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A Pause on Proof-of-Work: The New York State Executive Branch's Authority to Enact a Moratorium on the Permitting of Consolidated Proof-of-Work Cryptocurrency Mining Facilities

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A PAUSE ON PROOF-OF-WORK:

**THE NEW YORK STATE EXECUTIVE BRANCH'S AUTHORITY TO
ENACT A MORATORIUM ON THE PERMITTING OF CONSOLIDATED
PROOF-OF-WORK CRYPTOCURRENCY MINING FACILITIES**

By Jacob Elkin

March 2022

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CONTENTS

1.	Introduction	2
2.	An Overview of Proof-of-Work Cryptocurrency Mining	2
2.1	Proof-of-Work Cryptocurrency Mining and Its Environmental Impacts	2
2.2	Cryptocurrency Mining in New York.....	4
3.	The Legal Authority for a Moratorium on the Permitting of Consolidated Proof-of-Work Mining Facilities	7
3.1	Statutory Bases for a Permitting Moratorium	7
3.2	Potential Legal Challenges to a Moratorium.....	12
4.	The Potential for Additional Legislative Action	15
4.1	The Limits of Executive Action Under Current Law	16
4.2	Policy Considerations Relevant to Further Legislative Action	16
5.	Conclusion.....	18

1. INTRODUCTION

As cryptocurrency mining facilities have expanded their energy consumption, certain fossil fuel power plants have increased energy generation to provide behind-the-meter power to cryptocurrency miners. The New York legislature has responded by proposing bills to enact a moratorium on state permitting of such consolidated facilities while the New York Department of Environmental Conservation (DEC) studies their impacts through a Generic Environmental Impact Statement (GEIS), but these bills have stalled. This white paper analyzes the legal authority of the New York executive branch to put in place such a moratorium and concludes that the executive branch does possess such authority, though the paper notes that without legislative change, such a moratorium would be unlikely to reach cryptocurrency mining facilities receiving all of their power from the grid. This paper concludes by presenting policy considerations relevant to additional legislative action on proof-of-work mining operations.

2. AN OVERVIEW OF PROOF-OF-WORK CRYPTOCURRENCY MINING

2.1 Proof-of-Work Cryptocurrency Mining and Its Environmental Impacts

Cryptocurrency is decentralized digital currency that relies on blockchain technology.¹ Like other forms of currency, cryptocurrency can be used for purchasing goods and services; cryptocurrencies can also be invested in like stocks or other speculative assets.² Bitcoin, the largest cryptocurrency, relies on a verification method called “proof of work” to verify transactions and prevent fraud in a decentralized manner.³ Through the proof of

¹ Kate Ashford & John Schmidt, *What Is Cryptocurrency?*, FORBES ADVISOR (Jan. 25, 2022, 4:15 pm), <https://www.forbes.com/advisor/investing/what-is-cryptocurrency/>.

² *Id.*

³ Connie Lin, *How to Clean Up Crypto Mining — And What’s at Stake if We Don’t*, FAST COMPANY (Jan. 21, 2022), <https://www.fastcompany.com/90715099/bitcoin-crypto-mining-proof-of-work-explained>. Ethereum, the second-largest cryptocurrency, is currently transitioning from proof-of-work to the less energy-intensive proof-of-state consensus mechanism. See *Proof-of-Stake (POS)*, ETHEREUM, <https://ethereum.org/en/developers/docs/consensus-mechanisms/pos/> (last visited Feb. 23, 2022); Edward Oosterbaan, *Ethereum’s Latest Progress Toward Proof-of-Stake*, COINDESK (Oct. 13, 2021, 8:04 AM), <https://www.coindesk.com/tech/2021/10/13/ethereums-latest-progress-toward-proof-of-stake/>.

work process, “cryptocurrency miners—or anybody with a supercomputer—race to solve complex math puzzles that require vast reserves of processing power” in order to verify cryptocurrency transactions.⁴ Proof-of-work cryptocurrency miners receive cryptocurrency as payment for solving these problems.⁵

Proof-of-work mining requires significant—and ever-increasing—energy consumption. Bitcoin mining alone consumes roughly 91 terawatt-hours of electricity annually, more than is used by many nations—including Finland, which has a population of roughly 5.5 million people—and roughly equal to that of Washington State.⁶ A single bitcoin transaction consumes 2296.37 kilowatt-hours of electricity, equivalent to that of an average U.S. home over 78.71 days.⁷ This energy consumption has increased roughly tenfold over the last five years.⁸ Unsurprisingly, this magnitude of energy consumption generates a significant carbon footprint. Researchers have recently estimated that Bitcoin mining is responsible for 65.4 megatonnes of carbon dioxide emissions per year.⁹ Other estimates put Bitcoin’s annualized carbon footprint at 114.06 megatonnes of carbon dioxide, comparable with that of the Czech Republic, with a single Bitcoin transaction generating 1280.82 kilograms of carbon dioxide, equivalent to the emissions generated by 2,838,745 VISA transactions.¹⁰

In many instances, the energy demands of cryptocurrency mining has led to what has been called the “coal-to-crypto pipeline,” in which former coal plants transition to

⁴ Lin, *supra* note 3.

⁵ *Id.*

⁶ Jon Huang et al., *Bitcoin Uses More Electricity Than Many Countries. How Is That Possible?*, NYT (Sept. 3, 2021), <https://www.nytimes.com/interactive/2021/09/03/climate/bitcoin-carbon-footprint-electricity.html>; *see also* *Bitcoin Energy Consumption Index*, DIGICONOMIST, <https://digiconomist.net/bitcoin-energy-consumption/> (last visited March 1, 2022) (estimating Bitcoin mining’s annualized energy consumption at 204.50 terawatt-hours, comparable to that of Thailand).

⁷ DIGICONOMIST, *supra* note 6.

⁸ Huang et al, *supra* note 6.

⁹ Alex de Vries et al., *Revisiting Bitcoin’s Carbon Footprint*, 6 JOULE 1, 2 (2022).

¹⁰ DIGICONOMIST, *supra* note 6. Proof-of-work mining also generates considerable electronic waste, with the electronic waste generated by a single bitcoin transaction equating with that generated by 2.33 iPhones 12s. *Id.*

natural gas generation to deliver behind-the-meter power to mining facilities.¹¹ The federal Environmental Protection Act (EPA) has seemingly taken notice of this trend, denying permits to several former coal facilities that are now supplying behind-the-meter power to cryptocurrency mining facilities, though EPA has not explicitly related its actions to cryptocurrency mining.¹²

2.2 Cryptocurrency Mining in New York

The trend of fossil fuel power plants increasing generation to supply behind-the-meter power to proof-of-work mining facilities has popped up in New York, with the Greenidge Generation plant in Yates County, which was formerly a coal plant, recently transforming into a consolidated natural gas power plant and cryptocurrency mining operation.¹³ Greenidge's recent application to DEC to renew an existing Title V air quality permit¹⁴ has drawn significant attention and controversy.¹⁵ Senator Elizabeth Warren has written to Greenidge inquiring about the facility's impacts on "climate change, the local environment, and the cost of electricity for retail consumers,"¹⁶ and the DEC Commissioner has publicly stated that Greenidge has not demonstrated compliance with New York's

¹¹ See Jael Holzman, *EPA Tackles Coal-to-Crypto Industry Trend*, GREENWIRE (Jan. 18, 2022, 1:48 PM), <https://www.eenews.net/articles/epa-tackles-coal-to-crypto-industry-trend/>.

¹² *Id.*

¹³ See Corey Kilgannon, *A Bitcoin Boom Fueled by Cheap Power, Empty Plants and Few Rules*, NYT (Dec. 5, 2021), <https://www.nytimes.com/2021/12/05/nyregion/bitcoin-mining-upstate-new-york.html>; Brian Spegele & Caitlin Ostroff, *Bitcoin Miners Are Giving New Life to Old Fossil-Fuel Power Plants*, Wall Street J. (May 21, 2021, 7:00 AM), <https://www.wsj.com/articles/bitcoin-miners-are-giving-new-life-to-old-fossil-fuel-power-plants-11621594803>.

¹⁴ DEC requires Title V air quality permits for facilities "that are determined to be major sources under DEC's regulations or that are subject to federal acid rain program requirements." *State Facility Permits, Registrations and Fees*, N.Y. DEP'T OF ENV'T'L CONSERVATION, <https://www.dec.ny.gov/chemical/8569.html> (last visited Feb. 22, 2022). For large facilities that do not meet this definition, DEC issues state facility permits. *Id.*

¹⁵ Susan Arbetter, *Greenidge Generation Permit Renewal Draws Supporters, Critics Over Cryptocurrency Mining*, NY STATE OF POLITICS (Oct. 13, 2021, 7:30 PM), <https://nystateofpolitics.com/state-of-politics/new-york/politics/2021/10/13/greenidge-generation-permit-renewal-draws-supporters--critics-over-cryptocurrency-mining>; Jimmy Jordan, *Bitcoin Is Testing New York's Climate Policies*, ITHACA VOICE (Oct. 15, 2021), <https://ithacavoices.com/2021/10/bitcoin-is-testing-new-yorks-climate-policies/>.

¹⁶ Letter from Senator Elizabeth Warren to Jeffrey Kirt, CEO, Greenidge Generation Holdings (Dec. 2, 2021), <https://www.warren.senate.gov/imo/media/doc/2021.12.2.%20Letter%20to%20Greenidge%20Generation%20on%20Crypto.pdf>.

Climate Leadership and Community Protection Act (CLCPA).¹⁷ In February 2022, DEC delayed its decision on the permit by two months.¹⁸

Like all cryptocurrency mining facilities, Greenidge's mining activities require significant power to run, with the power going to Bitcoin mining at Greenidge potentially being enough to power more than 35,000 homes for one year.¹⁹ Nearby residents have stated that the plant has also caused significant warming of the nearby Seneca Lake.²⁰ Advocates have estimated that there are roughly thirty additional power plants in New York that could be converted into consolidated mining facilities like Greenidge.²¹

In order to give themselves time to respond to cryptocurrency's impacts through regulation, some local governments around the state have enacted moratoria precluding the siting of new mining facilities. In 2018, Plattsburgh, New York declared an 18-month moratorium on all applications or proceedings for the issuance of approvals or permits for commercial cryptocurrency mining operations within the city, making it the first U.S. city to enact such a moratorium.²² During the moratorium, Plattsburgh developed and promulgated a suite of regulations to mitigate the impacts of cryptocurrency mining.²³ Likewise, the Village of Sherburne, New York imposed a twelve-month moratorium on new

¹⁷ Peter Mantius, *DEC Commissioner Basil Seggos Says Greenidge Generation's Bitcoin Effort Does Not Comply with New York State Climate Law*, FINGERLAKES1 (Sept. 9, 2021, 8:58 AM), <https://www.fingerlakes1.com/2021/09/09/dec-commissioner-basil-seggos-says-greenidges-bitcoin-buildout-does-not-comply-with-new-york-state-climate-law/>.

¹⁸ Aoyon Ashraf, *Bitcoin Miner Greenidge's NY Power Plant Permit Delayed: Report*, COINDESK (Jan. 28, 2022, 7:14 PM), <https://www.coindesk.com/business/2022/01/29/bitcoin-miner-greenidges-ny-power-plant-permit-delayed-report/>.

¹⁹ Michael Hill, *Bitcoin-Mining Power Plant Raises Ire of Environmentalists*, AP NEWS (Oct. 16, 2021), <https://apnews.com/article/bitcoin-mining-new-york-power-plant-climate-change-516dbd319394a6a30f83d94947abad20>.

²⁰ Gretchen Morgenson, *Some Locals Say a Bitcoin Mining Operation Is Ruining One of the Finger Lakes. Here's How.*, NBC NEWS (July 5, 2021, 4:30 AM), <https://www.nbcnews.com/science/environment/some-locals-say-bitcoin-mining-operation-ruining-one-finger-lakes-n1272938>.

²¹ Hill, *supra* note 19.

²² Jason Axelrod, *Upstate New York City Becomes First to Place Moratorium on New Cryptocurrency Mining*, AMERICAN CITY & COUNTRY (March 19, 2018), <https://www.americancityandcountry.com/2018/03/19/upstate-new-york-city-becomes-first-to-place-moratorium-on-new-cryptocurrency-mining/>.

²³ City of Plattsburgh, NY, Local Law 6 (2018), <https://www.cityofplattsburgh-nv.gov/sites/cityofplattsburgh.com/files/city-clerk/local-laws/LL-6-2018.pdf>.

cryptocurrency mining businesses in 2021.²⁴ Also in 2021, the Town of Massena, New York put in place a 90-day moratorium on future cryptocurrency mining operations.²⁵

The New York legislature has also taken notice. Bills have been introduced in the New York State Senate and the New York State Assembly that would establish a three-year moratorium on new or renewed permits for electric generating facilities that utilize carbon-based fuels and that provide behind-the-meter electric energy to proof-of-work mining facilities.²⁶ The bills would also direct DEC to prepare a GEIS on statewide consolidated operations that use proof-of-work authentication methods to validate blockchain transactions.²⁷ An earlier version of the Senate moratorium bill, which originally proposed to freeze all new mining facilities (rather than just those consolidated with power plants), died in the Assembly after passing through Senate.²⁸

Regardless of the action of the New York legislature, the New York executive branch currently has authority to put a halt on new facilities like Greenidge by enacting a moratorium on issuing state permits to those facilities. The following section argues for the executive branch's authority to enact such a moratorium on state permitting of consolidated power plant and proof-of-work mining facilities in order to give the DEC time to study their impacts through a GEIS.

²⁴ Village of Shelburne, NY, Local Law No. 2 (2021), <https://sherburne.org/wp-content/uploads/2021/10/Moratorium-Local-Law-2-2021.pdf>.

²⁵ Bob Beckstead, *Town of Massena Agrees to 90-Day Moratorium on Future Cryptocurrency Mining Operations*, NNY360 (Aug. 7, 2021), https://www.nny360.com/communitynews/business/town-of-massena-agrees-to-90-day-moratorium-on-future-cryptocurrency-mining-operations/article_7d8b46f8-5ab4-5a63-8b8c-b2d5a22f2903.html.

²⁶ *Senate Bill S6486C*, NEW YORK STATE SENATE, <https://www.nysenate.gov/legislation/bills/2021/s6486> (last visited Feb. 22, 2022); *Assembly Bill A7389B*, NEW YORK STATE ASSEMBLY, <https://www.nysenate.gov/legislation/bills/2021/A7389> (last visited Feb. 22, 2022).

²⁷ *Id.*

²⁸ See NEW YORK STATE SENATE, *supra* note 26; Cameron Thompson, *New York Crypto Mining Bill Dies in Assembly After Passing State Senate*, COINDESK (July 11, 2021, 3:05 PM, updated on Sept. 14, 2021, 9:10 AM), <https://www.coindesk.com/markets/2021/06/11/new-york-crypto-mining-bill-dies-in-assembly-after-passing-state-senate/>.

3. THE LEGAL AUTHORITY FOR A MORATORIUM ON THE PERMITTING OF CONSOLIDATED PROOF-OF-WORK MINING FACILITIES

Under its current statutory authority, DEC can refrain from issuing new permits for consolidated power plants and mining facilities until it has rigorously studied the environmental effects of proof-of-work cryptocurrency mining through a GEIS. DEC can refrain from renewing permits for those facilities as well, as long as certain conditions are met. Such action would be consistent with the CLCPA and would likely survive legal challenge. What's more, the moratorium would follow the precedent established roughly a decade ago when New York faced another rapidly-growing and environmentally-damaging technology: high-volume hydraulic fracturing.

Section 3(a) of this paper describes two statutory tools that DEC can use to enact a moratorium on the permitting of proof-of-work cryptocurrency mining facilities: the State Environmental Quality Review Act (SEQRA), which DEC relied on for its high-volume hydraulic fracturing moratorium, and the CLCPA. Section 3(b) then assesses the strength of potential constitutional challenges to the moratorium.

3.1 Statutory Bases for a Permitting Moratorium

When high-volume hydraulic fracturing spread in prominence as a new method of extracting natural gas from—among other places—the Marcellus Shale, New York still relied on a 1992 GEIS which DEC had developed to apply to all oil and gas well permitting.²⁹ As a response to public pressure concerning the largely unstudied health and environmental impacts of high-volume hydraulic fracturing, the Governor signed an executive order in 2010 directing DEC to revise its GEIS and pause all permitting in the meantime, pointing to the fact that the State Environmental Quality Review Act (SEQRA) prevented the issuance of any permits prior to the completion of the final GEIS.³⁰ The moratorium was later extended, and after the state government further studied high-

²⁹ Patricia E. Salkin, *The Executive and the Environment: A Look at the Last Five Governors in New York*, 31 PACE ENV'T. L. R. 706, 746–47 (2014).

³⁰ *Id.* at 747; N.Y. Comp. Codes R. & Regs. tit. 9, § 7.41.

volume hydraulic fracturing’s impacts, resulted in an indefinite ban on the permitting of high-volume hydraulic fracturing.³¹

Given the increasing impacts of proof-of-work cryptocurrency mining, there is a strong argument for DEC to develop a GEIS to study mining’s environmental effects and develop potential alternatives to increased proof-of-work mining. Pursuant to DEC regulations, one of the factors supporting the issuance of a GEIS is when “separate actions hav[e] generic or common impacts,”³² which is almost certainly true of the conversion of power plants into consolidated proof-of-work mining operations. As with the high-volume hydraulic fracturing GEIS, if DEC does study proof-of-work mining through the GEIS process, SEQRA would prohibit the issuance of new permits to consolidated facilities until the release of the GEIS.³³

While the development of a GEIS would support the pausing of new permits for consolidated mining facilities, the question of whether it would support the pausing of permit renewals for those facilities is less clear. This question is centrally relevant because Greenidge and similar sites for consolidated facilities already have permits to operate as power generators; as a result, the question of how to treat Greenidge’s application for a permit renewal has been a contested one.³⁴ While the question may be contested, there is a strong argument that DEC does have authority to refuse to grant Greenidge’s and similar applications for permit renewals pending the development of a GEIS.

The Environmental Conservation Law provides an expedited process for applications for permit renewals or modifications “which do[] not involve a material change

³¹ See *High-Volume Hydraulic Fracturing in NYS*, N.Y. DEP’T OF ENV’T’L CONSERVATION, <https://www.dec.ny.gov/energy/75370.html> (last visited Feb. 22, 2022).

³² N.Y. Comp. Codes R. & Regs. tit. 6, § 617.10.

³³ N.Y. Comp. Codes R. & Regs. tit. 6, § 617.3 (“No agency involved in an action may undertake, fund or approve the action until it has complied with the provisions of SEQRA”).

³⁴ *Compare* Press Release, Greenidge Generation, State Department of Environmental Conservation Deems Greenidge Application for Title V Permit Renewal Complete (Sept. 9, 2021), <https://bit.ly/3JPiduq>, *with* Comments from Seneca Lake Guardian et al. in Opposition to the Draft Title V Air Permit for Greenidge Generating Station (Nov. 19, 2021), <https://bit.ly/3vegfQL>.

in permit conditions, the applicable law, environmental conditions or technology since the date of issuance of the existing permit.”³⁵ DEC regulations likewise provide that permit renewals are Type II actions, and thus exempt from the need for an environmental impact statement (EIS), when “there will be no material change in permit conditions or the scope of permitted activities.”³⁶ As DEC has explained in its guidance documents, the logic behind this regulation is that such activities “consist[] of a name or date change on a permit form” and have “no environmental impact.”³⁷ When a permit renewal “does involve a material change, then it is no longer Type II.”³⁸ Elsewhere in its regulations, DEC explains that an application for a permit renewal or modification can be treated as an application for a new permit that would require an EIS when “there is newly discovered material information or there has been a material change in environmental conditions, relevant technology or applicable law or regulations since the issuance of the existing permit.”³⁹ The New York courts have explained that the lessened requirements for permit renewals are meant to give “[a] degree of finality and stability . . . once a permitted activity has successfully met the initial SEQRA requirements.”⁴⁰

In the case of applications for permit renewals for newly-converted consolidated mining operations like Greenidge, there are strong arguments for DEC’s authority to treat those applications as applications for new permits that require the development of a new EIS. This is true even if the change from a pure power generator to a consolidated mining operation would not otherwise show up as a new permit condition. Most simply, the passing of the CLCPA after these facilities were granted their original (or most recently

³⁵ N.Y. Env’t Conserv. Law § 70-0115(a).

³⁶ N.Y. Comp. Codes R. & Regs. tit. 6, § 617.3, § 617.5.

³⁷ DEP’T OF ENV’T L CONSERVATION, SEQR HANDBOOK 39 (2020).

³⁸ *Id.* Examples of material changes in permit conditions “would be allowing a mine operator to excavate a mine to a greater depth than the previous permit allowed,” or “the redesign of access points to a shopping mall so that the shoppers would enter the highway at a different location.” *Id.*

³⁹ N.Y. Comp. Codes R. & Regs. tit. 6, § 621.11(h)(2).

⁴⁰ *Vill. of Hudson Falls v. New York State Dep’t of Env’t Conservation*, 557 N.Y.S.2d 702 (N.Y. App. Div. 1990), *aff’d*, 575 N.E.2d 394 (N.Y. 1991).

renewed) permits constitutes a change of applicable law that, as explained below, warrants a reconsideration of the permits' lawfulness. The change in purpose of these facilities from solely power generation to proof-of-work mining also constitutes material information that did not exist at the time that the original permits were granted. For one example of this change in material information, the SEQRA review for Greenidge's 2016 permit application provides:

Impact on Energy: The re-activation of Unit 4 at Greenidge Station will use biomass and natural gas to generate electricity. However, the operation of the plant itself will not create a new demand for energy. Rather, it will serve as another facility to help meet the current electricity demands of the region. As a result, the plant will have no significant adverse impacts in increasing the use of energy.⁴¹

After Greenidge's transition to a consolidated mining operation, DEC's analysis of the facility's energy use impacts may look far different. And as facilities like Greenidge are now using a significant amount of power they generate for proof-of-work mining, DEC's environmental analysis of such facilities may identify different alternatives to the permitting of the projects. Finally, when transitioning to consolidated proof-of-work mining operations correlates with increased greenhouse gas emissions, as is the case with Greenidge,⁴² the renewal of facilities' permits would have increased environmental impacts and should thus be based on updated environmental analyses. As a result, DEC's statutory authority and implementing regulations would allow them to treat these facilities' applications for permit renewals as applications for new permits, and thus pause their processing of the permits until a GEIS has been completed.

Along with the pause in permitting associated with the development of a GEIS, there is also a strong argument that the CLCPA itself provides authority for a moratorium on

⁴¹ SEQR Full Environmental Assessment Form Part 3 - Evaluation of the Magnitude and Importance of Project Impacts (Continuation) For Amended Negative Declaration, DEC Application #8-5736-00004/00001, /00016, and /00017 at 3 (June 28, 2016), <https://perma.cc/4KE6-NT7U>.

⁴² Comments from Seneca Lake Guardian et al., *supra* note 34 at 4.

permits to fossil fuel plants that are proposing to increase generation to power proof-of-work mining facilities. Section 7(2) of the CLCPA provides that:

In considering and issuing permits, licenses, and other administrative approvals and decisions, . . . all state agencies, offices, authorities, and divisions shall consider whether such decisions are inconsistent with or will interfere with the attainment of the statewide greenhouse gas emissions limits established in article 75 of the 38 environmental conservation law. Where such decisions are deemed to be inconsistent with or will interfere with the attainment of the statewide greenhouse gas emissions limits, each agency, office, authority, or division shall provide a detailed statement of justification as to why such limits/criteria may not be met, and identify alternatives or green-house gas mitigation measures to be required where such project is located.⁴³

DEC has relied on this section in denying permits to power plants that would risk interfering with the state's greenhouse gas emissions limits.⁴⁴ The CLCPA does not explicitly state whether Section 7(2) applies to applications for permit renewals, but such applications would fit under the section's particularly inclusive language. Furthermore, excluding permit renewals from Section 7(2) requirements would undermine the goal of the CLCPA to rapidly reduce New York's greenhouse gas emissions, as many sources of greenhouse gases operate under already-issued environmental permits.

Documents developed pursuant to the CLCPA further explicate New York agencies' authority to deny permits for facilities that would interfere with New York's greenhouse gas goals. The Division of Air Resources' draft policy document on the CLCPA and air permit applications, which would apply to new, renewed, or modified Title V permits and state air facility permits, provides the following list of potential factors that could lead to inconsistency with CLCPA greenhouse gas emissions limits:

- The project creates or enables a significant new source of GHG emissions;

⁴³ CLCPA § 7(2) (2019).

⁴⁴ See Notice of Denial of Title V Air Permit from Daniel Whitehead, Director, Division of Environmental Permits, N.Y. Dep't of Env't'l Conservation, to Danskammer Energy (Oct. 27, 2021), https://www.dec.ny.gov/docs/administration_pdf/danskammer10272021.pdf.

- The project will be directly responsible for a significant increase in demand for a known source of GHG emissions;
- The project directly reduces the market demand for, or access to, GHG emissions reduction technologies or strategies;
- The project prevents or makes it more difficult or expensive for the State to reduce GHG emissions;
- The project facilitates the expanded or continued use of fossil fuels through infrastructure development; and/or
- The project interferes with the attainment of the zero-emissions electric generation sector by 2040 requirement.⁴⁵

Several of these factors would apply to consolidated facilities, which create new GHG emissions to power proof-of-work mining and thus make it more difficult for the state to reduce emissions. Consistent with these directives, the New York State Climate Action Council’s Draft Scoping Plan for implementation of the CLCPA suggests “a moratorium on the permitting of new fossil fuel plants until the final Scoping Plan is in place, or until there is a demonstrated system reliability need that can only be addressed with fossil fuel generation.”⁴⁶ Even more specifically, the Climate Justice Working Group, created pursuant to the CLCPA, has suggested that the New York Climate Action Council should:

Address current and prospective emissions from crypto-currency mining operations to prevent the facilities from exploiting a loophole in PSC oversight to repower fossil generating facilities behind the meter. Place a moratorium on these operations until the conclusion of a full generic EIS to determine whether these operations can be mitigated to comply with the CLCPA.⁴⁷

Taken together, these documents suggest that the CLCPA grants the executive branch authority to deny permits for consolidated mining operations due to their climate impacts.

3.2 Potential Legal Challenges to a Moratorium

Despite the statutory bases for a moratorium described above, individuals may attempt to challenge such a moratorium as violating their constitutional rights. Two such

⁴⁵ N.Y. DEP’T OF ENV’T CONSERVATION, DIV. OF AIR. RES., DAR-21 at 5 (“The Climate Leadership and Community Protection Act and Air Permit Applications”) (draft) (2021), https://www.dec.ny.gov/docs/air_pdf/dar21.pdf.

⁴⁶ NEW YORK STATE CLIMATE ACTION COUNCIL, DRAFT SCOPING PLAN 155–56 (2021).

⁴⁷ NEW YORK STATE CLIMATE ACTION COUNCIL, DRAFT SCOPING PLAN APPX. B. 11 (2021).

challenges are most likely to arise, though neither would carry particularly strong legal weight. First, individuals or businesses hoping to engage in proof-of-work mining may challenge such a moratorium as violating their due process rights by denying them environmental permits to which they claim legal entitlement; second, individuals or businesses may challenge such a moratorium as constituting a regulatory taking of their ability to productively use their property. Both challenges would arise under the United States Constitution's Fourteenth Amendment.⁴⁸

In the case of the high-volume hydraulic fracturing ban, an individual challenged the statewide ban as depriving him of his right to due process. The individual initiated two separate legal challenges. In the first action, the court found that the individual lacked standing to bring his claims:

At the time of commencement of this proceeding, petitioner had not applied for a permit nor offered any proof that he met any of the requirements to obtain a permit. He offered no proof of any plans to move forward with the process and conceded that any plans would necessarily involve commitments by oil and gas exploration companies, of which he had none. Petitioner's standing at the time of filing was no different than that of any landowner in the state; thus he lacked standing to challenge the determination.⁴⁹

Later on, the individual brought the same claims in federal court, and the court again dismissed the action, holding that the state was protected under Eleventh Amendment sovereign immunity and that the doctrine of collateral estoppel required the court to defer to the state court's earlier judgement on standing.⁵⁰ As a result, neither the state courts nor the federal courts reached the merits of the challenge.

If the courts had reached the merits, current due process jurisprudence would have strongly weighed against the finding of a due process violation; in much the same way, a moratorium on permitting of consolidated mining operations would likely pass

⁴⁸ U.S. CONST. AMEND. XIV(1).

⁴⁹ *Morabito v. Martens*, 53 N.Y.S.3d 213, 215 (N.Y. App. Div. 2017).

⁵⁰ *Morabito v. New York*, 803 F. App'x 463, 464–68 (2d Cir.), as amended (Feb. 27, 2020), cert. denied, 141 S. Ct. 244 (2020), reh'g denied, 141 S. Ct. 886 (2020).

constitutional muster. In order to “establish a substantive due process violation, a plaintiff must show both (1) that she has an interest protected by the Fourteenth Amendment, and (2) that the statute, ordinance, or regulation in question is not rationally related to a legitimate government interest.”⁵¹ This is a very high bar.⁵² To fulfill the first factor, “a person clearly must have more than an abstract need or desire for [the property interest]. He must have more than a unilateral expectation of it. He must, instead, have a legitimate claim of entitlement to it.”⁵³ In this case, as permits for power plants to increase power generation for proof-of-work mining may rightly be considered to run afoul of the CLCPA, a plaintiff would not have a legitimate claim of entitlement to them. What’s more, protecting public health and controlling pollution are both legitimate government interests that would be furthered by a moratorium on consolidated mining operations.⁵⁴ As a result, courts would be highly unlikely to find that a moratorium on consolidated mining operations would constitute a substantive due process violation.

Likewise, existing case law on regulatory takings suggests that a moratorium would not run afoul of the Fourteenth Amendment. Under Supreme Court jurisprudence, “[a] regulatory taking occurs when the state or federal government imposes strict regulations on the use of private property that substantially diminishes its value or deprives the property of all economically beneficial use.”⁵⁵ The Supreme Court addressed whether a temporary moratorium would constitute a regulatory taking in *Tahoe-Sierra Pres. Council*,

⁵¹ *Winston v. City of Syracuse*, 887 F.3d 553, 566 (2d Cir. 2018).

⁵² *See Natale v. Town of Ridgfield*, 170 F.3d 258, 263 (2d Cir. 1999) (“Substantive due process is an outer limit on the legitimacy of governmental action. It does not forbid governmental actions that might fairly be deemed arbitrary or capricious and for that reason correctable in a state court lawsuit seeking review of administrative action. Substantive due process standards are violated only by conduct that is so outrageously arbitrary as to constitute a gross abuse of governmental authority.”).

⁵³ *Bd. of Regents of State Colleges v. Roth*, 408 U.S. 564, 577 (1972).

⁵⁴ *See, etc., Gallagher v. City of Clayton*, 699 F.3d 1013, 1021 (8th Cir. 2012); *Castaways Backwater Cafe, Inc. v. Fla. Dep’t of Bus. & Pro. Reguls. Div. of Alcoholic Beverages & Tobacco*, 214 F. App’x 955, 956 (11th Cir. 2007); *Haves v. City of Miami*, 52 F.3d 918, 922 (11th Cir. 1995).

⁵⁵ *Holli Brown, The Attack on Frack: New York’s Moratorium on Hydraulic Fracturing and Where It Stands in the Threat of Takings*, 41 ENV’T L. REP. NEWS & ANALYSIS 11146, 11150 (2011) (citing *Penn Central Transp. Co. v. New York City*, 438 U.S. 104 (1978) and *Lucas v. South Carolina Coastal Council*, 505 U.S. 1003 (1992)).

Inc. v. Tahoe Reg'l Plan. Agency, holding that such moratoria should be analyzed under the three-part framework developed in *Penn Central Transp. Co. v. New York City*.⁵⁶ Under the *Penn Central* framework, when a regulation impedes the use of property without depriving the owner of all economically beneficial use, a taking still may be found based on “a complex of factors,” including (1) the economic impact of the regulation on the claimant; (2) the extent to which the regulation has interfered with distinct investment-backed expectations; and (3) the character of the governmental action.”⁵⁷

For several reasons, a temporary moratorium on the permitting of consolidated mining facilities would be unlikely to constitute a regulatory taking. It is true that such a moratorium would have significant economic impacts on mining businesses. That said, given the CLCPA, plaintiffs would be unlikely to establish legitimate investment-backed expectations for new or renewed permits that allow increased greenhouse gas pollution in order to power proof-of-work mining facilities, weighing against the finding of a regulatory taking. The third factor—the character of the governmental action—would also weigh against that finding. The “character of the governmental action” analysis can be understood as an inquiry into whether the action is closer to the exercise of eminent domain—a classic taking—or closer to the standard exercise of the state’s police power.⁵⁸ In this case, the moratorium would not require any physical intrusion into consolidated facilities’ property, and would serve to protect the public against the nuisance-like effects on increased fossil fuel generation, making the action more similar to a standard exercise of the state’s police power than an exercise of eminent domain.⁵⁹ As a result, a challenge to the moratorium as constituting a regulatory taking would likely fail.

4. THE POTENTIAL FOR ADDITIONAL LEGISLATIVE ACTION

⁵⁶ *Tahoe-Sierra Pres. Council, Inc. v. Tahoe Reg'l Plan. Agency*, 535 U.S. 302 (2002).

⁵⁷ *Murr v. Wisconsin*, 137 S. Ct. 1933, 1943 (2017).

⁵⁸ Thomas W. Merrill, *The Character of the Governmental Action*, 36 VT. L. R. 649, 671–73 (2012).

⁵⁹ *Id.*

4.1 The Limits of Executive Action Under Current Law

The moratorium on power plant permits discussed above would reach a significant number of the largest current or anticipated proof-of-work mining facilities, but it would be unlikely to reach all proof-of-work mining in the state. Current state law does not contain a permitting scheme for cryptocurrency mining as such, so, outside of permitting of consolidated power plant and cryptocurrency mining facilities, which require permits due to the impacts of power generation, there is likely no avenue under the current regulatory framework for the executive branch to withhold approvals pending further analysis of proof-of-work mining's impacts.

This fact distinguishes the matter from the hydraulic fracturing moratorium discussed above. Pursuant to Article 23, Title V of New York's Environmental Conservation Law, DEC regulates all oil and gas drilling in the state, and no party may commence oil and gas drilling (including high-volume hydraulic fracturing) without a DEC permit issued pursuant to 6 CRR-NY 552.1.⁶⁰ As a result, the New York executive branch could effectively ban all new high-volume hydraulic fracturing in the state without legislative action by withholding permits for those operations. An executive branch-led moratorium on proof-of-work mining facilities would be unlikely to reach so far.

4.2 Policy Considerations Relevant to Further Legislative Action

Looking forward, the New York Legislature could pass new legislation to require proof-of-work cryptocurrency mining facilities to obtain a permit from DEC or another state agency prior to initiating mining activities. If this were the case, then the permitting agency's actions would also be guided by the CLCPA requirement that all state approvals be consistent with the state's greenhouse gas emissions limits. As discussed above, the Division

⁶⁰ N.Y. Env't Conserv. Law § 23-0501; 6 CRR-NY 552.1("It shall be unlawful for any owner or operator to commence operations to drill, deepen, plug back or convert a well for exploration, production, input, storage or disposal until he has filed an application with the department and has received a permit as specified below."); *see also* N.Y. Env't Conserv. Law § 23-0305 (describing DEC's power and authority over mineral resources, including through permitting).

on Air Quality’s draft policy document suggests that permits are inconsistent with those limits when a project “will be directly responsible for a significant increase in demand for a known source of GHG emissions;” “prevents or makes it more difficult or expensive for the State to reduce GHG emissions;” or “facilitates the expanded or continued use of fossil fuels through infrastructure development.”⁶¹ If those factors were to apply to all proof-of-work mining approvals, there is a strong argument that many mining facilities, which increase demand for hydrocarbon power and/or draw significant renewable energy resources from the grid, would run afoul of the factors.

Several policy considerations are relevant to the question of whether the legislature should enact permitting requirements (or other forms of regulation) for all proof-of-work cryptocurrency mining. In general, the legislature should assess whether such regulation is consistent with the policy goals contained in the CLCPA and New York’s recent constitutional amendment giving all New Yorkers a right to a healthy environment.⁶² As outlined above, proof-of-work mining places new energy burdens on New York. As of now, at facilities like Greenidge and elsewhere, that energy burden is frequently met by greenhouse gas-emitting energy sources like natural gas. As a result, the legislature should consider whether the proliferation of mining operations like Greenidge may counter to New York’s goal of quickly reducing the state’s greenhouse gas emissions.

That said, it is also possible for mining operations to receive clean energy from the grid or directly from renewable energy sources, and the legislature should assess whether a permitting requirement is appropriate for those facilities as well. On the one hand, proof-of-work mining’s high energy demands may make the energy transition more difficult by diverting renewable energy away from other uses.⁶³ On the other, many industries have

⁶¹ N.Y. DEP’T OF ENV’T CONSERVATION, DIV. OF AIR. RES., *supra* note 45 at 5.

⁶² N.Y. CONST. ART. I, § 19 (“Each person shall have a right to clean air and water, and a healthful environment.”).

⁶³ See de Vries et al., *supra* note 9 at 4 (“However, even if the Bitcoin mining industry manages to increase the use of renewable electricity, the use of the latter for Bitcoin mining is not without its own controversy. In November 2021, the Swedish Financial Supervisory Authority and Environmental Protection Agency called

high energy demands without being subject to a state permitting requirement. The legislature should also consider cryptocurrency mining’s other environmental or nuisance-like impacts—including impacts related to water quality, electronic waste generation, and noise⁶⁴—along with the potential economic benefits of an expanded cryptocurrency industry in New York.

5. CONCLUSION

In the absence of legislative action on proof-of-work cryptocurrency mining, the New York executive branch can use its permitting powers to freeze the expansion of consolidated mining facilities by refusing to grant environmental permits to such facilities while it assesses the impacts of proof-of-work mining through a GEIS. This action would likely only reach mining facilities that are receiving behind-the-meter energy from power plants, rather than those receiving energy from the grid. For the latter category of mining facilities, the legislature should consider initiating state-level regulation through legislation establishing a permitting requirement for all proof-of-work mining.

for a ban on cryptocurrency mining over concerns that the use of renewable electricity for mining could delay the energy transition of essential services”).

⁶⁴ See, etc., Renee Cho, *Bitcoin’s Impacts on Climate and the Environment*, COLUMBIA CLIMATE SCHOOL STATE OF THE PLANET (Sept. 20, 2021), <https://news.climate.columbia.edu/2021/09/20/bitcoins-impacts-on-climate-and-the-environment/>; Vipal Monga, *Bitcoin Mining Noise Drives Neighbors Nuts—a Giant Dentist Drill That Won’t Stop*, WALL ST. J. (Nov. 12, 2021, 10:30 AM), <https://www.wsj.com/articles/bitcoin-mining-noise-drives-neighbors-nuts-giant-dentist-drill-that-wont-stop-11636730904>.