen years later, Congress enacted what has been characterized as "the most important, and to the tribes, the most disastrous piece of Indian legislation in United States history: the General Allotment Act of

[23] Cherokee Nation v. Georgia, 30 U.S. 1, 18 (1831) ("[T]he Indians are acknowledged to have an unquestionable, and . . . unquestioned right to the lands they occupy, until that right shall be extinguished by a voluntary cession to our government; yet it may well be doubted whether those tribes which reside within the boundaries of the United States can . . . be denominated foreign nations. They may, more correctly . . . be denominated domestic dependent nations. They occupy a territory to which we assert a title independent of their will, which must take effect in point of possession when their right of possession ceases.").

[24] Montana v. United States, 450 U.S. 544, 565 (1981).

[25] *See generally* FELIX S. COHEN, COHEN'S HANDBOOK OF FEDERAL INDIAN LAW 26–75 (2005).

[26] *See Early Recognized Treaties with American Indian Nation*, UNIV. NEB., https://perma.cc/HMN3-LHYW, (last visited Apr. 23, 2023).

[27] *See* United States v. Winans, 198 U.S. 371, 381 (1905), explaining, "[T]he treaty was not a grant of rights to the Indians, but a grant of rights from them—a reservation of those not granted."

[28] *See generally* CHARLES J. KAPPLER, INDIAN AFFAIRS: LAWS AND TREATIES (*vols 1–5, 1904–1941*).

[29] COHEN, *supra* note 25, at 74, 75.

[30] Worcester v. Georgia, 31 U.S. 515, 519 (1832).

[31] DAVID H. GETCHES ET AL., CASES AND MATERIALS ON FEDERAL INDIAN LAW 187 (Thompson Reuters, 6th ed. 2011).

1887."[32] This "Dawes Act" was designed for two purposes: to open more land for settlement and to destroy tribes as distinct political communities.[33]

The Act authorized the president to allot portions of reservations to individual tribal members, in theory so that they would cultivate the allotments and assimilate into mainstream U.S. society as farmers.[34] Unsurprisingly, "there was no provision for consent of the tribes or the individual Indians."[35] Nor were many of the promised farming implements or supplies delivered.[36] The Act also authorized the Secretary of the Interior to dispose of all "excess" lands remaining after allotments had been made to tribal members, thereby depriving tribes of governmental control over their territory, and making more land available to non-Indian settlers.[37] Tribes' efforts to challenge allotment in the courts were largely unsuccessful, as the Supreme Court declared that tribes and their rights were subject to the "plenary power" of Congress irrespective of any previous treaty commitments made by the United States.[38]

The practical impact of the allotment era on the geographic and political integrity of tribes was catastrophic. Tribes' cumulative landholdings declined from 138 million acres in 1887 to 48 million acres in 1934.[39] Of the 48 million acres that remained, some 20 million were desert or semidesert, a situation particularly acute in the Great Plains and the Southwest.[40] Yet despite decades of military, legal, and political assaults on their rights, their sovereignty, and their way of life, tribal cultures and traditions were not completely destroyed by the allotment policy and assimilative pressures. Tribes and Indian people continued to fight to preserve their lands, their rights, and their cultures.

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[32] William C. Canby, AMERICAN INDIAN LAW IN A NUTSHELL 24 (West Acad. Publ'g, 7th ed. 2020).

[33] GETCHES, *supra* note 31, at 141.

[34] CANBY, *supra* note 32, at 25.

[35] *Id.* at 25.

[36] *Id.*

[37] Indian General Allotment Act of 1887, 24 Stat. 388 § 1-3, repealed by section 106(a)(1) of Pub. L. No. 106-462, 114 Stat. 2007 (2000).

[38] See, e.g., Lone Wolf v. Hitchcock, 187 U.S. 553, 565 (1903) ("Plenary authority over the tribal relations of the Indians has been exercised by Congress from the beginning, and the power has always been deemed a political one, not subject to be controlled by the judicial department of the government."). Viewing Lone Wolf in conjunction with two significant decisions protecting tribes' treaty rights – United States v. Winans, and Winters v. United States – it seems that the early 20th Century Supreme Court continued to adhere to the basic principles articulated in the so-called Marshall Trilogy. United States v. Winans, 198 U.S. 371, 381 (1905) (recognizing the continued existence of a treaty-based tribal fishing right); Winters v. United States, 207 U.S. 564, 577 (1908) (recognizing tribes' reserved water rights). The Marshall Trilogy established that when there is conflict between tribes and the federal government, tribes' rights must yield; but when there is conflict between tribes and states or tribes and individuals, tribes' rights prevail unless Congress has specifically declared otherwise. *See generally* Johnson v. M'Intosh, 21 U.S. 543 (1823); Cherokee Nation v. Georgia, 30 U.S. 1, 18 (1831); Worcester v. Georgia, 31 U.S. 515 (1832). Again, there is significant daylight between the principles articulated by the Supreme Court and real-world practice. But, as discussed further below, the continued vitality of these principles would play a key role in the reinvigorated vitality of tribes as sovereign political communities during the latter part of the 20th Century and to the present.

[39] CANBY, *supra* note 34 at 26.

[40] *Id*.

B. Legacy of Conquest

Moving from national policy and practices to the Colorado River Basin, the first thing to realize is that Native Americans have inhabited the basin since time immemorial.[41] Then, as now, there has been no single, monolithic population that could be referred to as *the* "Native American community." Rather, as our colleague says, "If you know one tribe, you know one tribe."[42] Each of the thirty federally recognized tribes in the basin has a unique history, culture, economy, and government. Yet these diverse communities share two important attributes: their connection to the land and a legacy of conquest.

The Colorado River system is the very place of origin for several Native American communities.[43]

> "It is *the* spot from which they emerged into this world, and from which they migrated for long periods to eventually arrive at their homelands. . . . Further, not only are the river system's corridors places of emergence and migration for Native peoples, they are also places to which tribal members will return when they pass on. Thus, the prevailing sense of stewardship for the land accompanying these connections is as powerful as it is unsurprising."[44]

Native Americans likewise shared a particular view of land ownership. While individual tribes identified with and occupied certain places, Native Americans did not "own" land in the sense of Euro-American colonizers.[45] Individual fee ownership was a wholly alien concept. Instead, Native Americans were dedicated to their communities and to a sense of cooperation for sustenance and survival.[46]

And that brings us to the second attribute—an experience shared by Native American communities within the Colorado River Basin, though not unique to them: a legacy of conquest.[47] Beginning in the first half of the 1500s and extending through the mid-1800s, Spanish and then Mexican leaders sought to upend the lifeways of Native Americans in what is now the American southwest.[48] The Spanish believed themselves superior to Native communities and heritage and assumed an obligation to "civilize" them.[49] When Mexico gained

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[41] *See* Jason Anthony Robison, *Indigenizing Grand Canyon*, 2021 UTAH L. REV. 101, 105–120 (2021) (noting specifically the primary and secondary sources included within the footnotes of that section of the article).

[42] This declarative statement has made its way into conversations about tribes in the Colorado River Basin thanks to our colleague Daryl Vigil, who uses the phrase to emphasize the diversity of tribal needs, interests, capacities, and priorities. The reality that there is no single tribal viewpoint or priority.

[43] *See generally* Robison, *supra* note 41 (describing the origin stories, including places of emergence, of the Havasupai, Hualapai, Hopi, and Zuni).

[44] *Id.* (describing Hopi and Zuni connections to the Colorado River system within and adjacent to the Grand Canyon); *see also* Jason Robison et al., *Community in the Colorado River Basin*, 57 IDAHO L. REV., 1, 12–13 (2021).

[45] Robison, *supra* note 41, at 12–13.

[46] *Id*. at 13-14.

[47] *See generally* EDWARD H. SPICER, CYCLES OF CONQUEST: THE IMPACT OF SPAIN, MEXICO, AND THE UNITED STATES ON INDIANS OF THE SOUTHWEST 1533–1960 (1962).

[48] *Id*. at 281–342 (examining Spanish and Mexican "civilizing" programs).

[49] *Id*. at 284–85.

independence from Spain in 1821, Mexicans followed in their predecessors' footsteps, self-identifying as "bearers of civilization."[50] While Mexico's civilizing program showed some continuity with Spain's, it did grant full citizenship to Native people, incorporate Native people into the nation-state, and distribute individual land parcels to Native families.[51] The United States, by contrast, was generally uninterested in extending political rights to Native Americans after it displaced Mexican control over the region.[52] However, it remained committed to the practice of trying to convert Native lifeways to those of the dominant society.[53]

The cumulative impact of this legacy of conquest created two significant tensions that persist today. First, colonizers tended to view the basin's natural resources—including plants, animals, water, and landscapes—in utilitarian terms, valuing them predominantly as commodities to be exploited for human consumption.[54] Native Americans, by contrast, while certainly living off the land and its resources, generally viewed nature as sacred, endowed with intrinsic value irrespective of its instrumental value to humans.[55] Second, the colonizers sought to impose all-encompassing, centralized political institutions as the primary instruments of social organization, in contrast to the small, local, and autonomous arrangements developed by Native communities.[56]

To appreciate how this legacy of conquest shaped the everyday life of Native Americans in the Colorado River Basin, consider the Jicarilla Apache Nation's story.[57] The tribe's ancestors arrived from the Mackenzie Basin in what is now Canada between 1300 and 1500.[58] The arid southwestern environment forced the Jicarilla people into a seminomadic subsistence lifestyle that ranged across large expanses of what is now northern New Mexico, southern Colorado, and the panhandle area of Oklahoma and Texas.[59] Jicarilla people clustered in family groups for these travels, but still maintained strong social cohesion throughout the entire tribe.[60]

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[50] *Id.* at 5–6.

[51] *Id.* at 334–35.

[52] Native Americans were not formally recognized as United States citizens until the passage of the Indian Citizenship Act of 1924. *See* Pub. L. No. 68-175, 43 Stat. 253 (1924). Even then, it was nearly 40 more years before all 50 states recognized Native Americans' rights to vote in state elections. The suppression of Native Americans' efforts to exercise these legal rights remains an American political tradition. *See*, *e.g.*, JEAN REITH SCHROEDEL, VOTING IN INDIAN COUNTRY: THE VIEW FROM THE TRENCHES, 26 (2020); Democratic Nat'l Comm. v. Hobbs, 948 F.3d 989, 1017-1021, (9th Cir. 2020), *cert. granted sub nom.* Bernovich v. Democratic Nat'l Comm., 141 S. Ct. 222 (October 2, 2020).

[53] SPICER, *supra* note 47, at 345–53.

[54] RICHARD WHITE, "IT'S YOUR MISFORTUNE AND NONE OF MY OWN": A NEW HISTORY OF THE AMERICAN WEST 212 (1991).

[55] *Id.* at 212–13.

[56] SPICER, *supra* note 47, at 6–9.

[57] This narrative draws on Daryl Vigil's personal experience. *See generally* VERONICA E. VELARDE TILLER, THE JICARILLA APACHE TRIBE: A HISTORY (1983).

[58] VELARDE TILLER, *supra* note 57, at 4.

[59] *Id.* at 4–5.

[60] *See id.* at 12–30.

In 1872, the Jicarilla people sought to reserve land in northern New Mexico.[61] Starting in 1873, however, the federal government attempted to move the Jicarilla people to the Mescalero Apache Reservation in southern New Mexico.[62] Many of the Jicarilla people refused to move, and others were dissatisfied living on that reservation.[63] By 1880, a second attempt was made to establish a reservation for the Jicarilla people in northern New Mexico, which again failed, this time due to intertribal conflict, the refusal of the Jicarilla and Mescalero Apaches to consolidate on the same reservation, and settlers' complaints.[64] In 1886, Jicarilla people still living on the Mescalero Reservation left and headed toward northern New Mexico.[65] This migration, combined with government attention to Jicarilla grievances, finally led to establishment of a reservation.[66] "The signing of the Executive Order of February 11, 1887, marked the end of an era in Jicarilla Apache history. The Indians had finally found a permanent home where the government could reasonably assure them of noninterference from whites."[67] At least that was the expectation.

Nearly immediately the Jicarilla people had to confront the allotment era. "For the Jicarillas, [the Dawes Act] created economic hardship and retarded social progress instead of helping to make them capable, self-sustaining American citizens."[68] "The standard of living and the quality of life on the Jicarilla Apache Reservation from 1887 to 1934 was intrinsically related to the economic problems fostered by the Dawes policies.[69] The Dawes philosophy . . . had attempted to reshape the Native Americans' way of life in the image of the American yeoman farmer, without proper planning and necessary tools."[70]

The land reserved for the Jicarilla people was agriculturally unproductive and lacked surface water, leading to dependence on federal rations to survive.[71] Because of these conditions, "[s]ome even left the reservation for fear of starvation."[72] The United States further hindered the Jicarilla people economically.[73] It was slow in building an agency, which was supposed to provide material support.[74] It limited the Jicarilla people's ability to earn income through employment.[75] Tribal efforts to improve their situation were suppressed.[76] The United States also egregiously mismanaged Jicarilla funds.[77]

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[61] *See id.* at 77–98.
[62] *Id.* at 77–78.
[63] *Id*. at 78–83.
[64] *Id.* at 83.
[65] *Id.* at 94.
[66] *Id.* at 97–98.
[67] *Id.* at 97.
[68] *Id.* at 99.
[69] *Id.* at 140.
[70] *Id.* at 140.
[71] *Id.* at 100, 120, 133.
[72] *Id.* at 108.
[73] *Id.* at 140.
[74] *Id.* at 105–06.
[75] *Id.* at 112, 121.
[76] *Id.* at 125, 127.

"Mismanagement of tribal funds was nothing new; but in the period 1908–20, when the tribe was in greatest economic need, the government chose to tie up its funds. While the funds were lying idle, the Jicarilla people were suffering unnecessarily from the ravages of poverty."[78]

During this time, the Jicarilla people came to the brink of extinction. Given the poor economic circumstances, poor living conditions, poor nutrition, and inadequate healthcare, tuberculosis, trachoma, measles, and influenza pervaded, reducing the population by over 30% between 1896 and 1920, from 853 to 588 people.[79] This figure remained below 600 people until 1923 (one year after the Colorado River Compact was ratified).[80]

The Jicarilla experience was not unique. Many other tribes in the Colorado River Basin and across the American West suffered similar travails.[81]

C. Role of Tribes in Shaping the Colorado River Compact

Considering this historical context, it is not surprising that Native Americans did not have a role in shaping the Colorado River Compact.

In a series of meetings in the 1910s and 1920s leading up to creation of the Colorado River Commission, the League of the Southwest wondered about the federal government's obligation to protect the water rights of Native Americans.[82] Whatever authority or responsibility the federal government may have had as a legal matter, "little was said about Indians or their water rights in any discussion of the Colorado River, including the deliberations at league meetings. Indians were a forgotten people in the Colorado Basin, as well as in the country at large; and their water needs, when not ignored, were considered negligible."[83]

By November 1922, the Colorado River Commission had reached agreement on the major issues of water allocation and storage and was now in a position to take up "the lesser questions" that remained.[84] One of these regarded tribal water rights. According to Norris Hundley, Jr., "[n]o attempt was made to discover how many Indians were in the basin or what their water

[77] *Id.* at 115–16.

[78] *Id.* at 113.

[79] *Id.* at 131.

[80] *Id.*

[81] *See* Jason Robison et al., *supra* note 44, at 28–30. Examples of similar histories can be seen with respect to tribes holding traditional connections to the Grand Canyon. *See* Jason Anthony Robison, *supra* note 41, at 124–27.

[82] The League of the Southwest was formed in November 1917 as a regional booster organization dedicated to promoting the Southwest and supporting economic development. By the time of its fourth meeting in Denver, Colorado in August 1920, the League had become a single-issue organization dedicated to the development of the Colorado River. At that meeting, Colorado lawyer Delph Carpenter proposed that the Colorado River states create a compact or interstate treaty under Article I Section 10 of the U.S. Constitution. In 1921, Congress authorized the states to negotiate an agreement for allocation of the river water, leading to the 1922 Colorado River Compact. *See* NORRIS HUNDLEY, JR., WATER AND THE WEST: THE COLORADO RIVER COMPACT AND THE POLITICS OF WATER IN THE AMERICAN WEST 83–138 (Univ. of Cal. Press, 2nd ed. 2009).

[83] *Id.* at 80.

[84] *Id.* at 210.

needs were. The commission simply assumed that the water rights of Indians were 'negligible.'"[85] Realizing that the federal government had some type of obligation to Native Americans, the federal representative on the Commission—Secretary of Commerce (and future President) Herbert Hoover—argued that it would be unwise to completely ignore this question.[86] Hoover therefore offered the so-called "wild Indian article," which was incorporated as Article VII of the Compact: "Nothing in this compact shall be construed as effecting the rights of Indian tribes."[87] As explained by at least one scholar, this de minimis consideration of tribal water rights left unresolved one of the most important issues in the basin.[88]

The Compact's disregard of tribal water rights is particularly ironic given that the U.S. Supreme Court had announced the Indian reserved water rights doctrine in *Winters v. United States* (1908), fewer than 15 years before the Compact's negotiation.[89] The *Winters* doctrine holds that when land is designated as an Indian reservation—whether by treaty, executive order, or statute—that reservation includes a right to enough water to satisfy the reservation's purpose(s).[90] The priority date for these water rights is no later than the date of the reservation's creation, which in the western United States (including the Colorado River Basin) often occurred before significant Euro-American settlement and water development.[91] Tribal uses that predate the reservation's creation are entitled to a priority date of "time immemorial."[92] This means that tribes have some of the most senior water rights to the Colorado River system's flows.[93]

Read in light of *Winters*, Article VII of the Compact is best understood to disclaim any intent to affect the recognition or realization of tribal water rights. Yet here is another discrepancy between principle and practice. Since the Compact's ratification in 1922, tribes' efforts to secure recognition, quantification, and development of reserved rights have been fraught with conflict, op-

[85] *Id.* at 211.

[86] *Id.* at 211–12.

[87] Colorado River Compact, Art. VII (1921); Lloyd Burton, *The American Indian Water Rights Dilemma: Historical Perspective and Dispute-Settling Policy Recommendations*, 7 UCLA J. ENV'T LAW & POLICY 1, 16 (1987).

[88] DANIEL MCCOOL, NATIVE WATERS: CONTEMPORARY INDIAN WATER SETTLEMENTS AND THE SECOND TREATY ERA 160 (The U. of Ariz. Press, 2022).

[89] Winters v. United States, 207 U.S. 564, 577 (1908).

[90] *See generally* Winters v. United States, 207 U.S. 564 (1908).

[91] SANDRA B. ZELLMER & ADELL L. AMOS, WATER LAW IN A NUTSHELL 382–83 (6th ed. 2021).

[92] Cong. Rsch. Serv., Indian Water Rights Settlement 4 n. 2 (2023).

[93] There is no single source that tabulates the relative priority of tribal and non-tribal water rights in the basin. The Supreme Court's 2006 consolidated decree in *Arizona v. California* highlights the relative seniority of the reserved rights held by the five Lower Colorado River tribes to their non-Indian neighbors with rights covered by that decree. Arizona v. California, 547 U.S. 150, 169, 174, 181(2006). The Water & Tribes Initiative's policy brief on *The Status of Tribal Water Rights in the Colorado River Basin* provides a comprehensive picture of tribal water rights in the basin but does not present them in the context of non-tribal water rights. This state of affairs in part further illustrates the basin community's longstanding neglect of tribal water rights but is also a consequence of the size of the basin and the fact that water rights regulation is most commonly and intra- rather than inter-state matter, *See generally* WATER & TRIBES INITIATIVE, *supra* note 11.

position, and delay.[94] The application of *Winters* to the basin was not formally applied until the U.S. Supreme Court's *Arizona v. California* decision in 1963,[95] and over significant objections from the State of Arizona.[96] In light of this history, an arguably more realistic interpretation of Article VII is that the Compact negotiators simply wished the federal government would make the Indian "problem" go away.

There is a rather obvious irony here. A key tenet of Western water law is "first in time, first in right."[97] Native Americans are indisputably the first people to inhabit the Colorado River Basin.[98] However, tribes were not involved in shaping the Compact (the so-called "cornerstone" of the Law of the River), and they have since faced an uphill battle to have their water rights recognized and realized, historically playing little to no role in formulating and implementing policy for the river system. In other words, first in time, first in right apparently applies to some people but not all people, at least not equally.

II. AN EVOLVING ROLE: TRIBAL ENGAGEMENT IN COLORADO RIVER GOVERNANCE, 1922–2022

A. Role of Tribes in Basin Governance[99]

On November 24, 1922, representatives of the seven Colorado River Basin states joined then-Commerce Secretary Herbert Hoover at The Bishop's Lodge in Santa Fe, New Mexico to sign the Colorado River Compact.[100] This agreement was historic for several reasons. It was the first interstate water compact drafted in U.S. history.[101] It laid the groundwork for Hoover Dam's construction, which changed the fate of the Southwest.[102] It brought a measure of stability to the basin by trying to assess and make space for the seven basin states' current and future water needs.[103] It did all of this, however, by largely ignoring inconvenient science of the day, which suggested there was not enough water to satisfy the ambitions of all the farms' and cities' boosters and the politicians serving them.[104] And the Compact largely ignored tribes' needs, interests, and

[94] *See generally* JOHN SHURTS, INDIAN RESERVED WATER RIGHTS: THE WINTERS DOCTRINE IN ITS SOCIAL AND LEGAL CONTEXT (U. of Okla. Press: Norman, 2000) (outlining the history of Indian reserved water rights).

[95] Arizona v. California, 373 U.S. 546, 600 (1963).

[96] *See generally* Oral Argument *Arizona v. California*, 373 U.S. 546 (1963), https://perma.cc/GZS9-DCQH.

[97] *See generally* ANTHONY DAN TARLOCK ET AL., WATER RESOURCE MANAGEMENT: A CASEBOOK IN LAW AND PUBLIC POLICY 121–192 (7th ed. 2014).

[98] *See* Robison et al., *supra* note 44, at 12–13. *See generally* PATRICIA NELSON LIMERICK, THE LEGACY OF CONQUEST: THE UNBROKEN PAST OF THE AMERICAN WEST 179–221 (1987).

[99] *See generally* Jay Weiner, *Colorado Basin Tribal Water Rights*, 202 WATER REP. 6 (2020); WATER & TRIBES INITIATIVE, *supra* note 18.

[100] See HUNDLEY, *supra* note 82, at 1–2.

[101] *See generally* TARLOCK ET AL., *supra* note 97, at 806–855.

[102] *See generally* HUNDLEY, *supra* note 82.

[103] *Id.*

[104] For an excellent review of this history, see generally ERIC KUHN AND JOHN FLECK, SCIENCE BE DAMMED: HOW IGNORING INCONVENIENT SCIENCE DRAINED THE COLORADO RIVER (2019).

water rights—a practice that persisted until at least the latter half of the twentieth century.

The continued evolution of federal Indian policy across the 20th Century helps contextualize basin tribes' participation—or the lack thereof—in governance. Moving away from the explicitly assimilationist and expropriative policies underly the Dawes Act, Congress ended the allotment era and granted more administrative control to tribes by passing the Indian Reorganization Act of 1934.[105] Among other things, the Act sought to protect the remaining tribal land base and empower tribes to establish legal structures for self-government.[106] These developments proceeded from the assumption, quite contrary to the allotment policy, that tribes would not only be in existence in perpetuity, but that they *should* be. In the 1950s and 1960s, however, the pendulum swung back again, leading to congressional efforts to "terminate" several tribes in an effort to end their existence as distinct political communities and to wholly assimilate their members into the dominant culture. Beginning in the 1970s, federal Indian policy shifted once again and reemphasized self-determination and self-governance.[107]

Against this backdrop, it is unsurprising that tribes' participation in Colorado River governance was at best mixed until the 1990s. For starters, the Upper Colorado River Basin Compact of 1948 incorporated a nearly identical provision as the Colorado River Compact's "wild Indian article": "Nothing in this Compact shall be construed as . . . [a]ffecting the obligations of the United States of America to Indian tribes."[108] Although the 1922 and 1948 compacts both acknowledge that the federal government has "obligations" to tribes in the basin, it was not until 1964 that any tribal water rights in the basin were legally quantified, with the U.S. Supreme Court's issuance of its *Arizona v. California* decree.[109] That decree established the rights of five tribes with reservations along the Lower Colorado River.[110] However, the Court also held that any tribe's water use within a given state must be charged against the state's allocation under the decree, thereby creating a disincentive for states to facilitate tribal water development and use when such uses might conflict with more favored constituencies.[111]

The process of quantifying tribal water rights in the Colorado River Basin reached a new phase with the advent of the modern settlement era in 1978, when the Ak-Chin Indian Community Settlement Act was approved.[112] By the

[105] Indian Reorganization Act of 1934, Pub. L. No. 73-383, 48 Stat. 984 (1934).

[106] Indian General Allotment Act of 1887, 24 Stat. 388 § 1-3, repealed by section 106(a)(1) of Pub. L. No. 106-462, 114 Stat. 2007 (2000).

[107] *See* Indian Self Determination and Educational Assistance Act of 1975, Pub. L. No. 93-638, 88 Stat. 2203 (1975).

[108] Upper Colorado River Basin Compact, Art. XIX(a) (1948).

[109] Arizona v. California, 376 U.S. 340, 343–53 (1964).

[110] *Id.* at 344–45.

[111] *Id.* at 343.

[112] *See* CONG. RSCH. SERV. & CHARLES V. STERN, INDIAN WATER RIGHTS SETTLEMENTS 1, 6 (2020) (providing a useful compendium on the current status of Indian reserved water rights settlements nationally). *See also Native American Water Rights Settlement Project*, UNIV. N.M.: DIGIT. REPOSITORY (last visited Apr. 23, 2023), https://perma.cc/2RR9-EPAQ (providing an online data base of settle-

end of 2020, 13 of the 30 federally recognized tribes in the Colorado River Basin had quantified water rights.[113] Five other tribes have some quantified water rights as well as some outstanding claims.[114] Altogether, through adjudication or settlement, these 18 tribes have recognized rights to a total of "3,206,088 acre-feet per year (af/yr), equal to 26% of the Colorado River's mean flow of 12.44 maf/yr at Lee's Ferry from 2000–2018 and nearly 22% of the mean flow of 14.76 maf/yr at Lee's Ferry from 1906-2018."[115] The tribes mainly use this water for irrigation, municipal, and residential purposes.[116] Twelve tribes have wholly outstanding or unresolved claims, many of which are being pursued through ongoing settlement negotiation.[117]

Even with better recognition of the scope and substance of their water rights, however, basin tribes have only more recently been able to participate meaningfully in policy dialogues, planning, and decision-making. This situation is partly attributable to the fact that, for many years, there was little incentive for tribes, individually or collectively, to demand representation in basin governance.[118] Contending with the pendulum of federal Indian policy, tribes needed to focus on the quantification and development of their own water rights ahead of broader policy and governance issues, while simultaneously addressing myriad other challenges with limited resources.[119] Also, through the 1980s water supply was greater than demand, so tribes' rights were generally not yet at meaningful risk of being crowded out by non-Indian water users.[120] And the seniority of tribes' priority dates (and the language of Article VII of the 1922 Compact) may have been viewed as sufficient to defer tribes' needs to take a more active role basin-wide.[121]

This situation began to change with the formation of the Ten Tribes Partnership (TTP) in 1992. TTP is a coalition of Upper and Lower Basin tribes advocating for increased influence and management of the Colorado River.[122] It includes ten tribes with water rights to the mainstem of the Colorado River, including the five Lower Basin tribes whose rights were decreed in *Arizona v. California* (Chemehuevi Indian Tribe, Cocopah Indian Tribe, Colorado River In-

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ments and other documents that "formalize the recognition of Native American water rights in the United States").

[113] *See* WATER & TRIBES INITIATIVE, *supra* note 11, at 3 (referencing current and comprehensive information on tribal water rights in the Colorado River Basin).

[114] *Id.*

[115] *Id.*

[116] *See* TRIBAL WATER STUDY, *supra* note 13, at 5.11-3, 5.11-4.

[117] WATER & TRIBES INITIATIVE, *supra* note 11, at 7.

[118] Weiner, *supra* note 99.

[119] *Id.*

[120] *Id.* at 5. *See generally The Hardest Working River in the West: A Story Map Exploring the Colorado River Through Data*, BABBITT CTR. FOR LAND & WATER POL'Y (Jan. 23, 2023), https://perma.cc/8UW3-VP7V; SALEHABADI, *supra* note 11.

[121] Weiner, *supra* note 99; *see* Colorado River Compact, Art. VII (1922) (codified at 43 U.S.C. 617l) (1928) (referencing that "nothing in this compact shall be construed as affecting the obligations of the United States of America to Indian tribes").

[122] *See Partnership*, TEN TRIBES PARTNERSHIP, https://perma.cc/7DUF-HQZF (last visited Apr. 23, 2023).

dian Tribes, Fort Mojave Indian Tribe, and Quechan Indian Tribe); four tribes in the Upper Basin (Ute Indian Tribe, Southern Ute Tribe, Ute Mountain Ute Tribe, and Jicarilla Apache Nation); and the Navajo Nation, whose reservation (and water rights) spans portions of both the Upper Basin and Lower Basin.[123] The TTP's purpose is to "increase the influence of tribes in Colorado River management and provide support for the protection and use of tribal water resources."[124]

The TTP has played a significant role in raising awareness and understanding of tribal water rights in the basin and the need for ensuring greater tribal participation in policy dialogues about river system management. It was also the driving force behind the *Tribal Water Study*, the most comprehensive look taken to date at the scope and status of tribal water rights in the basin.[125] The *Study* was the product of collaboration between the TTP and the Bureau of Reclamation between 2014 and 2018. It was initiated after Reclamation's *2012 Colorado River Basin Supply and Demand Study* attempted to characterize tribes' water rights and development plans without closely coordinating with basin tribes.[126] The *Tribal Water Study* highlights the ten TTP tribes' current and anticipated water uses, as well as some potential effects that additional tribal development may have on the river system.[127]

Other notable events reinforced this incremental progress of better addressing tribal water rights and integrating tribes into planning and decision-making processes. The 2004 Arizona Water Settlements Act made the Gila River Indian Community the single largest entitlement holder of Central Arizona Project water, and thus a critical player in Arizona and basinwide water management.[128] Similarly, the Colorado River Indian Tribes, who were decreed the single largest entitlement to Colorado River water in Arizona in *Arizona v. California*, seek to more fully utilize their water rights for on-reservation irrigation and off-reservation marketing and banking.[129] These and other examples

[123] TRIBAL WATER STUDY, *supra* note 13, at 3-1, 5.11-1.

[124] TEN TRIBES PARTNERSHIP, *supra* note 122.

[125] *See generally* BUREAU RECLAMATION, COLORADO RIVER BASIN TEN TRIBES PARTNERSHIP STUDY (2018).

[126] *Id.* at 1, n. 1.

[127] *See generally* TRIBAL WATER STUDY, *supra* note 13.

[128] According to the Central Arizona Project (CAP), "There are 22 federally recognized tribes in the state of Arizona. *About/Tribal Water Rights*, CAP, https://perma.cc/SS8K-47JV (last visited May 5, 2023). Of those tribes, 14 have either fully resolved, adjudicated rights, or partially resolved water rights claims; and of that group, a number of those tribes received a significant portion of their water through the CAP. Eleven Arizona tribes have outstanding water rights claims. Going forward, the 2004 Arizona Water Settlements Act set aside an additional 67,300 acre-feet of CAP water to address any remaining water rights settlement claims: 33,107 acre-feet remains for future settlements after the White Mountain Apache received 23,782 acre-feet; 6,411 acre-feet was reserved for the Navajo Nation; and 4,000 acre-feet was granted to the Hualapai Tribe in its pending settlement. In total, approximately 46% of the CAP water supply is, or will be, permanently allocated to Arizona Indian Tribes. This makes CAP the largest single supplier of Colorado River water to tribal water users in the Colorado River system." The website information highlights which Arizona tribes have fully resolved water rights, partially resolved water rights, unresolved water rights, and adjudicated rights. Arizona v. California, 373 U.S. 546, 83 S. Ct. 1468 (1963).

[129] *See Ian James*, Colorado River Tribes Seek Approval from Congress to Put Water on the Market in Arizona, AZ CENTRAL, https://perma.cc/WTW8-YTLE (Jan. 4, 2021, 4:34 PM).

illustrate that tribes are increasingly engaged in transactional problem-solving.[130]

The 2007 Colorado River Interim Guidelines for Lower Basin Shortages and Coordinated Operations for Lake Powell and Lake Mead (2007 Interim Guidelines),[131] however, reflect a significant missed opportunity to advance tribal engagement. Facing an historic drought, plummeting reservoir storage, and ongoing climate change, the federal government and the basin states embarked on a process in 2005 to develop a set of operating criteria for Lake Mead and Lake Powell to address a range of water conditions, particularly low flows.[132] The negotiations ultimately led to adoption of the 2007 Interim Guidelines, which govern management of the river system through 2025.[133] From the perspective of tribes, there was insufficient government-to-government consultation by the United States during these negotiations or regarding their ultimate outcome.[134] While the guidelines express a desire to increase "flexibility" in the basin, no consideration was given to whether and how tribes could provide or facilitate creative mechanisms to address the risks of water shortages.[135] Continued frustration with this missed opportunity is evident from comment letters sent by various tribes to Reclamation in 2020 during the agency's formal review of the 2007 Interim Guidelines.[136]

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[130] Another example of how tribes play a role in transactional problem-solving is the forbearance agreement entered into by the Quechan Indian Tribe and the Metropolitan Water District of Southern California (MWD) as part of a 2005 settlement of Quechan's claims for additional water rights above what was decreed by the United States Supreme Court in 1964. This agreement, approved by the U.S. Supreme Court in its 2006 Consolidated Decree issued in Arizona v. California, provides that if the Quechan Tribe chooses in a given year to "forbear" from diverting up to 13,000 acre-feet of its then-newly recognized water right in California, MWD will pay the Tribe on a per acre-foot basis at a predetermined rate for this forbearance. MWD is then entitled to divert the volume of water the Tribe forbears from diverting. Arizona v. California, 547 U.S. 150 (2006). This approach, while yet to be replicated elsewhere in the Basin, is worth further consideration as a model for simultaneously addressing tribes' needs to be able to fully benefit from their water rights and allowing the Basin to plan more strategically for an environment of water scarcity. For a more thorough review of recent transactions involving tribes and other water users, see generally WATER & TRIBES INITIATIVE, DEVELOPING THE NEXT FRAMEWORK TO MANAGE THE COLORADO RIVER: FLEXIBLE TOOLS TO BENEFIT TRIBES AND THE BASIN (2022).

[131] *See generally* BUREAU RECLAMATION, RECORD OF DECISION, COLORADO RIVER INTERIM GUIDELINES FOR LOWER BASIN SHORTAGES AND COORDINATED OPERATIONS FOR LAKE POWELL AND LAKE MEAD (2007).

[132] *Id.*

[133] *See Colorado River 2007 Interim Guidelines And Drought Contingency Plans*, WATER EDUC. FOUND., https://perma.cc/FQ7V-C9FY (last visited April 20, 2023). The Bureau of Reclamation has begun a process to revise the 2007 Interim Guidelines ahead of their scheduled expiration to incorporate more shortage management tools. *See* Notice of Intent To Prepare a Supplemental Environmental Impact Statement for December 2007 Record of Decision Entitled Colorado River Interim Guidelines for Lower Basin Shortages and Coordinated Operations For Lake Powell and Lake Mead, 87 Fed. Reg. 69042, 69042-69045 (Nov. 17, 2022).

[134] *See* Letter from Colorado River Tribes to David Bernhardt, Secretary of the Interior (Jun. 27, 2020), https://perma.cc/AKC3-JHHP.

[135] *See generally* BUREAU RECLAMATION, REVIEW OF THE COLORADO RIVER INTERIM GUIDELINES FOR LOWER BASIN SHORTAGES AND COORDINATED OPERATIONS FOR LAKE POWELL AND LAKE MEAD (2020), at 12.

[136] For a review of the issues and concerns raised by tribes and others during the review, see generally *Colorado River Basin: 7.D. Review & Report Background*, BUREAU RECLAMATION, https://perma.cc/ZR3D-AHN5 (July 13, 2022).

Reclamation's Pilot System Conservation Program, by contrast, specifically included tribes as part of its effort to prop up storage in Lake Powell and Lake Mead.[137] Created in 2014 and funded by the Central Arizona Water Conservation District, Metropolitan Water District of Southern California, Southern Nevada Water Authority, Denver Water, and Reclamation, the program sought out Lower Colorado River water users willing to forego deliveries they would otherwise rely upon in exchange for compensation.[138] The Colorado River Indian Tribes, Fort McDowell Yavapai Nation, Gila River Indian Community, and Tohono O'odham Nation all participated in the program, collectively conserving more than 110,000 acre-feet.[139] The Upper Colorado River Commission administered a similar program in the Upper Basin, but there was only one tribal project among its forty-five participants.[140]

The process that led to the 2019 Drought Contingency Plans (DCPs), particularly in Arizona, also reflects incremental progress in incorporating tribes into basin planning, problem-solving, and decision-making.[141] The DCPs became necessary because, despite the 2007 Interim Guidelines and Minute 319[142] to the U.S.-Mexico Treaty, storage in Lake Mead and Lake Powell continued to drop toward levels that could trigger a shortage declaration along the Lower Colorado River, potential reductions in (or total loss of) hydropower generation at Lake Powell, and the prospect of the Upper Basin states becoming unable to meet their delivery obligations under the Compact.[143] With prodding from the Secretary of the Interior—who is the Lower Colorado River watermaster under the Boulder Canyon Project Act (as interpreted in *Arizona v. California*), but who lacks a similarly clear grant of such plenary authority in the Upper Basin—the basin states began discussions in 2013 on strategies to avoid these outcomes.[144] Their efforts ultimately culminated in the enactment and execution of the Upper Basin and Lower Basin DCPs in 2019.[145]

To guide its participation in the Lower Basin DCP negotiations, Arizona created a thirty-eight-member steering committee that included representatives from the Colorado River Indian Tribes, Gila River Indian Community, and

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[137] *See Lower Colorado Region: Pilot System Conservation Program (Pilot Program)*, BUREAU RECLAMATION, https://perma.cc/WD9U-QW2X (Aug. 31, 2021).

[138] *Id.*

[139] *See* WATER & TRIBES INITIATIVE, *supra* note 11, at 4–5.

[140] *See* UPPER COLO. RIVER COMM'N, COLORADO RIVER SYSTEM CONSERVATION PILOT PROGRAM IN THE UPPER COLORADO RIVER BASIN 25 (2018).

[141] *See Colorado River Basin Drought Contingency Plans*, BUREAU RECLAMATION, https://perma.cc/P34Q-R6CV (Jan. 11, 2023).

[142] *See FACT SHEET: MINUTE 319,* INT'L BOUNDARY WATER COMM'N U.S. MEX., https://perma.cc/9TRU-LX9Z (last visited April 21, 2023) ("Binding agreement of the International Boundary and Water Commission, United States and Mexico, to help implement the 1944 Water Treaty between the two countries.")

[143] For a compendium of resources on the issue, see *Colorado River Basin Drought Contingency Plans*, BUREAU RECLAMATION, https://perma.cc/ZN3L-MMHV (March 13, 2023).

[144] Arizona v. California, 530 U.S. 392, 418, *modified*, 531 U.S. 1 (2000).

[145] BUREAU RECLAMATION, *supra* note 141.

Tohono O'odham Nation.[146] As noted earlier, each of these tribes holds quantified rights to large quantities of water, which they have developed, giving them a unique ability to contribute to mutually beneficial (i.e., transactional) solutions, as well as considerable leverage in negotiating agreements to share shortages with municipal and agricultural neighbors.[147] Reclamation also worked with the Inter Tribal Council of Arizona (ITCA)[148] to provide a clearinghouse for other interested tribes in Arizona to monitor the discussions. While certainly not perfect—multiple Arizona tribes continue to feel their concerns and interests were not adequately considered during negotiations—the role tribes played in the DCP process nonetheless reflects at least some progress from where things stood when the 2007 Interim Guidelines were developed.[149]

More recently, several forums have emerged to support tribal engagement in water policy dialogue and decision-making. These forums are emerging at different spatial scales reflecting different political jurisdictions and include both formal (i.e., convened by federal or state governments with particular authorities and responsibilities), and more informal initiatives. The Bureau of Reclamation, for example, initiated a Tribal Information Exchange (TIE) on August 20, 2021, to regularly inform and educate tribal leaders, staff, and advisors on the hydrologic situation in the basin and federal and state responses to the ongoing crisis.[150] The TIE generally meets monthly, though special meet-

[146] *Arizona Reconsultation Committee*, ARIZ. DEP'T WATER RES., https://perma.cc/SYZ5-BWWY (last visited Apr. 20, 2023) (showing the history, committee composition, and products associated with the Arizona Reconsultation Committee).

[147] WATER & TRIBES INITIATIVE, *supra* note 11, at 2, 4–5.

[148] Press Release, Inter Tribal Council of Ariz., Inter Tribal Council of Arizona and the Bureau of Reclamation Sign Historic Agreement to Ensure Tribal Participation in Colorado River Negotiations (Mar. 2, 2021) https://perma.cc/T4QT-ZZN8 (explaining that ITCA was established in 1952 to provide a united voice for tribal governments located in the State of Arizona to address common issues of concern).

[149] *See, e.g.*, Letter from Robert Miguel, chairman, Ak-Chin Indian Community, to Terrence J. Fulp, Regional Director Bureau Reclamation (June 8, 2020), https://perma.cc/KX9Y-JJFF (expressing the Ak-Chin community's perceived inadequacy of the DPC consultations). Notwithstanding the feedback from tribes that were not part of the steering committee, the Arizona Department of Water Resources and the Central Arizona Water Conservation District reconvened the same set of participants to sit on the Arizona Reconsultation Committee, the body tasked with steering Arizona's efforts to prepare for the process of negotiating a new management framework to replace the 2007 Guidelines. *See Committee Delegates*, ARIZ. RECONSULTATION COMM., https://perma.cc/42Y5-MH28 (last visited Apr. 20, 2023) (showing the participants of the Arizona Reconsultation Committee are the same participants from the Lower Basin Drought Contingency Plan Steering Committee). *See also* ARIZ. DEP'T WATER RES., *supra* note 146. *See generally Arizona Reconsultation Committee*, CENT. ARIZ. PROJECT, https://perma.cc/N8JL-Z889 (last visited Apr. 20, 2023) (housing up to date information on the Arizona Reconsultation Committee).

[150] As Reclamation put it in its initial e-mail to tribal leaders inviting participation in the TIE, "[d]ue to the critical situation in the Basin, the Department of the Interior is committed to clear coordination and communication with its partners, including tribes. To facilitate this critical communication, Interior and Bureau of Reclamation Leadership are introducing regularly scheduled technical information exchanges with tribes in the Colorado River Basin. Our goal is to provide an opportunity to share current information, listen to concerns, and respond to questions or requests." Phone call with Ernie Rheaume, Native American Affairs Program Manager for the Upper Basin Tribes at the Bureau of Reclamation (Apr. 17, 2023) (confirming that TIE as established in August 2021 is to facilitate information about drought response operations and to offer support related to guidelines to all 30 Colorado River Basin tribes). Meetings are held monthly and more

ings may be convened more frequently if events dictate.[151] To date, the TIE has largely served as a one-way channel of communication, with the Bureau of Reclamation providing updates on hydrology and various programs to address the ongoing drought.[152] There is little back-and-forth dialogue.[153]

In the Upper Basin, the six Upper Basin Tribes came together in 2021 with the Bureau of Reclamation, the four Upper Basin States (Wyoming, Colorado, Utah, and New Mexico), and the Upper Colorado River Commission to successfully negotiate a protocol that allows and encourages the tribes to participate in developing and implementing the Drought Response Operations Plan (DROP).[154] The DROP is designed in part to implement the Drought Response Operations Agreement, which is one of three elements of the Upper Basin Drought Contingency Plan.[155] Section 7.2 of the DROP provides that "[e]ach Upper Basin Tribe . . . may separately designate one representative to participate in and provide recommendations to any working group established by the DROA Parties to help draft, develop, implement, analyze proposals for, or monitor any Drought Response Operation."[156] The DROP makes clear that participation by any tribe in any work group does not replace any other opportunities for tribes to participate in drought response planning and decision-making, including formal consultation with the federal government.[157] This set of provisions creates a more meaningful pathway, and a permanent structure, for tribal engagement in this context and might serve as a good example for tribal engagement elsewhere in the basin. However, it still treats tribes as a secondary sovereign and not part of the decision-making table per se, which remains exclusively reserved for the Upper Basin states.

At the state level, in 2022 the Governor of Utah appointed the first ever tribal representative on the newly created Colorado River Authority of Utah, ensuring that a tribal perspective will be heard in those discussions.[158] The

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frequently when necessary. The Bureau of Reclamation is aiming to make the meetings more interactive by requesting presentations from tribes. *Id.*

[151] *Id.*

[152] Author observation: no public sources available at this time.

[153] Author observation: no public sources available at this time.

[154] In response to prolonged drought, low runoff conditions and critically low reservoir levels are threatening the of the Colorado River system, the Upper Division States and the Bureau of Reclamation, and the Upper Colorado River Commission developed the Drought Response Operations Plan (DROP) in accordance with the scope and purposes described in the DROA. *Colorado River Basin Drought Contingency Plans*, BUREAU RECLAMATION, https://perma.cc/N8JL-Z889 (March 13, 2023). DROA is part of the 2019 Colorado River Drought Contingency Plan for the Upper Colorado River Basin which aims to minimize the risk of Lake Powell declining below critical elevations. *Id.*

[155] *See* UPPER COLORADO RIVER COMM., AGREEMENT FOR DROUGHT RESPONSE OPERATIONS AT THE INITIAL UNITS OF THE COLO. RIVER STORAGE PROJECT ACT 1, 7 (2019).

[156] 2022 DROUGHT RESPONSE OPERATIONS PLAN EXEC. SUMMARY 23 (2022).

[157] *Id.*

[158] Press Release, Utah Gov., Gov. Cox Appoints Paul Tsosie to Colo. River Auth. Bd. (Sept. 20, 2022) https://perma.cc/AV9J-VBZ4. For a brief history of the Colorado River Authority of Utah, including the appointment of the first tribal representative to the board, see *Mission & Vision*, THE COLO. RIVER AUTH. UTAH, https://perma.cc/5ASH-HYQ4. For more information on the Authority, including the composition of the current Board, see *Board Members*, COLO. RIVER AUTH. UTAH, https://perma.cc/5Y7T-M8VX.

Colorado Water Conservation Board started meeting in 2021 on a sovereign-to-sovereign basis with the two tribes in the basin located in Colorado—Ute Mountain Ute and Southern Ute.[159]

To complement these formal arrangements and structural changes, several informal, ad hoc forums have also emerged to better engage tribes in dialogue and deliberation. The Upper Basin Dialogue emerged in 2020 and includes representatives from the six Upper Basin Tribes and ten conservation groups.[160] The intent of the dialogue, co-facilitated by the Water & Tribes Initiative and the Colorado River Sustainability Campaign, is to create a forum for tribes and conservation groups in the Upper Basin to work together on issues of common concern and advance shared priorities.[161] Participants created a *Shared Vision for the Upper Basin of the Colorado River Basin*,[162] which serves as a roadmap for ongoing discussions and collaborative action on short-term efforts to stabilize the system as well as longer-term initiatives to develop the post-2026 management framework.[163]

More recently, the four Upper Basin states and the Upper Colorado River Commission started meeting on a regular basis with the six Upper Basin Tribes.[164] Referred to as the *Upper Basin Tribes-States Dialogue*, and co-facilitated by UCRC and the Water & Tribes Initiative, the intent of this effort is to exchange information and explore opportunities to work together on shared interests.[165] The participants recently shared a consensus framework of priorities and requests with the Bureau of Reclamation and the Department of the Interior.[166] They are also in the process of exploring how to better accommodate tribal needs and interests in a revived system conservation pilot program, as well as how tribes can and should benefit from unused tribal water rights in the Upper Basin: more than 50% of the recognized water rights of tribes are undeveloped and unused, thus going downstream to benefit other water users and the system as a whole.[167]

In addition, representatives of the seven basin states started meeting with representatives of the Basin Tribal Coalition in May 2022.[168] This forum emerged from a collective recognition that the basin continued to lack an on-

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[159] *Governor Mitchell Reaffirms Commitment to Tribes for Colorado River Matters*, COLO. WATER CONSERVATION BD. (Dec. 14, 2021), https://perma.cc/MA2D-9RFM.

[160] *Upper Colorado River Commissioners and Upper Basin Tribes Convene Historic Meeting*, UPPER COLO. RIVER COMM'N (Aug. 10, 2022), https://perma.cc/9KH5-4ATC.

[161] *See generally* WATER & TRIBES INITIATIVE, *supra* note 18.

[162] *See generally* FEDERALLY RECOGNIZED TRIBES & CONSERVATION GROUPS IN UPPER BASIN, SHARED VISION FOR THE UPPER BASIN OF THE COLORADO RIVER BASIN: A RESOLUTION FOR SUSTAINABILITY (2022).

[163] *See generally id.* (discussing joint efforts and guiding principles for development).

[164] Jerd Smith, *Tribal Breakthrough? Four States, Six Tribes Announce First Formal Talks on Colorado River Negotiating Authority*, WATER EDUCA. COLO. (Sept. 21, 2022), https://perma.cc/LZ79-ZXVP.

[165] *See* FEDERALLY RECOGNIZED TRIBES & CONSERVATION GROUPS IN UPPER BASIN, *supra* note 162.

[166] *Id.* Authors McKinney & Vigil co-facilitated the Upper Basin Dialogue and as such much of the information in this section is based on personal observation and notes.

[167] McKinney & Vigil *supra* note 166. *See generally* FEDERALLY RECOGNIZED TRIBES & CONSERVATION GROUPS IN UPPER BASIN, *supra* note 162.

[168] *Id.*

going mechanism to facilitate sovereign-to-sovereign dialogue among tribes and the states.[169] At the first meeting, the participants agreed that (1) the three sets of sovereigns in the basin—the United States, states, and tribes—have unique and complementary roles in managing the Colorado River system; (2) tribes have made significant contributions in addressing Colorado River management issues in recent years and will play a meaningful role in shaping solutions to both short-term problems facing the basin as well as developing and implementing the post-2026 management framework for the river; (3) the three sets of sovereigns need to work together to identify and address the shared issues confronting the Colorado River Basin and its resources—including the post-2026 management framework (which will be guided by the National Environmental Policy Act—NEPA) as well as any process that may run parallel to the NEPA-process to address issues, concerns, policy tools, and/or solutions that fall outside the purpose and scope of the NEPA-driven process but are critical to building broad-based agreement on the next management framework; and (4) meaningful and significant engagement and discussions among the United States, tribes, and states are necessary to recognize and resolve barriers to addressing recognized and unresolved tribal water rights in the basin.[170] The participants continue to meet at least monthly to focus on a diverse portfolio of short-term and long-term efforts to manage the Colorado River.[171]

From a historical perspective, these adjustments to both the official and informal architecture of Colorado River governance represent steps in the right direction. Yet they also illustrate how much work still needs to be done to arrive at a governing framework that genuinely includes tribes, as sovereigns, in actual decision-making.

B. Evaluating the Role of Tribes: Sovereignty and Equity

After a long history of largely ignoring tribal needs, interests and rights, federal and state governments are increasingly integrating tribes into planning, problem-solving, and decision-making processes for water management in the Colorado River Basin.[172] While that is a positive trend, it is instructive to step back and examine how this history of tribal (dis)engagement relates to the obligations of the United States as referenced in Article VII of the Compact. To explore this topic, the discussion below reflects on two key tenets: (1) tribal sovereignty, as developed through law, policy, and practice, and (2) equity, as invoked in Article I of the Compact.[173] This analysis sets the stage for the article's final section addressing the future.

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[169] *Id.*

[170] *Id.*

[171] *Id.*

[172] *See* discussion *supra* Section (2)(a).

[173] *See* Jason A. Robison & Douglas S. Kenney, *Equity and the Colorado River Compact*, 42 ENV'T L.R. 1157, 1176 (2012) (framing this topic as "procedural equity" to represent the influence drawn from sovereigns and governance structures and "substantive equity" to represent the influence of equity as prescribed in the Compact).

1. Sovereignty

Although it should not need stating, it continues to be essential to reiterate that basin tribes are *sovereigns*, not just stakeholders on par with nongovernmental organizations (NGOs) or water users.[174] While the U.S. Supreme Court has held that tribes are not the functional equivalent of states or foreign nations under the American constitutional system, basin tribes nonetheless retain the right of self-governance as distinct political communities not subject to general state jurisdiction.[175]

As noted earlier, the Indian Reorganization Act of 1934 brought the allotment era to a close, while the pendulum of federal Indian policy swung again during the 1950s when Congress embarked on a contrary effort to "terminate" tribes as sovereigns.[176] But following the civil rights era of the 1960s, and especially since passage of the Indian Self-Determination and Education Assistance Act of 1975,[177] the federal government has tried to bridge the gulf between the principles of tribal sovereignty that the U.S. Supreme Court has espoused and the practice of engaging with tribes as actual sovereigns—a wide gap for the better part of this country's first 200 years of existence.[178]

Successive presidential administrations have aimed to reinvigorate this understanding of tribal sovereignty through policy statements and executive orders. Executive Order 13175 from 2000, for example, declares:

> "In formulating or implementing policies that have tribal implications, agencies shall be guided by the following fundamental principles: (a) The United States has a unique legal relationship with Indian tribal governments. . . . Since the formation of the Union, the United States has recognized Indian tribes as domestic dependent nations under its protection. The Federal Government has enacted numerous statutes and promulgated numerous regulations that establish and define a trust relationship with Indian tribes. (b) Our Nation . . . has recognized the right of Indian tribes to self-government. As domestic dependent nations, Indian tribes exercise inherent sovereign powers over their members and territory. The United States continues to work with Indian tribes on a government-to-government basis to address issues concerning Indian tribal self-government, tribal trust resources, and Indian tribal treaty and other rights. (c) The United States recognizes the right of Indian tribes to self-government and supports tribal sovereignty and self-determination."[179]

While there are many examples of the federal government and other actors espousing these principles in theory—yet deviating from them in practice—the modern recognition of tribal sovereignty reached a high point in the U.S. Supreme Court's 2020 decision in *McGirt v. Oklahoma*.[180] In that case, a man

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[174] *See supra* notes 21–24 and accompanying text.

[175] *See* Worcester v. Georgia, 31 U.S. 515, 540 (1832).

[176] *See supra* notes 102–04 and accompanying text.

[177] Indian Self-Determination and Education Assistance Act, Pub. L. No. 93-638, 88 Stat. 2203 (1975) (current version at 25 U.S.C. §§ 5301–5423).

[178] *See infra* notes 179–87 and accompanying text.

[179] Exec. Order No. 13175, 65 Fed. Reg. 67249 (Nov. 6, 2000). *See also* Memorandum on Tribal Consultation, 74 Fed. Reg. 57881 (Nov. 5, 2009) (President Obama reiterated many of the same principles in Memorandum for the Heads of Executive Departments and Agencies). *See infra* notes 284–289 and accompanying text.

[180] McGirt v. Oklahoma, 140 S.Ct. 2452, 2481 (2020).

convicted of a heinous crime challenged the State of Oklahoma's authority to try him on the ground that the crime scene was located within the Muscogee (Creek) Reservation.[181] The gist of Oklahoma's contrary position was that even if the locus of the crime scene had once been reservation land, that reservation had long since been diminished by Oklahoma becoming a state—specifically, by implication from a series of congressional acts or the state's long-standing treatment of the land as something other than a reservation, even if Congress had not expressly diminished the reservation.[182] A closely divided Supreme Court rejected these arguments.[183]

From the poetry of its opening line ("on the far end of the Trail of Tears was a promise") to the moral clarity of its concluding paragraph,[184] Justice Gorsuch's majority opinion exemplified one of the rarest species in American legal and political history: a vindication of a tribe's long-disregarded sovereignty in the face of a state's "parade of horribles" about potentially disruptive consequences of ruling in the tribe's favor.[185] It illustrates what happens when principles of federal Indian law defining the relationship between states and tribes are taken seriously—principles stretching back to those first articulated by Chief Justice Marshall in *Worcester v. Georgia* (1832).[186] In the wake of *McGirt*, significant portions of eastern Oklahoma have been clearly defined as Indian reservations, and the state and the tribes on those reservations are engaged in a fundamental reevaluation of their relationships to work through the consequences of the Court's decision.[187]

The Colorado River Basin could benefit from a similar wholesale reevaluation of the role of tribes in governance—a point explored in the next section of this article. As Justice Gorsuch noted pointedly in *McGirt*, "Congress can wel-

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[181] *Id.* at 2456.

[182] *Id.* at 2465.

[183] *Id.* at 2482.

[184] *Id.* at 2459, 2482 ("Unlawful acts, performed long enough and with sufficient vigor, are never enough to amend the law. To hold otherwise would be to elevate the most brazen and longstanding injustices over the law, both rewarding wrong and failing those in the right.").

[185] *See id.* at 2474–76.

[186] *Compare* McGirt v. Oklahoma, 140 S.Ct. 2452, *with* Worcester v. Georgia 31 U.S. 515 (1832).

[187] See Oklahoma v. Castro-Huerta, 142 S.Ct. 2486, 2492 (2022). For more information about *McGirt* and the context it arose out of, see generally Dylan R. Hedden-Nicely & Stacy L. Leeds, *A Familiar Crossroads: McGirt v. Oklahoma and the Future of Federal Indian Law Canon*, 51 N.M. L. REV. 300 (2021); MAINON A. SCHWARTZ & CONG. RSCH SERV., THIS LAND IS WHOSE LAND? THE *MCGIRT V. OKLAHOMA* DECISION AND CONSIDERATIONS FOR CONGRESS 4 (2020). It is also worth noting that before the ink was even dry on the *McGirt* decision, the State of Oklahoma launched a vigorous campaign to have its core holdings reversed or greatly limited, which culminated in the Supreme Court's 2022 decision in *Oklahoma v. Castro-Huerta*. *See* Ryan Maxey, *The Dangers of the McGirt Misinformation Campaign*, L.J. FOR SOC. JUST. AT A.S.U. (Oct. 22, 2021), https://perma.cc/AH7D-6GD8; *Castro-Huerta*, 142 S.Ct. 2486 (2022). Although the Court declined to reconsider the core holding from *McGirt*, the decision countenanced an unprecedented expansion of state criminal jurisdiction onto Indian reservations. *See* 142 S.Ct. 2486, 2504–05 (2022). The death of Justice Ruth Bader Ginsberg and the confirmation of Justice Amy Coney Barrett is the most obvious explanation for shift between McGirt and Castro-Huerta, as both were 5-4 decisions and the remaining eight justices adopted generally consistent views of the law between the two cases. *See* Hedden-Nicely & Leeds at 343.

come Native Americans to participate in a broader political community without sacrificing their tribal sovereignty."[188] Of course, there is no guarantee how the basin states might operationalize this vision of what might be termed "cooperative sovereignty," a nod toward the doctrine of "cooperative federalism."[189] Notwithstanding recent developments to better integrate tribes into planning and policy dialogue, old habits die hard.[190]

The sentiments of more than 100 leaders interviewed by WTI in 2019,[191] however, and the developments described above, reveal that there is an emerging consensus that tribes in the basin should be more meaningfully involved in policy discussions and negotiations about the future of the river system, including the development of the governing framework that will replace the 2007 Interim Guidelines. While the WTI interviewees articulated diverse reasons for arriving at this consensus view,[192] nearly everyone expressed interest in the critical question of "how" to achieve this goal—and more specifically, how to move from a practice of simply seeking tribal input and advice before decisions are made to a practice of shared decision-making among the basin's three (or four, counting Mexico) sets of sovereigns. The final section of this article provides a possible response to that question.

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[188] *McGirt*, 140 S.Ct. 2452, 2467 n.6 (2020).

[189] Cooperative sovereignty means that sovereignty not only refers to a right to independence, but also a responsibility to cooperate. *See generally* Franz X. Perrez, *Cooperative Sovereignty: From Independence to Interdependence in the Structure of International Environmental Law*, (Kluwer Law International, 2000). Cooperative federalism generally refers to a model of intergovernmental relations that recognizes the overlapping functions of the national and state governments. In the context of environmental law, this generally means that the federal government sets national standards while the states implement those standards within their boundaries. By contrast, dual federalism maintains that the national and state governments have distinct and separate government functions. *Cooperative Federalism*, CTR. FOR THE STUDY OF FEDERALISM (Aug. 13, 2018), https://perma.cc/WH36-RQG6. For a review of these concepts, *see generally* Hope M. Babcock, *Dual Regulation, Collaborative Management, or Layered Federalism*, 3 HASTINGS W. NW. J. OF ENVT'L L. & POL'Y 193 (1996); Robert L. Fischman, *Cooperative Federalism and Natural Resources Law*, 14 N.Y.U. ENVT'L L.J. 179 (2005).

[190] *See, e.g.*, Jennifer Solis, *Tribes seek to secure their water rights as Colorado River dries*, NEV. CURRENT (Dec. 14, 2021 6:24 AM), https://perma.cc/J4KH-H7D8; Michael E. Sakas, *Historically excluded from Colorado River policy, tribes want a say in how the dwindling resource is used. Access to clean water is a start,* CPR NEWS (Dec. 7, 2021 7:42 AM), https://perma.cc/KC2L-N9R4 (although several of the forums that have emerged are occasionally referred to as opportunities to facilitate sovereign-to-sovereign dialogue and relationships, it is still not clear what this means in practice and how sustainable this "practice" might be).

[191] WATER & TRIBES INITIATIVE, *supra* note 18, at 2.

[192] *See id* at 22 n.6. Three major reasons emerged among non-tribal interviewees: (1) respect for equity, social justice, and/or tribal sovereignty in relation to the negotiation process and basin tribes' abilities to develop and use their water rights; (2) interest in mitigating uncertainty over the impacts of tribal water development on non-tribal water users; and (3) commitment to engaging basin tribes in collaborative problem-solving aimed at meeting the needs and interests of both tribes and other water users reliant on the Colorado River. Tribes believe they need to be at the table because of their aboriginal connections to the river, their expertise and knowledge developed from this longstanding presence, and as a recognition of their sovereign status and the significance of the water rights they possess. *Id*.

2. Equity

Article I of the Colorado River Compact declares that one of its "major purposes" is "to provide for the equitable division and apportionment of the use of the waters of the Colorado River System."[193] The U.S. Supreme Court first announced its equitable apportionment doctrine in *Kansas v. Colorado*,[194] 15 years before the Compact's drafting (and one year before the *Winters* decision). While a detailed analysis of the doctrine is beyond the scope of this article,[195] two threshold observations are warranted.

First, the doctrine of equitable apportionment recognizes that "equality of right," rather than "equal division of the water," is the governing factor.[196] In other words, states stand on an equal basis when it comes to interstate streams—the fact that a use in one state is senior to a use in another is not necessarily the last word on who has a better water right, particularly in times of shortage.[197]

Second, what is "equitable" is very much in the eye of the beholder. In *Kansas v. Colorado*, for example, the Supreme Court dismissed Kansas's complaint on the ground that Colorado's water use had not yet caused such significant adverse effects in Kansas as to render inequitable the status quo of water division between the states.[198] There is far more art here than science. "Equity" is commonly regarded as synonymous with fairness, which in turn "is defined by context," including the "diversity of values affected by water allocation schemes and the variation in these values across time."[199]

Reflecting on a century of experience under the Colorado River Compact, it is important to consider whether its apportionment of the basin's water has in fact comported with its goal of "equity," particularly when it comes to the rights of tribes. In approaching this topic, it is useful to distinguish between substantive and procedural equity.[200] "Substantive equity" generally refers to the definition, allocation, and relative priorities of water rights, including principles of reciprocity, fidelity, reliability, and flexibility.[201] "Procedural equity" refers to the governance structures for apportionment schemes, including prin-

[193] Colorado River Compact (1922).

[194] Kansas v. Colorado, 206 U.S. 46, 104 (1907).

[195] For a comprehensive review of the equitable apportionment doctrine, see generally ANTHONY DAN TARLOCK & JASON ANTHONY ROBISON, LAW OF WATER RIGHTS AND RESOURCES § 10 (rev. ed. 2022). *See also generally* Robison & Kenney, *supra* note 173.

[196] Wyoming. v. Colorado, 259 U.S. 419, 465 (1922).

[197] Indeed, one of the prime considerations in the drafting of the Colorado River Compact was to ensure that the other six basin states were not deprived of access to water for their own future development by the seniority of the voluminous water rights already developed in California.

[198] Kansas v. Colorado, 206 U.S. at 117. The Supreme Court left open the possibility that Kansas could succeed on its complaint on a different set of facts at a later point in time. *Id.* at 117–18.

[199] Robison & Kenney, *supra* note 173, at 1175.

[200] The framework for the following analysis draws heavily on Robison and Kenney. *Id.* at 1173–209.

[201] *See generally id.* at 1177.

ciples of inclusivity, diligence, and transparency.[202] The Compact's substantive equity is considered in several chapters in *Cornerstone at the Confluence*, a timely analysis of the Colorado River Compact at its 100th anniversary,[203] while the analysis below focuses on procedural equity, particularly whether and how the three principles just noted have been brought to bear on the Compact's implementation.

The principle of inclusivity requires that "governance structures devised for apportionment schemes should be composed to provide opportunities for the full scope of parties whose interests are affected by the schemes to participate meaningfully in implementation processes."[204] In the Colorado River Basin, these parties include sovereigns (federal, state, and tribal), other water users (including those with interests in consumptive and nonconsumptive uses), and members of the general public.[205] A truly inclusive governance structure for the basin would allow for "meaningful" participation by these diverse parties, defined from their perspectives and experiences.

Judged through this lens, the first century of governance under the Compact has largely been a failure. As discussed above, tribes had essentially no role in the Compact's formation and have largely been marginalized until quite recently.[206] Beyond individual transactional arrangements through which certain tribes have been able to obtain compensation for contributing water to system conservation efforts or leasing their water rights to other water users, tribes have not yet been meaningfully invited to the table where basinwide policy issues are negotiated and decided.[207]

The principle of diligence refers to the need for governance arrangements that "ensure that the substantive terms of apportionment schemes are implemented fully and accurately—i.e., that water users abide by the terms of their entitlements, allocation priorities are adhered to, and so forth."[208] In light of this standard, overall diligence in the Lower Basin is arguably high. The Bureau of Reclamation, named the water master for the Lower Basin in the Boulder Canyon Project Act, regularly ensures that water users—including tribes—receive ordered water deliveries for the use of quantified water rights. Like-

[202] *Id.* at 1179.

[203] *See generally* JAMES ANTHONY ROBINSON, CORNERSTONE AT THE CONFLUENCE: NAVIGATING THE COLORADO RIVER COMPACT'S NEXT CENTURY (2022).

[204] Robison & Kenney, *supra* note 173, at 1180.

[205] *See generally* WATER & TRIBES INITIATIVE, *supra* note 18.

[206] While modern developments are far from perfect, it is important to emphasize that they illustrate that neither the Compact nor the Law of the River is so static that it cannot adapt to attain greater—and more equitable—inclusivity.

[207] *See generally* Notice of Intent to Prepare a Supplemental Environmental Impact Statement for December 2007 Record of Decision Entitled Colorado River Interim Guidelines for Lower Basin Shortages and Coordinated Operations For Lake Powell and Lake Mead 87 Fed. Reg. 69042 (November 17, 2022).

[208] Robison & Kenney, *supra* note 173, at 1180.

wise, the Upper Basin has never failed to meet its Compact delivery obligations to the Lower Basin, thereby demonstrating a significant degree of diligence.[209]

Focusing more specifically on tribe's needs, interests, and rights, an alternative standard of diligence is that the Secretary of the Interior, as trustee for tribes, "must exert uncompromised efforts to secure sufficient water to the Indian, not simply seek an accommodation between the interests."[210] Viewed from this perspective, current governance arrangements fall short of the principle of diligence.

For starters, several tribes continue to face obstacles to quantifying and confirming their water rights between the slow pace of adjudications and the difficulty of negotiating settlements. The basin has arrived at a place where the recognition of a tribe's rights, as a practical matter, risks water being taken away from non-Indians with junior priority dates who are able to use that water for free while the tribe's rights remain in limbo.[211] That latter dynamic also continues to impede tribes post-quantification, as one among *a variety of* legal, financial, and institutional barriers to developing and making full use of their water rights.[212] Less water for established non-tribal water users creates a disincentive for federal and states officials to provide the necessary technical and financial resources needed to develop recognized tribal water rights more fully. Tribes in the Upper Basin, for example, currently use about 670,000 af/yr out of a total reserved water right of 1.8 maf/yr; in other words, the Upper Basin Tribes are using only about 40% of their recognized water rights.[213]

Perhaps the most egregious consequence of these impediments to developing tribal water rights is that nearly 50% of tribal homes and communities in the Colorado River Basin lack access to clean drinking water and basic sanitation[214] The fundamental purpose of Indian water rights, as recognized in *Winters* and its progeny, is for the maintenance of a homeland for tribes; i.e., to allow the tribe to thrive and provide for the needs of its members in perpetuity. Access to a clean, reliable supply of water is basic to human health, and clearly a necessary component to making a homeland sustainable. Unfortunately, the federal government has largely failed to fulfill its trust obligation to provide access to clean water for tribes and, in many cases over the first century of the Compact, has actively undermined tribal water rights by constructing projects and providing water principally or entirely for the benefit of non-Indians.[215]

When it comes to the principle of transparency, the historical role of basin tribes in Colorado River governance leaves much room for improvement. Transparency in governance refers to the essential openness of the processes

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[209] *See generally* COLORADO RIVER GOVERNANCE INITIATIVE, DOES THE UPPER BASIN HAVE A DELIVERY OBLIGATION OR AN OBLIGATION NOT TO DEPLETE THE FLOW OF THE COLORADO RIVER AT LEE FERRY? (Natural Res. Law Ctr., Univ. Colo. Law Sch., 2012).

[210] Pyramid Lake Paiute Tribe v. Morton, 360 F. Supp. 669 (D.D.C. 1973).

[211] *See generally*, TRIBAL WATER STUDY, *supra* note 13, at Chapter 7.

[212] *Id.*

[213] *See generally*, TRIBAL WATER STUDY, *supra* note 13.

[214] HEATHER TANANA ET AL., *supra* note 14, at v.

[215] John Fleck, *Water tug of war goes on*, ALBUQUERQUE J., https://perma.cc/SB59-B8AW (Feb. 10, 2013 12:10 AM).

by which management decisions are made and implemented.[216] Effectuation of this principle requires processes that invite engagement by interested individuals and organizations. Yet as explained above, tribes have historically not been invited to participate in river system governance; nor have they had meaningful opportunities to provide input and advice prior to decisions being made by state and federal officials.[217] Rather, tribes most often have been on the receiving end of decisions and actions imposed by the federal government and basin states. Tribes have not been afforded the opportunity to decide whether to voluntarily accept these decisions, which reflects a lack of genuine collaboration.

The procedural inequity suffered by basin tribes during most of the Compact's first century is deep, but it is not irremediable. As a threshold matter, it is important to recognize that the understanding of "obligations" owed to basin tribes is far more robust now than it was in 1922. It is also important to highlight that the Compact couches these "obligations" as belonging exclusively to the federal government, without a passing glance at tribes' relationships with basin states. With the allotment era still in full swing in 1922, this dichotomy is understandable. But tribes refused to vanish, and *Arizona v. California* set the basin on a path toward requiring a broader consideration of their water rights.[218] Today, basin states realize they cannot afford to ignore—and often need to collaborate very closely with—tribes to achieve goals and address critical management challenges.

The basin community's understanding of procedural "equity" has evolved in other ways as well. For example, as part of the commitments made during the 2007 Interim Guidelines' formation, the basin states agreed to consult among themselves before embarking on litigation, a commitment that is nowhere to be found in the Compact itself, and an important trust-and-confidence building step in allowing the basin community to move forward in the face of unprecedented water scarcity.[219] Similarly, in the Interim Guidelines, Reclamation embraced specific obligations to consult with basin states under clearly delineated circumstances, something else not required by the Compact.[220]

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[216] *See generally* Robison & Kenny, *supra* note 173, at 1180.

[217] *Supra* Part II.A.

[218] *See generally* Robison & Kenny, *supra* note 173, at 1201, 1202; see *supra* Part II.A.

[219] *See* BUREAU RECLAMATION, *supra* note 131, at 19878.

[220] *See id.* at 19891–19892. By contrast, Congress approved and modified the Colorado River Compact in the *Boulder Canyon Project Act* (BCPA) of 1928 and left to the Secretary absolute discretion to allocate the effects of shortages. Boulder Canyon Project Act, Ch. 42, 45 Stat. 1057 (1928), codified as amended at 43 U.S.C. 617. The BCPA ratified the 1922 compact, authorized the construction of a federal facility to impound water in the Lower Basin (Boulder Dam, later renamed Hoover Dam) and related facilities to deliver water in Southern California (e.g., the All-American Canal, which delivers Colorado River water to California's Imperial Valley), and apportioned the Lower Basin's 7.5 MAF per year among the three Lower Basin states. It also directed the Secretary of the Interior to serve as the sole water master in the Lower Basin, a role in which the federal government manages the delivery of all water below Hoover Dam. *Arizona v. California* confirmed that Congressional delegation of authority. 373 U.S. 546, 565 (1963).

There is no reason similar commitments could not be made to formally include basin tribes in governance. And indeed, there would be significant equity in doing so—not merely to remediate the historical marginalization tribes have suffered, but also to address the water-scarcity challenges and hydrological trends facing the basin that are threatening to create conditions where even senior tribal water rights may be subject to curtailment. It is only right, therefore, that tribes are entitled to the opportunity to be full participants at the tables where the basin states and federal government make decisions about prospective shortages. Moreover, from an evolving equity standpoint, it is both appropriate and just to view tribes as empowered to contribute directly to solutions of the basin's problems, rather than viewing them as a problem to be solved.

As noted above, some progress has occurred over the last few years to support the inclusion of tribes in planning and policy dialogues. While some of these recent developments are becoming fully integrated into the permanent architecture of Colorado River governance, others are more informal and operate alongside the formal decision-making processes. Taken as a whole, these recent developments demonstrate an openness and a willingness among the established authorities—i.e., federal and state officials—to more fully embrace tribes as sovereigns and to adjust the architecture of governing the basin to share problem-solving and decision-making among all three (or four, counting Mexico) sets of sovereigns in the basin.

III. A ROAD MAP GOING FORWARD

The Colorado River Basin has been described as a diverse "community of communities,"[221] including but not limited to sovereigns, agricultural and municipal water users, recreationists and conservation groups, power providers, and the general public. Over the past two decades, this community has increasingly explored creative arrangements to address water-scarcity challenges.[222] Basin tribes, other sovereigns, and non-governmental stakeholders now have a unique opportunity to shape future governance, as the 2007 Interim Guidelines, Minute 323 to the U.S.-Mexico Treaty, and the DCPs all expire by the end of 2026.[223] While there are lessons to be learned from existing arrangements and recent practices, this is also a unique opportunity to consider a broader array of visions and options for governing the river system. The future should be fully informed, but not constrained, by the past.

The roadmap provided here revolves around three connected elements: enhance tribal capacity, embrace a more integrated vision for managing the

[221] *See* Robison, *supra* note 41, at 5.

[222] See *supra* Part II.B.1.

[223] *See generally* Request for Input on Development of Post-2026 Colorado River Reservoir Operational Strategies for Lake Powell and Lake Mead Under Historically Low Reservoir Conditions, 87 Fed. Reg. 37884, 37886 (June 24, 2022) (explaining "Both the 2007 Interim Guidelines and the DCPs are anticipated to be in place for an interim period through 2026. Similarly, Minute 323 is anticipated to be in effect through 2026.").

Colorado River system, and move toward permanent structures to support collaborative governance.

A. Enhance Tribal Capacity

Irrespective of whether the basin community embraces a more integrated vision and/or a more collaborative system of governance, there is much to be done to enhance tribal capacity in the basin. The WTI, in partnership with the Colorado River Sustainability Campaign, completed a comprehensive assessment of tribal capacity in the Colorado River Basin in 2022.[224] Twenty of the thirty tribes in the basin participated in the assessment.[225] One of the first impressions that emerge from its findings is the tremendous variation of capacity among tribes when it comes to managing water and engaging in policy discussions about the Colorado River system. Yet even the best-resourced tribes often face capacity challenges given that they have a similar panoply of responsibilities as states and must often try to carry out those responsibilities with the resources of local governments. On any given day, a tribal leader may be dealing with issues involving health, education, and welfare; cultural events such as funerals; economic development and natural resource management; and issues related to justice and law enforcement.[226] The staff resources available to tribal leadership also vary greatly from tribe to tribe.[227]

The WTI assessment report provides detailed information on the capacity-building needs and interests of the twenty participating tribes. While each faces unique challenges, several common needs emerged: (1) securing funding for staff, water programs, and infrastructure; (2) recruiting and retaining professional water resource staff; (3) providing training and support to existing staff and leadership; and (4) inspiring and informing future leaders and tribal communities to engage with water matters.[228] These findings are not surprising given the long history of marginalizing tribal needs, interests, and voices in the Colorado River Basin—not to mention the inequity in the amount of funding that has been invested in the Colorado River Basin to provide water to non-tribal communities (relative to tribal communities) for irrigation, municipal, and commercial uses, and basic governmental capacity building. In many ways, tribes are playing catch-up to non-tribal communities in the basin, which suggests that needs and opportunities to enhance tribal capacity will not be met by any single assessment, report, workshop, or even a one-time infusion of dollars. It is time for the federal government, both programmatically and in meaningful fulfillment of its tribal trust obligations, along with the philanthropic community and others to make an intentional, long-term commitment to

[224] *See generally* WATER & TRIBES INITIATIVE, ENHANCING TRIBAL WATER MANAGEMENT CAPACITY IN THE COLORADO RIVER BASIN: A BASELINE ASSESSMENT (2022).

[225] *Id*. at 4.

[226] *See generally* Anna Maria Ortiz, *Tribal and Native American Issues*, U.S. GOV'T ACCOUNTABILITY OFF., https://perma.cc/H32X-GVXQ (last visited Apr. 1, 2023).

[227] *See generally* WATER & TRIBES INITIATIVE, *supra* note 226 at 15–19.

[228] *Id.*

address the capacity building needs, interests, and priorities as defined by each tribe.

Enhancing internal tribal capacity is essential to facilitating tribes' ability to participate meaningfully in basinwide planning, problem-solving, and decision-making, including the development and implementation of the post-2026 management framework. Tribes need greater funding for staff and consultants to access and digest information, such as the modeling and other technical work underpinning management decisions. One way to demonstrate a commitment to enhancing tribal capacity is for federal and state governments, and perhaps other stakeholders such as conservation groups and corporate and philanthropic organizations, to provide resources for tribes to hire staff or contract for outside expertise and assistance, such as hydrologists, economists, lawyers, planners, and engineers. As a simple matter of social justice, providing these financial resources to tribes is warranted given that for more than a century the United States has spent billions of dollars on projects that have diverted water away from Indian country.

In addition to securing these types of resources, tribes also need better access to policymaking and decision-making processes. While each tribe has unique needs and interests, tribal leaders have clearly identified a common interest in ensuring recognition of and respect for tribal water rights, and removing barriers that historically have hindered equitable treatment of those rights.[229] This common interest reflects the reality that tribes' concerns are more likely to be acknowledged and accommodated when multiple tribes speak with a unified voice.[230] Two long-standing intertribal organizations in the basin, the Ten Tribes Partnership and the Inter-Tribal Council of Arizona, represent various cross-sections of tribes.[231] A more recent effort, originally known as the Tribal Leaders Forum and now referred to as the Colorado River Basin Tribal Coalition (Coalition), provides a "whole basin" platform for all thirty basin tribes to come together under one umbrella to advance their water-related interests.[232] Working through the Coalition, twenty tribal leaders endorsed a joint letter in November 2021 to the Secretary of the Interior and the basin-state governors clarifying their expectations to be meaningfully involved in developing and implementing the next management framework for the river system,

[229] In a joint letter from twenty tribal leaders to Secretary of the Interior Deb Haaland, tribal leaders explained that "Reclamation needs to account for Basin Tribes' current and future water use as well as Basin Tribes' use of water that is not yet quantified in developing the Next Framework. The Next Framework MUST also recognize and include support for Tribal access to clean water, Tribal water rights settlements, Tribal sovereignty, federal accountability to Tribal trust responsibilities, and providing operationally functional and flexible tools that will aid Basin Tribes in the full utilization of their water rights." Letter from twenty tribal leaders to Deb Haaland, Sec'y of the Interior (Nov. 15, 2021), https://perma.cc/2HP6-WJSF.

[230] In fact, this sentiment was expressed in a joint letter endorsed by 14 of the 30 tribes in the basin when they came together to create the Tribal Leaders Forum, now referred to as the Basin Tribal Coalition. Tribal Leaders Forum Letter of Invitation (Jan. 13, 2021), https://perma.cc/DJL5-NT45.

[231] *See* TEN TRIBES PARTNERSHIP, *supra* note 122; INTER TRIBAL COUNCIL OF ARIZONA, https://perma.cc/6CU9-XBFP (last visited Apr. 22, 2023).

[232] *Tribes*, WATER & TRIBES INITIATIVE, https://perma.cc/6PFC-TT8D (last visited Apr. 22, 2023).

as well as an initial set of policy goals.[233] As explained earlier, the Coalition also helped catalyze and participates in the ongoing Basinwide Tribes-States Dialogue, the first ever ongoing basinwide forum for tribes and states to engage on a sovereign-to-sovereign basis.[234]

Time will tell how effective and sustainable these efforts are to more meaningfully engage tribes in policymaking and decision-making processes. The pace of change in the basin (driven in large part by the hydrological crisis), along with the variation in capacity among tribes[235] suggests that some tribes are better positioned than others to engage in ongoing policymaking and collaborative problem-solving processes. It is also important to keep in mind that the substantive needs, interests, and priorities of tribes may vary, making it difficult for tribes in the basin to speak with one voice beyond broad statements of values and principles.[236]

Over the longer term, basin tribes may want to consider creating a distinctly tribes-led organization or institute capable of providing a comprehensive suite of services to enhance tribal capacity. These services could include mentoring future leaders; training leaders and staff; providing technical assistance to tribes; convening tribal leaders; facilitating collaborative problem-solving among tribes and other sovereigns and stakeholders; conducting and/or aggregating research, knowledge, and information relevant to tribes' needs and interests; and advocating for mutually agreed upon positions. Several well-established tribal organizations might provide useful insights on how to approach this long-term proposition, including the Yukon River Inter-Tribal Watershed Council,[237] Columbia River Inter-Tribal Fisheries Commission,[238] and Coast Funds.[239] Another model might be a congressionally chartered water resources institute for all thirty basin tribes, similar to the water resources research institutes created within each basin state under the Water Resources Research Act of 1964.[240] These institutes, modeled on successful federal agricultural research stations created as part of the New Deal in the 1930s, pursue practical research to address the nation's growing water problems.[241] The federal government provides basic support for each institute along with assorted grants.[242]

While tribal leaders seek to advance individual and common interests and to respond to repeated calls for clarity about what they need and/or want from

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[233] *See* Letter from twenty tribal leaders to Deb Haaland, Sec'y of the Interior, *supra* note 231.

[234] *See supra* Section II.

[235] *Id.*

[236] For example, the values and principles presented in the joint letter by twenty tribal leaders. *See* Letter from Twenty Tribal Leaders to Deb Haaland, Sec'y of the Interior, *supra* note 231.

[237] YUKON RIVER INTER-TRIBAL WATERSHED COUNCIL, https://perma.cc/QB4A-7EKS (last visited Apr. 22, 2023).

[238] COLUMBIA RIVER INTER-TRIBAL FISH COMMISSION, https://perma.cc/UUL5-24MQ (last visited Apr. 22, 2023).

[239] COAST FUNDS, https://perma.cc/JZP3-P7GR (last visited Apr. 22, 2023).

[240] NAT'L RSCH. COUNCIL, CONFRONTING THE NATION'S WATER PROBLEMS 45 (2004).

[241] *Id.* at 62.

[242] *Id.* at 45.

the post-2026 management framework, the impact of their efforts hinges not only on the human, social, and financial capital tribes can deploy and their ability to come together and build consensus, but also on the responsiveness of federal and state decision-makers. Tribes' interests and views should be considered to the same extent as those of other sovereigns, and tribes should have sufficient opportunity to influence decisions and outcomes. Tribes need some assurance from the federal government and the basin states that their engagement with tribes will be more than lip service or a box-checking exercise, but rather will lead to genuine tribal inclusion in the process of shaping and implementing the next framework for managing the Colorado River system. The recent efforts to improve tribal engagement in planning and collaborative problem-solving at different spatial scales—including but not limited to state-based initiatives, Upper Basin Tribes-States Dialogue, and Basinwide Tribes-States Dialogue—while far from perfect (especially because they do not incorporate tribes at the decision-making table per se), nevertheless reflect progress and suggest a path forward.[243]

B. Embrace a More Integrated Vision

As form follows function, it is essential to start any conversation about tribal engagement in Colorado River governance by clearly identifying the objectives the governance system is designed to achieve. The Law of the River has evolved for a century and currently includes a suite of policies and programs addressing topics such as water quality, power generation, endangered species, ecological needs, and recreation, all of which have been grafted onto the historical focus on consumptive use.[244] "Unfortunately, some of [these adjustments] have been treated as subservient to the allocative laws and others have been applied as if they were part of an entirely disconnected body of law."[245] The run-up to 2026 presents basin stakeholders with an opportunity to embrace a more comprehensive, integrated set of values associated with the river system. While some may take this as a call for wholesale reconstitution of the Law of the River,[246] past myopia "need not lead inexorably to the conclusion that the law of the river must be replaced or reformed root and branch."[247]

Building on this perspective, the WTI released a policy brief in 2020 titled *A Common Vision for the Colorado River System: Toward a Framework for Sus-*

[243] *See supra* Section II.A.

[244] For an overview of the place of conservation and environmental laws, policies, and programs in the Colorado River Basin, *see Law of the River*, UNITED STATES BUREAU OF RECLAMATION, https://perma.cc/J4VF-ZKBS (last visited April 2, 2023). For reference to specific programs *see* Colorado River Basin Salinity Control Act of 1974, Pub. L. No. 93-320 (1974) (*amended* 1984); Grand Canyon Protection Act, Pub. L. No. 102-575 § 1801, 106 Stat. 4669 (1992); Lower Colorado River Multi-Species Conservation Program, H.R. 5180 (2006).

[245] David H. Getches, *Colorado River Governance: Sharing Federal Authority as an Incentive to Create a New Institution*, 68 U. COLO. L. REV. 573, 577 (1997).

[246] Ian James, *supra* note 7 (interviewing Former Interior Secretary Bruce Babbitt).

[247] Getches, *supra* note 247.

tainability.[248] After reviewing goals for the river system articulated by tribes and other stakeholders, the authors identified several overlapping values and themes, and then synthesized this information into a common vision for the basin.[249] This vision was crafted in the form of a resolution that could be adopted by political communities and other entities in and around the basin and reads as follows:

> Whereas water is life; it is a precious, life-giving resource;
>
> Whereas water is sacred; it is valued for spiritual, cultural, and ecological purposes as well as for sustaining human populations and economies;
>
> Whereas water is foundational to the identities of tribes in the Basin and provides an intrinsic connection to their wellbeing and homelands;
>
> Whereas water in the Colorado River system is essential to urban and rural communities; municipal, agricultural, industrial, recreational, and other uses; and to more than 40 million people in two countries, seven states, and [thirty] sovereign Indian nations; and
>
> Whereas natural and cultural resource conservation are connected.
>
> Now, therefore, be it resolved that the next framework to govern the Colorado River system should:
>
> Promote and support the sustainable, resilient use of the River system for people and the rest of nature;
>
> Ensure the spiritual, cultural, and ecological integrity of the River system while providing water for human use and consumption;
>
> Equitably allocate water by considering the contemporary diversity of needs, interests, and priorities; historical use patterns; and the realities of drought and climate change;
>
> Promote and support reliable access to clean water for all residents of the Colorado River system;
>
> Leave the earth and its water systems better than we found them;
>
> Honor, respect, and realize the federal government's trust responsibility toward the Basin's tribes in a manner that acknowledges their sovereignty and human right to self-determination;
>
> Engage in collaboration as the action of first resort to develop policy and solve problems; and
>
> Integrate traditional indigenous knowledge with western science to better understand the River system and the consequences of alternative management scenarios.[250]

This vision reaches beyond a management framework focused solely on criteria for operating the river system's plumbing (like the 2007 Interim Guidelines).[251] Instead, it emphasizes the need to consider *holistically* consumptive uses alongside cultural and ecological uses such as instream flows, fish and wildlife needs, the sustenance of plants for traditional and subsistence purposes, and ceremonial and spiritual uses.[252] In the spirit that "we can have it all, but we can't have it all at once," the challenge is not only to seek consensus on a common vision for the Colorado River system, but also to agree on how

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[248] WATER & TRIBES INITIATIVE, A COMMON VISION FOR THE COLORADO RIVER SYSTEM: TOWARD A FRAMEWORK FOR SUSTAINABILITY, 1 (2020).

[249] *Id.*

[250] *Id.* at 5.

[251] *See* BUREAU OF RECLAMATION, *supra* note 131.

[252] WATER & TRIBES INITIATIVE, *supra* note 250, at 3.

best to realize that vision over time.[253] Although some basin leaders consulted by the WTI in 2019 see a "tension between taking a more holistic or comprehensive approach to the next set of guidelines versus a more incremental approach, most see this choice as a false dichotomy."[254] Our sense is that, "it is not an either/or proposition but more of a both/and proposition."[255] "[I]t is desirable to articulate a broad, comprehensive vision for the next 25-years (or longer) and then to move in that direction incrementally."[256] Adopting a sort of "pragmatic idealism,"[257] the key question becomes which elements of a common vision can and should be addressed in the next framework for governing the river system, and which elements might be better addressed in other forums or processes? Some parts of the common vision might be achievable more quickly, while other elements are likely to take more time.

Perhaps the most significant barrier in moving from vision to action, identified by several basin leaders interviewed by the WTI in 2019, and succinctly summarized by David Getches in 1997, is that "the awkwardness and the intractability of most of the Colorado River's problems reflect the absence of a venue to deal comprehensively with Colorado River basin issues."[258] The challenges posed to collective action engendered by the absence of such a framework are plainly on display now as the basin struggles to address the immediate hydrologic crisis that is threatening power production at and even water deliveries from Lake Powell and Lake Mead. To remedy this situation, Professor Getches and others have called for establishing a new entity that recognizes and integrates the interests of the basin's sovereigns, water users, and other stakeholders.[259]

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[253] *Id*. at 6.

[254] WATER & TRIBES INITIATIVE, *supra* note 18, at 17.

[255] *Id.*

[256] *Id*.

[257] *Id*.

[258] Getches, *supra* note 247, at 577.

[259] *See, e.g.*, David H. Getches, *Colorado River Governance: Sharing Federal Authority as an Incentive to Create a New Institution*, 68 COLO. L. REV. 573, 573–658 (1997). The idea of a river basin commission, council, or organization for the Colorado River has a long history as expounded by several notable scholars and experienced observers. In chronological order, see the following sources: NORRIS HUNDLEY, JR., WATER AND THE WEST: THE COLORADO RIVER COMPACT AND THE POLITICS OF WATER IN THE AMERICAN WEST 181 (1975) (discussing how several negotiators of the Colorado River Compact favored creation of a permanent Colorado River Commission in 1922); Reuel L. Olson, The Colorado River Compact 195–210 (September 1926) (Ph.D. Thesis, Harvard University) (advocating vigorously for the idea of a Colorado River Authority, though it was not included in the compact); Gilbert F. White, *A New Confluence in the Life of the River*, *in* NEW COURSES FOR THE COLORADO RIVER: MAJOR ISSUES FOR THE NEXT CENTURY 215, 223 (Gary D. Weatherford & F. L. Brown eds., 1986) (concluding that "[a] means might be found to bring together from inside and outside the basin a group representative of the diverse interests in water and related land resources to assess possible actions beyond those specified in the compact"); Charles W. Howe & W. A. Ahrens, *Water Resources of the Upper Colorado River Basin: Problems and Policy Alternatives*, *in* WATER AND ARID LANDS OF THE WESTERN UNITED STATES 169 (Mohamed T. El-Ashry & Diana C. Gibbons eds., 1988) (suggesting an interstate commission to do studies, monitor agreements, and promote dialogue); Douglas Steven Kenney, River Basin Administration and the Colorado: Past Practices and Future Alternatives 439-458, 467–468 (Ph.D. Dissertation, University of Arizona 1993) (proposing a Colorado River Council to be formed by compact, with participation by seven state governors and the Secretary); John G. Berggren, Transitioning to a New Era in Western United States Water Govern-

C. Move Toward Collaborative Governance

Developing the next framework to govern the Colorado River system presents an opportunity not only to embrace a broader, more inclusive vision, but to reflect on the 100th anniversary of the Colorado River Compact, identify lessons learned from that century of experience, and shape a governance arrangement that is more appropriate for the 21st century. The rate and scale of change occurring in the basin—including but not limited to aridification and precipitously declining water supply, population growth, increased outdoor recreation demands, as well as efforts by tribes and conservation groups to better integrate themselves into basin management—challenge the existing governance framework, which remains largely dominated by the United States and the basin states. The time is ripe to move from ad hoc, often crisis-driven collaborative problem-solving to more intentional, institutionalized systems of collaborative decision-making. There is a qualitative difference between "collaborative problem-solving," which typically seeks the input and advice of directly-affected stakeholders before decision-making is completed, and "collaborative decision-making," which involves a process of sharing decision-making authority among identified entities. Rather than creating a new process every time the basin community finds itself staring down a management crisis—which is time-consuming, fraught with uncertainty, and often leads to doing things the same old way (states in the driver's seat with the federal government riding shotgun, and everyone else crammed in the back and largely just along for the ride)—it is time to create an ongoing, collaborative framework for governing the system that is more inclusive, flexible, and adaptive. Such a system would avoid the need to stand up processes to renegotiate management agreements every several years and/or to seek congressional

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ance: Examining Sustainable and Equitable Water Policy in the Colorado River Basin (Ph.D. Dissertation, University of Colorado 2018) (examining policies and decision-making processes in the Columbia River Basin); John G. Berggren, et al. *A Pie No More? Building a More Equitable Colorado River Governance Structure*, *in* CORNERSTONE AT THE CONFLUENCE: NAVIGATING THE COLORADO RIVER COMPACT'S NEXT CENTURY 207, 207–223 (Jason A. Robinson, ed., 2022) (arguing for a more intentional governing structure, including a science panel, to enhance participation). It is worth noting, also, that international best practices for governing transboundary river basins suggest that an ongoing river basin commission is essential to effective and efficient water management. *See generally* MATTHEW MCKINNEY, ET AL., A SACRED RESPONSIBILITY: GOVERNING THE USE OF WATER AND RELATED RESOURCES IN THE INTERNATIONAL COLUMBIA BASIN THROUGH THE PRISM OF TRIBES AND FIRST NATIONS (2015) (outlining the historical context, the interests and aspirations of tribes and First Nations, the role of indigenous people in transboundary water management, and lessons for improving governance in the International Columbia Basin); Mariana Rivera-Torres & Andrea Gerlak, *Evolving Together: Transboundary Water Governance in the Colorado River Basin*, 21 INT'L ENV'T AGREEMENTS: POL., L., & ECON. 553, 553–574 (reviewing literature on transboundary water governance); SUSANNE SCHMEIER, GOVERNING INTERNATIONAL WATERCOURSES: RIVER BASIN ORGANIZATIONS AND THE SUSTAINABLE GOVERNANCE OF INTERNATIONALLY SHARED RIVERS AND LAKES (2012) (arguing that river basin organizations are the key institutions for managing internationally shared water resources); STEPHEN C. MCCAFFREY, THE LAW OF INTERNATIONAL WATERCOURSES (3rd ed. 2019) (examining how to apply the law on international watercourses); UNITED NATIONS ET AL., PROGRESS ON TRANSBOUNDARY WATER COOPERATION: GLOBAL STATUS OF SDG INDICATOR 6.5.2 AND ACCELERATION NEEDS, 2021 (2021) (providing decision-makers with reliable and up-to-date evidence on where acceleration is most needed in the Sustainable Development Goal 6 global acceleration framework implemented to ensure water and sanitation for all by 2030).

approval every time changes are needed. It would allow the basin community to adjust operations and management strategies more efficiently based on the changing climate and emerging needs, interests, and priorities. An adaptive system of planning and decision-making would also reflect the realization that the basin is too complex and faces too many uncertainties to have a single, sustainable permanent solution.[260] It would move from reactive to proactive decision-making and management, and it would more appropriately reflect and respect the full panoply of sovereigns in the basin.

Our purpose here is not to prescribe an ideal model for Colorado River governance. That effort should be done through an authentic, inclusive collaborative process that meaningfully involves all the diverse communities in the basin, including tribes.[261] We also realize that, barring an upheaval of catastrophic magnitude, it will be politically difficult to create an entirely new institution for governing the river system. But the Law of the River has never been a fixed, immutable edifice. So, if not now, when? And if not the current mix of tribal, state, federal, and other leaders, then who?[262]

Although it may be difficult to develop and implement a new governance arrangement all at once, it is possible to imagine the basin's diverse "community of communities" coming together to shape shared long-term goals for sustainability and then moving incrementally toward implementing them. This "pragmatic idealism" acknowledges that the basin's collaborative culture over the past two decades provides a solid foundation for transitioning from ad hoc problem-solving to ongoing, collaborative governance,[263] and that a more integrated, comprehensive approach of this sort is most likely to occur incrementally.

One step toward a new paradigm for Colorado River governance would be to create a Sovereign Governance Team (SGT) to oversee the next manage-

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[260] *Compare* 3 INTERNATIONAL INSTITUTE FOR APPLIED SYSTEMS ANALYSIS, ADAPTIVE ENVIRONMENTAL ASSESSMENT & MANAGEMENT 137 (C.S. Holling ed. 1978) ("[T]he inclusion of environmental considerations among the criteria for project adaptation and the integration of the assessment and planning processes . . . require[] mechanisms that allow the assessment to continue along the project evolution and mechanisms that allow the project to adapt in response to ecological considerations.") *with* John Fleck & Anne Castle, *Green Light for Adaptive Policies on the Colorado River*, WATER SEMIMONTHLY, December 21, 2021, at 4, 7 (Describing uncertainties stemming from evaporation, water flow, and tribal rights).

[261] *See* Mariana Rivera-Torres & Andrea K. Gerlak, *Evolving Together: Transboundary Water Governance in the Colorado River Basin*, 21 INT'L ENV'T AGREEMENTS: POL. L. & ECONS. 553 (2021) ("[R]esearch also uncovers an uneven institutionalization of participation and transparency in the basin. There exist concerns that some stakeholders at the subnational level . . . especially tribes . . . have been insufficiently engaged.").

[262] *See* generally WATER & TRIBES INITIATIVE, *supra* note 11, at 14 ("Arguments for an [overarching] commission [or council] include (1) establishing clear, consistent, transparent processes for making decisions and resolving disputes (and therefore avoiding the need to reinvent the process time and again); (2) dedicating staff whose responsibility is to consider the entire basin, rather than a portion of the basin; and (3) moving from an ad hoc system of collaboration to a more deliberate and inclusive system of planning and decision-making. Arguments against a commission or council include (1) resistance to redefining the role of states; (2) transaction costs to create such a commission; and (3) fear of the unknown.").

[263] *See* WATER & TRIBES INITIATIVE, *supra* note 11, at 16.

ment framework's implementation.[264] While it would be preferable to have this structure in place to develop the post-2026 management framework, we recognize doing so is impractical given the limited window between now and 2026 and the acute hydrologic challenges already confronting the basin that require a more immediate response. It is more realistic, therefore, to imagine the foundation for an SGT being laid during the next management framework's development, and then actualized during its implementation.

An SGT is not an idea created out of whole cloth, and is consistent with past calls for a river basin commission or council for the Colorado River.[265]

The U.S. State Department under President Obama established a Sovereign Review Participation Process "for sovereign parties to collaborate and coordinate" with the federal government in conducting technical studies and developing and evaluating alternatives for the future of the Columbia River Treaty—based in part that on the rationale that "History has shown that failure to include the voices of tribal officials in formulating policy affecting their communities has all too often led to undesirable and, at times, devastating and tragic results. By contrast, meaningful dialogue between Federal officials and tribal officials has greatly improved Federal policy toward Indian tribes. Consultation is a critical ingredient of a sound and productive Federal-tribal relationship."[266] The Columbia River Treaty, in effect since 1964, is an agreement between two sovereigns—United States and Canada—to coordinate flood control and to share hydropower benefits across their shared border.[267] It calls for two "entities" to be designated to implement treaty arrangements—a U.S. entity and a Canadian entity.[268] The U.S. entity includes the Bonneville Power Administration and the Army Corps of Engineers.[269] The treaty provided that either country could terminate most of the Treaty's provisions at any time after the treaty's first 60 years upon giving at least 10 years notice.[270] Created in the run-up to 2014, which was the first opportunity for either party to trigger the treaty's termination provisions, the Sovereign Review Participation Process was designed to inform and advise the U.S. entity on the treaty's past, present, and potential future.[271] This dynamic offers a reasonable parallel to the window now open to federal, state, and tribal sovereigns in the Colorado River Ba-

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[264] *See* WATER & TRIBES INITIATIVE, *supra* note 11, at 10–11 (discussing "Sovereign Review Team").

[265] *See* Matt Jenkins, *In Search of Solutions: Water & Tribes Initiative Encourages Collaborative Approach to Colorado River Management*, 23 LAND LINES 75, 76 (2021). See also note 259 for a review of the history of calls for a river basin commission for the Colorado River basin.

[266] Memorandum on Tribal Consultation, 74 Fed. Reg. 57881 (Nov. 5, 2009). The purpose, structure, and mechanics of the Sovereign Review Participation Process are explained in *Columbia River Treaty 2014–2024 Review Sovereign Review Team Sovereign Participation Process,* Approved by the SRT on July 14, 2011.

[267] *See generally* UNITED STATES ARMY CORPS OF ENGINEERS, COLUMBIA RIVER TREATY 2014/2024 REVIEW (April 2013).

[268] Treaty Relating to Cooperative Development of the Water Resources of the Columbia River Basin, Can.-U.S., Jan. 17, 1961, 15 U.S.T. 1555.

[269] *Id.*

[270] *Id.*

[271] CONG. RSCH. SERV. & CHARLES V. STERN, COLOMBIA RIVER TREATY REVIEW 1, 2 (2023).

sin to reconsider the past, present, and potential future of governance arrangements for the river system ahead of 2026.

The Sovereign Review Participation Process included three layers of participation: (1) formal government-to-government consultation on a one-to-one basis between the federal government and the Columbia River Basin's four states and fifteen tribes;[272] (2) a Sovereign Review Team comprised of members from ten federal agencies, the four states, and the fifteen tribes (the tribes being collectively represented by five delegates); and (3) a Sovereign Technical Team composed of technical staff from all three sets of sovereigns. As a genuinely collaborative effort, the process also provided multiple opportunities for diverse stakeholder participation and public participation.[273]

The most salient features of this experience relative to the role of tribes in governing the Colorado River system are twofold: an explicit recognition of tribes as sovereigns alongside the state and federal governments; and genuine inclusion of tribes in collaborative decision-making.[274] These features are particularly notable because, as in the Colorado River Basin, tribes' needs and interests were largely excluded during the Columbia River Treaty's original negotiation and implementation.[275]

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[272] *Columbia River Treaty: Hearing to Consider the Draft Reg'l Recommendation Regarding the Columbia River Treaty Before the Comm. On Energy and Nat. Res.*, 113th Congress, 8 (2013) (Prepared statement of Brigadier General John Kem, Commander, U.S. Army Corps of Engineers, Northwestern Division, Member U.S. Entity for the Columbia River Treaty, and Stephen Oliver, Vice President, Generation Asset Management, Bonneville Power Administration, Coordinator, United States Entity for the Columbia River Treaty) ("Throughout the Columbia River Treaty 2014/2024 Review process, the U.S. Entity has consulted extensively with regional sovereigns, stakeholders, and the public."), https://perma.cc/L3SR-UEKR; *Id.* at 12 (Statement of Joel Moffett, Chairman, Columbia River Inter-Tribal Fish Commission) ("[T]he Columbia Basin Tribes are working with the U.S. Entity and other regional sovereigns to finalize a high level, consensus based regional policy recommendation on the future of the Columbia River Treaty."); *Id.* at 14 ("The Sovereign Participation is three-tiered: the first tier is government-to-government, where decisions are made regarding policy issues.").

[273] *Columbia River Treaty: Hearing to Consider the Draft Reg'l Recommendation Regarding the Columbia River Treaty Before the Comm. On Energy and Nat. Res.*, 113th Congress, 8 (2013) (Prepared statement of Brigadier General John Kem, Commander, U.S. Army Corps of Engineers, Northwestern Division, Member U.S. Entity for the Columbia River Treaty, and Stephen Oliver, Vice President, Generation Asset Management, Bonneville Power Administration, Coordinator, United States Entity for the Columbia River Treaty) ("Throughout the Columbia River Treaty 2014/2024 Review process, the U.S. Entity has consulted extensively with regional sovereigns, stakeholders, and the public . . . the U.S. Entity has heard from and understands the perspectives of the regional stakeholders through individual meetings, workshop sessions, panel discussions and presentations, and public comment periods.").

[274] *Id.* at 2 (Opening Statement of Hon. Ron Wyden, U.S. Senator from Oregon) ("Today, based upon their Treaty rights and other laws, the Columbia Basin Tribes are rightfully involved in the deliberations regarding system operations to protect salmon and other natural resources"); *see id.* at 11 (Statement of Joel Moffitt) ("Through Basin wide partnership and collaboration the tribes seek to manage the Columbia River for today's modern values not the outdated values of the 1960s when the original Columbia River Treaty was signed.").

[275] *See id.* at 13 ("In developing this coordinated system operation under the Treaty with Canada, the U.S. did not consult with the Columbia Basin Tribes nor consider the effect of the Treaty on our cultural and natural resources.").

A SGT could also build on lessons learned from international best practices for transboundary river basin commissions,[276] successful sovereign-to-sovereign negotiations over Indian reserved water rights settlements,[277] negotiations between and among federal and tribal governments on Endangered Species Act implementation,[278] and emerging experiments in co-management of public lands.[279] The design of a SGT might also benefit by considering any lessons learned from the 7/10 process initiated by the Ten Tribes Partnership and the Secretary of the Interior.[280] It should also build on the principles and

[276] *See* OECD, STAKEHOLDER ENGAGEMENT FOR INCLUSIVE WATER GOVERNANCE 172 (2015) (Table 7.1 Principles on Stakeholder Engagement in Water Governance), https://perma.cc/6D9T-9AKG; *The OECD Principles on Water Governance*, OECD (last visited April 15, 2023, 10:00 AM), https://perma.cc/5J2R-XFKM.

[277] *See, e.g.,* CONG. RSCH. SERV. & CHARLES V. STERN, INDIAN WATER RIGHTS SETTLEMENT (2023); *see also* BONNIE G. COLBY ET AL., NEGOTIATING TRIBAL WATER RIGHTS: FULFILLING PROMISES IN THE ARID WEST 58–67 (2005).

[278] On June 5, 1997, Secretary of the Interior Bruce Babbitt and Secretary of Commerce William Daley signed a joint Secretarial Order on American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endangered Species Act. For a review of this model, see Charles F. Wilkinson*, The Role of Bilateralism in Fulfilling the Federal-Tribal Relationship: The Tribal Rights-Endangered Species Secretarial Order*, 72 WASH. L. REV. 1063, 1063 (1997). The Order culminated 18 months of work by tribes and federal officials to establish an administrative system to resolve difficult questions involving tribal rights and the Endangered Species Act. As explained by Wilkinson, "The Order is important for the ESA's implementation. It also carries broader significance, for it serves as one major example of how the government-to-government relationship between the United States and Indian tribes can be successfully implemented." *Id*.

[279] Since the creation of Bears Ears National Monument by President Obama in 2016, there is an increasing interest in exploring co-management arrangements for federal public land management among federal and tribal governments. Proclamation - Establishment of the Bears Ears National Monument Proclamation No. 9558, 82 Fed. Reg. 1139, 1139 (Dec. 28, 2016), https://perma.cc/G3VV-5H2S. For the first time in history, a president used the Antiquities Act to honor the request of tribal Nations to protect sacred sites. The original proposal was developed by the Bears Ears Inter-Tribal Coalition, made up from representatives of the Hopi Nation, Navajo Nation, Ute Mountain Ute Tribe, Ute Indian Tribe of the Uintah Ouray and Zuni Tribe. While the Coalition did not achieve everything it hoped for (it advocated for protecting 1.9 million acres and the Obama administration settled on 1.35 million acres), the proclamation created the Bears Ears Commission, which includes one elected member from each of the five tribes. Those representatives will partner with federal agencies on decisions regarding management of the national monument land. This type of co-management arrangement does not delegate authority to tribes nor is it a call for tribal unilateralism. The defining principle is "To share authority and responsibility." It is also worth noting that the Obama Administration took this action in this case absent the consent of the State of Utah. For a comprehensive review of co-management arrangements as they apply to federal public land management, see Monte Mills & Martin Nie, *Bridges to a New Era: A Report on the Past, Present, and Potential Future of Tribal Co-Management on Federal Public Lands*, 44 PUB. LAND & RES. L. REV. 54, 54 (2021). For a recent, popular review of the theory and practice of co-management on federal public lands, see Miyo McGinn, *How Tribal Co-managing Movements are Transforming the Conservation of Public Lands*, POPULAR SCI., Oct. 10, 2022, https://perma.cc/9EVN-LGGR.

[280] In the early 1990s, representatives of the seven basin states and the Ten Tribes Partnership (TTP) came together to address the problems facing the Colorado River basin. The intent of the "7/10 Process," as it is colloquially known, was for state and tribal officials to explore ways to improve water use efficiency, new river management strategies, and voluntary water transfers to extend supplies and reduce the risk of shortages. The 7/10 process was limited to the ten tribes of the TTP because these groups had established water rights to waters of the mainstem of the Colorado River. U.S. BUREAU RECLAMATION, COLORADO RIVER BASIN TEN TRIBES PARTNERSHIP TRIBAL WATER STUDY 3-1 (2018). It may be worth examining how this process could be improved.

spirit of several Biden Administration policy pronouncements: White House *Memorandum on Tribal Consultation and Strengthening Nation-to-Nation Relationships* (January 26, 2021);[281] Memorandum from the Office of the President on *Indigenous Traditional Ecological Knowledge and Federal Decision Making* (November 15, 2021);[282] *Joint Secretarial Order on Fulfilling the Trust Responsibility to Indian Tribes in the Stewardship of Federal Lands and Waters* (Order No. 3403, November 15, 2021);[283] interagency MOU on *Tribal Treaty Rights and Reserved Rights* (November 15, 2021);[284] and an interagency MOU *Regarding the Protection of Indigenous Sacred Sites* (November 16, 2021).[285] Collectively, these policy pronouncements acknowledge tribes' interest in federal public lands and waters, including the cultural values and often-sacred nature of such resources. They also reflect an important recognition of the need not only to meaningfully consult tribes on decisions related to core tribal interests, but also to engage tribes in co-management, co-stewardship, and shared decision-making.

Individually and collectively, these policy pronouncements create a useful framework for sovereign-to-sovereign relationships, as highlighted by President Biden's memorandum on *Tribal Consultation and Strengthening Nation-to-Nation Relationships*:

> "American Indian and Alaska Native Tribal Nations are sovereign governments recognized under the Constitution of the United States, treaties, statutes, Executive Orders, and court decisions. It is a priority of my Administration to make respect for Tribal sovereignty and self-governance, commitment to fulfilling Federal trust and treaty responsibilities to Tribal Nations, and regular, meaningful, and robust consultation with Tribal Nations cornerstones of Federal Indian policy. The United States has made solemn promises to Tribal Nations for more than two centuries."[286]

The memorandum goes on to provide high-level direction to the Biden administration on how to achieve these goals.[287] It also affirms the Biden administration's commitment to previous presidential directives that have guided the "Nation-to-Nation" relationship, including Executive Order 13175 of November

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[281] *See generally* Memorandum on Tribal Consultation and Strengthening Nation-to-Nation Relationships, 2021 DAILY COMP. PRES. DOC. 91 (Jan. 26, 2021).

[282] *See generally* Memorandum for the Heads of Departments and Agencies on Indigenous Traditional Ecological Knowledge and Federal Decision Making from Eric S. Lander and Brenda Mallory (Nov. 15, 2021) https://perma.cc/XR8L-E3AG.

[283] *See generally* U.S. DEP'T INTERIOR, U.S. DEP'T AGRIC., ORDER NO. 3403, JOINT SECRETARIAL ORDER ON FULFILLING THE TRUST RESPONSIBILITY TO INDIAN TRIBES IN THE STEWARDSHIP OF FEDERAL LANDS AND WATERS (2021).

[284] *See generally* MEMORANDUM OF UNDERSTANDING REGARDING INTERAGENCY COORDINATION AND COLLABORATION FOR THE PROTECTION OF TRIBAL TREATY RIGHTS AND RESERVED RIGHTS (Nov. 15, 2021).

[285] *See generally* MEMORANDUM OF UNDERSTANDING REGARDING INTERAGENCY COORDINATION AND COLLABORATION FOR THE PROTECTION OF INDIGENOUS SACRED SITES (Nov. 15, 2021). For a discussion of this topic, see generally Kevin Washburn, *Facilitating Tribal Co-Management of Federal Public Lands*, 2022 WIS. L. REV. 263 (2022).

[286] Memorandum on Tribal Consultation, *supra* note 281.

[287] *See id.*

6, 2000, "Consultation and Coordination with Indian Tribal Governments," and the Presidential Memorandum of November 5, 2009, "Tribal Consultation."[288]

As a corollary to the Biden Administration's policy framework, the design of a SGT could also draw on the Bureau of Reclamation's policy guidelines to enhance tribal-federal relations, released in July 2020.[289] The guidelines explicitly state, that:

> "Each federally recognized Indian tribe is a sovereign nation; federally recognized Indian tribes maintain a distinct legal and political relationship with the United States. This government-to-government relationship is unique for each individual tribe. It is separate and distinct from the relationship Reclamation maintains with States, counties, local municipalities, water districts, irrigation districts, or members of the general public."[290]

To facilitate government-to-government relationships, the guidelines provide a framework for tribal-Reclamation "protocol agreements," defined as "mutually agreed-upon principles and procedures for interacting and communicating . . . ."[291] Once established, the intent of a protocol agreement is to facilitate "meaningful and proactive consultations . . . strengthening government-to-government relationships, and . . . entering into partnerships or collaborative efforts that support tribal water resources and the mission of Reclamation."[292]

The Biden Administration's policy pronouncements provide a clear and useful roadmap, but the proof is moving from policy to implementation. Likewise, none of the other examples mentioned above provide definitive guidance for how a SGT ought to be stood up. However, they do provide models for how federal, state, and tribal governments can successfully engage on a sovereign-to-sovereign basis, something the Colorado River still lacks on a basinwide scale.

A SGT, as envisioned here, would recognize the principles of sovereignty and equity discussed above and build on basin tribes' emerging capacity to engage in transactional problem-solving. It would create a more level playing field among basin sovereigns, where tribes are recognized as sovereigns alongside the basin states and the federal government, rather than as another "interest group" or "stakeholder" as in past processes. It would integrate tribes in a meaningful way into planning and decision-making; provide opportunities to meaningfully engage all stakeholders, experts, and the public; and could perhaps grow to include a role for Mexico as an additional sovereign in recognition of the transboundary nature of the Colorado River basin.[293] A SGT could

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[288] *See* Exec. Order No. 13175, 65 Fed. Reg. 67249 (Nov. 6, 2000); Establishment of Bears Ears National Monument, *supra* note 285.

[289] *See, e.g.,* U.S. BUREAU RECLAMATION, WORKING WITH INDIAN TRIBAL GOVERNMENTS; CONSULTATION, CULTURAL AWARENESS, AND PROTOCOL GUIDELINES (2020).

[290] *Id.* at 1.

[291] *Id.*

[292] *Id.*

[293] To be clear, we do not view an SGT as replacing the separate bilateral United States-Mexico process under the auspices of the International Boundary and Water Commission as called for in the 1944 US-Mexico Water Treaty. *See generally* Utilization of Waters of the Colorado and Tijuana Rivers and of the Rio Grande Treaty Between the United States of America and Mexico, Feb. 3, 1944, 59. Stat. 1219. It would merely be supplementary to it to further enhance and facilitate sovereign-to-sovereign communication and decision-making throughout the basin. For

thus serve as a body to facilitate adaptive management and collaborative problem-solving in the whole basin on an ongoing basis.

To ensure successful integration into the architecture of governing the basin's water resources, federal legislation most likely would be needed to authorize a SGT. A logical vehicle would be the legislative package that inevitably will be required to implement the post-2026 management framework. Properly designed and capacitated, a SGT could then become the primary vehicle to oversee that framework's implementation. To achieve this goal, the authorizing legislation would need to clarify several design elements.

First, it would need to identify the SGT participants. One option would be an appointment process whereby (1) the governor of each basin state names one representative (similar to what happens today); (2) the federal government selects a limited number of representatives (perhaps one each from the Upper Basin and Lower Basin, or individual representatives from key agencies such as Reclamation, the Western Area Power Administration, the U.S. Fish and Wildlife Service, and/or the National Park Service); and (3) the basin tribes collectively choose seven representatives (to match the number of state representatives) according to whatever formula the tribes deem appropriate. As noted above, in the Columbia River Basin there were a set number of seats for tribes in the Sovereign Review Participation Process—five delegates for fifteen tribes—and the tribes negotiated among themselves over their representation. Adopting a similar approach would keep the core group relatively small yet inclusive of all three (or four if Mexico is included) sets of sovereigns. The basin community should also consider the merits of including alternates for each representative.[294]

Second, the authorizing legislation would need to delineate the scope of the SGT's authority. We recognize there is likely to be significant debate over whether the SGT should be an advisory council or a true decision-making body. From our perspective, the basin needs more holistic governance, and creating the SGT as a full-fledged decision-making body would enhance its legitimacy, credibility, and effectiveness—to the entire basin's benefit. It might be more politically palatable for the legislation initially authorizing the SGT to come with a sunset date, perhaps 10 years, to allow for date-certain reassessment of the SGT's performance. And the relationship between the SGT's powers and duties, and the powers and duties of the Secretary of the Interior and the Upper

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more information on the role of the IBWC in governing the Colorado River, see INTERNATIONAL BOUNDARY & WATER COMMISSION, https://perma.cc/8C88-AHM7 (last visited Mar. 30, 2023). For an excellent review of the literature on transboundary water governance, including an assessment of the IWBC, see generally Mariana Rivera-Torres & Andrea Gerlak, *Evolving Together: Transboundary Water Governance in the Colorado River Basin*, 21 INT'L ENV'T AGREEMENTS 553 (2021).

[294] The advantage of using of alternates in multi-party negotiation, collaborative problem-solving, and consensus building is to ensure that a particular interest or view is represented in the ongoing dialogue if the designated representative is unavailable for a particular meeting or workshop. The downside is that there may not be the same level of trust among the alternate and other participants, and the alternate may not have an up-to-date understanding of the issues, options, and dynamics of the ongoing dialogue. In the final analysis, our experience is that consistency of participation is paramount to consensus-building.

Colorado River Commission under current law would need to be clearly and carefully addressed.

Third, the authorizing legislation would need to clarify opportunities for broad engagement by water users, stakeholders, and the general public, and to otherwise ensure that the SGT is well-resourced and staffed. Like the Sovereign Review Team in the Columbia River Basin,[295] the SGT could use a variety of social media, in-person, and other mechanisms to raise public awareness and understanding and to seek the input and advice from the general public on appropriate issues. It could also create working groups to include additional stakeholders and experts, delegate assignments to those working groups, and ask the groups to generate reports and recommendations. Accomplishing all these tasks and providing other backbone support will require staff and funding. Federal funding is perhaps the most obvious source, but careful consideration should be given to ensuring that any funding mechanism is reliable and durable.

When an early iteration of the idea of a SGT was presented during a basin-wide workshop convened by WTI in February 2020, it received mixed reviews.[296] Many participants agreed that a SGT could provide a more meaningful role for basin tribes in decision making, better integrate diverse perspectives and information into planning and problem-solving processes, and facilitate better mutual understanding among the sovereigns.[297] At the same time, many participants questioned how all 30 tribes in the basin could best be represented on the SGT, particularly in light of the diversity of interests and capacities among tribes.[298] Concern was also raised about how a SGT could be structured to ensure that its work would be seriously considered by the ultimate federal decision-makers if it is only advisory and not part of the formal decision-making process. Some participants raised a question as to whether the creation of a SGT would be subject to the Federal Advisory Committee Act,[299] while other participants asked operational questions about who would convene, staff, and fund a SGT as well as the challenge of how consensus might be reached among such a large and diverse group of participants.[300] Some participants noted as problematic the fact that, by definition, a SGT would not include representatives of irrigators, conservation groups, and other water users in the basin.[301] And it was also noted that a SGT could supplement

[295] CONG. RSCH. SERV., *supra* note 283 at 6.

[296] WATER & TRIBES INITIATIVE, *supra* note 18 at 60–61.

[297] *Id.*

[298] *Id.* It cannot be emphasized enough that each tribe is unique, with its own goals, interests, culture, resources, and capabilities. It is no more realistic to expect a singular "tribal" position than a single "state" one.

[299] Federal Advisory Committee Act of 1972, Pub. L. No. 92-463, 86 Stat. 770. This Act "formalized a process for establishing, operating, overseeing, and terminating these advisory bodies and created the Committee Management Secretariat to monitor compliance with the Act." Federal Advisory Committee Act (FACA) Management Overview, G.S.A, https://perma.cc/28JN-K5BJ (last visited Mar. 30, 2023). In 1976, Executive Order 12024 delegated to the administrator of GSA all responsibilities of the president for implementing the Federal Advisory Committee Act (FACA). *Id.*

[300] WATER & TRIBES INITIATIVE, *supra* note 18 at 10.

[301] *Id.*

and complement other processes, but should not replace formal government-to-government consultation with basin tribes.[302]

Many of these issues and concerns focus on questions of design and implementation, which could be effectively addressed during a genuinely collaborative process to design a SGT. Inevitably, many other details would need to be addressed to create a viable and effective SGT. But that exercise alone would bring value to the basin community, making space for necessary conversations about a governance structure that is more inclusive of tribes—as well as other stakeholders—than the state-driven and tribe-excluding model created when the Colorado River Compact was drafted a century ago.

CONCLUSION

The title of this article, "First in Time," shines a spotlight on a basic irony built into the Law of the River. First in time, first in right is a key tenet of Western water law. Yet while Native Americans are indisputably the first inhabitants of the Colorado River Basin and have relied on its water and other resources since time immemorial, they were sidelined in the shaping of the Compact and its governing institutions, and they have faced uphill battles to secure and protect their water rights—even to simply being able to provide access to clean water for their members.

Despite this historical inequity, there is reason to hope for a better future. Federal and state sovereigns, the primary decision-makers in the basin over the last century, increasingly embrace a more collaborative, sovereign-to-sovereign approach to problem-solving, if not decision-making. At the same time, tribes are increasing their capacity to help solve the basin's water-shortage issues and insisting on seats at decision-making tables as sovereigns. The negotiation and implementation of the next management framework presents an important inflection point for the basin at the onset of the Compact's second century. It will take vision, passion, candor, and open, honest hard work by all sovereigns, as well as non-sovereign stakeholders, to jointly craft a future for the basin that is both equitable and sustainable. We believe the community of communities that defines the Colorado River system is up to the task.

POSTSCRIPT

Several notable changes have emerged over the past few months since the final draft of this article was prepared. First, one of the largest snowpacks in the last 30 years during the winter of 2023 brought a temporary reprieve to the Colorado River basin.[303] In the upper river basin, for example, snowpack peaked at more than 150% of normal. While some observers hint that this

[302] *Id.*

[303] For more on this topic, see Ian James, *Drought ravaged Colorado River gets relief from snow. But long-term water crisis remains*, L.A. TIMES (Apr. 8, 2023, 5:00 AM), https://perma.cc/W526-YLKG; Scott Dance, *Lake Powell is rising more than a foot a day. But megadroughts effects will still be felt*, WASH. POST (May 11, 2023, 6:30 AM), https://perma.cc/6KQA-HSKK.

means the basin does not need to cut water use as much as expected back in June 2022, others suggest that it is not wise to kick the can down the road. The snowpack provides "breathing room" to allow water managers and stakeholders to develop agreements to "permanently reduce use by about 25% or more of Colorado River water."[304]

Second, in response to the potential for ongoing low run-off conditions and unprecedented water shortages in the Colorado River Basin, the Bureau of Reclamation released a draft Supplemental Environmental Impact Statement (SEIS) on April 11, 2023, to potentially revise the 2007 Interim Guidelines for operating Glen Canyon and Hoover Dams.[305] The draft SEIS presented three alternatives, including a no action alternative. The two action alternatives proposed to cut water use in the Lower Basin using either the established system of priorities (i.e., first in time, first in right) or cutting all water users in the Lower Basin the same percentage. These bookend alternatives would have resulted in dire consequences for tribes and other water users in the Lower Basin, and apparently provided sufficient incentive for the Lower Basin states to negotiate a three-state agreement to conserve at least 3 maf of water through the end of 2026 to protect Lake Powell and Lake Mead.[306] The agreement calls for the federal government to pay about $1.2 billion to irrigation districts, cities, and tribes in the three states if they temporarily use less water. The states have also agreed to make additional cuts beyond that amount to generate additional reductions if necessary to prevent Lake Powell and Lake Mead from declining below critical elevations. In response to this three-state proposal, Reclamation withdrew the draft SEIS in order to analyze the proposal and determine whether it should be included as part of the suite of alternatives evaluated in a final NEPA document.

Third, the architecture of the governing the basin has evolved to better integrate tribes into collaborative problem-solving and decision-making. The Colorado Water Conservation Board and the Colorado River Board of California—the primary decision-making bodies for each of those states—both appointed tribal representatives to these decision-making bodies for the first time ever in 2023.[307] And, one of the core prescriptions of this article is getting

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[304] *See* James, *supra* note 303 (quoting Bill Hasencamp, manager of Colorado River water resources for the Metropolitan Water District of Southern Colorado, in the Ian James article cited above).

[305] *See Supplemental Environmental Impact Statement for Near-term Colorado River Operations*, BUREAU RECLAMATION, https://perma.cc/VZK4-5DJ6 (May 24, 2023) (noting that the draft SEIS has been temporarily withdrawn).

[306] *See* Press Release, Biden-Harris Administration Announces Historic Consensus System Conservation Proposal to Protect the Colorado River Basin (May 24, 2023), https://perma.cc/DWY8-5VMX. *See also* Letter from The Colorado River Basin States Representatives of Arizona, California, and Nevada to Camille Touton, Commissioner for the Bureau of Reclamation (May 22, 2023), https://perma.cc/Y9QN-Z2VT.

[307] On the Colorado Water Conservation Board appointment, see Shannon Mullane, *Lorelei Cloud is first-ever tribal member on Colorado's top water board*, COLO. SUN, https://perma.cc/J6SA-5KS7 (April 28, 2023, 2:54 PM). On the Colorado River Board of California appointment, see *Quechan Indian Tribe President Jordan Joaquin Becomes First Tribal Representative To Sit On The Colorado River Board of California*, FORT YUMA QUECHAN INDIAN TRIBE, https://perma.cc/33ML-X5VG (last visited May 30, 2023).

some traction, albeit in some very preliminary but promising ways. Several tribes, the basin states, and even some people in the federal government have started talking about something like the Sovereign Governance Team explained earlier to help develop the post-2026 management framework. No one has endorsed anything just yet.[308] However, this is tremendously encouraging news, and demonstrates the realization among all three sets of sovereigns in the basin that if the basin is going to develop a management plan for a drier future, it needs a different type of process to both develop and implement that type of plan.

We therefore see encouraging signs for the future, and hope the manner in which basin leaders adapt the architecture of governing the Colorado River system in the face of uncertainty and water scarcity can provide salutary lessons to other river basins in the American West and beyond.

[308] Since this article was published in the *Natural Resources Journal*, the Bureau of Reclamation established the Federal-Tribes-States Group to help guide the development of the post-2026 management framework. The group meets on an ad hoc basis, is attended by representatives from all three categories of domestic sovereigns, and represents the first time in history that Tribes are formally sitting at the same table with federal and state officials to develop long-term strategies to manage the Colorado River system. As of yet, there is no publicly available documentation about this effort. For more information, please contact one of the authors.

CONTROL, FAULT, AND KNOCK-FOR-KNOCK: A GUIDE TO SELECTING INDEMNITIES IN ENERGY CONSTRUCTION AND SERVICES AGREEMENTS

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Tanner Harris**

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Synopsis: Selecting an indemnity in construction and services agreements continues to present challenges for both energy project owners and their contractors. Legacy classification of indemnity clauses into categories such as "broad form," "intermediate form," and "limited form" no longer serves a useful purpose as many anti-indemnity statutes prohibit broad form and intermediate form indemnities. We propose a new framework for selecting energy construction and services indemnities that is based primarily on the degree of control exerted over the project site. A "control-based indemnity," which places the burden of proof on the contractor to demonstrate that the owner did not cause the loss, should be used when the contractor controls the worksite. A "fault-based indemnity," which places the burden of proof on the owner to demonstrate that the contractor caused the loss, should be used when the contractor does not control the work site. A "knock-for-knock indemnity," which makes each of the contracting parties responsible for their own losses regardless of the cause, should be used when there are many contractors conducting operations at a single worksite, where determination of responsibility for a loss can be difficult and expensive. By analyzing the relative level of control exercised over the worksite by the contractor, parties can select indemnities that more suitably allocate risk. This framework also generally reflects the indemnity usage our law firm has recently observed while negotiating energy construction and services agreements, including those for pipeline, solar, wind, LNG, carbon capture, refinery, nuclear, and other facilities.[1]

I. Introduction
II. Control-Based Indemnities: *Res Ipsa Loquitur* and the Presumption of Fault
III. Fault-Based Indemnities: Ensuring Recovery of Legal Costs
IV. Knock-for-Knock Indemnities: No-Fault

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[1] While we discuss and apply this indemnity framework in the context of energy construction and services agreements, these principles may find useful application in other industries and circumstances which are outside the scope of this article.

V. Indemnity Selection Matrix: Using Degree of Control to Select the Proper Indemnity
VI. Conclusion

I. INTRODUCTION

Indemnities are hard. Even in the cerebral halls of The University of Chicago Law School, the very mention of the word "indemnity" causes students' eyes to glaze over. The words in an indemnity clause may be written in English, but they are loaded with hidden meanings and implications. One student struggling to understand an indemnity clause described it as a "house of mirrors." On top of the contractual language, practitioners must contend with varying statutory regimes, which potentially reduce enforceability of indemnities.[2]

Energy project owners and their contractors use indemnity clauses to modify the fault-based liability regime that would otherwise control under applicable law. Owners and contractors should be able to reduce moral hazard—which arises when one party's incentive to take precautions is diminished due to another person bearing the consequences of a loss[3]—by placing liability for certain risks in the hands of the party best able to avoid that risk.[4] When an owner shifts more risk to a contractor than would otherwise exist under applicable law,[5] the parties should expect a corresponding increase in the price for the contractor's work. Owners are therefore incentivized to select an indemnity regime that maximizes the gains achieved through elimination of moral hazard while minimizing the costs arising from excessive allocation of risk to the contractor.[6] If a contractor is well-positioned to prevent a loss from occurring, the

[2] While this article peripherally discusses issues that arise from the interaction of contractual indemnity language with applicable law, the interaction between indemnity language and local law is not its focus. Each practitioner must take care to ensure that indemnity language is consistent with applicable law.

[3] David Rowell & Luke B. Connelly, *A History of the Term "Moral Hazard"*, 79 J. OF RISK AND INS. 1051 (2012). The term "moral hazard" originated in insurance literature and has been adopted by economists to generally describe loss-increasing behavior that arises under insurance or in other contexts where Party A bears the costs of Party B's actions, and Party B therefore lacks adequate incentive to minimize losses. *Id.* at 1051.

[4] Evra Corp. v. Swiss Bank Corp., 673 F.2d 951, 957 (7th Cir. 1982) ("[T]he costs of the untoward consequences of a course of dealings should be borne by that party who was able to avert the consequence at least cost and failed to do so.") (describing the animating principle of Hadley v. Baxendale [1854] 156 Eng. Rep. 145). Placing the costs of negative consequences in the hands of the party best able to avoid those negative consequences is a concept arising in tort law. *Id.*

[5] S. Scott Gaille, Reducing Conflict and Risk: Why Parties Benefit from Using Enumerated Adjustment Clauses in Energy Construction and Services Agreements, 42 ENERGY L. J., 123 (2021). There are situations where a project owner is better served by accepting additional risk rather than shifting risk to the contractor. Id. at 138-39 ("By bearing the risk for differing site conditions, owners receive bids closer to the true cost of work. Owners can then engage the most efficient contractor rather than the contractor who may have been a poor estimator of the risk of encountering differing site conditions and thus submitted the lowest bid.").

[6] Penny L. Parker & John Slavich, *Contractual Efforts to Allocate the Risk of Environmental Liability: Is There a Way to Make Indemnities Worth More Than the Paper They Are Written On?*, 44 SMU L. REV. 1349 (1991). A contractual indemnity may also operate to limit the indemnitor's liability to the indemnitee such that the indemnitor's liability is less than its liability would otherwise be under

price for it bearing such a risk should be less than if the contractor is asked to bear losses that it cannot prevent.

Practitioners have traditionally placed indemnity provisions into three categories:[7] (1) "broad form" (also called "sole negligence"); (2) "intermediate form" (also called "contributory fault"); and (3) "limited form" (also called "comparative fault").

- *Broad Form.* A broad-form indemnity requires the contractor to indemnify the owner against all losses which occur in connection with the contractor's work, even losses caused by the owner's sole negligence. This type of indemnity uses language that requires the contractor to indemnify the owner "regardless of the fault" of the owner.
- *Intermediate Form.* An intermediate-form indemnity requires the contractor to indemnify the owner against all losses which occur in connection with the contractor's work, except in cases of the owner's sole negligence. This means that if the contractor is found to be even 1% responsible for a loss, it becomes obligated to indemnify the owner for the entire loss.
- *Limited Form.* A limited-form indemnity is usually based on comparative fault,[8] which requires the contractor to indemnify the owner for

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the fault-based liability regime that would otherwise apply. Id. at 1351-52 ("Under certain circumstances, an indemnity may actually serve to limit, not extend, the indemnitor's liability to the indemnitee. For example, an indemnity drafted as the exclusive remedy between the parties may be limited contractually to a 'survival' period that is shorter than the statute of limitations for actions that could otherwise be brought under applicable tort and contract theories.").

[7] Edward Arnold et al., *What Does the Indemnity Clause Cover and When Does the Claim Accrue,* SEYFARTH (Jan. 2, 2019), https://www.constructionseyt.com/2019/01/indemnity-clause-cover-claim-accrue/. Indemnification generally includes the duty to defend, and contractual obligations in the energy industry are no different. Scott Gaille, *3 Types of Indemnities (Energy Construction),* GAILLE PLLC (July 10, 2019), https://gaillelaw.com/2019/07/10/3-types-of-indemnity-energy-construction-gaille-energy-blog-issue-79. While the duty to indemnify is "a duty to make good any loss, damage, or liability incurred by another," this duty generally arises at the end of a lengthy fact-finding (and potentially litigious) process that may take months or years to resolve. *Indemnity*, Black's Law Dictionary (10th Ed. 2014); Christopher R. Mosley et al., *Litigating the Duty to Indemnify*, SHERMANHOWARD (Mar. 9, 2022), http://shermanhoward.com/wp-content/uploads/2022/04/Litigating-the-Duty-to-Indemnify.pdf. By contrast, the duty to defend includes active defense or funding of the defense while the fact-finding process is ongoing and pending resolution. For further discussion, *see* Sean McChristian, *Indemnity vs. Duty to Defend: Know the Differences and Potential Critical Variations in State Law*, UNDER CONSTR.: A.B.A. F. ON CONSTR. L. (Aug. 16, 2019), https://www.americanbar.org/groups/construction_industry/publications/under_construction/2019/summer/indemnity-vs-duty/.

[8] Arnold et al., *supra* note 7. A limited-form indemnity also can be further limited based on contributory fault. Tom Stilwell & Sameer Mohan, *Deconstructing Anti-Indemnity in Texas, Louisiana, California and New York*, BAKERHOSTETLER (May 14, 2015), https://www.bakerlaw.com/files/uploads/News/Linked%20documents/ConstructioAnti-IndemnityPresentation.pptx. A contributory fault approach requires the contractor to indemnify the owner for losses which occur in connection with the contractor's work, to the extent that the owner can demonstrate that the owner was not contributorily at fault for the loss. This form of indemnity is the conceptual opposite of the intermediate form, because if the owner cannot prove that the contractor was 100% at fault for the loss, it cannot obtain the indemnity. *Understanding Indemnification Clauses*, MAYNARDNEXSEN (Dec. 6, 2021), https://www.maynardnexsen.com/publication-understanding-indemnification-clauses. This type of indemnity uses language that requires the contractor to indemnify the owner

losses only to the extent that the owner can demonstrate the contractor's responsibility for the loss. This means that if the contractor is found 1% responsible for a loss, it is only required to indemnify the owner for 1% of that loss. This type of indemnity uses language that requires the contractor to indemnify the owner "only to the extent" of contractor's fault.

Due to the passage of anti-indemnity acts in the majority of United States jurisdictions, the utility of referencing the three categories described above during contract negotiation has declined. These anti-indemnity acts now generally deem void any indemnity requiring a contractor to indemnify an owner for the owner's own negligence.[9] This means that the broad form and intermediate form indemnities are often no longer enforceable.[10]

In any event, current energy industry practice no longer aligns with the legacy categories of broad, intermediate, and limited forms. In our experience, indemnification clauses in construction and services agreements now typically fall into one of three new categories:

- *Control-Based.* A control-based indemnity allocates risk for loss to the contractor, subject to the contractor's opportunity to prove that the loss was caused by the owner's negligence—in which case, the contractor's indemnification would be proportionately reduced to the extent of the owner's negligence. Under a control-based indemnity, the burden of proof generally rests on the contractor.
- *Fault-Based.* A fault-based indemnity allocates risk for loss to the contractor to the extent that the owner can prove that the contractor was at fault for such loss. Under a fault-based indemnity, the burden of proof generally rests on the owner.

"only to the extent" of the negligent acts or omissions of the contractor, but also adds that the contractor's indemnification obligation will be excused if the loss is due "in any part" to the owner's negligence or other culpable conduct. Arnold et al., *supra* note 7.

[9] TEX. INS. CODE ANN. § 151.102 (2012) ("[A] provision in a construction contract . . . is void and unenforceable as against public policy to the extent that it requires an indemnitor to indemnify, hold harmless, or defend a party . . . against a claim caused by the negligence or fault . . . of the indemnitee . . . ."); CAL. CIV. CODE § 2782(a) (West 2012) ("[P]rovisions . . . contained in . . . any construction contract and that purport to indemnify the promisee against liability for damages for death or bodily injury to persons, injury to property, or any other loss, damage or expense arising from the sole negligence or willful misconduct of the promisee . . . are against public policy and are void and unenforceable . . . ."); N.Y. GEN. OBLIG. LAW § 5-322.1(1) (McKinney 2023) ("A covenant . . . in . . . [a construction contract] purporting to indemnify or hold harmless the promisee against liability for damage arising out of bodily injury to persons or damage to property contributed to, caused by or resulting from the negligence of the promisee . . . is against public policy and is void and unenforceable . . . ."); LA. STAT. ANN. § 9:2780.1(B) (2018) ("[A]ny provision . . . contained in . . . a . . . construction contract which purports to indemnify, defend, or hold harmless . . . the indemnitee from or against any liability for loss or damage resulting from the negligence or intentional acts or omissions of the indemnitee . . . is contrary to the public policy of this state and is null, void, and unenforceable.").

[10] TEX. INS. CODE ANN. § 151.102 (2012); *see* CAL. CIV. CODE § 2782(a) (West 2012); *see also* N.Y. GEN. OBLIG. LAW § 5-322.1(1) (McKinney 2023); *see also* LA. STAT. ANN. § 9:2780.1(B) (2018).

- *Knock-for-Knock (No Fault).* A knock-for-knock indemnity allocates risk based on the identity of the party experiencing the loss, regardless of which party was at fault. Each party bears its own losses, irrespective of whether another party's negligence may have caused them. Under a knock-for-knock indemnity, burden of proof is irrelevant since it does not matter which party was at fault.

This article analyzes each of these indemnities and identifies the primary driver for selecting among them as the extent to which a contractor exercises control over the work site. We conclude by providing a simplified framework and matrix that can be used as a reference to determine which type of indemnity should be selected.

II. CONTROL-BASED INDEMNITIES: *RES IPSA LOQUITUR* AND THE PRESUMPTION OF FAULT

The distinguishing characteristic of a control-based indemnity is that the contractor bears the burden of proof to demonstrate that the owner is not entitled to receive indemnification, rather than the owner being required to prove the contractor's fault in order to receive indemnification. This paradigm is motivated by the same theoretical underpinnings of the common law principle known as *res ipsa loquitur,* which is Latin for "the thing speaks for itself."[11]

The English case *Byrne v. Boadle* first applied the doctrine of *res ipsa loquitur* in 1863.[12] As the plaintiff, Mr. Byrne, walked down a street, he was struck by a barrel of flour which fell from the defendant Mr. Boadle's flour shop window, injuring Byrne.[13] In his suit against Boadle for negligence, Byrne was unable to present any witnesses to establish that Mr. Boadle or any of his employees committed any negligent acts which caused the barrel of flour to fall.[14] The trial court applied a traditional formulation of the causation requirement (i.e., that the plaintiff had the burden of proof to demonstrate the defendant's negligence) and granted judgment for Boadle on the basis that no evidence had been presented by Byrne on the issue of causation.[15] On appeal, Byrne argued that although he was unable to present any witnesses to demonstrate Boadle's negligence, he should prevail in the negligence action anyway because Boadle and his employees were in control of the flour shop and barrels of flour generally do not fall from windows without some act of negligence causing the barrel to fall.[16] Byrne argued that in situations like these, the burden of proof should be on the defendant to demonstrate that no negligent acts had oc-

[11] *Res Ipsa Loquitur*, MERRIAM-WEBSTER, https://www.merriam-webster.com/legal/res%20ipsa%20loquitur (last visited Mar. 2, 2023).

[12] Byrne v. Boadle [1863] 159 Eng. Rep. 299.

[13] *Id.*

[14] *Id.*

[15] *Id.*

[16] *Id.*

curred, rather than upon the plaintiff to prove that the defendant committed a negligent act.[17]

The Exchequer Court agreed with Byrne that in the circumstances alleged, the defendant should have the burden of proof to demonstrate that he was not negligent.[18] Chief Baron Pollock explained:

> There are certain cases of which it may be said *res ipsa loquitur*, and this seems one of them. I think it would be wrong to lay down as a rule that in no case can presumption of negligence arise from the fact of an accident. Suppose in this case the barrel had rolled out of the warehouse and fallen on the plaintiff, how could he possibly ascertain from what cause it occurred? It is the duty of persons who keep barrels in a warehouse to take care that they do not roll out, and I think that such a case would, beyond all doubt, afford *prima facie* evidence of negligence. A barrel could not roll out of a warehouse without some negligence, and to say that a plaintiff who is injured by it must call witnesses from the warehouse to prove negligence seems to me preposterous. . . .[19]

> . . . I think it apparent that the barrel was in the custody of the defendant who occupied the premises, and who is responsible for the acts of his servants who had the control of it; and in my opinion the fact of its falling is *prima facie* evidence of negligence, and the plaintiff who was injured by it is not bound to show that it could not fall without negligence, but if there are any facts inconsistent with negligence it is for the defendant to prove them.[20]

The fundamental basis for Chief Baron Pollock's opinion was the defendant's control of the flour shop and responsibility for the acts of his servants.[21] Pollock recognized that in analogous situations in which this legal principle might apply, the following circumstances would exist simultaneously: (i) it would be unlikely for the event to have occurred without the defendant's negligence; and (ii) the plaintiff would have a near-impossible task of obtaining truthful testimony from employees of the defendant.

The doctrine of *res ipsa loquitur* remains substantially the same today.[22] *Black's Law Dictionary* describes the circumstances under which application of

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[17] *Id.*

[18] *Id.*

[19] *Id.* The first known use of the term *res ipsa loquitur* (but in the form *res loquitur ipsa*) appeared in *Pro Milone*, a speech made by Marcus Tullius Cicero in 52 BC on behalf of his friend Titus Annius Milo who was accused of murdering his political enemy Publius Clodius Pulcher. Jeffrey Kahn & John Lopatka, *Res Ipsa Loquitur: Reducing Confusion or Creating Bias?*, 108 Kentucky L.J. 239, 245 n.29 (2019); *see What is Res Ipsa Loquitur?*, DIMARCO ARAUJO MONTEVIDEO (Apr. 24, 2018), https://www.damfirm.com/res-ipsa-loquitur/. As part of his defense of Milo, Cicero argued that political gangs who had taken control of the streets of Rome were responsible for the resulting injuries. While Chief Baron Pollock does not expressly cite Cicero's use of this legal maxim, it is assumed that Pollock was making reference to Cicero's original use in his opinion.

[20] Byrne v. Boadle [1863] 159 Eng. Rep. 299.

[21] *Id.*

[22] For example, in Bond v. Otis Elevator Company, 388 S.W.2d 681 (Tex. 1965), a contractor installed and maintained an elevator under an agreement requiring it to indemnify the owner for losses arising from the contractor's negligence. *Id.* The Texas Supreme Court determined that both the owner and the contractor were liable to a plaintiff injured by the elevator due to their joint control of the instrumentality causing the injuries (but ultimately allocated liability to the contractor due to the contractual indemnity). *Id.; see* General Elevator Co. v. District of Columbia, 481 A.2d 116 (D.C. 1984) (accepting the principle that *res ipsa* type reasoning is useful in determining allocation of liability under a contractual indemnity, even when the principle of *res ipsa loquitur* does not technically apply under the specific facts at issue).

the *res ipsa loquitur* principle is appropriate: "(1) the occurrence resulting in injury was such as does not ordinarily happen if those in charge use due care; (2) the instrumentalities were under the management and control of the defendant; and (3) the defendant possessed superior knowledge or means of information about the cause of the occurrence."[23]

These circumstances parallel those commonly found on many energy projects. First, contractors have built hundreds of solar plants, thousands of wind turbines, and millions of miles of pipelines. Due to the repetitive nature of energy work by experienced contractors, major losses do not ordinarily occur without someone's negligence. Second, on such energy projects, it is usually the contractor that exercises management and control over the project site—and is therefore best positioned to prevent a loss. The owner's presence is limited to a small number of inspectors who act as mere observers and do not exercise control over the work. Third, almost all of the personnel with knowledge of causation for the loss are likely to be employees or subcontractors of the contractor.

Under a typical limited form (fault-based) indemnity, the owner is only entitled to receive indemnification for claims or losses "to the extent" of the contractor's fault. This means that the project owner may find itself in the same position as the unfortunate Mr. Byrne, who was struck by the falling barrel.[24] In circumstances where the contractor controls the work site (much like how Mr. Boadle controlled his flour shop), a typical fault-based indemnity may prohibit an owner from receiving any indemnification from the contractor due to a potentially insurmountable obstacle: the burden of proof.[25]

We recently witnessed a modern version of *Byrne v. Boadle* on a compressor station project. During the course of construction, hundreds of contractor personnel came on and off the site, while only a handful of owner personnel were present (e.g., a site inspector and an owner representative). The contractor supplied and installed thousands of small steel fasteners, each easily identifiable by their shape and color. Near the conclusion of the project, the contractor initiated the commissioning and startup procedure to test a newly-installed compressor turbine. Upon initial startup of the turbine, a discordant sound emanated from the turbine, and the contractor immediately shut down the turbine to investigate the cause of the noise. After opening up the damaged turbine, personnel recovered a small fastener of the same shape and color as those used by the contractor. The fastener had apparently fallen or been kicked into the compressor station piping by accident and then had been sucked into the turbine upon startup. When the owner invoked the contractual indemnity to receive reimbursement for damage to the turbine, the contractor argued that the owner must provide eyewitness or video evidence of contractor personnel knocking or dropping the fastener into the compressor station piping. But the owner had no such evidence.

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[23] *Res ipsa loquitur*, BLACK'S LAW DICTIONARY (11th ed. 2019).

[24] Byrne v. Boadle [1863] 159 Eng. Rep. 299.

[25] *Id.*

One purpose of a control-based indemnity is to avoid such results. The owner should not be responsible for bearing risks that are within the control of the contractor—such as the care and handling of fasteners. A control-based indemnity generally includes language as shown below:[26]

> Contractor shall Indemnify[27] Owner Group from any and all claims or losses directly or indirectly based on, in connection with, relating to, or arising out of the Work or any member of Contractor Group's actions or inactions under this Agreement. Notwithstanding the foregoing, Contractor's Indemnification obligation shall be reduced in accordance with principles of comparative responsibility to the extent that Contractor proves that Owner Group's negligence, gross negligence, or willful misconduct caused such claims or losses.

Because such a control-based indemnity does not require a contractor to indemnify the owner for the owner's own negligence, the provision is presumptively consistent with anti-indemnity statues in the United States.[28] Even in the absence of an anti-indemnity statue, the contractor should not be asked to indemnify an owner for events that are the fault of the owner—which itself results in economic inefficiency arising from the contractor being forced to make assumptions about the degree of care that will be exercised by the owner and structure its bid accordingly.

Circumstances where a third party is at fault for some or all of a loss can complicate control-based indemnities. In our practice, we have seen four general approaches to resolving this issue:

- *Contractor Indemnifies Owner for All Third-Party Responsibility*. Under this first approach, the contractor indemnifies the owner for the proportion of fault attributable to the third party. The rationale for this approach is that the party in control (the contractor) is allocated this risk and is thereby appropriately incentivized to implement precautions to minimize third-party losses (e.g., by providing an off-duty police officer to direct traffic at the site entrance). This approach does not prohibit the contractor from seeking reimbursement from responsible third parties or insurance policies.[29]

[26] We have noticed that while students and practitioners may understand and correctly describe the conceptual differences between types of indemnities, they often struggle to classify specific indemnity language into its proper category. We provide this simplified example language to assist the reader in linking the concepts discussed herein to contractual language that allows those concepts to become operative. This language is simplified and abbreviated and should not be considered "model" language. For example, a control-based indemnity may also include a process by which the owner agrees to refund to contractor a percentage of advanced defense costs—to the extent the contractor demonstrates that owner negligence contributed to the loss.

[27] Indemnify is defined to include both costs of defense and costs of indemnification.

[28] Note that anti-indemnity case law remains poorly developed. For example, the Texas Anti-Indemnity Act became effective on January 1, 2012, but the first cases substantively interpreting the Act did not appear until 2022. *See* Signature Indus. Servs. v. Int'l Paper Co., 638 S.W.3d 179 (TEX. 2022). We are currently unaware of any case law holding that a control-based indemnity is unenforceable under the applicable anti-indemnity statute.

[29] To avoid double recovery, the contractor's indemnification obligation is reduced to the extent that the owner receives insurance proceeds from a Builder's All-Risk policy in respect of the loss. However, this does not excuse the contractor from indemnifying the owner while the insurance claim is pending.

- *No Indemnity of Owner for Losses Caused by Third Parties.* Under this second approach, the owner does not receive indemnification for losses to the extent that the contractor can demonstrate such losses were caused by third parties. The rationale for this approach is that the contractor may have little or no power to avoid or mitigate the actions of third parties and that allocating the risk of third-party negligence to the contractor will not serve to affect incentives in a meaningful way.
- *Contractor Indemnifies Owner Unless Contractor Fault is Zero.* Under this third approach, the contractor indemnifies the owner for the proportion of fault attributable to the third party unless the contractor can demonstrate that it had zero responsibility for the loss. The rationale for this third approach is similar to the second approach, except here the parties assume that the contractor will have at least some power to avoid or mitigate the actions of third parties (e.g., by placing warning signals near the site entrance). However, some third-party actions will occur regardless of the contractor's efforts to avoid third-party losses (e.g., a reckless driver traveling at twice the speed limit), and in these circumstances placing responsibility for the loss on the contractor would not decrease the probability of the loss occurring.
- *Contractor Indemnifies Owner for Half of Third-Party Responsibility.* Under this fourth approach, the owner and contractor share the risk of third-party negligence equally. This may be viewed as a "fair" approach because it makes the owner and contractor equally responsible for losses which may be outside the control of either party while still preserving the incentive for the contractor to implement safeguards and controls to prevent losses.

The distinguishing characteristic of the control-based indemnity is that the contractor bears the burden of proof regarding the comparative negligence of others, on the basis that the contractor controls the site where the work is occurring. The practical application of a control-based indemnity results in temporary indemnification of the owner until investigation into causation concludes. If the investigation shows that a member of the owner group (or, in the variations discussed above, a third party) was wholly or partially responsible for the loss, the owner must proportionally reimburse the contractor for amounts previously paid to the owner.[30]

[30] Whether a contractor is obligated to defend and indemnify an owner against certain claims may depend upon interpretation of the relevant anti-indemnity statute. For example, the Texas Supreme Court recently interpreted the Texas anti-indemnity statute to rule against an owner's attempt to obtain certain defense costs from its contractor. *Signature Indus. Servs.*, 638 S.W.3d 179. The contractor had been performing maintenance and construction work for the owner before the parties became embroiled in a payment dispute. *Id.* at 184. The contractor alleged that the owner's failure to pay caused it to miss required tax payments. *Id.* at 185. As the contractor's financial situation deteriorated, the contractor's president (who had personally guaranteed certain loans to the contractor) also sued the owner directly. *Id.* at 185-86. The owner then sought indemnification from the contractor against the president's claim under the contract's control-based indemnity. *Signature Indus. Servs.*, 638 S.W.3d 179. The Court explained that while the "true cause" of the president's personal liability may have been the contractor's failure to pay taxes, the Texas

In our experience, the control-based indemnity is the predominant form of indemnity both at greenfield projects (i.e., those locations that do not require working in and around existing owner facilities) and at contractor-controlled work locations within an existing owner facility (i.e., where the contractor has the ability to restrict the presence of non-contractor personnel other than the owner's representative and inspectors). The principal rationale is similar to that of *res ipsa loquitur*. Owners of energy projects hire contractors with track records of successfully constructing similar facilities. These expert contractors execute the work using their own hand-picked personnel and subcontractors. The owner typically maintains minimal oversight of day-to-day work. Therefore, if something goes wrong, it is likely to be the contractor's fault—and the control-based indemnity protects the owner from finding itself in a position where its limited site presence makes it difficult to prove negligence.

The control-based indemnity also may serve as a screening mechanism for energy project owners to sort contractors based on their level of comfort with the proposed project. In the process of reviewing redlines to construction agreements by contractors, we have noticed a correlation between a contractor's level of experience with similar projects in the same geographic area and whether or not such contractor is willing to accept a control-based indemnity. The less experience a contractor has with a given type of energy project in the relevant geographic area, the riskier it is for a contractor to accept a control-based indemnity. Even if indemnification is rarely invoked, an owner may benefit from using the control-based indemnity to screen out those contractors with lower experience levels, and suitable contractors may benefit by using their acceptance of the control-based indemnity to differentiate themselves from less-experienced competitors.

III. FAULT-BASED INDEMNITIES: ENSURING RECOVERY OF LEGAL COSTS

The distinguishing characteristic between the control-based indemnity and the fault-based indemnity is which party bears the burden of proof. Under the control-based indemnity, the contractor bears the burden to prove that the owner (or in some cases, a third party) was responsible for all or part of the loss. Under the fault-based indemnity, it is the owner that must carry the burden of proof and demonstrate that the contractor was responsible for all or part of the loss. A fault-based indemnity is integrated into a construction or services agreement using language similar to the following:

> Contractor shall Indemnify Owner Group from any and all claims or losses directly or indirectly based on, in connection with, relating to, or arising out of the Work or any member of Contractor Group's actions or inactions under this Agreement, but only to the extent caused by the negligent acts or omissions of Contractor Group, and shall defend Owner Group from any suit or action brought against Owner Group founded upon the allegation of any such claim or loss.

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anti-indemnity statute only asks whether the "claim" for which indemnity is sought was "caused by" the fault of the indemnitee, and that this determination could be made on the basis of the pleadings without additional factual inquiry. *Id.* at 195.

Like the control-based indemnity and its theoretical foundation in the common law principle of *res ipsa loquitur*, the fault-based indemnity is also rooted in common law principles. Depending on the jurisdiction, an obligation for one party to indemnify another may arise under (1) an "express contractual indemnity," (2) an "implied contractual indemnity," or (3) an "equitable implied indemnity."[31] Express contractual indemnities are "derived from specific language of a contract where one party expressly promises to indemnify the other for a particular kind of loss," while an implied contractual indemnity "arises where a duty to indemnify may be implied from a contractual relationship between two parties."[32] As two industry observers explained:

> The historical bases of indemnity are the related legal theories of unjust enrichment and restitution. At least as to comparative equitable indemnity, and to some degree implied contractual indemnity, courts have determined that it would be unfair for one of several parties causing damage to another to be 'unjustly enriched' by not having to compensate the injured party for the damage that they did cause, and allowing for restitution to the party that actually did pay. In other words, if you were partly responsible for damage that somebody else paid for, it's only fair that you pay them back.[33]

A contractual relationship between an owner and a contractor is one where an indemnity may be implied:

> Typically, [an implied contractual indemnity] action stems from a breach of contract between the two parties where the indemnitor agreed to perform services. The agreement implied an obligation to do the work in a proper manner and to discharge damages resulting from an improper performance. For example, in [a Wyoming Supreme Court case], the engineering company built a heating system for the architect of an instructional facility under an oral subcontract. The heating system's failure to meet specifications caused the architect to pay additional costs. The architect sued the engineer for indemnity for the financial settlement he had to pay.[34]

If such claims are already available as a matter of law, then what is the purpose of a fault-based indemnity? While an owner may be able to make a common law indemnification claim against its contractor, a properly drafted indemnification clause will also allow the owner to recover certain types of losses, such as "attorney's fees, which are not typically recoverable under a common law cause of action."[35] However, even when the contract contains a fault-based indemnity provision, questions may arise regarding the scope of the contractor's duty to defend.[36]

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[31] Sherri L. Sweers & Thomas B. Quinn, *The Law of Indemnity in Wyoming: Unravelling the Confusion*, 31 LAND & WATER L. REV., 811, 811-12 (1996).

[32] *Id.* at 813-14.

[33] Theodore D. Levin et al., *An Overview of Indemnification and the Duty to Defend*, AM. COUNCIL OF ENG'G COMPANIES 1, 2 (2014), https://docs.acec.org/pub/DA77E02A-C742-9915-1727-73DF2CCC23B9.

[34] Sweers & Quinn, *supra* note 31, at 815 (describing the facts in Kemper Architects, P.C. v. McFall, Konkel & Kimball Consulting Engineers, Inc., 843 P.2d 1178 (Wyo. 1992)).

[35] *Indemnification Clauses in Commercial Contracts*, THOMPSON REUTERS, https://legal.thomsonreuters.com/en/insights/articles/indemnification-clauses-in-commercial-contracts (last visited Mar. 10, 2023).

[36] Levin et. al., *supra* note 33. "The obligation to defend is broader than the obligation to indemnify because it applies regardless of the merits of the third-party suit. The allegations of the

Some fault-based indemnities provide for a refund of defense costs, to the extent that the contractor is not found to be at fault.[37] Others do not. For example, in *English v. BGP Intern., Inc.*, a project owner hired a contractor to conduct seismic exploration activities on "land owned by approximately 15,000 different parties."[38] After the contractor commenced exploration activities without first obtaining the permission of certain landowners, the landowners named both owner and contractor in lawsuits alleging trespass and negligence.[39] The contractor refused the owner's request for defense against the lawsuits, insisting that it did not owe a duty to defend unless the owner demonstrated that the contractor was negligent.[40] The relevant indemnity provision required the contractor to

> protect, defend, indemnify and hold harmless [the owner] . . . against loss or damage arising out of any claim or suit . . . resulting from operations when [the contractor] . . . commence[s] field operations without the [consent of all landowners] or any claim or suit arising out of the negligent actions or omission of [contractor].[41]

In determining that the contractor owed a duty to defend, the court emphasized that "the duty to defend and duty to indemnify are distinct and separate duties," and that "the duty to defend is determined solely by the precise language in the contract and the factual allegations in the pleadings."[42]

In most cases, however, the contractor's indemnity is not applicable to the extent that anyone other than a member of "Contractor Group" (which includes contractor, contractor's personnel, contractor's subcontractors, and such subcontractors' personnel) caused the claim or loss. Consider a hypothetical vehicle accident at the site gate involving a contractor vehicle, an owner vehicle, and a third-party vehicle in which each of the drivers was found to be one-third negligent. The contractor's indemnity would usually only extend to its own driver's negligence. The result is that the contractor's indemnity of the owner would be for one-third of the owner's defense costs, claims, and losses arising from such accident.

One potential inefficiency of using a fault-based indemnity (rather than a control-based or knock-for-knock indemnity) is the inherent uncertainty in determining *ex ante* whether the contractor or the owner will bear the costs of a hypothetical loss. As John Collins and Denis Dugan explained almost 60 years ago, "[t]he problem of allocating the cost of injuries and property damage incurred on premises during the time work is being performed by contractors . . . presents, at base, a question of insuring against the risks and of who buys the

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lawsuit trigger the obligation to defend, not the ultimate disposition of the case." *Indemnification Clauses in Commercial Contracts*, *supra* note 35.

[37] *Indemnification Clauses in Commercial Contracts, supra* note 35.

[38] English v. BGP Intern., Inc., 174 S.W.3d 366, 369 (Tex. App. 2005).

[39] *Id.*

[40] *Id.* at 369, 375-76.

[41] *Id.* at 369.

[42] *BGP Intern., Inc.*, 174 S.W.3d at 371-72 (quoting Farmer's Tex. County Mut. Ins. Co. v. Griffin, 955 S.W.2d 81, 82 (Tex. 1997). *See* Tesoro Petroleum Corp. v. Nabors Drilling USA, Inc., 106 S.W.3d 118, 125 (Tex. App. 2003) ("The duty to defend may be triggered by the pleadings, but the duty to indemnify is based on the jury's findings.").

insurance."[43] Because a fault-based indemnity leaves the owner susceptible to losses actually caused by the contractor's actions or inactions (but causation of such losses may be impossible to demonstrate), both the owner and contractor are at risk of bearing the loss and therefore incur a duplication of costs if both choose to insure against the same loss.[44]

In our practice, we typically see fault-based indemnities where the contractor does not exercise management and control over the project site. For example, the owner could have two construction contractors working at the same site, each performing a different type of work. By way of further example, a contractor may be asked to work within a running facility, among the owner's operational personnel. In such cases, *res ipsa loquitur* principles are no longer applicable because it is unfair to presume a given contractor is at fault for a loss. Such loss is equally likely to have been caused by another contractor or one of the owner's employees.[45]

IV. KNOCK-FOR-KNOCK INDEMNITIES: NO-FAULT

A knock-for-knock indemnity is a mutual indemnity where each party contractually assumes liability for injuries and damages to its own employees, contractors, subcontractors, and property, regardless of the fault or cause of the injury or damage.[46] Under this type of indemnity, also called an "identity-based indemnity," the parties agree to accept liability for injury or damage to their own personnel or property, even when the party suffering the loss can demonstrate that the loss occurred due to the fault of another party.

A knock-for-knock indemnity is integrated into a construction or services agreement using reciprocal language similar to the following:

> Contractor shall Indemnify Owner Group from any and all claims or losses directly or indirectly based on, in connection with, relating to, or arising out of bodily injury, illness, or death of any member of Contractor Group [or property damage to any property of Contractor Group],[47]

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[43] John R. Collins & Denis W. Dugan, *Indemnification Contracts – Some Suggested Problems and Possible Solutions*, 50 MARQ. L. REV. 77, 84-85 (1996).

[44] *Id*. at 85 (describing a similar outcome when an indemnity clause is unnecessarily vague: "One problem with a general form of indemnification which does not make explicit whether it is to provide indemnification in cases where the owner's negligence allegedly causes or joins in causing the damages, is that there is likely to be double insurance coverage with consequent duplication of cost.").

[45] Stanley A. Martin & Leah A. Rochwarg, CONSTRUCTION LAW HANDBOOK § 28.04(A) (2018). Negligence-based indemnities also may be appropriate for subsets of claims in certain circumstances, such as: (i) claims related to defects in owner-provided designs, (ii) claims related to defects in owner-supplied materials, and (iii) claims that occur years after completion (in which the owner's maintenance practices could have caused the loss). These examples are similarly consistent with the principle of the degree of contractor's control being the determining factor.

[46] Russell E. Jumper & Timothy J. Fandrey, *General Contractor Clauses: Knock-for-Knock Indemnification*, THOMSON REUTERS PRACTICAL LAW (2021); *see* In re Deepwater Horizon, 470 S.W.3d 452, 456 n.5 (Tex. 2015).

[47] Some anti-indemnity statutes allow knock-for-knock indemnities for personal injury but not for property loss. For example, the Texas Anti-Indemnity Act "does not apply to a provision in a construction contract that requires a person to indemnify, hold harmless, or defend another party

> whether caused by the sole or concurrent negligence or fault of any member of Owner Group, which arise out of or relate to the Work.
>
> Owner shall Indemnify Contractor Group from any and all claims or losses directly or indirectly based on, in connection with, relating to, or arising out of bodily injury, illness, or death of any member of Owner Group [or property damage to any property of Owner Group], whether caused by the sole or concurrent negligence or fault of any member of Contractor Group, which arise out of or relate to the Work.

The primary advantage of knock-for-knock indemnification is certainty regarding which party is responsible for which losses.[48] Under a knock-for-knock approach, litigation costs are reduced or avoided because it does not matter who caused the loss—it only matters who experienced the loss.[49] Such certainty provides additional cost savings by reducing the potential overlap in insurance policies procured by the various parties.[50] Under such an identity-based approach, the responsibility for a loss is clear and risk is predictably allocated at the time of contracting. This means that insurance coverage only needs to be obtained for a party's own property and personnel (and not also for losses that could be inflicted on others).

Knock-for-knock indemnities also may increase transparency between the parties regarding mitigation of risks.[51] Under a control-based or fault-based indemnity, a party may seek to shift the responsibility for a loss to the other party, especially when the loss is substantial. This attempted loss shifting generally plays out through costly litigation or arbitration, where each party has an incentive to obscure or distort the cause(s) of a loss because establishing actual causation determines responsibility for the loss. This situation presents a prisoner's dilemma, whereby each party's self-interest is served by attempting to lay blame on the other party, but the mutual interests of all parties would be best served by identifying the true cause of the loss to ensure it does not reoccur. An identity-based, knock-for-knock regime provides a solution for this prisoner's dilemma because it removes causation as the determining factor for allocating responsibility. Because the parties know that responsibility for a loss remains fixed regardless of who caused the loss, information sharing and development of best practices are encouraged. For example, we witnessed a case where a contractor continued to attempt to remedy a collapsed tunnel (throwing good money after bad) in an effort to escape liability under an indemnification clause—when it would have been in everyone's best interest to

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to the construction contract or a third party against a claim for the bodily injury or death of an employee of the indemnitor, its agent, or its subcontractor of any tier." TEX. INS. CODE § 151.103 (2012).

[48] Robert Meade & Nicholas Neuberger, *Knock-for-Knock Indemnities: Risk Allocation in Offshore Oil and Gas Contracts*, LEXISNEXIS (2019), https://bracewell.com/news/knock-knock-indemnities-risk-allocation-offshore-oil-and-gas-contracts.

[49] *Id*.

[50] *Id*.

[51] *Id*.

abandon the tunnel and proceed with an alternative route. Under a knock-for-knock regime, the contractor may have avoided such expenditures.

Despite these advantages, the knock-for-knock indemnity has a significant downside—the unappealing result of an innocent party potentially bearing the costs of another's negligence.[52] Knock-for-knock indemnities may also contribute to moral hazard by failing to create proper incentives for contractual parties to avoid the imposition of losses on others. This moral hazard may be exacerbated when a contractor is faced with time or cost pressure. In such cases, a contractor may select means or methods that introduce additional risks to others but minimize time or cost. By contrast, under a control-based or fault-based indemnity, a contractor would be less likely to "cut corners" in order to finish a task in a shorter period of time or at a lower cost, because the potential losses (for which it would owe an indemnity) would far outweigh any gain the contractor would receive.

Due in part to these considerations, many jurisdictions have restricted or prohibited the use of knock-for-knock indemnities on public policy grounds.[53] For example, the Texas Construction Anti-Indemnity Act renders void and unenforceable a contractual provision to the extent that it requires one party to indemnify another against a property[54] loss claim caused by the negligence or fault of the indemnitee. By contrast, the Texas Oilfield Anti-Indemnity Act provides an exception for agreements which provide indemnification for claims caused by the indemnitee's own negligence if the indemnity obligation is supported by liability coverage furnished by the indemnifying party.[55] As a result, whether a knock-for-knock indemnity is enforceable under Texas law will depend in part on whether the Construction Anti-Indemnity Act or the Oilfield Anti-Indemnity Act applies to the indemnity and the character of the particular losses indemnified.[56]

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[52] Indeed, even jurisdictions that permit knock-for-knock indemnities acknowledge their imperfect nature. In an English case involving a tugboat accident, the court described the knock-for-knock indemnity between the litigants as "a crude but workable allocation of risk and responsibility" given the reality that "happenstance" would otherwise often determine who should be liable. Smit v. Mobius [2001] EWHC (Comm) 531 [19] (Comm) (Eng.).

[53] *See* TEX. INS. CODE ANN. § 151.102; CAL. CIV. CODE § 2782(a); N.Y. GEN. OBLIG. LAW § 5-322.1(1); LA. STAT. ANN. § 9:2780.1(B).

[54] TEX. INS. CODE ANN. § 151.102. Note that the Texas Anti-Indemnity Act provides an exception for bodily injury or death claims for employees of the indemnitor and permits indemnity for the sole or partial negligence or fault of the indemnitee for those claims only. *Id.* § 151.103.

[55] TEX. CIV. PRAC. & REM. CODE ANN. § 127.005 (West 1999). *See* Russell E. Jumper & Timothy J. Fandrey, *General Contract Clauses: Knock-for-Knock Indemnification Provision (TX)*, PRACTICAL LAW (Dec. 15, 2021), https://content.next.westlaw.com/practical-law/document/I7bf17e0c36cd11e99687ad62ac048e9b/General-Contract-Clauses-Knock-for-Knock-Indemnification-Provision-TX?viewType=FullText&transitionType=Default&contextData=(sc.Default) ("Texas . . . has carved out an exception . . . that allows parties to use an indemnity provision if the provision is supported by certain liability insurance coverage"); Thomas A. Donaho, *Texas Oilfield Indemnity Handbook* 8-10, BAKERHOSTETLER, https://www.bakerlaw.com/webfiles/Litigation/2019/Articles/06-19-2019-Texas-Oilfield-Indemnity-Handbook.pdf (explaining the insurance coverage exception in the Texas Oilfield Anti-Indemnity Act).

[56] Amy K. Wolfshohl & Cornelius M. Sweers, *Engineering, Procurement, and Construction Contracts in Texas: Key Provisions, Issues and Pitfalls*, 17 CONSTR. L.J. 6, 23 (2021) ("[W]hen the [Texas Oilfield Anti-Indemnity Act] does not apply to a construction project, the [Texas] Construction Anti-

Where knock-for-knock indemnities are permitted by applicable law, the benefits of identity-based indemnification generally only prevail when multiple parties with large numbers of personnel and equipment are all occupying the same work location—with little or no delineation between work areas and no clear control of the worksite by a single party.[57] In these circumstances, a control-based indemnity is unworkable because no single party controls the work site and thus the underlying principle of *res ipsa loquitur* does not apply. Likewise, a fault-based indemnity regime may be impractical due to the high cost of demonstrating causation due to the number of potential parties and instrumentalities involved.[58]

Knock-for-knock indemnities have historically been observed in contracts governing work on offshore oil and gas platforms because this work environment is the most likely to be characterized by many parties operating simultaneously in a work area that is not wholly controlled by any single party.[59] In the litigation occurring in the aftermath of the 1988 Piper Alpha oil platform explosion, Lord Bingham described the motivation for the "market practice" of using knock-for-knock indemnities:

> Operations to exploit the oil and natural gas resources of the North Sea have two prominent features relevant for present purposes. First, such operations are potentially hazardous . . . The second feature worthy of note is the involvement of many contractors and sub-contractors . . . [T]he Piper Alpha disaster led to claims against 24 different contractors. Of those on board the platform who were killed, 134 were employed by contractors and 31 by the operator. Of those who survived, 55 were employed by contractors and 6 by the operator.[60]

However, a knock-for-knock indemnity is not automatically appropriate for all offshore work. For example, it is erroneous to argue that a knock-for-knock indemnity should apply to an offshore construction project being undertaken by a single general contractor who is in control of the platform or vessel where the work is occurring. In such cases, the many subcontractors are part of the general contractor's "group," and therefore a control-based indemnity by the general contractor would be appropriate. Thus, rather than merely assuming that "offshore scope of work" automatically implies a knock-for-knock indemnity, practitioners should consider whether a control-based or fault-based indemnity would result in a more appropriate allocation of risk.

Indemnity Act applies and would render a [Texas Oilfield Anti-Indemnity Act] knock-for-knock indemnity provision at least partially unenforceable.").

[57] Alex Johnson, *Indemnities in Offshore Construction Projects – Do Not Be Shocked by Knock for Knock* 1-2, SQUIRE PATTON BOGGS (2016), https://www.squirepattonboggs.com/~/media/files/insights/publications/2016/09/construction-and-engineering-update-autumn-2016/construction-and-engineering-update-autumn-2016.pdf. "'[K]nock for knock' indemnities (assuming they are well crafted, precise, and clear) are likely to be upheld by English courts and however crude the arrangement might seem, the courts seem to accept that it does offer some certainty in an extremely risky work environment." *Id.* at 3.

[58] Caledonia North Sea Ltd. v. British Telecomms. Plc [2002] UKHL 4.

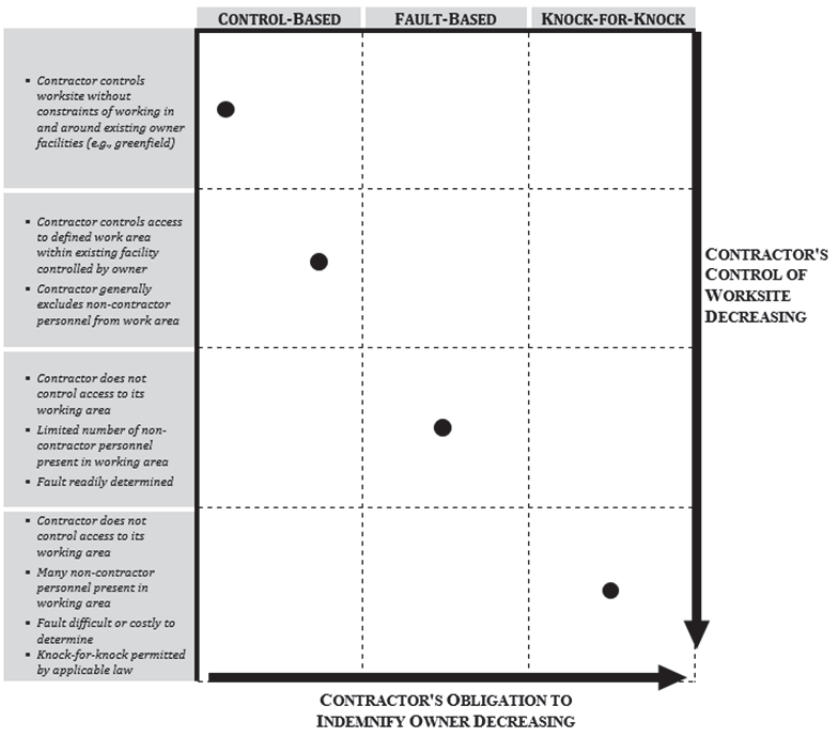
[59] Patrycja Mielcarek, *The Knock-for-Knock Agreements in the Offshore Sector Under the United States and Norwegian Law: The Problem of Gross Negligence and Willful Misconduct* (2012) (on file with U. of Oslo Faculty of Law).

[60] Caledonia North Sea Ltd. v. British Telecomms. Plc [2002] UKHL 4.

Because identity-based indemnities involve mutual indemnification for losses between the contracting parties, these indemnities generally do not address third-party claims or losses. Instead, when an identity-based indemnity is implemented, third-party claims and losses are generally handled via a fault-based indemnification provision whereby each contracting party indemnifies the others for third-party claims and losses to the extent of the indemnitor's negligence.

V. INDEMNITY SELECTION MATRIX: USING DEGREE OF CONTROL TO SELECT THE PROPER INDEMNITY

On any given energy project, the contractor's relative level of control over the work site will exist somewhere along a continuum. Certain project circumstances allow the contractor to exercise near-complete control over the work site, with nearly all on-site personnel either employees or subcontractors of the contractor. By contrast, other projects require contractor personnel to undertake work alongside dozens of unrelated contractors with no clear delineation between work areas. Each of these circumstances—and those existing in between—calls for application of an indemnity paradigm designed to balance incentive alignment against economic inefficiency. The matrix below illustrates this continuum of control and the type of indemnity that strikes the appropriate balance between these trade-offs. Note that as the contractor's control over the worksite decreases, its obligation to indemnify the owner similarly decreases:



VI. CONCLUSION

Selecting contractual indemnities in energy construction and services agreements has become increasingly difficult due to confusion among practitioners regarding when certain types of indemnities are appropriate. This difficulty is further compounded by the general inapplicability of historical indemnification categories to the types of indemnities typically being used in construction and services agreements. By moving toward consideration of indemnities as control-based, fault-based, or identity-based (knock-for-knock), owners and contractors can more efficiently allocate the risk of losses using indemnification principles based primarily on relative control over the contractor's working area. In doing so, a contractor bears the burden of proving the owner's negligence when the contractor has sole control over a location, an owner bears the burden of proving the contractor's negligence when the owner allows a contractor to work in and around owner personnel or other contractors, and everyone bears their own losses when there are many parties working alongside each other.

Leveraging ESG Principles to Help Secure Critical Mineral Supply Chains

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I. INTRODUCTION

As our population grows, the world faces an increasing transition to alternative energy sources that reduce carbon emissions. Meanwhile, we have become more cognizant of the impact our utilization of natural resources has on the environment and local communities. As such, an increasing global awareness of sustainability has begun to dawn. Investors are aligning their investments with their values, and companies have begun communicating those values in the form of Environmental, Social, and Governance ("ESG") disclosures and reports.

Historically, these disclosures and reports have helped investors identify where companies succeed in certain identified value areas, such as with environmental incentives or diversity and inclusion. However, when dealing with companies at the forefront of the energy transition, ESG reports and disclosures have started to morph into a planning and stakeholder communication tool. This has benefited the companies that have made this transition, helping them secure both necessary operating permits and a social license to operate from the communities with which they are interacting.

The United States is facing exponentially increasing demand for numerous mined materials for alternative energy and other initiatives; meanwhile, permitting times and litigation continue to plague mining projects across the western United States. Mining companies can begin utilizing their ESG goals and policies to help identify areas in which they can begin moving toward faster permitting and identify ways to obtain a social license that will help mitigate litigation risks.

Elements of ESG reporting often intersect with the federal regulations that concern protecting the environment and people. For example, when permitting a mine on National Forest System lands, Congress has tasked the U.S. Forest Service with the responsibility of evaluating a proposed project's impacts on water, air, land, plants, wildlife, and local communities, including those communities that have historically been underrepresented. ESG disclosures or reports often require a company to set forth its goals and policies regarding much of the same.

Similarly, Congress tasked other federal agencies with ensuring employee safety and well-being under various health and safety laws, including the Occupational Safety and Health Act and the Mine Health and Safety Act. Companies are often already considering these issues under the banner of ESG, figuring out ways to decrease employee turnover, increase community well-being, and improve employee morale.

This article begins by exploring the expanding and pressing need for a domestically sourced critical mineral supply and the current issues in securing that supply. Then it turns to ESG, explaining how the current disclosure and reporting structure can help companies relay information about their mineral projects to permitting agencies and the public to facilitate project approval. Finally, this article provides several examples of real-world ESG policies and how they have been utilized to effectively plan new projects, support permitting, and increase positive public perception of mining.

II. A DOMESTIC MINERAL SUPPLY CHAIN CONUNDRUM

A. The Critical Mineral Supply Chain

The United States has a critical mineral shortage. In recent years the government has spent an increasing amount of time and energy devoted to figuring out how to safely and quickly establish a domestic supply of numerous minerals.

The United States Geological Survey has defined "critical mineral" as a non-fuel mineral, or mineral material essential to the economic or national security of the United States, and that has a supply chain vulnerable to disruption.[1] Critical minerals are also defined as serving an essential function in manufacturing a product, the absence of which would have significant consequences for the economy or national security.[2] The United States Geological Survey currently lists 50 mineral commodities as critical to the U.S. economy and national security.[3]

Before the United States can fix its critical mineral supply chain, it must first define what is inhibiting it. The vulnerabilities in the United States' critical mineral supply chain can likely be categorized into three distinct areas: (1) rapidly rising demand; (2) global competition; and (3) governance.

1. Rapidly Rising Demand

Many clean energy technologies, such as renewable power (solar photovoltaic, onshore and offshore wind, concentrating solar power, hydro, geothermal, and biomass), nuclear power, electricity networks (transmission and distribution), electric vehicles, battery storage, and hydrogen (electrolysers and fuel cells) require critical minerals for development.[4] The types of mineral resources needed for these clean energy technologies is varied. For example, current battery technologies require lithium, cobalt, and nickel.[5] Rare earth elements are used in wind turbines and electric vehicles ("EVs").[6] And copper and aluminum are vital for constructing electricity networks.[7] Gold and silver are used in many clean energy technologies such as EVs and solar power technologies but are also used in computers, cell phones, 5G communications, advanced combustion vehicles, defense technologies, and medical technologies.[8]

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[1] Jason Burton, *U.S. Geological Survey Releases 2022 List of Critical Minerals*, U.S. GEOLOGICAL SURV., Feb. 22, 2022, https://perma.cc/658Z-6ULQ.

[2] *Id.*

[3] *Id.*

[4] *See* INT'L ENERGY AGENCY, *The Role of Critical Minerals in Clean Energy Transitions* 21, May 2021, https://perma.cc/ZCA8-FS7F.

[5] *Id.*; *see also* NAT'L MINING ASS'N, *40 Common Minerals and Their Uses* 2–4, March 2021, https://perma.cc/UCE4-BEGY [hereinafter *40 Common Minerals*].

[6] INT'L ENERGY AGENCY, *supra* note 4, at 28; *40 Common Minerals*, *supra* note 6, at 5.

[7] INT'L ENERGY AGENCY, *supra* note 4, at 28; *40 Common Minerals*, *supra* note 6, 1–2.

[8] *See* Mitchel J. Krebs, *Coeur Comments to USGS Critical Minerals 12-9-21 w.sig*, Fed. Reg. 6, Dec. 9, 2021, https://perma.cc/3HTK-8GLS.

Over the course of the last several years, there has been a global trend toward the implementation of more clean energy technologies. But this transition has barely put a dent in CO_2 emissions.[9] It is estimated that to reach net-zero emissions globally by the year 2050[10] the installation of solar, wind, and renewable electricity networks needs to expand by threefold. The sales of EVs need to increase by 25-fold by the year 2040.[11] Because all of these clean energy technologies require more quantities of critical minerals than traditional energy technologies, the demand for critical minerals is only going to intensify.[12]

As noted by the International Energy Agency,

> [A] typical electric car requires six times the mineral inputs of a conventional car, and an onshore wind plant requires nine times more mineral resources than a gas-fired plant. Since 2010, the average amount of minerals needed for a new unit of power generation has increased by 50 percent as the share of renewables has risen.[13]

In addition to facing this rapidly increasing demand, the United States must also contend globally with countries that benefit from not only geographic concentration of both extractive and processing facilities but also less stringent environmental and societal compliance measures.

2. Global Competition

The geographic concentration of a mineral certainly plays a role in a country's ability to mine critical minerals. However, there are also many other factors that go into the extraction and processing of these critical minerals. One notable feature of critical minerals is market control held by certain countries and the geopolitical power that comes with cornering the market for specific materials.

For example, China is currently responsible for nearly 65 percent of the extraction of rare earth elements globally.[14] Additionally, the majority of the processing of these minerals occurs in China.[15] The extraction of rare earth elements (and critical minerals in general) requires high-cost financing, long lead

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[9] INT'L ENERGY AGENCY, *supra* note 4, at 28.

[10] The United States has a 2050 net zero goal as well as several other significant climate-related goals. *See* COUNCIL ON ENV'T QUALITY, *Federal Sustainability Plan*, https://perma.cc/E7FD-DH9C (last visited Dec. 27, 2022).

[11] INT'L ENERGY AGENCY, *supra* note 4, at 28.

[12] THE WHITE HOUSE, *Building Resilient Supply Chains, Revitalizing American Manufacturing, and Fostering Broad-Based Growth: 100-Day Reviews under Executive Order 14017*, 152 (June 2021), https://perma.cc/8RHP-SYFZ; Denholm, Paul, Patrick Brown, Wesley Cole, et al., *Examining Supply-Side Options to Achieve 100% Clean Electricity by 2035*, Nat'l Renewable Energy Laboratory, xix, 2022, https://perma.cc/AG7M-CJWQ.

[13] INT'L ENERGY AGENCY, *supra* note 4, at 5, 28.

[14] Wood, Helfgott, et al., *The Mosaic Approach: a Multidimensional Strategy for Strengthening America's Critical Minerals Supply Chain*, Wilson Ctr. at 6, https://perma.cc/U5P7-XWHH (Mar. 31, 2023).

[15] *Id.* at 6–7.

times, and the pricing volatility of the minerals themselves.[16] Thus, regardless of the existence of rare earth elements in other countries, this has resulted in the inability of those other countries to reclaim portions of the rare earth elements market from China—despite efforts to do so.[17]

Because rare earth elements are an important input for certain new technologies, China has used them as a weapon during geopolitical disputes.[18] In the summer of 2010, China reduced export quotas of rare earth elements by 40 percent.[19] In September of the same year, it boycotted exports to Japan over an incident near the contested Senkaku/Diaoyu Islands in the East China Sea.[20] Disputes over these export restrictions were not solved for nearly five years, despite actions from the World Trade Organization.[21]

Rare earth elements are not the only critical minerals that are susceptible to being held hostage over geopolitical issues. Cobalt and lithium face similar problems.[22] Both are indispensable to tech, the green economy, and national defense, and they are only mined in a few geographic areas in the world.

Lithium deposits are highly concentrated in South America, with Argentina, Bolivia, and Chile holding the majority of the world's currently known lithium resources. Australia and China also have sizable lithium deposits, and in the United States, lithium deposits are being discovered in Nevada.[23] While in theory this means that there may be sufficient lithium available, there are issues with the flow of mined lithium into the market due to the slow development of these deposits. South American political turmoil has been a source of concern for the lithium industry—with protests over environmental issues and high government taxes making lithium production less competitive. Meanwhile, China has taken steps to vertically integrate the lithium market, pursuing opportunities to purchase mines in South America and Australia as well as constructing processing facilities in its own country.[24]

Cobalt is mined mostly in the Democratic Republic of Congo ("DRC"), where labor and environmental practices employed by the mining industry are highly unethical. A 2016 Amnesty International report found that thousands of miners, including children, were digging deep into the earth to mine cobalt with

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[16] Sophia Kalantzakos, *The Race for Critical Minerals in an Era of Geopolitical Realignments*, 2020 Vol. 55, No. 3 THE INT'L SPECTATOR 1, 5, https://perma.cc/5SL9-PVS2 [hereinafter *The Race for Critical Minerals*].

[17] *Id.*

[18] *Id.*

[19] *Id.* at 4.

[20] *Id.*

[21] *Id.*

[22] *See id.* at 6–10.

[23] *Id.*; Oliver Milman, *There's Lithium in Them Thar Hills – But Fears Grow Over US 'White Gold' Boom*, THE GUARDIAN, Oct. 18, 2022, https://perma.cc/7YF2-YEZK.

[24] *The Race for Critical Minerals*, *supra* note 16, at 7.

no safety precautions.[25] The United States currently has only one cobalt mine, which opened in October 2022.[26]

While global competition remains fierce, the United States can widen its market share by expanding both domestic extraction and processing. However, the United States faces serious regulatory issues in doing so.

3. Government regulation

The last vulnerability in the critical minerals supply chain is government regulation. Permitting policies play a critical role in the global competition for critical minerals and can oftentimes make a difference in how fast minerals can be extracted and enter the supply chain.

The extensive nature of permitting in the United States is comprehensive and thorough, but it is also difficult, timely, and costly. This puts the United States and its allies at a distinct disadvantage compared to competitors like China and the DRC, which have less extensive environmental and other permitting requirements. To mine in the United States, companies must obtain a wide variety of permits, including but not limited to environmental permits, developmental and operational permits, reclamation bonding and related activities, and permits from authorizing agencies. In addition, mines must comply with strict health and safety measures to ensure that their employees are well taken care of. A major mining project on federal lands may be subject to 30 or more local, state, and federal regulations and programs.[27]

It is estimated that the process to acquire the permits and authorizations needed to mine in the United States is anywhere from seven to ten years.[28] This is in stark contrast to that of Canada or Australia, which maintain equally stringent environmental standards but where the average permitting period is two years.[29]

Recently, the United States has made efforts to reform the permitting regime, but these have been met with significant challenges, both politically and legally. Continued permitting delays in the United States pose a significant threat to the development of new projects, as it is estimated that the expected value of a mine in the United States is decreased by half as a direct result of the prolonged permitting process.[30]

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[25] *See* AMNESTY INTERNATIONAL, *Democratic Republic of Congo: "This is what we Die for": Human Rights Abuses in the Democratic Republic of the Congo Power the Global Trade in Cobalt,* Jan. 19, 2016, https://perma.cc/3B7N-SBX6.

[26] Kirk Siegler & Eric Whitney, *In Idaho, America's First, and Only, Cobalt Mine in Decades is Opening*, NPR, Oct. 8, 2022, https://perma.cc/3U3T-ABRF.

[27] SNL METALS & MINING, *Permitting, Economic Value and Mining in the United States* 23, June 19, 2015, https://perma.cc/Q9BU-RQDV.

[28] *Id.* at 7.

[29] *Id.*

[30] *Id.*

B. Actions Taken to Secure the Supply Chain

As awareness of looming supply chain issues has risen, the U.S. government has begun taking steps to reform the critical minerals supply chain. In December 2017, President Trump issued Executive Order 13817 ("EO 13817").[31] EO 13817 requested the publication of a report detailing (i) strategy to reduce the nation's reliance on critical minerals, (ii) an assessment of progress toward developing critical minerals recycling and reprocessing technologies as well as technological alternatives to critical minerals, (iii) options for accessing and developing critical minerals though investment and trade with allies, (iv) a plan to improve mapping of critical minerals resources in the United States, and (v) recommendations for streamlining permitting processes for discovery, production, and domestic refinement of those critical minerals.[32]

The resulting report, *A Federal Strategy to Ensure Secure and Reliable Supplies of Critical Minerals*, listed specific actions for federal agencies to complete "in order to ensure the Nation has access to a reliable and robust source of critical minerals to support the Nation's economic prosperity and national defense."[33] The actions outlined in the report included calls for (i) advancing transformational research, development and deployment across mineral supply chains; (ii) strengthening America's critical mineral supply chains and defense industrial base; (iii) enhancing international trade and cooperation related to critical minerals; (iv) improving the understanding of domestic critical mineral resources; (v) improving access to domestic critical mineral resources on federal lands and a reduction in federal permitting time frames; and (vi) growing the American critical minerals workforce.[34]

The COVID-19 pandemic and resulting supply chain disruptions further revealed long-standing vulnerabilities in the U.S. supply chains. In particular, the pandemic drastically impacted industries that relied on foreign supply chains such as healthcare, technology, and defense.[35] In response to the both the strategy report and the resulting COVID-19 pandemic, President Trump issued Executive Order 13953 in September 2020, declaring a national emergency to deal with the threat of the United States' undue reliance on foreign countries for its critical mineral resources.[36]

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[31] A Federal Strategy to Ensure Secure and Reliable Supplies of Critical Minerals, Exec. Order 13817, 82 Fed. Reg. 60835 (Dec. 20, 2017) [hereinafter EO 13817].

[32] EO 13817, *supra* note 31, at 60836.

[33] DEP'T OF COMMERCE, *A Federal Strategy to Ensure Secure and Reliable Supplies of Critical Minerals*, 10–11, https://perma.cc/PSF5-SLDU.

[34] *See id.* at 4–5, 14–47.

[35] *See, e.g.*, THE ECONOMIST, *Why Is There a Shortage of Semiconductors?*, Feb. 25, 2021, https://perma.cc/VR33-LN3S; Jack Ewing and Don Clark, *Lack of Tiny Parts Disrupts Auto Factories Worldwide*, N.Y. Times (Jan. 13, 2021), https://perma.cc/QDM8-LA2M; Yangzong Huang, *U.S. Dependence on Pharmaceutical Products from China*, Council on Foreign Relations Blog, Aug. 14, 2019, https://perma.cc/JU68-8UQL.

[36] Addressing the Threat to the Domestic Supply Chain from Reliance on Critical Minerals from Foreign Adversaries and Supporting the Domestic Mining and Processing Industries, Exec. Order No. 13953, 85 Fed. Reg. 62539, 62540 (Sept. 20, 2020).

In February 2021, shortly after taking office, President Biden issued Executive Order 14017, *America's Supply Chains*, which ordered a review of vulnerabilities in the United States' critical mineral and material supply chains within 100 days of issuance.[37] By June 2021, the Departments of Commerce, Energy, Defense, and Health and Human Services had compiled a report that reviewed the current supply chains for critical minerals ("100-day Report").[38]

The 100-day Report focused on supply chains for four different key products: (i) semiconductor manufacturing and advance packaging; (ii) large capacity batteries; (iii) critical minerals and materials; and (iv) pharmaceuticals and active pharmaceutical ingredients.[39] For purposes of the mining industry, the most important product supply chains analyzed in the 100-day Report were the supply chains for large capacity batteries and critical minerals and materials. Finding that the supply chains lacked the desired robustness needed to help sustain the American economy, as well as to drive future clean energy goals, the 100-day Report recommended identifying and incentivizing the U.S. mining and production of critical minerals to be used for both defensive purposes and production of new green energy technologies.[40] Important to the 100-day Report's recommendations was that any critical minerals be "sustainably and responsibly produced and processed…while adhering to the highest environmental, labor, community engagement, and sustainability standards."[41]

In 2022, to promote the changes called for in the 100-day Report, the Biden Administration released its Fundamental Principles for Domestic Mining Reform ("Fundamental Principles").[42] The Fundamental Principles called for a variety of actions on behalf of the federal government to responsibly source critical minerals for the green energy transition. Included among the goals were calls to establish strong mining standards, secure sustainable domestic supply, and provide permitting certainty.[43]

In conjunction with the Fundamental Principles, the Interagency Working Group ("IWG") on Mining Reform was launched to review existing mining laws, regulations, and permitting processes.[44] IWG is tasked with making recommendations to Congress for improvements to the mining process, from initial exploration through reclamation, and will assess the content and effectiveness of mining regulatory structures in other jurisdictions to identify potential best practices that could be adopted by the United States.[45] In March, the IWG

[37] America's Supply Chains, Exec. Order 14017, 86 Fed. Reg. 11849, 11849-50 (Feb. 24, 2021).

[38] THE WHITE HOUSE, *Building Resilient Supply Chains, Revitalizing American Manufacturing, and Fostering Broad-Based Growth: 100-Day Reviews under Executive Order* 14017, June 2021), https://perma.cc/4XK7-E5FV.

[39] *Id.* at 8–9.

[40] *See id.* at 12–18.

[41] *Id.* at 15.

[42] DEP'T OF INTERIOR, Biden-Harris Administration Fundamental Principles for Domestic Mining Reform, 1, Feb. 22, 2022, https://perma.cc/TZM8-32WF.

[43] *See id.* at 1–4.

[44] DEP'T OF INTERIOR, *Interior Department Launches Interagency Working Group on Mining Reform,* Feb. 22, 2022, https://perma.cc/G4A9-JSXP.

[45] *Id.*

called for comments from stakeholders to help inform the IWG's deliberations.[46]At the time of publication, the IWG was still deliberating on its recommendations, although it has released some information regarding the initiation of early consultation with tribal governments.[47]

C. Remaining Domestic Roadblocks to Establishing the Critical Mineral Supply Chain

While the current administration appears to be taking steps to alleviate stressors on the critical mineral supply chain, there remain significant roadblocks to establishing a steady, reliable, and environmentally sound domestic supply of these minerals. As noted above, one of the largest roadblocks to establishing the critical mineral supply chain is the U.S. permitting process.

In a study published by the Council on Environmental Quality ("CEQ") in 2020, it was noted that the average timeline for preparing an Environmental Impact Statement ("EIS") is more than 4.5 years.[48] Only one-quarter of the EISs evaluated in the study took less than 2.2 years, and another quarter took over 6 years.[49] This is despite the CEQ's stated guidance that an EIS should not take more than one year for issuance.

In addition to long permitting times, there are profound impacts from litigation. Frequently, litigation is the "final step" of the National Environmental Policy Act ("NEPA") process.[50] Because NEPA litigation has become so common, mining companies routinely anticipate at least two to three years of litigation delays when planning a proposed mining project.[51] Costly and time-consuming lawsuits burden projects and federal agencies and can hurt communities waiting for jobs, tax revenues, and other project-related benefits to materialize.[52]

Finally, under the current permitting regime, evaluation of a mineral project requires experienced and well-trained personnel, who can not only understand the project's complexities but also the project's potential social, cultural, and environmental effects.[53] The burden of balancing and understanding these complexities is often shouldered by agency employees who are overworked or

[46] 87 Fed. Reg. 18811 (Mar. 31, 2022).

[47] *See* THE WHITE HOUSE, *Fact Sheet: Biden-Harris Administration Announces New Actions to Support Indian Country and Native Communities Ahead of the Administration's Second Tribal Nations Summit,* Nov. 30, 2022, https://perma.cc/2KKZ-ERQB.

[48] COUNCIL ON ENV'T QUALITY, *Environmental Impact Statement Timelines* 1, June 12, 2020, https://perma.cc/A4ZH-UPG2.

[49] *Id.*

[50] *See* COUNCIL ON ENV'T QUALITY, *NEPA Litigation Surveys: 2001-2013*, https://perma.cc/S28N-LKU4 (This survey conducted by the CEQ demonstrates the number of NEPA analyses challenged in court per year from 2001 to 2013).

[51] *See* Mark Compton, *AEMA Response to Interagency Working Group on Mining Regulations, Laws and Permitting*, AM. MINING & EXPL. ASS'N, 10, Aug. 30, 2022, https://perma.cc/U6HJ-JA6U.

[52] *Id.*

[53] *See id.*

inexperienced. Additionally, the agencies often fail to acknowledge the potential negative impacts of *not* approving a mining project.[54]

The rise of ESG reporting could help to alleviate some of these roadblocks. While ESG reports were originally designed for investor communication, many companies are beginning to use their ESG reports for more than traditional use. Companies should utilize ESG planning and reporting to enhance and speed up permitting processes and communicate a mining company's story to community stakeholders concerned about a mining project's potential impacts.

On the permitting front, companies can utilize the information presented in ESG reports to help agencies understand at a basic level whether a project would have positive social or environmental impacts and the social or environmental implications of not approving the project. Companies can also utilize ESG policies to analyze their proposed projects' impact on water, air, and other environmental factors and then adjust their plans accordingly. This will help companies choose project alternatives that better align with their company and stakeholder goals while increasing transparency and community trust.

To understand how a company may leverage its ability to utilize its ESG report in the nontraditional way, it is important to understand what exactly is included in an ESG report and some forthcoming regulatory issues, as well as to explore how other mining companies are already utilizing their ESG reports in nontraditional ways.

III. ENVIRONMENTAL, SOCIAL, AND GOVERNANCE

"Environmental, Social, and Governance," or ESG, is a term used by investors to describe a set of standards for a company's behavior. "Environmental" factors consider how a company manages and safeguards environmental concerns. "Social" factors include how a company manages its relationships with employees, suppliers, customers, and the communities in which it operates. The last element, "Governance," deals with a company's leadership, executive pay, internal controls, and shareholder rights. ESG can sometimes be called "sustainability" or "sustainable investing."[55]

Companies frequently set internal ESG goals to measure their success in implementing various sustainability initiatives or outcomes. Many mining companies have incorporated the United Nations Sustainable Development Goals ("SDGs") to tackle the most pressing ESG issues.[56] This blueprint includes 17 goals that countries—and companies—can use to measure their role in ending poverty and improving health and education, all while tackling climate change and preserving precious natural resources.[57]

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[54] *See id.*

[55] *See* MSCI, *Approaches to Sustainable Investing*, https://perma.cc/KWU2-C4FA (last visited Dec. 28, 2022); *see also* BLACKROCK, *Sustainable Investing & MSCI ESG Ratings*, https://perma.cc/4TBJ-VEH9 (last visited Dec. 28, 2022).

[56] UNITED NATIONS, *The 17 Goals*, https://perma.cc/KVN2-FX3N (last visited Dec. 28, 2022); *see also* PERPETUA, *Sustainability Roadmap*, 5–8, Apr. 2022, https://perma.cc/8MLR-WVAC; COEUR MINING, *2021 ESG Report*, 82, 2021, https://perma.cc/T2SC-7JP.

[57] United Nations, *The 17 Goals*, *supra* note 56.

Public companies in the United States are then required to report on their achievement of their ESG goals using a chosen disclosure method.[58] Currently, there are several widely accepted voluntary disclosure methods, including the Global Reporting Initiative Standards ("GRI Standards"), the Task Force on Climate-related Financial Disclosures ("TCFD"), and the Sustainability Accounting Standards Board ("SASB") standards.[59]

The GRI Standards include (i) Universal Standards, which apply to all companies, (ii) Sector Standards, which apply to specific sectors, and (iii) Topic Standards, which apply to disclosures relevant to a particular topic.[60] The GRI Standards contain disclosures allowing an organization to report information about its impacts in a consistent and credible way. They are based in part on intergovernmental documents such as the *Organisation for Economic Co-operation and Development Guidelines for Multinational Enterprises* and *the United Nations Guiding Principles on Business and Human Rights*.[61] The GRI Standards are designed to help users assess whether a company is meeting expectations set out in the instruments but do not set allocations, thresholds, goals, targets, or any other benchmarks for good or bad performance.[62]

The SASB standards identify a subset of environmental, social, and governance issues that could be most relevant to financial performance and enterprise value for 77 different industries.[63] The SASB standards were developed using a standard-setting process that utilized (i) evidence based-research, (ii) input from companies, investors, and subject-matter experts, and (iii) oversight and approval from the independent SASB.[64] SASB standards contain disclosure topics, associated accounting metrics and technical protocols, and activity metrics for each industry.[65] In September 2020, the SASB also released a supplemental guidance document covering how to disclose information related to greenhouse gas emissions, regardless of industry.[66]

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[58] *See* U.S. SEC. AND EXCH. COMM'N, *SEC Announces Enforcement Task Force Focused on Climate and ESG Issues*, Mar. 4, 2021, https://perma.cc/Z7VL-5WFT.

[59] These are by no means the *only* voluntary disclosure standards available to companies. In fact, some organizations are in the process of identifying and creating additional standards that may prove more valuable than those explored in this article. For example, the Taskforce on Nature-related Financial Disclosures is in the process of developing a risk management and disclosure framework for organizations that will focus on nature-related risks to help support the global financial markets' shift away from nature-negative outcomes. *See* TASKFORCE ON NATURE-RELATED FINANCIAL DISCLOSURES, *About*, https://perma.cc/6SKJ-ASKA.

[60] GLOBAL REPORTING INITIATIVE, *How to Use the GRI Standards*, https://perma.cc/BU6Z-MQBY (Mar. 31, 2023).

[61] GRI STANDARDS, *Consolidated Set of the GRI Standards*, 1.1, https://perma.cc/DAN6-XJG5 (Mar. 31, 2023).

[62] *Id.*

[63] SASB STANDARDS, *Standards Overview,* https://perma.cc/US3M-BDQ4 (last visited Jan. 6, 2023).

[64] *Id.*

[65] SASB STANDARDS, *SASB Standards Application Guidance,* 1.0 https://perma.cc/W75H-VECE (last visited Mar. 31, 2023); *see also* SASB STANDARDS, *SASB Standards, Metals & Mining and Coal Operations Standards*, https://perma.cc/2EVE-V7ED (last visited Jan. 6, 2023).

[66] *See generally* SASB STANDARDS, SASB *Implementation Supplement: Greenhouse Gas Emissions and SASB Standards*, Sept. 2020), https://perma.cc/AD38-739K.

The last set of voluntary disclosure standards, the TCFD standards, are recommendations that provide a foundation for climate-related financial disclosures.[67] The TCFD standards were developed to help companies disclose information related to climate change. The disclosure recommendations are structured around four thematic areas representing core elements of how companies operate: governance, strategy, risk management, and metrics and targets. The four recommendations are interrelated and supported by 11 recommended disclosures that build out the framework with information that should help investors and others understand how reporting organizations think about climate-related risks and opportunities. Companies can utilize the TCFD standards with other disclosure standards, like SASB standards, to create a clearer picture for investors.

In addition to these more statistically focused disclosures, many companies publish plain-language sustainability or ESG reports.[68] These ESG reports often summarize the company's yearly accomplishments and set forth future goals. These reader friendly ESG reports allow stakeholders to easily access and understand more complicated issues and see a breakdown of where the company is and where it is going.

A. The Intersection of ESG Disclosure and Environmental Regulation

One of the most salient examples of how ESG and mining industry regulatory compliance can work hand in hand is the play between the recently proposed U.S. Securities and Exchange Commission ("SEC") requirements for climate disclosures and the requirements to evaluate greenhouse gas ("GHG") emissions and climate change under NEPA.

In March 2022, the SEC proposed detailed and wide-ranging requirements for publicly traded companies to disclose their GHG emissions and climate risks in their registration statements and annual or other periodic reports (the "Proposed Rule").[69] This Proposed Rule would require public companies to disclose certain climate-related information that would have material impacts on their business or financial reports, most notably mandating companies to disclose certain GHG emission metrics.[70] Many companies would also need to obtain independent third-party attestation for their GHG emission disclosures and report on any progress made toward their climate-related goals.[71]

The Proposed Rule aims to enhance and standardize climate-related disclosures for investors.[72] For example, instead of companies using the volun-

[67] TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES, *About*, https://perma.cc/UJ4G-SS9N (Mar. 31, 2023); *see also* TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES, *Recommendations of the Task Force on Climate Related Financial Disclosures*, June 15, 2017, https://perma.cc/N2M2-FPTG.

[68] *See, e.g.*, PERPETUA RESOURCES, *2021 Sustainability Report,* (June 24, 2022), https://perma.cc/ZR2A-6D3Q.

[69] *See* The Enhancement and Standardization of Climate-Related Disclosures for Investors, 87 Fed. Reg. 69, 21334 (Apr. 11, 2022).

[70] *Id.*

[71] *See id.* at 21424.

[72] *See id.* at 21335–37.

tary reporting recommendations under the GRI Standards, SASB standards, or TCFD standards, they would use the mandatory disclosure requirements under the Proposed Rule. And while the Proposed Rule was partly modeled on existing voluntary disclosure frameworks, it does include some differences.

The Proposed Rule builds on SEC guidance that was issued in 2010 that requested the disclosure of information on climate change.[73] The stated goal of the rule was to provide investors with consistent, comparable, and useful information for making investment decisions.[74] The Proposed Rule would require companies to disclose information about the following matters:

- **Governance.** The Proposed Rule would require disclosure of a company's oversight and governance of climate-related risks by its boards and management.[75]
- **Risk Management.** The Proposed Rule would require companies to disclose their processes for identifying, assessing, and managing climate-related risks and whether any such processes are integrated into their overall risk management systems.[76]
- **Transition Plans.** The Proposed Rule would require the disclosure of any potential transition plan due to climate-related risk management strategies, and if there is a plan, the company would be required to disclose a description of the plan, including the relevant metrics and targets used to identify and manage any physical and transition risks.[77]
- **Scenario Analysis.** The Proposed Rule would require companies to disclose if they have run any scenario analyses to assess the resilience of their business strategy. If a scenario analysis has been conducted, the company would be required to disclose the scenarios, parameters, assumptions, analytical choices, and projected principal financial impacts.[78]
- **Climate-Related Targets or Goals.** The Proposed Rule would require any companies that have publicly set climate-related targets or goals to disclose (1) the scope of activities and emissions included in the target, the defined time horizon by which the target is intended to be achieved, and any interim targets, (2) how it intends to meet its climate-related targets or goals, (3) relevant date to indicate whether it is making progress toward meeting the target or goal and how such progress has been achieved, with updates each fiscal year, and (4) if carbon offsets or renewable energy certificates have been used as part of its plan to achieve climate-related targets or goals, as well as certain

[73] *Id.* at 21337.

[74] *Id.* at 21335, 21336–37.

[75] *See id.* at 21345, 21359–61, 21467.

[76] *See id.* at 21345, 21361–62, 21432, 21467–68.

[77] *See id.* at 21345, 21361–63, 21464–67.

[78] *See id.* at 21356–59, 21449, 21464–67.

information about the carbon offsets and renewable energy certificates.[79]

- **Material Impact Risks.** The Proposed Rule would require companies to disclose how climate-related risks have or would likely have a material impact on their business and consolidated financial statements, which may manifest over the short, medium, or long term.[80]
- **Effects on Strategy, Business Model, and Outlook.** The Proposed Rule would require companies to disclose how any identified climate-related risks have or would likely affect their strategy, business model, and outlook.[81]
- **Line-Item Impact.** The Proposed Rule would require companies to disclose the impact of climate-related events and transition activities on (1) the line items of consolidated financial statements and (2) the financial estimates and assumptions used in financial statements.[82]
- **Greenhouse Emissions.** The Proposed Rule would require companies to disclose information related to GHG emissions based on the following three categories:
    - *Scope 1 (direct GHG emissions)*. The Proposed Rule would require disclosing the amount of GHG emissions directly produced by a company through its own business operations.
    - *Scope 2 (emissions from purchased energy)*. The Proposed Rule would require the disclosure of the amount of indirect GHG emissions from purchased electricity or other forms of energy to keep a business running.
    - *Scope 3 (emissions from value chain activities)*. The Proposed Rule would require the disclosure of a company's set emissions targets or goals that include Scope 3 emissions. Scope 3 emissions include emissions from both upstream and downstream activities in the value chain, including emissions from the goods and services purchased by the company.[83]

While the Proposed Rule has not yet been adopted,[84] many companies are beginning to gear up for the significant impacts that this rule is expected to have. The Proposed Rule is expected to influence how investors, key stakeholders, and the outside world measure a company's commitment to sustainability and combatting climate risks from here on out.

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[79] *See id.* at 21405–07, 21437–38, 21468–71.

[80] *See id.* at 21353–55, 21464–67.

[81] *See id.* at 21353–55, 21431, 21468.

[82] *See id.* at 21345, 21464–65.

[83] *See id.* at 21468–71.

[84] The SEC has indicated that April 2023 is the "Final Action" estimate for the Proposed Rule. *See* OFFICE OF INFORMATION AND REGULATORY AFFAIRS, *Climate Change Disclosure*, 2022, https://perma.cc/79FM-WX7M.

However, one question has arisen: What is the impact of the SEC's Proposed Rule on companies, like mining companies, that already track and report GHG emissions, and other climate change goals, under other regulatory regimes? When examining the Proposed Rule against climate change guidance provided under NEPA, it becomes clear that there are some parallels between the SEC's mandatory disclosures and the evaluation of climate effects under NEPA.

On January 9, 2023, the CEQ published new Guidance on Evaluating GHG and Climate Change Effects under NEPA ("GHG Guidance").[85] This newly minted GHG Guidance updates the CEQ's 2016 GHG guidance document, which described how agencies should assess GHG emissions and climate change when reviewing a major federal action under NEPA.[86]

The GHG Guidance explains how agencies should apply NEPA principles and existing best practices for climate change analyses.[87] The contents of the GHG Guidance can be summarized as follows:

- **Early Planning.** The GHG Guidance recommends that regulatory agencies identify proposed actions, reasonable alternatives, and potential mitigation and resilience measures that incorporate considerations regarding GHG emissions and climate change early in the NEPA process.[88]
- **Quantification of GHG Emissions.** The GHG Guidance recommends that agencies seek to quantify a proposed action's projected GHG emissions or reductions for the expected lifetime of the action, considering any available data and GHG quantification tools suitable for the proposed action.[89]
- **Assessment of Potential Climate Change Effects.** The GHG Guidance recommends that agencies use projected GHG emissions associated with the proposed action to help assess any potential climate change effects.[90]

[85] It is unclear how long the GHG Guidance will be in place, since it has been deemed an "interim" guidance. *Id.* The Biden administration is expected to further revise the NEPA regulations in the fall of 2023, which ultimately could incorporate the guidance, making it superfluous. *See* The White House, CEQ Restores Three Key Community Safeguards during Federal Environmental Reviews (Apr. 19, 2022), https://perma.cc/FDW6-5QCE.

[86] *See* Edward Boling & Jacob Aronson, *CEQ Issues Guidance on Evaluating Greenhouse Gas and Climate Change Effects Under NEPA,* PERKINS COIE, Jan. 10, 2023, https://perma.cc/43VB-E9KR.

[87] *See* National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions and Climate Change, 88 Fed. Reg. 1196, 1197 (Jan. 9, 2023). The guidance does not establish or change legal requirements. Nevertheless, agencies will likely rely on the guidance when conducting NEPA reviews, and courts may give some deference to the guidance as they did with prior CEQ climate change guidance documents. *See, e.g.*, *WildEarth Guardians v. Jewell*, No. 1:16-CV-00605-RJ, 2017 WL 3442922 (D.N.M. Feb. 16, 2017); *WildEarth Guardians v. Jewell*, 738 F.3d 298, 309 (D.C. Cir. 2013).

[88] *See* 88 Fed. Reg. 1196 at 1198, 1209.

[89] *See id.* at 1198, 1200–03.

[90] *See id.* at 1198.

- **Social Cost Estimates.** The GHG Guidance recommends that agencies provide context regarding any potential social costs of GHG estimates. The goal of providing the social costs includes (1) translating climate impacts into a more accessible metric of dollars, (2) allowing decision-makers and the public to make comparisons, (3) helping the evaluation of the significance of an action's climate change effects, and (4) providing a better understanding of the trade-offs associated with the action and its alternatives.[91]
- **Reasonably Foreseeable Direct, Indirect, and Cumulative GHG Emissions.** The GHG Guidance discusses various methods for appropriately calculating reasonably foreseeable direct, indirect, and cumulative GHG emissions.[92]
- **Reasonable Mitigation.** The GHG Guidance advises agencies regarding the consideration of reasonable alternatives and mitigation measures and how they may address short-term and long-term climate change efforts.[93]
- **Best Available Information and Science.** The GHG Guidance advises agencies to use the best available information and science when assessing the potential future state of the affected environment in NEPA analyses and how to provide up-to-date examples of existing scientific data.[94]
- **Community Resilience.** The GHG Guidance provides recommendations to agencies regarding the use of information developed during the NEPA process to understand how to make local communities more resilient to the effects of a changing climate.[95]

The GHG Guidance goes significantly beyond any prior guidance document issued by the CEQ and beyond that of the requirements to track GHG emissions and climate change that have been established by courts.[96] Some of the most notable developments of the GHG Guidance include: (1) that agencies quantify a project's reasonably foreseeable direct and indirect GHG emissions annually and over a project's lifetime; (2) that the effects of a project's GHG emissions should be monetized using a social cost calculation; and (3) that GHG emissions should be mitigated to the greatest extent possible.[97]

When examined, some crossover themes exist between the SEC's Proposed Rule and the CEQ's GHG Guidance. While the ultimate information requirements under the two regulatory authorities may differ, the table below highlights a few areas of crossover. It proposes ways in which mining compa-

[91] *See id.* at 1198, 1200–06, 1208–09.

[92] *See id.* at 1198, 1204–05.

[93] *See id.* at 1198, 1206.

[94] *See id.* at 1198.

[95] *See id.* at 1198, 1208.

[96] *See* Boling & Aronson, *supra* note 89.

[97] *Id.*

nies may strategize their thinking around the development of ideas for new or existing mining projects.

SEC Proposed Rule Required Disclosure	**GHG Guidance Recommended NEPA Consideration**	**Information Supplied by Company**
Disclosure of GHG emissions (Scope 1, Scope 2, and Scope 3). *See* 87 Fed. Reg. at 21468.	Agencies should quantify GHG emissions associated with a potential project, including any reasonably foreseeable direct, indirect, and cumulative effects of GHG emissions. *See* 88 Fed. Reg. at 1200-05.	Companies will be required to track information related to their GHG emissions. This includes GHG emissions that are directly produced by the company as well as those that are produced upstream and downstream due to the company's activities.
Transition Plan Disclosures. A transition plan may include a plan to reduce GHG emissions in line with a registrant's commitments or commitments of jurisdictions in which it has significant operations. Transition plans may also be important to registrants and their shareholders to the extent transition risk arises from changes in customer or business counterparty preferences, technological change, or changes in market prices. *See* 87 Fed. Reg. at 21361, 21464-67.	GHG Guidance recommends that agencies leverage early planning processes to integrate GHG emissions and climate change considerations into the identification of proposed actions, reasonable alternatives (as well as the no-action alternative), and potential mitigation and resilience measures. 88 Fed. Reg. at 1198.	Companies can utilize any planning required under NEPA to help identify ways in which they can transition from higher emission operations to lower emission operations. In practice this may look like identifying project alternatives that utilize renewable energy or EVs and disclosing the process by which the company developed and plans to transition to said alternative under the SEC rules.
Once registrants have identified climate related risks, they must then describe the actual and potential impacts of those risks on their strategy, business model, and outlook. This includes	Agencies must identify and analyze any potential mitigation measures that will avoid or reduce GHG emissions. Agencies should consider mitigation, particularly avoidance and minimization, as early as	How a mining company plans for, and mitigates, climate change risks to Environmental Justice communities under NEPA could have an impact on its disclosures for strategy

impacts on business operations; products or services; activities to mitigate or adapt to climate-related risks, including the adoption of new technologies or processes; expenditure for research and development; and any other significant changes or impacts. *See* 87 Fed. Reg. at 21353-54.	possible in the development of their actions, including during scoping, public engagement, and alternatives analysis. *See* 88 Fed. Reg. at 1206. Analysis should also consider how climate change can make a resource, ecosystem, human community, or structure more vulnerable to many types of effects and lessen its resilience to other environmental effects. *See* 88 Fed. Reg. at 1208.	toward climate change risk. A mining company may strategize to avoid areas in which there is higher water stress, or if mineral deposits are in areas with high water stress, the company would plan under NEPA how to maintain water quality for communities to prioritize future water availability. Oftentimes, providing water security involves additional funding and support that may not have been considered when planning a mine.

B. Materiality and Social Licensing

Before departing the regulatory landscape, this article will discuss the importance of items that may be material under the SEC disclosure requirements but may not necessarily be monitored under other regulatory rules or laws. For example, a company's diversity, equity, and inclusion ("DEI") program is likely a material item that is reportable, but there is not a law or regulatory regime[98] that regulates and monitors the development of a DEI program.

While items that are material under SEC disclosure requirements but not otherwise regulated may not at first blush seem as important to incorporate into a company's ESG policy, they can in fact provide great benefit outside of the traditional scope of providing investors with information. Many mining companies have come to understand that their ESG policies and programs help them operate with a "social license."

A social license is the public's ongoing acceptance of a company or industry's standard business practices and operating procedures by its employees, stakeholders, and the general public.[99] The concept of the social license is closely tied to many of the ESG policies that have already been (and will be) discussed in this article.

Because of mining practices in the 1800s, early 1900s, and in some cases more recently, the mining industry had lost much of its social license. However, as our country moves into the age of renewable energy, the mining industry has sought to build back its social license and is tackling the task of building trust within the communities in which it operates as well as with other stakeholders. To do this, companies must be seen as operating responsibly, taking

[98] At least none that this author is aware of.

[99] INVESTOPEDIA, *Social License to Operate (SLO): Definition and Standards,* May 31, 2021, https://perma.cc/ZJ2J-FUVV.

care of their employees and the environment, and being good corporate citizens. If problems arise, the public expects the company to take responsibility and resolve any issues quickly and in an appropriate manner.

IV. ESG IN THE REAL WORLD

Obtaining a social license consistently ranks among the top risks for mining companies.[100] Acquiring a social license can assist a company to brainstorm innovative ideas and proceed through permitting processes in a quicker manner because there will be less opposition to projects proposed by companies that have a reputation for taking care of people and the environment.[101] While theorizing about how mining companies *could* utilize information collected for one regulatory requirement to help strategize and report under another regulatory requirement, real-life examples are often more useful than theories. Below are some examples of mining companies in the western United States that have utilized innovative ESG policies and goals to help with either environmental permitting or acquiring the social licensing needed to help advance their projects. Additionally, this article provides suggestions on how companies may incorporate similar programs to enhance the speed at which they can obtain regulatory permits or social license to operate.

A. Perpetua Resources: A Case Study of Pre-Mining Utilization of ESG Policies

Perpetua Resources Idaho, Inc. ("Perpetua") is a mining company based and operating in Idaho. The company owns the Stibnite Mine site and is working on permitting the Stibnite Gold Project. The Stibnite Gold Project ("Stibnite Project") is in central Idaho, approximately 100 miles northeast of Idaho's capital city, Boise. The Stibnite Project will redevelop one of the largest and highest-grade gold projects in the United States.[102] Additionally, the Stibnite Project will provide the U.S. market with the ability to domestically source the critical mineral antimony used in both high-capacity batteries (for energy storage) and weaponry (for national security).[103] The Stibnite Project is expected to produce enough antimony to meet approximately 35 percent of the U.S. annual demand in the first six years of operation.[104] Currently, the United States has no domestic antimony production.[105]

The Stibnite Project site has a legacy mining history. Beginning over 100 years ago, miners began digging for gold in the area.[106] Today, over 10.5 million tons of legacy spent ore, and unlined tailings are interacting with ground

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[100] EY, *Top 10 Business Risks and Opportunities for Mining and Metals in 2023,* 25–27, https://perma.cc/YA8A-MLMW (last visited Feb. 18, 2023).

[101] *See id.*

[102] PERPETUA RESOURCES, *Why Perpetua Resources*, 1, Nov. 2022, https://perma.cc/3JAQ-2A8P.

[103] *Id.* at 1–2.

[104] *Id.* at 2.

[105] *Id.*

[106] PERPETUA RESOURCES, *SDEIS Project Overview,* 8, Dec. 2022, https://perma.cc/X7CP-TLBQ.

and surface water at the site.[107] Because of the spent ore and tailings, there has been significant habitat degradation in the area, including blocked fish passage and sedimentation discharges into the watershed.[108]

Perpetua's goals for the Stibnite Project site include cleanup, and it proposed a Plan of Restoration and Operations ("PRO") to the U.S. Forest Service in 2016. The PRO proposes to re-mine and backfill the legacy tailings, reconstruct fish passage, and construct a tailings storage facility that will be composite-lined to prevent any future environmental impacts to the surrounding watershed.[109] At the time of writing, the PRO was in its sixth year of federal review under NEPA. It had just finished a 75-day comment period on a Supplemental Draft Environmental Impact Statement ("SDEIS"). A record of the decision is anticipated in early 2024. The permitting process for the Stibnite Project has been nothing less than arduous. And it is no secret that the Stibnite Project has faced some opposition.[110] However, early in the Stibnite Project development process, Perpetua established a strong set of ESG policies that helped the company develop its PRO and create connections within the community that can be used as a future model for other mining companies.

1. Perpetua's ESG Policy

Perpetua has an established set of principles that it follows with regards to environmental protection, social responsibility, and corporate governance.[111] The ESG policy, in combination with the company's Sustainability Roadmap, set forth both guiding principles and specific targets for the company to meet as it moves through the decision-making process and public reporting.[112] The ESG policy is meant to be a living document that is updated as the Stibnite Project advances through the permitting process, to operations, and to eventual reclamation and closure.[113]

The company lists its five guiding principles for responsible mineral development as follows:

- Perpetua Resources' purpose is to leave the [Stibnite] Project site better than we found it and to leave a lasting legacy of economic benefits in Valley County and Idaho.
- Perpetua Resources recognizes that responsible corporate behavior [sic] concerning environmental, social and governance factors can generally positively influence long-term financial performance.

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[107] *Id.*

[108] *Id.*

[109] *Id.* at 13–16.

[110] *See, e.g.*, Will Tiedemann, *Stop Stibnite: Protecting Air Quality*, IDAHO CONSERVATION LEAGUE, Dec. 22, 2022, https://perma.cc/JG7P-TLQU.

[111] PERPETUA RESOURCES, *ESG Policy,* 1, Dec. 28, 2021, https://perma.cc/BH3M-EBRK [hereinafter *ESG Policy*].

[112] *Id.* at 2; *see also*, PERPETUA RESOURCES, *Sustainability Roadmap*, 5–8, Apr. 2022), https://perma.cc/PC7T-LRQJ [hereinafter *Sustainability Roadmap*].

[113] *ESG Policy*, *supra* note 111, at 2.

- Disclosure is the key that allows stakeholders and other interested parties to better understand, evaluate and assess potential risk and return, including the potential impact of ESG factors on Perpetua Resources' performance.
- Perpetua Resources' investment analysis should incorporate ESG factors to the extent they affect risk and return.
- Perpetua Resources acknowledges the division of authority and responsibilities among the three parties core to corporate governance—shareholders, directors, and managers.[114]

While the ESG policy goes on to list a rather robust set of goals and commitments, in April 2022, Perpetua released an even more in-depth stakeholder guide ("Sustainability Roadmap") outlining its ESG policies and goals, how it anticipates achieving those policies and goals, and how those goals align with the SDGs established by the United Nations.[115]

Perpetua's environmental goals include commitments to conservation, minimizing and mitigating any environmental impacts of the Stibnite Project, creating opportunities for environmental "net benefits," addressing climate change, managing hazardous substances in a responsible manner, and protecting the health and safety of its employees.[116] In the Sustainability Roadmap, Perpetua lists four main environmental goals. These include (1) improve and protect water quality, (2) conserve water, (3) limit its footprint, and (4) be a responsible link in the clean energy supply chain.[117]

Perpetua is currently reporting using SASB standards, but the measures reported are expected to change once operations begin.[118] As such, Perpetua has designed its ESG goals and principles to morph with the Stibnite Project. It used these principles and goals to help inform what alternatives were evaluated and ultimately selected under NEPA.

2. Perpetua's Water Plan

One of the main community concerns and the biggest environmental issues with the Stibnite Project site is the poor water quality in the watershed. The water at the Stibnite Project site has been heavily impacted by decades-old mining activity that was largely unregulated during World War II.[119] Despite numerous settlements between prior operators and government agencies, the site has been effectively abandoned, and no party has addressed the existing

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[114] *Id.*

[115] *Sustainability Roadmap*, supra note 112 at 5–8.

[116] *ESG Policy*, *supra* note 111, at 7–12.

[117] *Sustainability Roadmap*, *supra* note 112, at 6.

[118] For example, Perpetua is only tracking nonmineral and waste recycling, but when operations begin, Perpetua will also track mine waste. *See* PERPETUA RESOURCES, *2021 Sustainability Report*, 41, 50–52, June 24, 2022, https://perma.cc/XB6P-349V.

[119] In the Matter of Stibnite Mine Site, CERCLA Dkt. No. 10-2021-0034, Administrative Settlement Agreement and Order on Consent for Removal Actions, ¶ 2 (U.S. EPA Region 10, Jan. 15, 2021), https://perma.cc/AB4L-LFFS.

poor water quality conditions.[120] In 2021, the Environmental Protection Agency ("EPA") concluded that the current site conditions constitute an "actual or threatened release of hazardous substances" that warrants immediate and time-critical actions to protect human health, welfare, and the environment.[121]

The Stibnite Project proposes to improve water quality over the existing conditions through the reprocessing and safe storage or reuse of legacy tailings at the site. But because the site has such poor existing water quality, Perpetua moved and successfully gained approval to begin cleanup of the site before beginning mine construction.[122]

In 2021, Perpetua entered into an Administrative Settlement Agreement and Order on Consent ("ASAOC") with the EPA to begin site cleanup.[123] The ASAOC authorizes Perpetua to provide private investment and conduct time-critical cleanup actions necessary to address water quality concerns that have plagued the site for decades.[124]

Under the ASAOC, Perpetua will remove over 325,000 tons of historical tailings and waste from waterways, reroute streams from waste areas, and investigate historical audits to assess additional water needs.[125] Additional actions will be taken during the construction, mining, and reclamation phases of the Stibnite Project. Under the PRO, Perpetua has proposed eliminating the largest waste rock storage facility and applying geosynthetic liners to pit backfills, tailings storage facility, and tailings storage facility buttress to protect water quality. Perpetua will also treat water that is discharged beyond the project site.

Given the history and water quality legacy at the Project site, there has been a lot of community concern over monitoring the Stibnite Project. In response, Perpetua recognized the need to provide community members with direct access and insight into water quality conditions throughout the life of the Stibnite Project and created a citizen water monitoring program.[126] The goal of the independent water monitoring program is to enhance the transparency of the Stibnite Project and help ensure that the company's data is representative of the environmental conditions present at the site. To achieve this, the Stibnite Advisory Council, which consists of a group of elected community members, hired the Idaho Water Resources Research Institute from the University of Idaho to collect, analyze, and report on ground and surface water samples in conjunction with an EPA-certified lab twice a year.

Through the program, the Idaho Water Resources Research Institute will visit the site and collect samples, in conjunction with Perpetua, from nine dif-

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[120] *Id.*

[121] *Id.* ¶¶ 32–33.

[122] *See id.* ¶¶ 42–49.

[123] *See id.* ¶ 1. The administrative order lists "Midas Gold Corp." as a party to the agreement. In 2021, Midas Gold Corp. changed its name to Perpetua Resources.

[124] *See id.* ¶¶ 42–49.

[125] PERPETUA RESOURCES, *ASAOC Fact Sheet*, July 2022, https://perma.cc/R9SG-8L43.

[126] *See Sustainability Roadmap*, *supra* note 112, at 16.

ferent surface and groundwater locations and two quality control sites.[127] The samples will then be sent to separate laboratories and analyzed for different chemical components, and differences and consistencies between the analysis will be reported via the advisory council's website.[128] In the program's first year, 97 percent of the surface water analyses and 98 percent of the groundwater analyses came back "unflagged" (i.e., there were no significant differences between the lab results).[129] The Idaho Water Resources Research Institute determined that this was an acceptable range and that there did not appear to be a consistent bias between the laboratories specific to any analyte or site location.[130]

The overall strategy of the Stibnite Project in respect to water quality management is unique and can serve as a future example for mining projects that have legacy histories. It aligns with many worldwide ESG goals, such as SDG goals that require the restoration of water-related ecosystems and improving water quality by reducing pollution and the release of hazardous chemicals.

It also creates opportunity for the community to "buy in" to the Stibnite Project. The community water quality monitoring program helps the community feel more secure with the water quality data that is being reported because the water is being tested and analyzed by an independent third party. Additionally, the cleanup that is occurring at the Stibnite Project site is actually underway—something that is incredibly expensive, and which was not happening otherwise. While some parties have yet to "buy in" to the Stibnite Project as a whole, the cleanup allows the company to demonstrate its commitment to environmental stewardship.[131]

3. Perpetua's GHG Emissions and Impacts to Climate Change

Perpetua also has a unique opportunity to pre-planning for GHG emissions. Perpetua began tracking its Scope 1 and Scope 2 GHG emissions in 2017.[132] Furthermore, Perpetua has begun planning for the commencement of operations and how it plans to deal with emissions from its mining activities.

Perpetua has consciously brainstormed ways to mitigate or offset its emissions and evaluated the feasibility of renewable energy credits, carbon offsets, forestry banks, and other programs.[133] Perpetua plans on obtaining power from Idaho Power, which supplies clean energy to the grid and is committed to 100 percent clean energy by 2045.[134] Additionally, Perpetua has in-

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[127] Naveen Joseph et al, *Interlaboratory Comparison Report for the Community Environmental Monitoring Program of the Stibnite Gold Mine Project*, 2, Mar. 10, 2022, https://perma.cc/F47L-E6B3.

[128] *See id.*

[129] *Id.* at 7–10.

[130] *Id.* at 11–12.

[131] Clark Corbin, *Initial Cleanup Underway at Abandoned Stibnite Mine as Company Hopes to Resume Mining*, IDAHO CAP. SUN, Aug. 30, 2022, https://perma.cc/PR95-P8FA.

[132] *Sustainability Roadmap*, *supra* note 112, at 28.

[133] *Id.* at 29.

[134] *Id.*

stalled and utilizes a 25.5kW solar array to power much of the work on-site, which accounted for 44 percent of its 2021 energy supply.[135]

Perpetua is committed to tracking its Scope 3 emissions. While these types of emissions are generally harder to track, it is important for mining companies to be aware of the impacts that their materials have on the downstream market.[136] To help with downstream emissions, Perpetua has entered into an agreement to provide antimony to Ambri, a U.S. manufacturer of stationary clean energy storage batteries.[137] This commitment fulfills the SDG goals of upgrading the world's infrastructure and retrofitting industries to help reduce GHG emissions by utilizing new energy technologies.[138]

The early identification and quantification of Perpetua's GHG emissions benefited it greatly as it moved through the permitting process for the Stibnite Project and will continue to do so as it continues reporting to the SEC.[139] For example, the SDEIS identifies one of the contributing factors to GHG emissions is the site's electricity use.[140] Because Perpetua had identified Idaho Power early on as an electricity provider, it could quantify emission rates for the power expected to be consumed at the site and offset some of that power utilization through the use of its own solar panels.

The U.S. Forest Service in the SDEIS noted that the short-term emissions from the Stibnite Project would ultimately result in a long-term benefit, mostly due to the improvements to the watershed that will reduce the severity of warmer temperatures, variable precipitation, decreased snowpack, lower stream flows, warmer stream temperatures, and changes in wildlife patterns.[141] However, one of the issues that the U.S. Forest Service could consider analyzing is any impact that the recovery of antimony would have on reducing Scope 3 downstream emissions in the long term. For example, in the long term, the Stibnite Project is expected to provide antimony that is needed for renewable or alternative energy, replacing traditional energy sources.

4. Takeaways

A few things can be learned from Perpetua and the Stibnite Project. First, companies looking for ways to connect with their communities should look for opportunities to listen to community concerns, such as concerns over water quality, and incorporate those concerns into their ESG policies and goals. This has benefited Perpetua to the extent that it was able to adjust its PRO that

[135] *Id.*

[136] *Id.*

[137] *Id.*

[138] *Id.*

[139] As explained above, companies that are clearly tracking their GHG emissions can utilize the data to satisfy requirements under both the SEC's Proposed Rule and the GHG Guidance for NEPA analysis. The Stibnite Project SEIS was evaluated under the CEQ's 2016 GHG Guidance, which does differ from the GHG Guidance referenced in this article. *See* USDA *Stibnite Gold Project Supplemental Draft Environmental Impact Statement (SDEIS)*, Ch. 4, 60, Oct. 2022, https://perma.cc/AJ7Y-PJBZ.

[140] *Id*. at 66.

[141] *Id*. at 74.

took into account community concerns such as light pollution, water quality monitoring concerns, and other issues.

Second, when seeking permitting for future projects, companies should try to incorporate calculations or descriptions for GHG Scope 3 reductions if their proposed project will promote future renewable projects. Because the Biden Administration has put such a large emphasis on the sourcing of critical minerals, like antimony, for renewable energy, the U.S. Forest Service and other permitting agencies may take a hard look at how they can incorporate the analysis of the impacts of the future reduction of Scope 3 emissions due to the mining of critical minerals into their decisions.

B. Sibanye-Stillwater: A Case Study of ESG Driving Good Neighbor Initiatives

Sibanye-Stillwater ("Stillwater") is a multinational mining and metals processing group with a diverse portfolio of mining and processing operations and projects across five continents.[142] Its portfolio consists of:

- platinum group metal ("PGM") operations in the United States, South Africa, and Zimbabwe;
- gold operations in South Africa;
- copper, gold, and platinum metal exploration properties in North America and South America; and
- a zinc retreatment facility and copper property in Australia.[143]

Stillwater also owns stakes in several lithium projects and a zinc tailings retreatment facility.[144]

Stillwater's U.S. operations are based in Montana.[145] Both are PGM operations that extract and process PGM ore from the only known significant source of PGMs in the United States and the highest-grade deposit of PGMs in the world.[146] The Montana mines produce primarily palladium and platinum.[147] Stillwater also owns and operates the Columbus Metallurgical Complex, located in Columbus, Montana, which smelts material mined to produce PGM-rich filter cake and recycles autocatalysts to recover PGMs.[148]

1. Stillwater's ESG Policy

Stillwater has a robust and far-reaching ESG policy. Due to its operations across various continents, its policy includes everything from environmental

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[142] SIBANYE-STILLWATER, *About Us*, https://perma.cc/52H3-U5SG (last visited Jan. 29, 2023).

[143] SIBANYE STILLWATER, *Business*, https://perma.cc/ZE4L-7BEC (last visited Jan. 29, 2023).

[144] *Id.*

[145] SIBANYE-STILLWATER, *US PGM Operations*, https://perma.cc/QV6U-HPYM (last visited Jan. 29, 2023).

[146] *Id.*

[147] *Id.*

[148] *Id.*

protection to ensuring that labor has been obtained in compliance with the human rights principle of free, prior, and informed consent.[149]

Stillwater has developed its "iCARES" values to describe its approach to ESG and the sustainable management of its operations.[150] The iCARES values include innovation, commitment, accountability, respect, enabling, and safety. The graphic below demonstrates how Stillwater contemplates each of these values when making decisions about business strategy.

Stillwater's environmental policies include:

- Protect the environment, prevent incidents and minimize harm through proactive management.
- Design and implement a closure plan that incorporates concurrent re-habilitation and post-mining land uses in conversation with local communities and government.
- Drive resilience of ecosystems supporting a net gain in biodiversity.

[149] SIBANYE-STILLWATER, *Environmental, Social and Governance Policy*, June 2021, https://perma.cc/X56Z-RLB4 [hereinafter *Environmental, Social and Governance Policy*].

[150] SIBANYE-STILLWATER, *Sustainability*, https://perma.cc/M6FT-BZ5E (last visited Jan. 29, 2023).

- Respect legally protected areas and heritage sites.
- Sustainably use and source water resources through conservation and effective and efficient management programs and initiatives.
- Manage air quality proactively to reduce emissions in line with global protocols.
- Promote awareness and drive initiatives to combat the impact of global warming and climate change.
- Reduce, reuse, and recycle all types of wastes and products containing metals and minerals where practical and economically feasible.
- Apply a comprehensive risk-based management approach to tailings storage facilities through all stages of their lifecycles.[151]

Stillwater currently discloses under the TCFD framework.[152]

2. Stillwater's Good Neighbor Authority

Stillwater recognizes that developing a good community relationship supports its business in multiple ways. However, one of the main drivers of building a community relationship remains the reduction in litigation risk.

One way that Stillwater has developed its community relationship in Montana is through a "Good Neighbor Agreement" ("GNA") with three local stakeholder organizations, the Northern Plains Resource Council, the Stillwater Protective Association, and the Cottonwood Resource Council.[153] The parties signed the GNA in 2000, and it is still in effect today.[154]

The GNA is relatively unique within the mining industry because it provides a framework for the protection of the natural environment while still promoting the economic development of the mine.[155] It binds Stillwater to certain commitments and higher standards than what would be required under federal and state regulatory processes.[156]

The parties have utilized the GNA for dispute resolution and positive engagement, and Stillwater has used it to communicate transparently and productively with stakeholders.[157] In the 20-plus years of the GNA's existence, there have been no formal conflicts, arbitrations, or environmental litigation.[158] This is a significant achievement for a mining company.

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[151] *Environmental, Social and Governance Policy*, *supra* note 149.

[152] *See, e.g.*, SIBANYE-STILLWATER, *Climate Change Related Disclosure: TCFD Recommendations*, https://perma.cc/U36K-ZA2S (last visited Jan. 29, 2023).

[153] SIBANYE-STILLWATER, *The Good Neighbor Agreement, Fact Sheet 2021*, https://perma.cc/GR7S-NSA7 (last visited Jan. 29, 2023).

[154] *Id.*

[155] *Id.*

[156] *Id.*

[157] *Id.*

[158] *Id.* at 2.

The current focuses of the GNA include traffic restrictions, tailings facilities, and water quality issues.[159] The GNA has funding that provides for the employment of experts to advise the group on these and other issues so that it can fully understand the mining operation's potential environmental and social impacts.[160] The group then provides feedback to the mine in permitting and mine planning areas before formal comment periods so that permitting strategy can be adjusted to address stakeholder concerns where necessary.[161] The system has reduced permitting delays and largely eliminated negative comments during public comment periods.[162]

3. Takeaways

Companies can benefit by creating stakeholder advisory boards. Not only do stakeholder advisory boards offer insight to certain environmental and social issues that the company may overlook, but they can also provide critical support during permitting. Companies can also leverage this positive support during the permitting process to avoid permitting delays and even costly litigation.

C. Coeur Mining, Inc., GHG, and Corporate Pay

Coeur Mining, Inc. ("Coeur"), is a U.S.-based, precious metals producer with four wholly-owned operating mines: the Palmarejo gold-silver complex in Mexico, the Rochester silver-gold mine in Nevada, the Kensington gold mine in Alaska, and the Wharf gold mine in South Dakota.[163] Coeur also wholly owns the Silvertip silver-zinc-lead exploration project in British Columbia and has interests in several other exploration projects throughout North America.[164]

Coeur strives to integrate sustainable operations and development into business decisions and strategic goals.[165] It proactively conducts its business with a focus on positively impacting the environment, the health and safety of its employees, and the socioeconomics of the communities in which it does business.[166]

To set its ESG policy, Coeur conducts a periodic materiality assessment through engagement with internal and external stakeholders.[167] In 2021, the assessment expanded to include large stockholders and community leaders and incorporated a risk/opportunity lens and a double materiality standard (i.e., topics stakeholders believe have the highest potential impact on Coeur and those on which Coeur could potentially have the biggest impact). This as-

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[159] *Id.*

[160] *Id.*

[161] *Id.*

[162] *Id.*

[163] COEUR MINING, *About Us*, https://perma.cc/6C3N-A674 (last visited Jan. 29, 2023).

[164] *Id.*

[165] COEUR MINING, *2021 ESG Report*, 9 https://perma.cc/PQ9M-U52U (Mar. 31, 2023).

[166] *Id.*

[167] *Id*. at 13.

sessment helped Coeur identify topics that it considers the most material with respect to ESG-related matters. Those include:

The company considers elements from all three of the voluntary disclosure frameworks when reporting its ESG-related activities, and it also includes reference to the SDGs.[168]

1. Coeur's Scenario Analysis

In 2021, Coeur conducted a scenario analysis to test the resilience of its business strategy against potential climate risks and opportunities.[169]

Several themes arose from the analysis. First, all scenarios created vulnerabilities in the business model.[170] Second, almost all scenarios involved an impact on carbon costs, which results in increases in raw material costs, power costs, and tariffs.[171] Finally, the analysis indicated that there would be increased pressure on the company to maintain its social license to operate.[172]

The analysis helped Coeur develop the following business strategy, which centers around four main pillars:

- Knowledge and understanding of risks and opportunities;
- Managing and mitigating impact through steps to reduce potential risks and enhance resilience;
- Producing raw materials that are essential for clean energy production and infrastructure; and
- Measuring and reporting metrics and targets with increasing transparency and accountability.[173]

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[168] *Id.*
[169] *Id.* at 23.
[170] *Id.* at 24.
[171] *Id.*
[172] *Id.*
[173] *Id.* at 23.

Due to this scenario analysis, Coeur has begun implementing a climate strategy and decarbonization plan that includes increasing its efficiency and reducing its Scope 1 and Scope 2 GHG emissions. Coeur's principal sources of Scope 1 emissions include diesel fuel (65 percent), purchased grid electricity (21 percent), and natural gas (11 percent).

2. Coeur's Energy and Emissions

In 2020, Coeur went through a comprehensive target-setting process to develop an organization-wide GHG net intensity emissions reduction target. In 2021 and early 2022, Coeur set a goal of 35 percent net intensity reduction by 2024. Key drivers to reaching this goal include maturing projection methods and incorporating reductions achieved through newly available and acquired renewable energy grid power and associated renewable energy credits. While Coeur does expect energy consumption and emissions for the company to increase overall due to an expansion at one of its facilities, it expects to implement several key projects to help it reach its goal.

For example, the emissions and energy projects completed in 2021 included:

- Integrating emissions projections into business improvement processes so that management has increased visibility into how projects will impact emissions;
- Sourced 44 percent of power for the Wharf mine from wind;
- Optimized blasting and increased bench height at the Rochester mine;
- Implemented ventilation-on-demand in underground mines at Kensington; and
- Converted kiln heating from diesel to induction at the Palmarejo complex.

To incentivize the company to meet this goal, the company added an additional ESG metric to executive pay, which tied 20% of the 2022 three-year performance share award to the achievement of the company's public GHG emissions net intensity reduction goal.[174] Compared to others in the industry, 81 percent of Coeur's CEO pay was variable, or "at-risk," meaning that a substantial portion of executive compensation is tied to the achievement of annual and long-term strategic objectives.[175] Additionally, hourly employees at Coeur's operations can participate in cash incentive programs that are designed to drive achievement of certain operational performance or site-specific goals, such as production, safety, and environmental metrics.[176]

Finally, Coeur is partnering with local groups to help reduce carbon emissions outside of its business operations. In June 2021, Coeur also partnered with Renewable Juneau to support the Juneau Carbon Offset Fund ("JCOF").[177]

[174] *Id.* at 64.
[175] *Id.*
[176] *Id.*
[177] *Id.* at 30.

The JCOF is Alaska's only locally targeted carbon offset initiative.[178] Juneau businesses, residents, and visitors are invited to offset their carbon footprint by either purchasing carbon offsets from the JCOF's website or by donating to the JCOF.[179] Revenues raised will be used to help qualified Juneau lower-income households replace oil-based heating systems with high-efficiency heat pumps powered by renewable electricity generated by hydropower.[180] Coeur's contribution to Renewable Juneau will help the JCOF through supporting these transitions and helping cover the costs necessary for the JCOF to pursue becoming a certified carbon offset project.[181]

3. Takeaways

Companies can utilize scenario analysis to understand their most vulnerable areas, such as the risk of not decreasing carbon use. Additionally, there are multiple ways to identify and reduce carbon emissions, including identifying the key drivers of Scope 1 emissions, locating alternative power sources, and tying goals to executive pay. Finally, companies should not overlook the opportunity to work with community members toward decarbonization, as often times there are already existing opportunities in the community. These opportunities may help a company reach its stated metrics or assist the company with obtaining a social license to operate.

V. CONCLUSION

While there may not be a silver bullet to fixing the United States' critical mineral supply chain, mining companies can and should begin leveraging their ESG reports to help identify future risks and opportunities in the market. ESG reports can help stakeholders, government officials, and investors understand where a company has been and where it plans on going with respect to a wide variety of ESG issues. This in turn will help incentivize higher environmental and social performance, increase sustainably and responsibly produced volumes, and lower the cost of sourcing them.

[178] *Id.*
[179] *Id.*
[180] *Id.*
[181] *Id.*

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Part III — Topical Reading

Topical Reading

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