

**California Carbon Capture and Storage  
Review Panel**

**TECHNICAL ADVISORY COMMITTEE  
REPORT**

**Carbon Dioxide Pipelines**

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# CALIFORNIA CARBON CAPTURE AND STORAGE REVIEW PANEL

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***Other white papers for the panel will include***

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Carbon capture and sequestration are unlikely to occur on the same site. Pipelines will be needed to transport captured carbon dioxide (CO<sub>2</sub>) from the capture site to the injection site. This issue paper briefly describes the current regulation of CO<sub>2</sub> pipelines in terms of both safety and siting authority. It also discusses tools to acquire or use rights-of-way for CO<sub>2</sub> pipeline.

## Pipeline Safety

CO<sub>2</sub> pipelines have been operating in the United States for almost 40 years, and there are approximately 3,600 miles of CO<sub>2</sub> pipelines in operation today.<sup>1</sup> The Pipeline and Hazardous Materials Safety Administration (“PHMSA”), which is part of the Department of Transportation, regulates the safety of interstate CO<sub>2</sub> pipelines under the Hazardous Liquid Pipeline Safety Act of 1979.<sup>2</sup> CO<sub>2</sub> is defined under PHMSA’s regulations as “a fluid consisting of more than 90 percent CO<sub>2</sub> molecules compressed to a supercritical state.”<sup>3</sup> Although CO<sub>2</sub> is not considered a hazardous liquid under PHMSA’s regulations, it is effectively treated as if it were a hazardous liquid (*i.e.*, subject to the same regulatory framework).<sup>4</sup> These regulations address design, construction, operation and maintenance, corrosion control, and reporting requirements.<sup>5</sup>

The State Fire Marshal has the “exclusive safety regulatory and enforcement authority over intrastate hazardous liquid pipelines” in California under the Elder California Pipeline Safety Act of 1981.<sup>6</sup> The State Fire Marshal has adopted PHMSA’s safety regulations.<sup>7</sup> However, it is not clear whether the State Fire Marshal has authority to regulate the safety of intrastate CO<sub>2</sub> pipelines, because supercritical CO<sub>2</sub> has not been defined as a hazardous liquid.<sup>8</sup>

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<sup>1</sup> Adam Vann & Paul W. Parfomak, *Regulation of Carbon Dioxide (CO<sub>2</sub>) Sequestration Pipelines: Jurisdictional Issues* (April 15, 2008).

<sup>2</sup> See 49 U.S.C. §§ 60102(i).

<sup>3</sup> 49 C.F.R. § 195.2.

<sup>4</sup> See Philip M. Marston & Patricia A. Moore, *From EOR to CCS: The Evolving Legal and Regulatory Framework for Carbon Capture and Storage*, 29 ENERGY L. J., 421, 450 (2008).

<sup>5</sup> See 49 C.F.R. Pt. 195.

<sup>6</sup> CAL. GOV’T CODE §§ 51010 *et seq.*

<sup>7</sup> See 19 CAL. CODE REG. § 2000.

<sup>8</sup> In 1988 Congress amended the Hazardous Liquid Pipeline Safety Act to require that the Secretary of Transportation regulate CO<sub>2</sub> pipeline facilities. See 54 Fed. Reg. 41912, 41913 (Oct. 12, 1989). Although the Elder California Pipeline Safety Act has been amended since 1988, its scope does not appear to have been similarly broadened to include CO<sub>2</sub> pipelines. Because PHMSA’s regulations do not define CO<sub>2</sub> as a hazardous liquid, the State Fire Marshal may not have authority under the Elder California Pipeline Safety Act to regulate the safety of intrastate CO<sub>2</sub> pipelines in California. Legislative action may be needed to address this situation.

California’s Division of Oil, Gas & Geothermal Resources (“DOGGR”), which is part of the Department of Conservation, regulates “facilities attendant to oil and gas production, including pipelines not subject to regulation” under the Elder California Pipeline Safety Act. CAL. PUB. RES. CODE § 3106(a). See also CAL. PUB. RES. CODE § 3010 (defining production facility as “any equipment attendant to oil and gas production or injection operations including, but not limited to, \* \* \* pipelines that are not under the

The California Public Utilities Commission does apply PHMSA's safety regulations to pipelines operated by public utilities, such the federal safety regulations may apply to an intrastate CO<sub>2</sub> pipeline operated by a public utility in California.<sup>9</sup> At this time there are no CO<sub>2</sub> pipelines in California.

## Pipeline Siting

### a) Cortez Pipeline Case Study

Because pipelines can cover large distances, siting pipelines can be extraordinarily complex. Built by Shell in the early 1980s, the Cortez Pipeline extends over 500 miles from Colorado, through New Mexico, and into Texas, and is used to transport CO<sub>2</sub> produced from geologic reservoirs for use in enhanced oil recovery. Almost 130 miles of the route cross federal land, for which BLM issued an easement after extensive environmental review.<sup>10</sup> Shell obtained easements from the Bureau of Indian Affairs to cross eighteen miles of "allotment lands" held in trust for individual Navajos by the federal government. Another 30 miles traversed Native American reservations, and Shell negotiated easements with the respective tribes, but was prepared to utilize a longer, alternative route around the reservations if negotiations were unsuccessful, because it could not condemn a route through the reservations. The pipeline also crossed roughly 70 miles of state land. Finally, property rights had to be obtained from over 700 different landowners for nearly 300 miles of private land. Most of the crossing rights for this private land were obtained through negotiated agreements, which were undoubtedly influenced by the Shell's ability to condemn the easements if negotiation was unsuccessful.<sup>11</sup> In the end, twelve condemnation suits had to be filed. Simply put, long CO<sub>2</sub> pipelines are impractical, if not impossible, to site without the power of eminent domain.

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jurisdiction of the State Fire Marshal" under the Elder California Pipeline Safety Act). Assuming intrastate CO<sub>2</sub> pipelines are not subject to regulation under the Elder California Pipeline Safety Act, DOGGR could assert jurisdiction over intrastate CO<sub>2</sub> pipelines to the extent they are used for enhanced oil recovery. However, the better interpretation of this statutory provision is that DOGGR has authority over CO<sub>2</sub> pipelines that are part of oil production facilities. See 56 Fed. Reg. at 26923 (describing how PHMSA's predecessor exempted CO<sub>2</sub> distribution facilities "downstream of where carbon dioxide is delivered to a production facility in the vicinity of a well site" from regulation under its Hazardous Liquid Pipeline Safety Act's regulations). In any event, DOGGR does not yet have authority over CO<sub>2</sub> pipelines used for pure carbon sequestration (e.g., in saline formations).

<sup>9</sup> See CPUC General Order No. 112-E, Subpart C.

<sup>10</sup> Roger G. Ryman, *Cultural, Technical and Environmental Hurdles Overcome: The Story of the Cortez Pipeline Before Construction*, RIGHT OF WAY (June 1982). Shell also had to obtain permits to cross nearly 40 federal and state highways, and franchises from each of the 14 counties along the route were required to cross county roads.

<sup>11</sup> N.M. STAT. ANN. § 70-3-5.A. See also 1983-1986 Op. Att'y Gen. N.M. 146 (Jan. 19, 1984) (opining that even though New Mexico case law required that condemnation result in "public use" rather than "public benefit," a court would give great deference to the legislatures determination that a CO<sub>2</sub> pipeline was a "public use" even though the public would not be entitled to use the pipeline).

**b) No Federal Siting Authority for Non-Federal Land**

No federal agency exercises authority over the siting of interstate CO<sub>2</sub> pipelines on non-federal land.<sup>12</sup> In 1979 the Federal Energy Regulatory Commission (“FERC”) ruled that the Natural Gas Act (“NGA”) did not give it jurisdiction over a proposed interstate pipeline that would transport 98% pure CO<sub>2</sub>.<sup>13</sup> In the last five years, FERC has reaffirmed that it does not have jurisdiction over CO<sub>2</sub> pipelines.<sup>14</sup> Consequently, unless the federal government amends the NGA to cover CO<sub>2</sub> pipelines, the federal power of eminent domain is not available for interstate CO<sub>2</sub> pipelines.<sup>15</sup>

**c) The Bureau of Land Management (“BLM”) Can Authorize the Crossing of Federal Land**

BLM has authority under two statutory schemes to permit the siting of CO<sub>2</sub> pipelines on federal land. Pursuant to Title V of the Federal Land Policy and Management Act (“FLPMA”), BLM can issue rights-of-way over and under federal land for a variety of systems including the following: (1) systems for the transportation and storage of liquids and gasses (other than natural gas or synthetic gaseous fuels), which would include anthropogenic CO<sub>2</sub> produced at biofuels plants, coal gasification plants, or captured from stacks of coal or gas fired power plants; (2) systems for the generation of electric energy, which might include sequestration facilities required for electric power plants; and (3) any other systems or facilities that are in the public interest and require rights-of-way.<sup>16</sup> In addition, BLM can authorize pipelines for the transportation of “naturally-occurring carbon dioxide” under Section 28 of the Mineral Leasing Act.<sup>17</sup> Pipelines authorized under the Mineral Leasing Act become “common carriers” that must “accept, convey, transport, or purchase without discrimination all \* \* \* gas delivered to the pipeline.”<sup>18</sup>

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<sup>12</sup> See generally Marston, footnote 4 *supra* at 452-54.

<sup>13</sup> *Cortez Pipeline Co.*, 7 FERC 61024 (1979) (concluding that “no goal or purpose of the NGA [would be advanced] by assuming jurisdiction over the [proposed CO<sub>2</sub> pipeline] project. This result is reached by considering the source of the production, the use of the production, and the actual chemical composition of the production involved, in light of the goals of the NGA”).

<sup>14</sup> *Southern Natural Gas Co.*, 115 FERC 62266 (2006) (The pipeline “following abandonment by sale will be either non-jurisdictional intrastate [natural gas] or CO<sub>2</sub> facilities, and therefore, the facilities will be exempt from jurisdiction under” the NGA.).

<sup>15</sup> See 15 U.S.C. § 717f(h) (authorizing holder of FERC-issued certificate of public convenience and necessity to condemn easements for interstate natural gas pipelines).

<sup>16</sup> 43 U.S.C. § 1761(a). Section 302(b) of FLPMA, which authorizes BLM to issue easements, permits, and leases for industrial and commercial uses that cannot be authorized under other laws, could be another source of siting authority. See Department of the Interior, Report to Congress: Framework for Geological Carbon Sequestration on Public Land (2009)

<sup>17</sup> See *Exxon Corporation v. Lujan*, 970 F.2d 757 (10th Cir. 1992) (interpreting 30 U.S.C. § 185(a)).

<sup>18</sup> 30 U.S.C. § 185(r)(2)(A).

#### d) Siting Under State Law

A handful of states have enacted statutes specifically authorizing the use of eminent domain for CO<sub>2</sub> pipelines.<sup>19</sup> These statutes tend to fall into one of two categories.<sup>20</sup> In one category are eminent domain statutes that are closely related to enhanced oil recovery.<sup>21</sup> Pipelines used for carbon sequestration outside of enhanced oil recovery would not be able to utilize the eminent domain authority granted in this category of statutes. In the other category are eminent domain statutes that require the CO<sub>2</sub> pipeline become a common carrier.<sup>22</sup> For example, Texas only authorizes the use of eminent domain for CO<sub>2</sub> pipelines if the pipeline company agrees in writing that it is “a common carrier subject to the duties and obligations conferred or imposed by this chapter.”<sup>23</sup> The obligations that accompany designation as a common carrier could be problematic for CO<sub>2</sub> pipelines,<sup>24</sup> which may well be built with just enough capacity and be contractually obligated to transport all the CO<sub>2</sub> generated from a particular emitter.

There are two general constitutional restraints on the exercise of eminent domain: the taking must be for a “public use” and “just compensation” must be paid.<sup>25</sup> Of these two restraints, the “public use” limitation is the more visible concern when the condemned land will be “used” by a private entity. However, “public use” has been defined broadly by California courts as “a use which concerns the whole community or promotes the general interest in its relation to any legitimate object of government.”<sup>26</sup> Further, the California legislature has

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<sup>19</sup> See, e.g., LA. REV. STAT. ANN. § 19:2(10); MISS. CODE ANN. § 11-27-47; N.M. STAT. ANN. § 70-3-5.A; N.D. CENT. CODE §§ 49-19-01(1), 49-19-12; TEX. NAT. RES. CODE §§ 111.002(6), 111.019(a).

<sup>20</sup> See Joel Mack & Buck Endemann, *Making Carbon Sequestration Feasible: Toward Federal Regulation of CO<sub>2</sub> Sequestration Pipelines*, 38 ENERGY POLICY 735, 737 (2010).

<sup>21</sup> LA. REV. STAT. ANN. § 19:2(10) (authorizing use of eminent domain for CO<sub>2</sub> pipelines to be used in enhanced oil recovery operations in Louisiana or in other states); MISS. CODE ANN. § 11-27-47 (authorizing use of eminent domain for CO<sub>2</sub> pipelines to be used in enhanced oil recovery operations in Mississippi). Although New Mexico’s statute is not expressly tied to enhanced oil recovery, it is part of New Mexico’s chapter of laws concerning oil and gas and. Indiana just gave

<sup>22</sup> N.D. CENT. CODE §§ 49-19-01(1), 49-19-12; TEX. NAT. RES. CODE §§ 111.002(6), 111.019(a).

<sup>23</sup> TEX. NAT. RES. CODE §§ 111.002(6). See also N.D. CENT. CODE § 49-19-11 (requiring that the pipeline must “agree expressly that it, without discrimination, will accept, carry, or purchase, the \* \* \* carbon dioxide of the state or of any person not the owner of any pipeline, operating a lease or purchasing \* \* \* carbon dioxide at prices and under regulations to be prescribed by the” Public Service Commission).

<sup>24</sup> See, e.g., *Tex. Rice Land Partners, Ltd. v. Denbury Green Pipeline-Texas LLC*, 296 S.W.3d 877 (Tex. Ct. App. 2009) (involving contention that CO<sub>2</sub> pipeline for enhanced oil recovery cannot be a common carrier). This case is now pending before the Texas Supreme Court.

<sup>25</sup> *City of Oakland v. Oakland Raiders*, 32 Cal. 3d 60, 64 (1982). Cf. *Murphy v. Burch*, 46 Cal. 4th 157, 170 (2009) (noting that valid public use does not exist when the condemnation would “benefit only a private company or individual”).

<sup>26</sup> *City of Oakland*, 32 Ca. 3d at 69.

provided that any use for which statutes allow eminent domain to be exercised constitutes a legislative declaration that such use is a public use.<sup>27</sup>

California does not have a statute specifically authorizing the use of eminent domain for CO<sub>2</sub> pipelines. However, public utilities in California can use the power of eminent domain when needed for their facilities.<sup>28</sup> For example, a “pipeline corporation may condemn any property necessary for the construction and maintenance of its pipeline.”<sup>29</sup> Pipeline corporations could include entities that own or operate pipelines used to transmit CO<sub>2</sub> in a supercritical state.<sup>30</sup> Utilizing this authority, however, would require that the operator of a carbon sequestration pipeline be a public utility,<sup>31</sup> which could in turn limit the sphere of emitters that might be able to implement carbon sequestration.

One alternative to condemning easements across private land is to utilize existing public easements, such as roads. In *Bello v. ABA Energy Corp.* the California Court of Appeals upheld a privately-owned natural gas exploration and production company’s installation of pipelines within public rights-of-way.<sup>32</sup> To do so, a proposed use should:

“(1) serve as a means, or be incident to a means, for the transport or transmission of people, commodities, waste products or information, or serve public safety; (2) serve either the public interest or a private interest of the underlying landowner that does not interfere with the public’s use rights; and (3) not unduly endanger or interfere with use of the abutting property.”<sup>33</sup>

Of course, permission is needed from the public entity with jurisdiction over the right-of-way.

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<sup>27</sup> CAL. CODE CIV. PRO. § 1240.010.

<sup>28</sup> CAL. PUB. UTIL. CODE §§ 610 *et seq.*

<sup>29</sup> CAL. PUB. UTIL. CODE § 615.

<sup>30</sup> CAL. PUB. UTIL. CODE § 227 (defining pipeline as a facility use to transmit “crude oil and other fluid substances except water through pipe lines”). *See also* CAL. PUB. UTIL. CODE §§ 217, 218, 612 (authorizing electric corporations to utilize the power of eminent domain for electric facilities, which could conceivably include pipelines to dispose of CO<sub>2</sub>). Common carriers, *i.e.*, entities providing transportation for the public, also have the power to condemn property that is necessary for its facilities. CAL. PUB. UTIL. CODE §§ 211, 620. *But see Tex. Rice Land Partners, Ltd. v. Denbury Green Pipeline-Texas LLC*, 296 S.W.3d 877 (Tex. Ct. App. 2009) (involving contention that CO<sub>2</sub> pipeline for enhanced oil recovery cannot be a common carrier because it does not offer service to the public).

<sup>31</sup> *See* CAL. PUB. UTIL. CODE § 216(a) (requiring that public utilities perform a service for, or delivery a commodity to, the public). *See also* CAL. PUB. UTIL. CODE § 625 (requiring that the Public Utilities Commission must find that condemnations by public utilities for the purpose of offering competitive services would serve the public interest).

<sup>32</sup> 16 Cal. Rptr. 3d 818 (Cal. Ct. App. 2004).

<sup>33</sup> *Id.* at 829-20 (internal citations omitted).

## Summary

There may be a gap in the California's regulation of the safety of intrastate CO<sub>2</sub> pipelines. Although the California Public Utilities Commission applies federal pipeline safety standards to pipelines owned by public utilities, the State Fire Marshal's legal authority under the Elder California Pipeline Safety Act of 1981 may not extend to CO<sub>2</sub> pipelines and legislation may be required to address this issue.

The development of CO<sub>2</sub> pipelines for enhanced oil recovery illustrates that long CO<sub>2</sub> pipelines are impractical, if not impossible, to site without the power of eminent domain. There is no federal authority for siting CO<sub>2</sub> pipelines on private land. Although public utilities in California can exercise the power of eminent domain in certain circumstances, other entities that could sequester CO<sub>2</sub>, such as oil refineries, lack that ability, which could hinder the broader implementation of carbon sequestration. For that reason, legislation authorizing the use of eminent domain for CO<sub>2</sub> pipelines that are not owned and operated by public utilities would likely further the implementation of carbon sequestration.