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United States Court of Appeals
Tenth Circuit

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PUBLISH

UNITED STATES COURT OF APPEALS

FOR THE TENTH CIRCUIT

PAMELA STONE, an individual; TWYLA RUSAN, an individual; M. JAMIE MORROW, an individual; THE SOUTH PARK COALITION, a non-profit 501(c)(4) Colorado corporation,

Plaintiffs - Appellees,

and

BE THE CHANGE USA, a non-profit 501(c)(4) Colorado corporation,

Plaintiff,

v.

HIGH MOUNTAIN MINING COMPANY, LLC, a Wyoming limited liability company,

Defendant - Appellant,

and

JAMES R. MURRAY, an individual,

Defendant.

COLORADO MINING ASSOCIATION; COLORADO STONE, SAND & GRAVEL ASSOCIATION; UNITED STATES OF AMERICA,

Amici Curiae.

No. 22-1340

Appeal from the United States District Court
for the District of Colorado
(D.C. No. 1:19-CV-01246-WJM-STV)

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David S. Gualtieri (Todd Kim, Assistant Attorney General, and Cynthia Taub, Attorney, with him on the brief), Environment and Natural Resources Division, United States Department of Justice, Washington, D.C., for Amicus Curiae Plaintiff-Appellees.

Before **HARTZ**, **TYMKOVICH**, and **PHILLIPS**, Circuit Judges.

TYMKOVICH, Circuit Judge.

This appeal arises from a suit between private parties under the federal Clean Water Act's citizen-suit provision. 33 U.S.C. § 1365. High Mountain Mining Co. operates a gold mine near Alma, Colorado, within the South Platte River floodplain. High Mountain hauls excavated material to a processing plant where it is washed with river water to recover gold. The wastewater is then discharged to four unlined Settling Ponds.

Plaintiffs filed this citizen suit under the Clean Water Act, alleging, among other things, that High Mountain violated the Act because seepage of pollutants from the ponds flowed into the groundwater and then migrated to the Middle Fork of the South Platte River. The CWA requires anyone operating a point source that discharges pollution into a navigable stream obtain from the Environmental Protection Agency a point source discharge permit. The Supreme Court has instructed us that a discharge to groundwater can be the "functional equivalent of a direct discharge" in certain circumstances, depending on the interplay of the point source, seepage, ground water, subsurface conditions, and the navigable water. *County of Maui v. Hawaii*, 140 S. Ct. 1462, 1476 (2020). The Supreme Court told lower courts to apply a number of nonexclusive geophysical factors to determine whether the connection between the point source and the navigable water could invoke federal regulation at the expense of local or state regulatory regimes.

Following a bench trial, the district court agreed that the Settling Ponds were a point source and found that High Mountain's operation of them constituted an unpermitted discharge of pollutants into navigable waters, thus violating the CWA. High Mountain appeals that judgment. We have appellate jurisdiction under 28 U.S.C. § 1291 and REVERSE the district court. We hold that the district court made a legal error in concluding that the evidence of High Mountain's Settling Ponds discharging to groundwater was sufficient to show the functional equivalent of a direct discharge into the Middle Fork of the South Platte River. The court failed to consider all the relevant geophysical factors relevant to the particular circumstances

here. Given the broad application of the CWA to mines throughout the Mountain West, we remand to the district court for further proceedings consistent with *Maui*.

I. Background[1]

A. Factual History

High Mountain is a Wyoming limited liability company. In 2011, High Mountain purchased 512 acres of property containing the Alma Placer Mine and began mining operations the next year.[2] The mine property is bounded by the town of Alma to the west and southwest; the active mining site is directly next to the Middle Fork of the South Platte River. High Mountain operates the mine under a permit from the Colorado Division of Reclamation, Mining and Safety (DRMS). High Mountain possesses no state or federal permit to discharge pollutants into the Middle Fork.

High Mountain operates the Alma mine by digging a hole and transporting the excavated material to the on-site processing plant. When the material arrives at the processing plant, it is put into a feed conveyor and fed into the plant. Inside the plant, High Mountain applies water and uses screens and sluices to separate materials by size and weight. The plant produces many materials, including sand, gravel, and gold.

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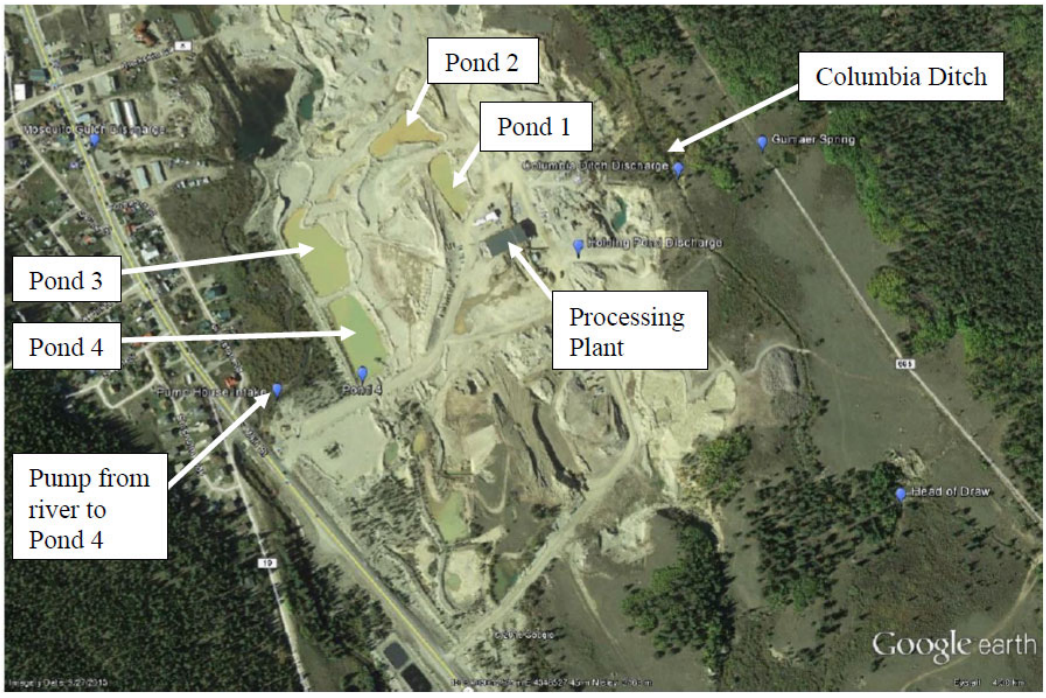
[1] Facts are taken from the district court's Findings of Facts and Conclusions of Law.

[2] A placer mine is a mine "where the minerals are not located in veins or lodes within rock, but are usu[ally] in softer ground near the earth's surface." *Dahl v. United States*, 319 F.3d 1226, 1227 (10th Cir. 2003).

Larger diameter materials like gravel and sand are piled outside the plant to be sold. The sluices separate gold particles from other small-diameter materials that are also sold. Finer grained materials that are not sifted out by the process include sand, clay, and silt. These materials flow into a large pipe in the process plant which discharges them into Pond 1—the first of four settling ponds. As the water from the plant flows from Pond 1 to Pond 2, the heaviest particles—like fine sand—sink to the pond's bed. As the water flows from Pond 2 to Pond 3 and from Pond 3 to Pond 4, particles continue to fall to the ponds' beds; by the time the water reaches Pond 4, it contains much less suspended material. The water in Pond 4 is then recycled back to the processing plant, and the process repeats.



Alma Placer Mine {Aplt. Br. at 9; App., Vol. XXV, A5684 (incorporating labels)}

High Mountain obtains water from the Middle Fork of the South Platte River at two points of diversion: (1) the pumphouse below Pond 4, which pumps water

from the River into Pond 4 or up to the processing plant, and (2) the Columbia Ditch north of the mine. The Columbia Ditch obtains water from the Middle Fork miles upstream.

The Settling Ponds are 20 feet higher than the Middle Fork, with an embankment between the Middle Fork and Ponds 3 and 4. The distance between the Middle Fork and the top of the embankment of Pond 4 is about 90 feet.

B. Procedural History

Plaintiffs brought this case under the citizen-suit provision of the CWA, 33 U.S.C. §§ 1331(a) and 1365(a), contending that High Mountain discharges pollutants from its property into the Middle Fork without a permit. Plaintiffs alleged that High Mountain's activities produced pollution in the four Settling Ponds and that this polluted water seeped through the bottoms of the ponds, entered the groundwater, and flowed into the Middle Fork. Because High Mountain did not have a National Pollutant Discharge Elimination System (NPDES) permit, Plaintiffs asserted this was a CWA violation.

After a four-day bench trial, the district court ruled that High Mountain violated the CWA. The court found that the Settling Ponds were point sources that channeled pollutants into the Middle Fork through groundwater and that the industrial wastewater in the ponds was a statutory pollutant. The court penalized High Mountain $500,000, about equal to the costs of installing liners in Ponds 1–4, but declined to issue any injunctive relief.

II. Analysis

High Mountain argues the district court erred in applying the legal framework that the Supreme Court has established for CWA cases involving groundwater next to navigable streams. In *County of Maui v. Hawaii*, 140 S. Ct. 1462, the Supreme Court laid out an analysis to be used in these cases to determine whether the groundwater discharge was the functional equivalent of a direct discharge to a stream or river, as required by the CWA. As we explain, although we agree with much of the district court's analysis, we conclude that it did not go far enough in analyzing evidence as it relates to groundwater discharges as required by the Supreme Court. And given the disruption that CWA liability may pose to Colorado's mining regulatory regime, we reverse the district court's finding of a Clean Water Act violation and remand for further proceedings.

A. Standard of Review

We review the district court's legal conclusions and conclusions on mixed questions of law and fact that "primarily" involve "the consideration of legal principles" de novo. *Roberts v. Printup*, 595 F.3d 1181, 1186 (10th Cir. 2010). Factual findings are reviewed for clear error. *Id.* Factual findings "are clearly erroneous when they are unsupported in the record, or if after our review of the record we have the definite and firm conviction that a mistake has been made." *Holdeman v. Devine*, 572 F.3d 1190, 1192 (10th Cir. 2009) (internal quotation marks omitted). But we are "not bound by the clearly erroneous standard when the trial

court has based its findings on an erroneous view of the law." *Valley Imp. Ass'n, Inc. v. U.S. Fid. & Guar. Corp.*, 129 F.3d 1108, 1123 (10th Cir. 1997).

B. Clean Water Act

The Federal Water Pollution Control Act Amendments of 1972, "colloquially called the Clean Water Act, completely rewrote the then-existing Federal Water Pollution Control Act." *City & Cnty. of San Francisco v. U.S. Env't Prot. Agency*, 75 F.4th 1074, 1097 (9th Cir. 2023) (Collins, J., dissenting). The FWPCA "employed ambient water quality standards specifying the acceptable levels of pollution in a State's interstate navigable waters as the primary mechanism in its program for the control of water pollution." *EPA v. California ex rel. State Water Res. Control Bd.*, 426 U.S. 200, 202 (1976).

"These overall standards for particular bodies of water were intended 'to serve both to guide performance by polluters and to trigger legal action to abate pollution.'" *City and County of San Francisco*, 75 F.4th at 1097 (quoting *EPA v. California*, 426 U.S. at 202). "But the system 'proved ineffective' in practice . . . [b]ecause the focus was on the ultimate aggregate level of pollution in the body of water" instead of "the preventable *causes* of water pollution" such as pollutant discharge. *Id.* at 1097–98 (quoting *EPA v. California*, 426 U.S. at 202). The old approach under the FWPCA required "work[ing] backward from an overpolluted body of water to determine which point sources [were] responsible and which must be abated." *EPA v. California*, 426 U.S. at 204.

"The revised FWPCA—which was officially given the alternative title of the 'Clean Water Act' in 1977, . . . t[ook] an entirely different approach that include[d] two major changes." *City and County of San Francisco*, 75 F.4th at 1097–98. "First, rather than measuring an individual polluter's performance 'against limitations derived from water quality standards to which it and other polluters must *collectively* conform,' the CWA directly regulates discharges from specific point sources by setting 'effluent limitations'—*i.e.*, 'restrictions . . . on quantities, rates, and concentrations of chemical, physical, biological, and other constituents which are discharged from point sources.'" *Id.* at 1098 (quoting *EPA v. California*, 426 U.S. at 204–05).

"Second, to implement this shift to a direct regulation of discharges, the CWA 'establish[ed] the [NPDES] as a means of achieving and enforcing the effluent limitations.'" *Id.* (quoting *EPA v. California*, 426 U.S. at 205 (footnote omitted)). "'Under the NPDES, it is unlawful for any person to discharge a pollutant without obtaining a permit and complying with its terms,' which include the applicable effluent limitations for the relevant point sources." *Id.* (quoting *EPA v. California*, 426 U.S. at 205). "In short, the permit defines, and facilitates compliance with, and enforcement of, a preponderance of a discharger's obligations under the Amendments." *EPA v. California*, 426 U.S. at 205.

Congress enacted the CWA with the stated objective to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters." 33 U.S.C. § 1251(a). To prove a violation of the CWA, a plaintiff must show that a defendant:

(1) discharged (2) a pollutant (3) into navigable waters (4) from a point source (5) without an NPDES permit. *Sierra Club v. El Paso Gold Mines, Inc.*, 421 F.3d 1133, 1142 (10th Cir. 2005), *as corrected* (Oct. 21, 2005); 33 U.S.C. §§ 1311(a), 1342(a)(1).

"[T]he Act defines pollution as 'the man-made or man induced alteration of the chemical, physical, biological, and radiological integrity of water.'" *PUD No. 1 of Jefferson Cnty. v. Washington Dep't of Ecology*, 511 U.S. 700 (1994) (quoting § 1362(19)). The CWA's definition of pollution is expansive and "expressly evinces Congress' concern with the physical and biological integrity of water." *Id.* The term "pollutant" includes "industrial waste discharged into water." § 1362(6). "Discharge of a pollutant" means "any addition of any pollutant to navigable waters from any point source." 33 U.S.C. §§ 1311(a), 1362(12).

"Navigable waters" means "the waters of the United States," § 1362(7), including certain non-navigable tributaries, 33 C.F.R. § 328.3(a)(3)). The CWA regulates natural drainage only where there is "a connection or link between discharged pollutants and their addition to navigable waters." *Sierra Club*, 421 F.3d at 1146. "Point source" means "any discernable, confined and discrete conveyance . . . from which pollutants are or may be discharged." § 1362(14). An NPDES permit is thus required only when a discernible, confined, and discrete conveyance adds pollutants to navigable waters.

The CWA establishes strict liability: an unpermitted discharge constitutes a violation regardless of fault and is subject to enforcement by state or federal

authorities or private citizens. § 1319(d) ("Any person who violates section 301 . . . of this title . . . shall be subject to a civil penalty . . . for each violation."); § 1311(a) ("Except as in compliance with [inapplicable exemptions], the discharge of any pollutant by any person shall be unlawful.").

C. Colorado's Regulatory Regime

The Water Quality Control Division (WQCD) of the Colorado Department of Public Health and Environment administers the State's compliance with the Clean Water Act's NPDES permit program. *See* C.R.S. § 25-8-501. The WQCD "use[s] the same trigger under the Colorado Water Quality Control Act as is used under the federal Clean Water Act, which is a discharge of pollutants from a point source to [state waters], which is a broader category than [federal waters]." App., Vol. XV, A3406:9–15; *see also* 5 Colo. Code Regs. § 1002-61:61.1. Since the mid-1990s, the WQCD has required an NPDES permit for discharges of pollutants to groundwater that are directly connected to the surface water. App., Vol. XV, A3413:24–A3414:2. A facility discharging to groundwater "within 300 feet of a surface water body" has a "general duty" to determine whether the facility is "required to obtain a surface water [discharge] permit." *Id.*, A3441:1–A3442:3.

But a permit is not required for discharges from impoundments when the discharge is subject to the jurisdiction of an implementing agency such as DRMS. 5 Colo. Code Regs. § 1002-61:61.14; Colo. Rev. Stat. § 25-8-202(7). DRMS is the implementing agency for mining operations and has primary jurisdiction or regulatory authority over groundwater pollution, groundwater discharges, and

nonpoint source discharges at mine sites in the state. Colo. Rev. Stat. § 25-8-202(7); 5 Colo. Code Regs. §§ 1002-61:61.14, 61.28; Mem. of Agreement, at 1–2. The only exception to an implementing agency's primary jurisdiction is when the Water Quality Control Commission (WQCC)[3] has made specific findings and promulgated a regulation through a public rulemaking hearing. C.R.S. § 25-8-202(7)(b)(II)–(III).

When the WQCC held a rulemaking to revise its discharge permitting regulation, it expressly exempted from WQCD's permitting authority groundwater discharges from impoundments—such as settling ponds—that are subject to an implementing agency such as DRMS. 5 Colo. Code Regs. § 1002-61:61.14(1)–(2); *see also* 5 Colo. Code Regs. § 1002-61:61.2(43) (defining "impoundment"). In the WQCC's express exclusions to the rulemaking, it explained that "[a]ctivities regulated by [implementing agencies], where 'activity' is defined . . . as 'any operation that may discharge or cause a discharge of pollutants to ground water' are not subject to this permitting regulation." 5 Colo. Code Regs. § 1002-61:61.28. As for impoundments at mining operations, "[c]onsistent with Section 25-8-202(7), the potential ground water quality impacts from [impoundments] would be addressed in the first instance by" DRMS. *Id.*

[3] The WQCC is "solely responsible for the adoption of water quality standards and classifications for state waters," whereas the WQCD is "solely responsible for the issuance and enforcement of permits authorizing point source discharges to surface waters of the state." Colo. Rev. Stat. § 25-8-202(7).

D. Maui *Factors*

For the first time, the Supreme Court addressed in *County of Maui v. Hawaii*, the question of whether the CWA "requires a permit when pollutants originate from a point source but are conveyed to navigable waters by a nonpoint source, here, groundwater." 140 S. Ct. at 1468 (internal quotation marks omitted). Its review of "the statutory provisions at issue" led it to conclude that a permit is required "if the addition of the pollutants through groundwater is the *functional equivalent of a direct discharge* from the point source into navigable waters." *Id*. (emphasis added).

In *Maui*, the Court considered whether a wastewater reclamation facility that injected treated water into wells hundreds of feet underground needed an NPDES permit when the effluent traveled half a mile through groundwater to the ocean. The Court, in holding that a permit was required, reasoned that Congress intended to require a federal permit not only when there was a direct discharge from a point source into navigable waters, but also when there was the functional equivalent of a direct discharge—*i.e.*, when a discharge reaches the same result "through roughly similar means"—such as pollutants reaching navigable waters through groundwater. *Maui*, 140 S. Ct. at 1476.

To illustrate its point, the Court offered two examples in which the permitting requirement applies, and where it does not. The first instance was "[w]here a pipe ends a few feet from navigable waters and the pipe emits pollutants that travel those few feet through groundwater (or over the beach), the permitting requirement clearly applies." *Id.* But where a "pipe ends 50 miles from navigable waters and the pipe

emits pollutants that travel with groundwater, mix with much other material, and end up in navigable waters only many years later, the permitting requirements likely do not apply." *Id.* The Court stressed that it was honoring the language of the CWA and "Congress' basic aim to provide federal regulation of identifiable sources of pollutants entering navigable waters without undermining the States' longstanding regulatory authority over land and groundwater." *Id.*

The Court was careful to note that "this approach . . . does not, on its own, clearly explain how to deal with middle instances." *Id.* Instead, the Court listed seven non-exclusive factors to consider in determining whether a discharge to groundwater is the functional equivalent of a direct discharge:

> (1) transit time;
>
> (2) distance traveled;
>
> (3) the nature of the material through which the pollutant travels;
>
> (4) the extent to which the pollutant is diluted or chemically changed as it travels;
>
> (5) the amount of pollutant entering the navigable waters relative to the amount of the pollutant that leaves the point source;
>
> (6) the manner by or area in which the pollutant enters the navigable waters; and
>
> (7) the degree to which the pollution (at that point) has maintained its specific identity

Id. at 1476–77.

The Court noted that "[t]ime and distance will be the most important factors in most cases," but reviewing courts need to be careful not to unduly disrupt existing state regulatory regimes over the same discharge facilities. *Id.* at 1477.

E. Application of the Maui *Factors*

Conducting our own *Maui*-factors analysis, we disagree with the district court and conclude that its *Maui* analysis did not support its conclusion that High Mountain's groundwater discharge was the functional equivalent of a direct discharge into navigable waters. We first review the evidence adduced at trial and then address each *Maui* factor.

1. Trial Evidence

At trial Plaintiffs argued that High Mountain's activities produced pollution in the four Settling Ponds and that this polluted water infiltrated into the ground through the bottoms of the ponds, entered the groundwater, and flowed into the Middle Fork—the functional equivalent of a direct discharge.

The district court relied on four categories of evidence to support its factual findings that there was a discharge to groundwater from the Settling Ponds, a hydrological connection between the Settling Ponds and the Middle Fork, and that the wastewater was a pollutant: (1) the Collier Geophysics surveys of Ponds 3 and 4; (2) inspection and permitting documents addressing the design of the Settling Ponds; (3) expert testimony at trial; and (4) water-quality testing.

a. Geophysical Surveys

Plaintiffs hired Collier Geophysics to perform geophysical surveys of Ponds 3 and 4 on July 9, 2021. App., Vol. XII, A3026. Philip Sirles is the "operations manager and senior geophysicist" in the Denver office of Collier Geophysics. *Id.*, Vol. XIV, A3326:7–8. The district court qualified Mr. Sirles under Federal Rule of

Evidence 702 to provide expert opinion testimony in geology and geophysical investigations, with a specialty in impoundment seepage. *Id.*, A3329:24–A3330:3.

Mr. Sirles's tasks were "to look at the pond bottom and see its integrity," *i.e.*, whether it had an effective clay liner, and to "determine if there might be any seepage paths." *Id.*, A3330:9–17. Mr. Sirles's team conducted two geophysical surveys on and around Ponds 3 and 4: a Frequency Domain Electromagnetic (FDEM) survey and a Ground Penetrating Radar (GPR) survey. *Id.*, Vol. XII, A3026.

Mr. Sirles's team sent a signal through the water using GPR to deduce the thicknesses of several layers of material at the bottom of Ponds 3 and 4. *Id.*, Vol. XIV, A3334:7–19. Mr. Sirles concluded that the bottom of Pond 3 is highly reflective, suggesting a permeable fines material, rather than impermeable clay. *Id.*, A3345:4–7. Mr. Sirles also had "never seen fines that are impermeable," *id.*, A3393:3–4, so he concluded that the bottom of Pond 3 "doesn't possess enough clay to be an impermeable clay liner." *Id.*, A3341:16–17. As for Pond 4, Mr. Sirles testified that the GPR signals penetrated to greater depths across the entire survey area, suggesting that the bottom of Pond 4 consists of even more permeable materials than Pond 3, and that those permeable materials are present over a broader area as well. *Id.*, A3344:1–21.

At trial, the district court determined there was substantial evidence showing that the Settling Ponds were designed to leak. In 2003 and 2004, the Colorado Division of Minerals and Geology inspected the Alma mine. Those inspection reports described the mining process and explained that water is discharged "into a

series of settlement basins that allow the water to infiltrate into the ground before any actual surface discharge occurs." App., Vol. XX, A4866, A4870. A 2015 permit, prepared for High Mountain by Greg Lewicki, labeled Ponds 3 and 4 as "groundwater pond[s]," because, at that time, they "believe[d] that water would infiltrate into the ground." *Id.*, Vol. XVII, A3869:2–5.

Mr. Lewicki has been involved with permitting at the mine since the early 2000s. He has worked with all operators at the mine since that time and has visited the mine many times to observe operations. In 2015, Mr. Lewicki represented to Colorado officials that "[w]ater from the slurry seeped into the ground at all pond sites." *Id.*, Vol. XVI, A3827:16–19.

High Mountain introduced evidence that since at least 2017, Ponds 3 and 4 have had an impermeable clay liner but the district court was not convinced that the Settling Ponds had *effective* clay liners. In December 2017, High Mountain submitted a revised permit application, also prepared by Mr. Lewicki. The revised permit stated that water infiltration into the ground would be negligible because the Settling Ponds were in "native material that has a significant portion of fines within it," and because sluicing operations would result in a buildup of silt and fines on the pond's bottom. *Id.*, Vol. XXII, A5131. Consequently, water would leave the ponds only as a result of recycling to the sluice itself and evaporation.

Mr. Lewicki testified that over time Ponds 3 and 4 have formed an impermeable seal. *Id.*, Vol. XVI, A3759:23–A3760:13. He claimed that when High Mountain cleans out Ponds 3 and 4, it leaves many feet of clay in as a liner. *Id.*,

A3838:21–24. According to Mr. Lewicki, Ponds 3 and 4 may contain as much as twenty feet of clay in them, which he believes is enough to provide a seal. *Id.*, A3839:1–6. Mr. Lewicki admitted that he hadn't performed any tests or surveys to determine how much clay was at the bottom of Ponds 3 and 4. *Id.*, A3839:19–20.

Notwithstanding High Mountain's evidence, the district court found that Ponds 3 and 4 were not effectively sealed and were discharging into the groundwater below them. The court also found that Ponds 1 and 2 were discharging to groundwater. Mr. Lewicki testified that water from the processing plant flows through Pond 1 in one day, which does not give Pond 1 time to collect any clays. *Id.*, A3852:7–14. Rather, Pond 1 collects materials with a diameter of 3/8-inch to 1/4-inch. *Id.*, A3852:19–20. He also testified that Pond 2 does not collect significant amounts of clay; mostly, Pond 2 collects sand. *Id.*, A3852:22. Based on this testimony, the court found that it was even less likely that Ponds 1 and 2 developed an impermeable seal than Ponds 3 and 4 did so.

As part of the geophysical survey Collier performed for Plaintiffs, Mr. Sirles was also tasked with determining whether there were seepage paths from Ponds 3 and 4 into the Middle Fork. Mr. Sirles's team conducted an FDEM investigation to detect potential seepage paths from Ponds 3 and 4. This investigation was conducted with a handheld electromagnetic instrument that transmitted electric signals into the ground and received signals from depths of 5,10, and 15 feet below the ground, respectively. Readings from the FDEM instrument were taken as the technician walked through all accessible areas around Ponds 3 and 4 and along the ponds' embankments.

As for Pond 3, Mr. Sirles identified an unusual pattern on the northwest corner of the pond, near the crest of the embankment. He defined this area as "Anomaly A." Mr. Sirles concluded that Anomaly A showed a narrow and shallow flow path with higher moisture content than surrounding soils. Mr. Sirles also found that Anomaly A also suggested the "vertical migration of the water." *Id.*, Vol. XIV, A3356:18–23.

As for Pond 4, Mr. Sirles identified another area, defined as "Anomaly B," in which the data revealed "blanket seepage," that is, seepage across a much broader area than Anomaly A. *Id.*, A3357:8–11. Anomaly B showed higher volumes of water at a depth of 15 feet, as compared to the shallower Anomaly A. The anomalies revealed water in concentrated areas below the Settling Ponds but above the Middle Fork. The district court reasoned that since water does not flow uphill, the anomalies were unlikely produced by the water in the Middle Fork. Mr. Sirles testified that rainwater would not account for the anomalies because it falls uniformly. *Id.*, Vol. XV, A3595:22–23. The anomalies were thus additional evidence the ponds were leaking.

The FDEM survey also produced data about the sides of Ponds 3 and 4. The blue area on Mr. Sirles's figures that fully encircled Pond 4 and much of Pond 3 suggested soils comprised of fines and mud, with a conductivity of 10 millisiemens/meter on his linear scale. *Id.*, Vol. XXVI, A5881. Mr. Sirles testified that, had the blue area encircling the ponds been comprised of the type of material that provides an impermeable barrier or seal, the conductivity detected with the

FDEM instrument would have been at least 100 mS/m: an order of magnitude higher than was actually detected. *Id.*, Vol. XV, A3389:16–A3390:22; *id.*, A3391:1–19.

b. Inspection and Permitting Documents

The district court also considered High Mountain's communication with two different State agencies that confirmed, contrary to its position in litigation, that water seeps out of Ponds 3 and 4 and percolates into the groundwater alluvium and the Middle Fork. In seeking to prevent the State's mining agency from regulating its groundwater, High Mountain told the Division of Mining, Reclamation and Safety that "no groundwater is removed from the site; *it all seeps back into the alluvium* via the adjacent seepage pit." App, Vol. XXII, A5230 (emphasis added).

In its representations to the Colorado Department of Public Health and Environment, High Mountain argued against mandating stormwater permits for its operations. It premised its argument on the assertion that "[w]ater from the slurry seeps into the ground at all pond sites and never enters the surface water system." *Id.*, Vol. XVI, A3827:16–19. But at trial, High Mountain's expert acknowledged that water infiltrating the ground would "flow to the Middle Fork." *Id.*, Vol. XVII, A3876:8–12.

High Mountain's inspection reports and permits confirmed the connection between the Settling Ponds and the Middle Fork. The district court considered evidence, including the mine's pre-litigation permits and agency inspection reports. *See, e.g.*, Order at 18 ¶ 93 (High Mountain's managing partner "signed permits during the period 2012 to 2015 which specifically stated that the ponds *did* allow for

water to seep into the ground"); App., Vol. XX, A4866, A4870 (Colorado's Division of Reclamation, Mining and Safety observed water discharging into "settlement basins that allow the water to infiltrate into the ground"); *id.*, Vol. XVII, A3866:1–4 (High Mountain tells State stormwater division "all water seeps into the ground"). Plaintiffs' hydrologist Carla Johnson also testified that without such a design, the mine would have a serious problem with the Settling Ponds overtopping to cause water flow across the mine site surface into the Middle Fork. *Id.*, Vol. XIV, A3226:17–22.

We note that throughout this period, High Mountain complied with the state regulatory regime—DRMS as the implementing agency and its required permitting scheme. No discharge permit was required and infiltration from the Settling Ponds was permitted.

c. Expert Testimony

The district court found that "all but one expert who testified on the issue agreed that if the Settling Ponds discharged to groundwater, that groundwater would flow to the Middle Fork." Order at 17 ¶ 89. Plaintiffs' expert Mr. Sirles described the materials through which any seepage from the ponds would occur as "coarse materials that are highly permeable." *Id.* ¶ 91. Defense expert Mr. Lewicki conceded that water discharged to the ground would "flow to the Middle Fork." *Id.* ¶ 90. High Mountain acknowledges in its brief that even "DRMS believed the Settling Ponds were infiltrating into the ground . . . ." Aplt. Br. at 31 n.9.

Plaintiffs also presented evidence that groundwater is pervasive at the mine, requiring High Mountain to pump it away in order to effectively dredge for gold. App., Vol. XXII, A5122–23 ("Most gold-bearing gravel is expected to be located below the water table; therefore, a pump will be located below the working area in each mining area to dewater the pit prior to mining."); *id.*, Vol. XXI, A5084 ("During operation the cut will be pumped . . . ."). High Mountain's DRMS permits recognize that groundwater exists at "River level" and "will be encountered in the gold mining operation." *Id.*, Vol. XXII, A5145; *see also id.* A5192 ("[G]roundwater inflows into the active cut will be approximately 50–100 gallons per minute and this amount of water would be pumped to the sediment pond system.").

Plaintiffs adduced extensive evidence and testimony supporting the district court's finding that the Settling Ponds channeled pollutants into the Middle Fork. The 2005 DRMS inspection report states that when operating as intended the pond water will "infiltrate properly back into the alluvial groundwater system." *Id.*, Vol. XX, A4871. Moreover, both of Plaintiffs' experts stated that any liquids seeping out of the ponds travel to the Middle Fork. *Id.*, Vol. XIV, A3300:11–12 (Johnson: "all groundwater reaches the river in that area."); *id.*, A3377:1–22 (Sirles: pond bottom is at River level); *id.*, A3345:15–25 (Sirles: coarse, permeable materials under Ponds 3 and 4 would allow for transmission of water). High Mountain's expert admitted that seepage would flow to the Middle Fork. *Id.*, Vol. XVII, A3876:8–12.

Ms. Johnson presented testimony on the transit time—two days—for water to flow from the Settling Ponds through groundwater to the Middle Fork. Order at 18

¶ 95. Ms. Johnson's "opinion [was] based on a calculation she made according to Darcy's Law, a formula that mathematically describes the flow of a fluid through a porous medium." *Id.* ¶ 96. Ms. Johnson "assumed that the discharge was 100 feet from the Middle Fork, at a height of 20 feet, and that the soil was composed of 25% fine clay, 25% silt and clay, 25% sand, and 25% gravel." *Id.* Her figure of 25% fine clays was conservative compared to High Mountain's expert's range of 10–15% for the Alma Mine's soil. *Id.* ¶ 96.

d. Water-quality Testing

The last category of evidence was water-quality testing at the ponds. The district court found that the Settling Ponds were contributing pollutants to groundwater and then to the Middle Fork based on water-quality sampling from one day in July 2016. Arrakis, Inc., the company contracted by High Mountain to perform the water-quality testing at the mine, sampled water from ten points in and around the mine.[4] The district court found relevant the samples taken from Pond 4, the Pumphouse next to Pond 4, and the Columbia Ditch. The results of the Arrakis analysis "show[ed] a marked increase in pollutant levels in Pond 4 as compared to the levels of the same pollutants in the water at both diversion points." Order at 20–21 ¶ 107.

With that factual development in mind, we turn to the *Maui* factors.

[4] The owner and CEO of Arrakis, James R. Murray, is a managing member and part-owner of High Mountain and a defendant in the suit.

2. Maui *Analysis*

The district court used the *Maui* factors to determine that High Mountain's discharge to groundwater from the unlined Settling Ponds and then to the Middle Fork was the functional equivalent of a direct discharge. The court found the first three factors supported Plaintiffs: transit time, distance traveled, and the nature of the material through which the pollutant traveled.[5] The district court concluded the remaining factors carried no weight because there was either limited evidence or High Mountain presented no evidence to persuade the court that the factors should weigh in its favor.

In light of the complex topography of the Alma Placer Mine and its environs, we hold that it was legal error for the district court to conclude that the unlined Settling Ponds were the functional equivalent of a direct discharge, primarily on the first two factors of time and distance. Although we largely agree with the court's analysis on the first two factors, in the particular circumstances here, the court should have made additional findings on the additional *Maui* factors, including how much the pollutant is diluted or chemically changed as it travels and the amount of pollutant entering the navigable waters relative to the amount of the pollutant that leaves the point source.

[5] Because of the limited evidence presented about the nature of the material below the Settling Ponds, the court gave the third factor little weight.

a. Transit Time and Distance Traveled

In summary, the district court found that there was evidence in the record for a transit time of "approximately two days." Order at 30 ¶ 162. The district court said that even if this transit time were off by a factor of ten, it would still be only a fraction of the "many years" transit time contemplated in *Maui* that would weigh against applying the CWA. *Id.* at 30–31 ¶¶ 162–63. This factor favors Plaintiffs.

The district court found that Ponds 3 and 4 are uphill from the river and "less than 100 feet away," so "it makes physical and logical sense that a discharge to groundwater so close to the river is the functional equivalent of a direct discharge into the river." *Id.* at 29 ¶ 154. There are virtually no fact findings on Ponds 1 and 2, but the court noted they "are only slightly further away" from the river than Ponds 3 and 4. *Id.* at 30 ¶ 158.

There is additional support in the record for the distance traveled, however. Between the Middle Fork and the top of the embankment of Pond 3 is about 70 feet. *Id.* at 10 ¶ 43. From the Middle Fork to the top of the embankment of Pond 4 is about 90 feet. *Id.* ¶ 44. The pathways (anomalies) out of the bottom of the ponds are "close to the river." App., Vol. XIV, A3376:12–14. As the district court found, time and distance here are "but a tiny fraction" of the extreme examples presented in *Maui*. Order at 30 ¶¶ 158, 162, 163. This factor favors Plaintiffs.

b. Nature of the Material Passed Through

The district court first noted that the evidence at trial showed the soil around the Settling Ponds consisted of porous materials: "[a] combination of fine and coarse-

grained sediments." Order at 31 ¶ 164. Plaintiffs' expert testified that the soils around the ponds are made up of boulders, cobbles, gravels, silts, and clays. *Id.*

The court then stated that "Defendants introduced no evidence that the nature of the materials through which the pollutants traveled should weigh in their favor." *Id.* at 32 ¶ 165. The court found that this factor favored Plaintiffs but that there was "limited evidence presented about the composition of the soil below the Settling Ponds" so it gave this factor little weight. *Id.* ¶ 166.

c. Final Four Factors

As for the remaining factors—(4) the extent to which the pollutant is diluted or chemically changed as it travels; (5) the amount of pollutant entering the navigable waters relative to the amount of the pollutant that leaves the point source; (6) the manner by or area in which the pollutant enters the navigable waters; and (7) the degree to which the pollution has maintained its specific identity—the district court acknowledged that it lacked, or there was limited, evidence to analyze or apply them. *Id.* at 32 ¶¶ 167–170.

The court found that neither party presented evidence on the fourth (dilution) and seventh (identity) factors. The court said that High Mountain presented no evidence that these factors should weigh in its favor, so the court gave them no weight. Likewise, it said that there was limited evidence on the fifth (amount) factor, so the court gave it no weight. The court did not mention the sixth factor—the manner by or area in which the pollutant enters the navigable waters.

We recognize that the Supreme Court's list in *Maui* was illustrative rather than exhaustive. Importantly, the Court recognized time and distance as the two "most important factors in *most* cases, but not necessarily every case." *Maui*, 140 S. Ct. at 1477 (emphasis added). Indeed, the facts here are so starkly different from those present in *Maui* that to conclude there was the functional equivalent of a direct discharge largely on the basis of just time and distance is not supportable on this record. This case is one of the "middle ground" cases *Maui* warned about, and one of the few to be resolved post-*Maui*. 140 S. Ct. at 1477. Though transit time, distance traveled, and the materials passed through favored Plaintiffs, the district court erred by effectively ending the analysis there. In analyzing the fourth and seventh factors, the district court said neither party presented evidence and that "[h]ad Defendants introduced evidence that the materials below the pond were effective at filtering pollutants, this factor would have weighed in their favor." Order at 32 ¶ 168 n.5.

There is evidence, however, that several of these under-analyzed factors, such as dilution and amount of discharge *might* be important in the context here. In particular, the levels of the principal polluting elements (calcium, potassium, magnesium, and sodium) measured by the Arrakis water-quality sampling study were quite similar when measured at the Columbia Ditch (well upstream of the mine) and the pumphouse (downstream from the mine). If the levels of river pollutants above and below the mine are essentially the same, perhaps there is some mechanism that has kept polluting chemicals in the pond from escaping with the water that ends up in the river. To be sure, we cannot say because the record and analysis are incomplete.

But *Maui*'s plain directive suggests that the functional-equivalent test has some measure of qualitative and quantitative dimensions, which is highly relevant here where the water-quality testing is wanting in terms of what impact, if any, the seeping water from the Settling Ponds has on the Middle Fork. Indeed, the complex topography of the area makes a finding of a functionally-equivalent discharge too speculative given High Mountain's close neighbors.[6] Seepage from the Settling Ponds might only reach the Middle Fork in such a diluted form, or at such minute quantities, if not both, to fail to meet the *Maui* standard. We do not know from this record and analysis.

Rather than holding Plaintiffs accountable for failing to put on evidence of all the geology that would establish the functional equivalent of a direct discharge to the Middle Fork, the court effectively shifted the burden to High Mountain to prove the Settling Ponds were *not* the functional equivalent of a direct discharge. The lack of a full analysis of the competing factors ignored *Maui*'s caution to courts against decisions that "create serious risk[] . . . of undermining state regulation of groundwater," 140 S. Ct. at 1477, yet that is precisely what the district court did on too thin of a record and analysis. The complex topography of not just the surrounding area, but our circuit writ large, and the complicated and overlapping

[6] The Alma Placer Mine is adjacent not only to Highway 9—to which the Colorado Department of Transportation applies deicing chemicals that contain some of the same elements the court found at Pond 4, the Pumphouse, and Columbia Ditch—but also to Alma's nearby municipal wastewater treatment plant and is downriver from hard rock metal mines in Buckskin Gulch.

regulatory regimes that surround the State of Colorado's 10,380 *active* mines[7] required a more comprehensive and rigorous application of the competing *Maui* factors.

Rather than dismissing Plaintiffs' claims for failure to provide sufficient evidence to assess relevant *Maui* factors, however, the district court may decide to reopen the evidentiary hearing in light of the guidance provided by this opinion.

III. Conclusion

We reverse the district court's finding of a Clean Water Act violation and remand for further proceedings consistent with this opinion.

[7] We take judicial notice of Bureau of Land Management statistics. This figure does not include the thousands of other active mines in the rest of the Tenth Circuit footprint.