

Still **IN THE PITS**

California is still failing to protect groundwater and air quality from oil and gas wastewater disposal in unlined and open air pits.

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CLEAN WATER ACTION
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Acknowledgements

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Cover Photo: Racetrack Hills facility, Kern County, CA. Photo courtesy of 'Pistachio Production'.

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Executive Summary

In 2014, Clean Water Action released *In the Pits: Oil and Gas Wastewater Disposal into Open Unlined Pits and the Threat to California's Water and Air*. Our investigation found evidence of harm to both groundwater and air quality, and major regulatory and enforcement gaps. We called for an immediate prohibition on open pit disposal, insisted that the state hold polluters accountable for cleaning up contamination, and demanded increased monitoring for water and air pollution.

Since *In the Pits* was released, the public and regulatory communities' understanding of oil and gas wastewater pits has increased and state and regional agencies have made significant progress in their approach to regulating oil and gas wastewater disposal. However, there are still substantial deficiencies in the state's oversight of these disposal practices. The report includes our findings that:

The continued gaps in data and monitoring indicate that regulators are unable to ensure the protection of drinking and irrigation water. Following increased scrutiny from the environmental community, the media, and the public, there has been a significant increase in scientific study, data collection and thereby the public's understanding of the historic use and threats posed by disposal pits. There is growing evidence of pollution and the California Council on Science and Technology (CCST) has recommended ending this disposal method, a recommendation that Clean Water Action made in *In the Pits*. However, there are still major gaps in data collection and dissemination, including inadequate chemical testing of produced water in pits. The continued shortcomings in data collection, monitoring and chemical disclosure highlight the inadequacies of the state's efforts to regulate disposal of wastewater into unlined pits and its inability to protect drinking and irrigation water from this disposal method.

Improved regulatory action, but still not enough. Oversight of pits has increased and agencies have begun to regulate the hundreds of unpermitted pits. The Central Valley Regional Water Quality Control Board has increased staffing and focused attention on the problem of disposal pits. There are new plans for monitoring air and groundwater near pits, and pit disposal from stimulated wells is now prohibited. However, in most cases, the Regional Water Boards have continued to allow discharge that threatens groundwater, and have failed to close pit facilities, even where monitoring has identified underground migration of harmful chemicals, or when they are operating illegally — either without permits, or impacting water quality. This regulatory inaction demonstrates that the public cannot rely on the current regulatory approach to protect public health and the environment.

Improved understanding of where pits are located and their regulatory status. Since 2014, the known number of pits has changed dramatically: Updated numbers as of February 2016:

- 1165 total pits, 790 of which are active — compared to 2014 inventories showing 630 total and 432 active pits. The vast majority (1113 total, 746 active) are in the Central Valley. The Central Coast Regional Water Quality Control Board has now also identified 52 pits (44 of which are active).

The public now knows how many pits are not regulated adequately either by failing to have a permit to operate or possessing a permit that is so old that it predates regional water policies.

- 60.1% (475) active pits, and 68.9% (803) of all pits are inadequately permitted. These pits either do not have a permit, or have a permit that was issued prior to adoption of the local Basin Plan.

Failure to shut down polluting facilities. State and regional agencies continue to fall short in regulating effectively and shutting down pits that are, or may be polluting vital aquifers. There are still hundreds of sites where operators discharge toxic wastewater, threatening groundwater and air quality, and are out of compliance with water quality laws and policies. This report highlights evidence from three pit facilities that show impacts to groundwater in Kern County, yet regulators allow all three continue to operate. Regulators have found the Racetrack Hills, Fee 34, and McKittrick 1 and 1-3 facilities to be sources of migration of wastewater into, or threatening to enter, sources of drinking or irrigation water.

Updated recommendations: Based on our increased understanding and improved data, this report contains a revised set of recommendations to reduce, and ultimately end, air and water pollution from open-pit disposal.

1. **We continue to call for the state to implement an immediate prohibition on disposal into open pits, a recommendation supported by CCST, an independent and politically neutral scientific review panel.**

In addition, we recommend that regulators:

2. Enforce existing water quality laws and shut down pits that are polluting, will likely pollute high quality groundwater, or do not have up to date permits.
3. Enforce SB 4 regulations more broadly and prohibit waste from wells that have been stimulated from being disposed of in pits.
4. Require complete chemical disclosure for all fluids used in oil and gas wells and comprehensive testing of chemicals that may be present in produced water.
5. Ensure that the wastewater reporting mandate established by SB 1281 is fully implemented.
6. Maintain an accurate and up to date database of pits.
7. Develop guidance for the regional boards on data collection and dissemination.

8. Include a prohibition on open pits in the California Air Resources Board's (ARB) new regulations on methane from oil and gas production, and at a minimum, expedite planned air monitoring.
9. Undertake a thorough investigation of inactive and historical pits to identify potential legacy pollution.

I. Introduction

Clean Water Action's 2014 report *In the Pits: Oil and Gas Wastewater Disposal into Open Unlined Pits and the Threat to California's Water and Air* highlighted the threats to public health and the environment posed by disposal of oil and gas wastewater into open pits in California and recommended ending their use. At the time, the state was failing to address the potential harm posed by this disposal method. More than a year later both regulators and the public have a much better understanding of the problem. However, regulatory protections are still lacking.

Before Clean Water Action published *In the Pits*, there was a very limited understanding of the scope of the problem. For example, the number and locations of pits was largely unknown, though it was suspected that the problem extended well beyond the 432 active and 198 idle pits that the Central Valley Regional Water Quality Control Board (Central Valley Water Board) had inventoried in its region. As a result of increased scrutiny, this has been confirmed. This follow-up report highlights changes in knowledge,



PHOTO COURTESY OF 'PISTACHIO PRODUCTION'

Racetrack Hills Unlined Pit and Spray Field Facility, operated by Valley Water Management. Kern County, CA.

data, and oversight since 2014. It also includes updated recommendations based on the increased understanding of the problem and the inadequate progress by regulators to address the threats to the environment and public health posed by this disposal method.

II. The continued gaps in data and monitoring indicate that regulators are unable to ensure the protection of drinking and irrigation water.

There have been numerous changes in data and public information about oil and gas wastewater disposal into open and unlined pits in the last year. Some of the developments that contributed to an increased understanding of the problems posed by this type of disposal include:

- **Scientific review.** In July 2015, the California Council on Science and Technology (CCST) released Volumes II and III of *An Independent Assessment of Well Stimulation in California*, as mandated by Senate Bill 4 (Pavley, 2013).^{*} The CCST study found that from 2011 through 2014 operators reported 58% of wastewater from stimulated (hydraulically fractured or acidized) wells was dumped into unlined pits in California.¹ The CCST study notes: “Because the primary intent of unlined pits is to percolate water into the ground, this practice provides a direct pathway for the transport of produced water constituents, including returned stimulation fluids, into groundwater.”²

The CCST study also states: “**If the presence of hazardous concentrations of chemicals cannot be ruled out, [agencies] should phase out the practice of discharging produced water into percolation pits.** Agencies should investigate any legacy effects of discharging produced waters into percolation pits including the potential effects of stimulation fluids.”³ [Bold added for emphasis.]

- **Increased reporting by the media.** In the last year, open pit disposal has garnered significant media attention. The Los Angeles Times,⁴ San Francisco Chronicle,⁵ and many other media outlets and blogs have covered the issue. This increased media attention has helped educate both the public and decision makers and has spurred increased oversight.
- **Improved, but imperfect, data collection and dissemination by regulators.** Increased data collection is improving the overall understanding of how the oil and gas industry manages its wastewater. While there has been progress in data collection, there are still serious deficiencies.

PROGRESS: A better understanding of the scope of the problem has emerged from more complete inventories by the Regional Water Boards that specify

^{*}Hereafter referred to as “the CCST study.” Available online at: https://ccst.us/projects/hydraulic_fracturing_public/SB4.php

location, permit status and the operator of known pits. The State Water Board has begun to update its Geotracker database with the locations and some information on pits.

DEFICIENCIES: Data collection and dissemination is not consistent. For example, the Central Valley and Central Coast Regional Water Quality Control Boards do not collect or report the same information, such as whether or not multiple pits at the same facility are counted as one pit or individually. These inconsistencies make statewide analysis challenging and limit understanding.

Data on inactive pits is also incomplete. The reported numbers of “inactive” pits do not include all pits that may have been shut down years ago, yet could have polluted nearby groundwater or soil. State records indicate that there were thousands of pits across Kern County, yet a complete dataset of their locations is not available — Division of Oil, Gas and Geothermal (DOGGR) had kept “rough estimates” of active and idle pits. One inventory document, sent from DOGGR to the Central Valley Regional Water Board in 2014, displays pit counts as high as 2,074 dating back to 1990. See chart and graph on p. 12 to see changes in pit counts over time.



PHOTO: ANDREW GRINBERG

Wastewater tank. Mt. Poso Oil Field. Kern County, CA.

- ***Legislatively mandated data on disposal methods: improved but incomplete reporting.***

PROGRESS: Senate Bill 1281 (Pavley), passed in 2014, requires operators to report disposal methods for all oil and gas wastewater on a quarterly basis to DOGGR. The State now collects data on the total volume of wastewater disposed of into open pits and by other methods.* SB 1281 also requires DOGGR to provide the State Water Board with a complete inventory of pits on an annual basis. Operators disclosed that 691 acre feet (more than 225,000,000 gallons) of produced water were disposed of into unlined pits in the first quarter of 2015. Second quarter reporting showed that operators dumped 718 acre feet (nearly 233,000,000 gallons) of wastewater into unlined pits, and another 14 acre feet (more than 4,561,000 gallons) into lined pits for evaporation. This volume represents about 7% of all produced water disposal reported under SB 1281.

DEFICIENCIES: The first SB 1281 reports were late and incomplete, with only 60% of operators' data publicly available months after reporting was due. Second quarter reporting was more complete, covering nearly 90% of all oil production. DOGGR has yet to provide its first annual inventory on pits to the State Water Board as mandated by SB 1281. Since the Regional Water Boards have taken over as the lead agencies on inventorying pits, the State Water Board should take on the role of producing an annual report on the use of pits and the state's actions to address them. To date, no agency has produced such a report.

- ***Inadequate chemical data.***

PROGRESS: There has been limited testing of chemical constituents in pits. As the Regional Water Boards investigate and create inventories of pits, some testing has been required and made public on a case-by-case basis. The results show high levels of salts, boron and other harmful chemicals including carcinogens such as benzene. A limited number of test results are available to the public on the State Water Board's Geotracker website and the Central Valley Board's website.**

DEFICIENCIES: Operators are not required to report chemicals used in all oil production activities such as enhanced oil recovery (EOR) and routine well maintenance. There is evidence that the same, or similar chemicals used for well stimulation (subject to mandatory disclosure), are also used in other oil and gas processes (not subject to mandatory reporting requirements).⁶ This

*SB 1281 data is available online at: <http://www.conservation.ca.gov/dog/SB%201281/Pages/Index.aspx>

** Central Valley Water Board has posted test results on this web page: http://www.waterboards.ca.gov/centralvalley/water_issues/oil_fields/information/disposal_ponds/index.shtml

means there are potentially hundreds of unknown added chemicals in oil and gas wastewater and regulators lack the information needed to effectively regulate disposal. This lack of data also renders monitoring less effective because testing is not tailored to the actual chemicals that may be present or potential interactions between chemical additives and naturally occurring chemicals. Additionally, there is no systematic, required testing of oil and gas wastewater in general, or for specific disposal techniques.

The many deficiencies in data collection, monitoring and chemical information demonstrate that regulators would be unable to ensure protection of water resources from open pits. Without accurately characterizing the volumes, locations, chemical makeup and geologic conditions there is no way to ensure that harmful chemicals do not enter groundwater that may have beneficial uses.

III. Improved regulatory action, but still not enough

Armed with new data and increased pressure from the public and Legislature, regulators have begun to address the issue, but their efforts fall short. Some of the progress and the deficiencies are highlighted below.

- ***Increased staffing to enforce water quality laws.***

PROGRESS. The Central Valley Water Board has expanded staffing in its oil and gas program. In roughly two years, the staff size will have increased from just two full time staff to 17. This additional staff will allow for more oversight and increase capacity to enforce the law.*

- ***Increased, yet inadequate oversight by Central Valley regulators.***

PROGRESS: The Central Valley Water Board has begun to regulate disposal pits more actively and has developed a work plan to address the hundreds of non-compliant pits throughout the region.** The work plan establishes a timeline to bring all pits under Waste Discharge Requirement (WDR) permits by the end of 2016 and develop a general order specifying requirements for protection of water quality. Proactively working to bring all disposal pits into compliance with water quality laws is an important step.

DEFICIENCIES. The compliance schedule allows hundreds of pits to continue to threaten water quality, and many to operate illegally without adequate permits. The work plan falls well short of a truly effective policy such as prohibiting disposal pits, and instead continues to threaten groundwater with contamination. Unless the general order that the Regional Board adopts

*For a discussion of the State and Regional Water Boards mandate to protect water quality from disposal pits, see "In the Pits," p.11-13.

**More information on the Central Valley Water Board's program on disposal pits can be found online at: http://www.waterboards.ca.gov/centralvalley/water_issues/oil_fields/index.shtml



PHOTO: CENTRAL VALLEY REGIONAL WATER QUALITY CONTROL BOARD

The Fee 34 facility, operated by Valley Water Management, Bakersfield CA.

includes a prohibition of pit disposal, water quality protections will continue to be inadequate.

- **Unregulated disposal pits are common in the Central Coast region.**

PROGRESS: The Central Coast Regional Water Quality Control Board (the Central Coast Board) has initiated an investigation of pits in its region, identifying 52 total (44 active) pits across Santa Barbara, Monterey, and San Luis Obispo counties. Only three Central Coast pits have WDR permits to operate.

DEFICIENCIES: The Central Coast Board has not publicly announced a compliance schedule or a plan to address disposal pits in its region. Additionally, the Central Coast inventory does not count all pits, but rather each location where there are pits, but does not specify if there are multiple pits at each location.

- **Confirmed contamination.**

PROGRESS: Central Valley Board staff have demonstrated that Valley Water Management Company (“Valley Water”) is contaminating groundwater

east of Bakersfield at the “Racetrack Hills” and “Fee 34” disposal facilities. Groundwater monitoring at these sites shows that a plume of wastewater containing salts, boron, and potentially other harmful constituents has spread out beneath the pits into an aquifer that serves numerous drinking water and irrigation wells. The Racetrack Hills site also contains a “spray field” where Valley Water runs sprinklers around the clock to dispose of produced water on a hillside. Natural drainage at the site flows into Cottonwood Creek, a tributary of the Kern River, which is a major drinking water source for the city of Bakersfield.⁷

DEFICIENCIES: The Central Valley Board, despite evidence of groundwater pollution, and in conflict with recommendations of its own staff, has allowed these facilities to continue to operate until at least 2018, adopting a lenient Cease and Desist Order (CDO) that includes an unnecessarily slow timeline for compliance. Clean Water Action has challenged the decision with a legal petition to the State Water Board, and is calling for an immediate shutdown of these facilities.*

- ***Interest from air regulators.***

PROGRESS: As part of the plan by the California Air Resources Board (ARB) to address short-lived climate pollutants, such as methane, the state plans to launch a monitoring program to study the air emissions from open pits.⁸ The plan is still in development and the effectiveness of monitoring remains to be seen.

DEFICIENCIES: This monitoring falls short of what is needed to stop air pollution from pits. ARB is developing regulations on methane emissions from oil and gas production activities, yet the discussion draft of the rules does not include measures to address air pollution from pits. Additionally, oversight from regional air regulators remains insufficient — there have been no changes to air district rules or oversight practices concerning pits. Independent air monitoring at the McKittrick 1 and 1-3 pit facilities in West Kern, conducted as part of a Clean Water Action investigation in 2014, found elevated levels of methane and dozens of volatile organic compounds (VOC's), including Benzene and Hexanone levels exceeding long-term health effects screening levels (ESL's).** A more proactive and protective approach would be to include a prohibition on disposal pits as part of the upcoming ARB regulations on methane emissions from oil and gas production.

*Clean Water Action, represented by Earthjustice, filed an administrative petition to the State Water Board to intervene and stop the pollution at these sites. Petition available online at: <http://bit.ly/CWAPitPetitionSWRCB>

** A discussion of air quality threats and inadequacies of the San Joaquin Air Pollution Control District oversight of pits can be found in “In the Pits” pp. 18–20.

- ***New regulations prohibit unlined pits for wastewater from SOME stimulated wells.***

PROGRESS: Regulations developed pursuant to Senate Bill 4 (Pavley) were implemented in July, 2015. These new rules prohibit open pit disposal for wastewater originating in wells that were subject to a well stimulation treatment, such as hydraulic fracturing or acidizing. They provide that “fluids shall be stored in containers and shall not be stored in sumps or pits.” (SB 4 Well Stimulation Treatment Regulations. Cal Code of Regs. tit. 14, § 1786) Data reported by operators to DOGGR pursuant to SB 4, show that newly stimulated wells are not sending any produced water to open pits for disposal, and that 99.8% of wastewater associated with wells stimulated since January 1, 2014 has been disposed of via Class II injection wells — less than 0.2% of wastewater from stimulated wells in this period has been recycled.⁹

DEFICIENCIES: The new regulations do not ensure that ALL wastewater that contains stimulation fluids and well stimulation treatment chemicals is not dumped into open pits — wastewater produced from wells that filed a well stimulation notice (regulated by the interim well stimulation regulations) with DOGGR prior to July 2015 are not subject to these regulations. Additionally, the regulations do nothing to keep chemicals from other processes, such as enhanced oil recovery (EOR), acid intensive maintenance or any other production activities, out of unlined pits. As noted above, many of the same chemicals used in well stimulation treatments are also used in these processes.

- ***Plans for expanded groundwater monitoring.***

PROGRESS: As required by SB 4, the State Water Board developed “Model Criteria for Groundwater Monitoring in Areas of Oil and Gas Well Stimulation.” The adopted criteria require unlined pits to be included when the state designs regional monitoring plans in oil fields that are or may be subject to well stimulation.¹⁰

DEFICIENCIES: Regional monitoring plans under SB 4 have not yet been designed or implemented. It may take several years to produce monitoring results. It is unclear how effective the monitoring will be and whether or not the plans will be designed to actually detect pollution from pits. As designs for regional groundwater monitoring move forward, monitoring wells should be located appropriately to monitor migration from both active and legacy pits. Plans should be designed to detect contaminant plumes close to original pit sites, so any migration is detected as early as possible.



PHOTO: ANDREW GRINBERG

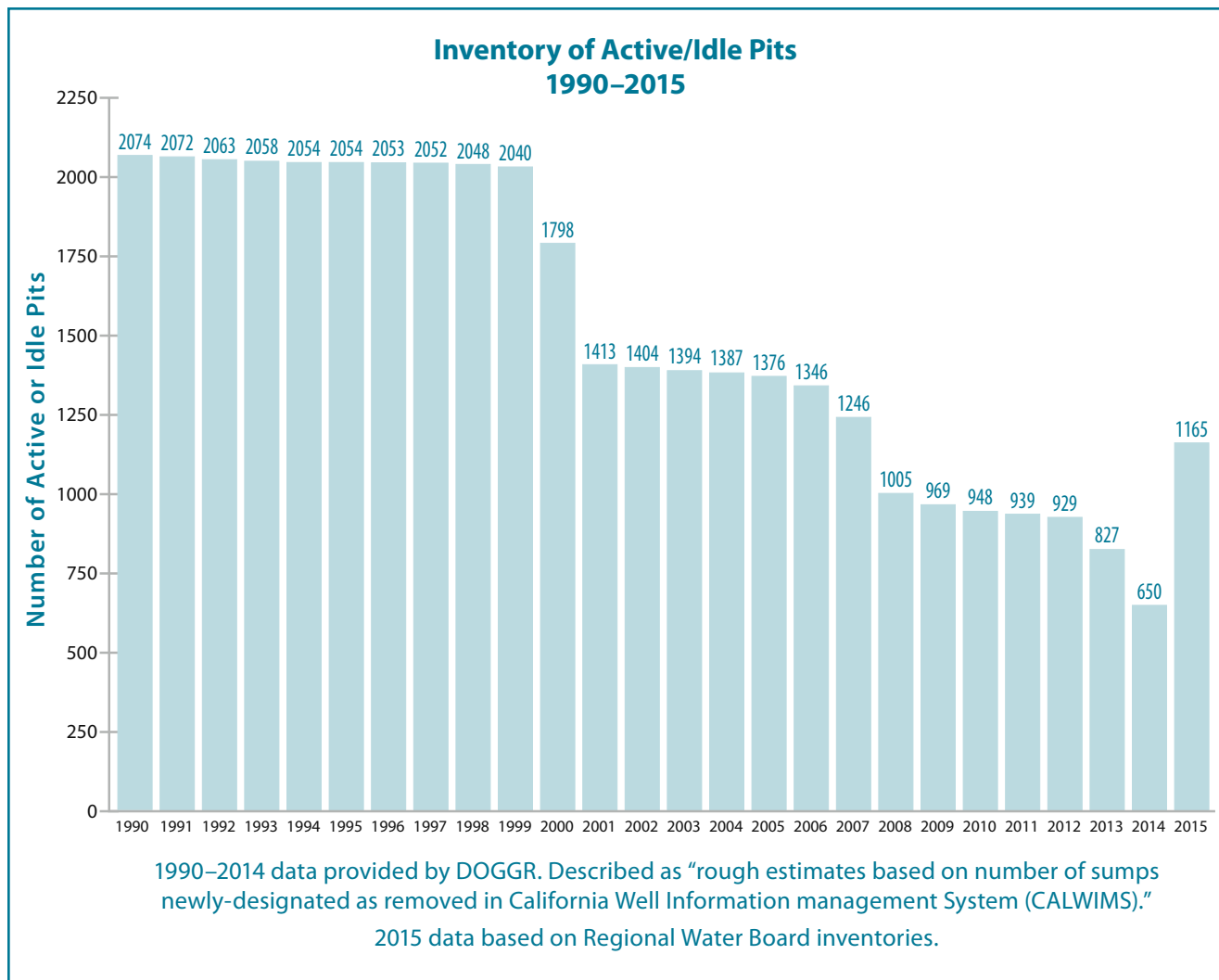
A pipe gushes wastewater into an unlined pit in Kern County.

IV. Improved understanding of pit locations and their regulatory status

The first result of increased oversight has been a better understanding of pit locations and their activity status, either “active” or “inactive.” The new information also changes the historical understanding of how many pits exist. [Chart 1](#) shows DOGGR’s data from a 2014 inventory of active and idle pits. Because the number of identified pits has increased dramatically since 2014, the accuracy of the historical record is questionable. The 2,074 known pits in 1990 may significantly underreport number of active and idle pits at that time, as record keeping and inventories have been inadequate. Without accurate historical information, the impacts of legacy pits remain largely unknown.

In order to use newly available data, FracTracker Alliance has created inventory charts and maps. All maps and analyses are based on data provided by the Regional Water Quality Control Boards. Both the Central Valley and Central Coast Boards have reported active pits in their regions. Actual pit status and location has not been independently verified in all cases, and initial review of data suggests there may be some errors and inconsistencies between datasets. [Table 1](#) shows where there are active and inactive pits by county and region. [Map 1](#) shows all known pits in California, their

Chart 1. Historic pit counts



activity status and whether or not they have a Waste Discharge Requirement (WDR) permit.

- **Permit status of pits — most pits are not properly regulated.**

All legally operating and fully regulated disposal facilities must be issued a WDR permit from the State or a Regional Water Board. Many pits, both active and inactive, do not have a permit ([See Table 2](#)), and the majority of permits were issued prior to the adoption of current policies established by local Basin Plans. ([Table 3](#)).

In the Central Valley, the Tulare Lake Basin Plan was adopted in 1975 and establishes how water quality laws and regulations are enforced in that region. WDR permits that were issued prior to 1975 in the Central Valley, unless subsequently updated, should be considered out-of-date and may not adequately enforce the standards in the Basin Plan. For example, the Tulare Lake Basin plan sets specific guidelines for discharge into unlined pits and addresses common produced water constituents such as boron and

Table 1. Pits by location and activity status

Region	County	Total	Active	Inactive
Central Valley		1113	746	367
	Kern	1020	673	347
	Fresno	45	31	14
	Tulare	29	28	1
	Kings	14	14	0
	San Benito	5	0	5
Central Coast		52	44	8
	Santa Barbara	40	35	5
	Monterey	9	9	0
	San Luis Obispo	3	0	3
CALIFORNIA TOTAL		1165	790	375

Table 2. Pits by permit status

Region	Number of Pits	Number Unpermitted	% Unpermitted
Central Valley	Total Pits: 1113	444	39.9
	Total Active Pits: 746	187	25.1
Central Coast	Total Pits: 52	49	94.2
	Total Active Pits: 44	41	93.2
CALIFORNIA TOTAL	Total Pits: 1165	493	42.3
	Total Active Pits: 790	228	28.9

Table 3. Permit age of pits

Region	Number of Permitted Pits	Out of Date Permit*	% Out of Date
Central Valley	Total Permitted Pits: 644	310	48.1
	Active Permitted Pits: 532	247	46.4
Central Coast	Total Permitted Pits: 3	0	0
	Active Permitted Pits: 3	0	0
CALIFORNIA TOTAL	Total Permitted Pits: 647	310	47.9
	Active Permitted Pits: 535	247	46.2

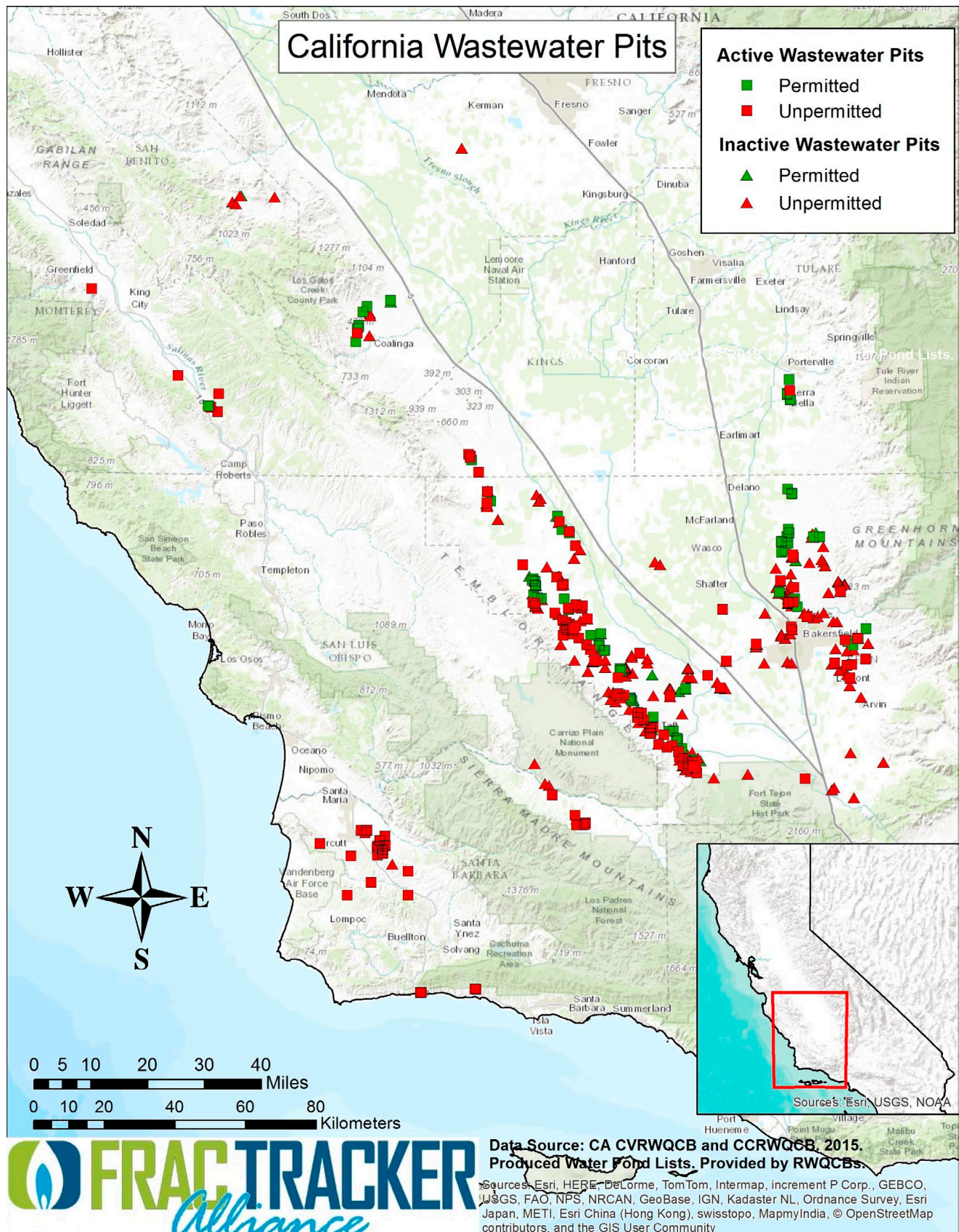
*Out of date permits are defined as permits issued prior to adoption of the applicable basin plan: 1975 for the Tulare Lake (Central Valley); 1971 for the Central Coast.

Table 4. Inadequate permit status

Region	Number of Pits	Inadequate Permit*	% Inadequate
CALIFORNIA TOTAL	Total Pits: 1165	803	68.9
	Total Active Pits: 790	475	60.1

*Inadequate permit status is defined as any pit that is either 1) not covered by a WDR permit, or 2) was issued a WDR permit prior to the initial adoption of the appropriate basin plan.

Map 1. Wastewater pits in California showing activity and permit status



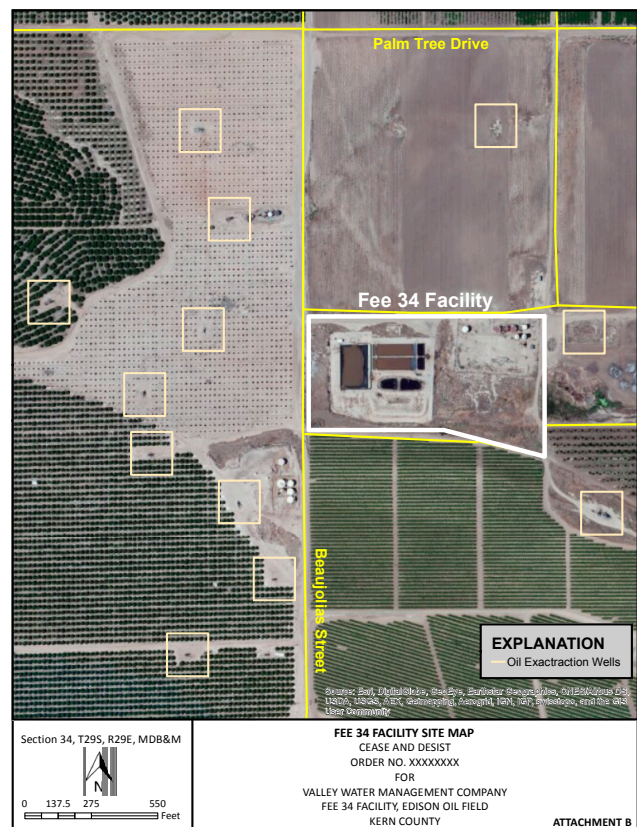
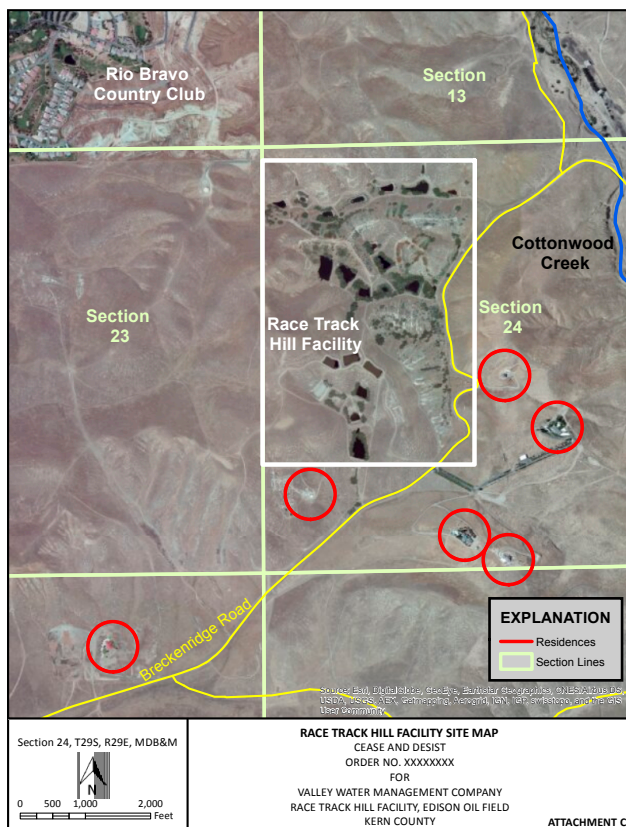
chlorides. More than half of the permits for active pits in the Central Valley were issued prior to 1975 ([Table 3](#)).

The Central Coast Interim Water Quality Control Plan (the precursor to the Central Coast Basin Plan) was adopted in 1971. There are three permitted active pits in the Central Coast region, which were all issued after the adoption of the Central Coast plan, meaning that they should be considered up-to-date ([Table 3](#)).

As shown in [Table 4](#), the vast majority of pits statewide are either not permitted, or received a permit prior to the adoption of the applicable Basin Plan. More than 60% of active pits and more than 68% of all pits are inadequately permitted, meaning that these pits may not be in compliance with water quality protections.

V. Failure to shut down polluting facilities

Example 1: Regulators adopting weak enforcement orders. Considerable progress has been made in exposing and understanding this problem. The Central Valley Water Board has established a compliance schedule to bring all pits either under active permits or other enforcement orders (such as shutting them down) by the end of 2016. The pace of enforcement has increased as the Regional Water Board has added staff who are



Aerial photos of the “Racetrack Hills” pit and spray field facility (left) and the “Fee 34” pit facility. Images courtesy of the Central Valley Regional Water Quality Control Board.

investigating oil and gas wastewater more thoroughly than ever before. Increased staff and more proactive regulatory enforcement environment are encouraging signs.

Unfortunately, regulators and lawmakers are failing to provide real protections for surface and groundwater. The Central Valley Water Board has not shut down pit facilities, even when evidence is sufficient to warrant aggressive enforcement action, as demonstrated by the case of the Fee 34 and Racetrack Hills facilities.

These two sets of pits on the East Side of Kern County, operated by Valley Water, are currently allowed to discharge despite evidence that they are polluting the underlying groundwater, a high quality aquifer that is currently being used as a drinking water source by nearby homes and farms.

At the “Racetrack Hills” facility in the Edison Oil Field, Valley Water operates 27 unlined pits as well as a spray field, where sprinklers run around the clock spreading produced water on a hillside. The pits at Racetrack Hills received a WDR permit in 1958. The spray field was never granted a permit. Regional Water Board staff determined that a plume of contamination has spread out beneath the facility into the aquifer, and that it was likely that runoff from the facility could enter Cottonwood Creek, a tributary of the Kern River — a source of drinking and irrigation water for Bakersfield.

At the “Fee 34” facility, which received a WDR permit in 1992, staff found inadequate oversight of the six oil wastewater pits on site, including a lined wastewater storage pit that is leaking, and the likely migration of chemicals into the underlying aquifer.



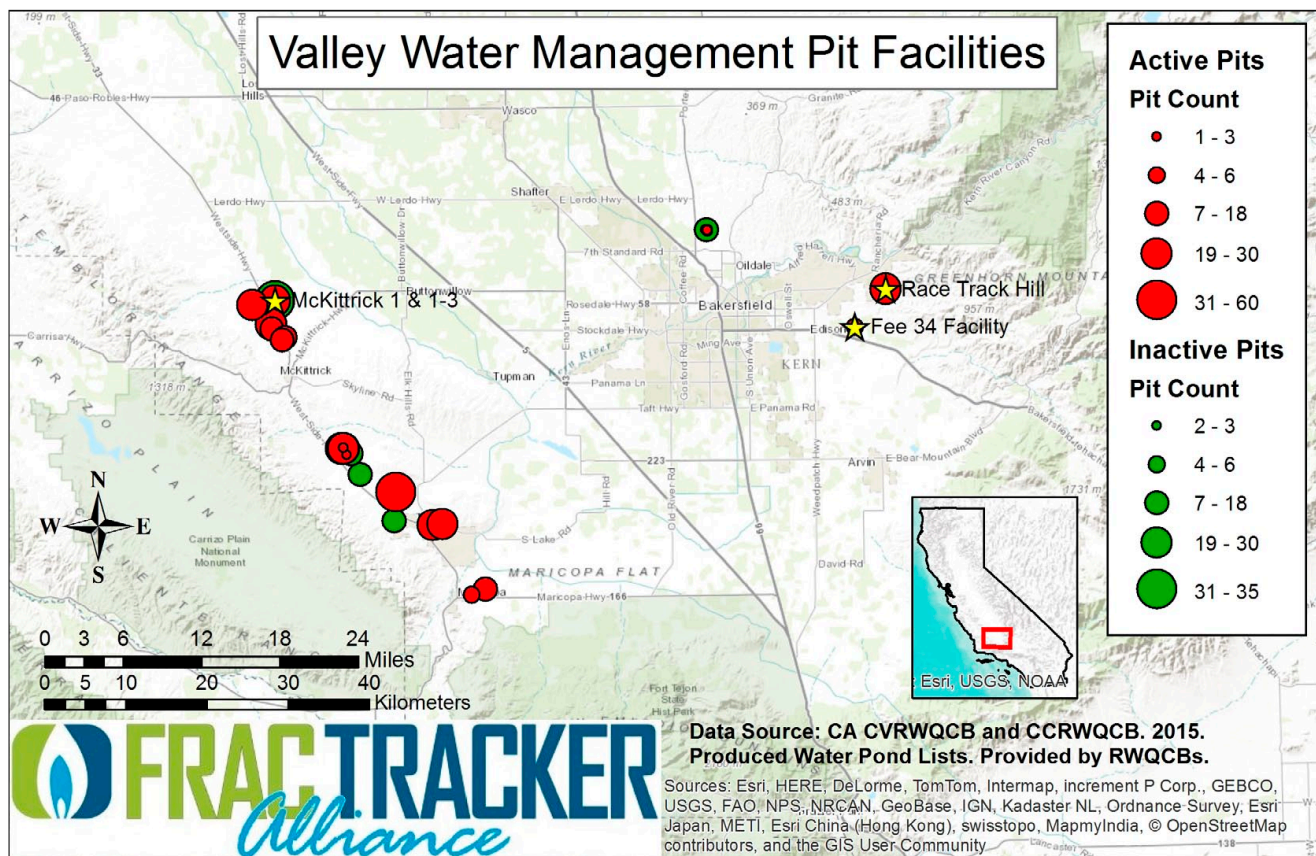
PHOTO COURTESY OF 'PISTACHIO PRODUCTION'

Aerial photo of unlined pits at the Racetrack Hills facility. Kern County, CA.

Despite the recommendation of staff that the spray field operations be halted immediately and the remainder of the operations of the two facilities brought into compliance with water quality laws by the end of 2016, the Central Valley Board voted to allow the spray field to remain open and the deadline for compliance for the ponds to be delayed until 2018.*

Valley Water Management Company

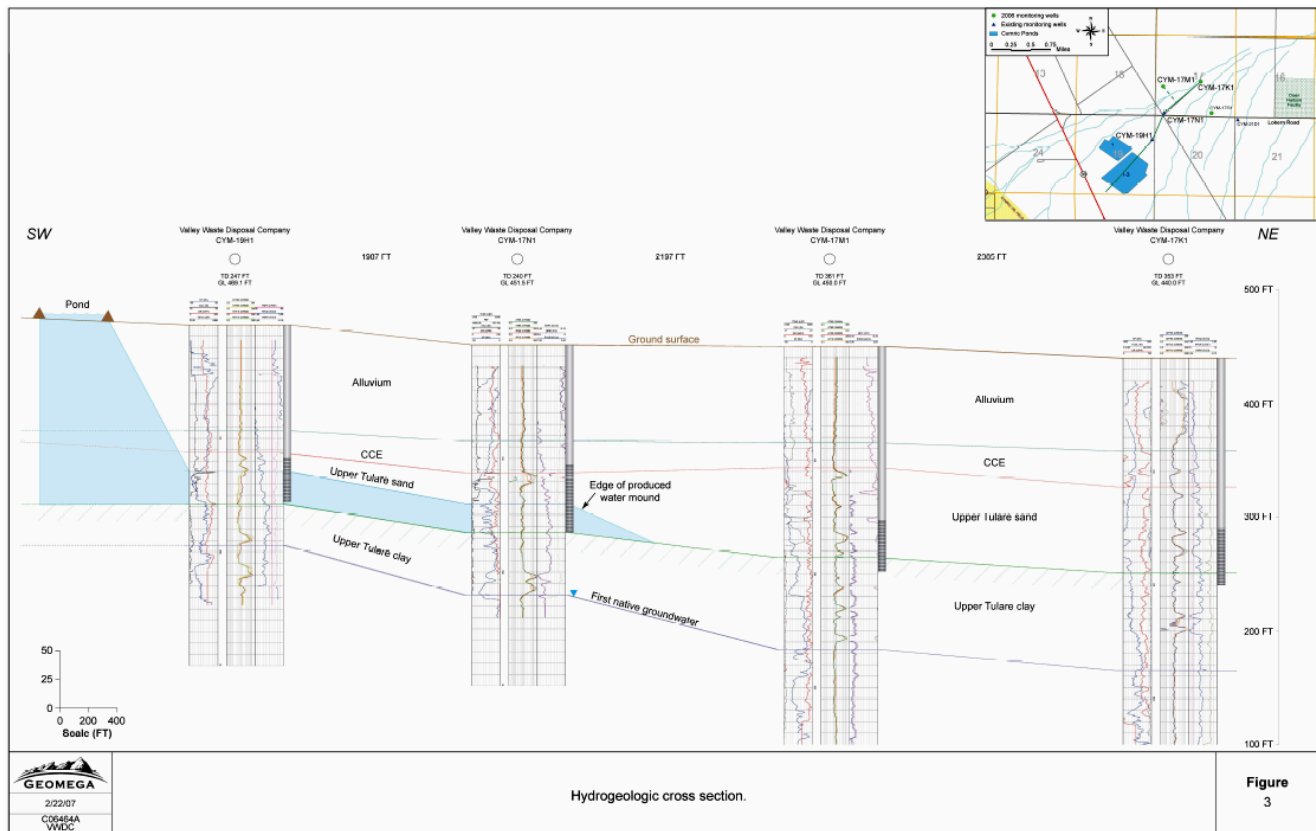
Valley Water Management Company ("Valley Water") is the largest operator of individual pits in the state. [Map 2](#) shows all of Valley Water's pits. Racetrack Hills, Fee 34 and McKittrick 1 and 1-3 are shown with stars. According to the Central Valley Board's inventory, Valley Water operates 462 individual ponds, at 28 facilities. The next largest operators are Aera Energy, which operates 67 pits at 26 facilities, California Resources Corporation which operates 62 pits at 51 facilities, and E&B Natural Resources Management Corporation, which operates 53 pits at 28 facilities. Valley Waste Disposal Company (the predecessor of Valley Water) was formed in 1932 to dispose of oil and gas wastewater in the Central Valley, and was granted nonprofit status in 1992, and in 2011/12 changed its name from Valley Waste to Valley Water Management Company. One Valley Water facility in the Midway-Sunset Field is listed as containing 60 active pits. The McKittrick 1 and 1-3 facility, which was featured in Clean Water Action's *In the Pits* report, is listed as containing 62 pits, 27 of which are listed as active. Both of these large facilities are located on the West Side of Kern County. Racetrack Hills is the largest facility on the East Side of Kern, with 27 pits and a spray field.



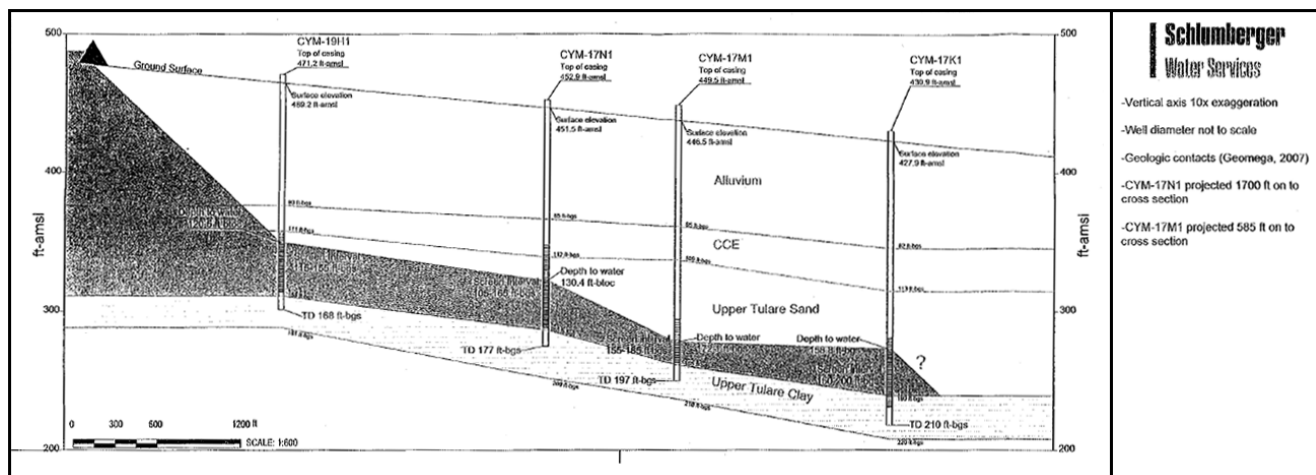
Map 2: Pit facilities operated by Valley Water Management. Facilities with larger dots are made up of more individual pits. Facilities featured in this report are marked with stars.

*A full description of the Fee 34 and Racetrack Hills facilities, as well as enforcement measures can be found in the Cease and Desist order issued on July 30, 2015: California Regional Water Quality Control Board Central Valley Region. Order No. R5-2015-0093.

Example 2: Monitoring shows spread of pollution; still no regulatory action taken (update on case study from 2014 report). In the Pits focused on the McKittrick 1 and 1-3 pits in West Kern. At the time of publication, Valley Water Management, the operator of that facility had been monitoring groundwater quality in the vicinity of the pits, and since 2004 had detected a plume of wastewater that had migrated roughly 1 mile from the site of the pits. The report highlighted monitoring results and a cross section showing that the plume of contaminated wastewater had spread past the first two of four



Cross section of McKittrick 1 and 1-3 pits plume of wastewater from 2007 monitoring report.



Cross section of McKittrick 1 and 1-3 pits plume of wastewater extending to an unknown distance of at least 6,550 feet, and an increase of at least 2,385 feet since 2007.

monitoring wells.¹¹ In March 2015, Valley submitted updated monitoring results, to the Central Valley Water Board.* The monitoring report includes evidence that the underground plume of wastewater has migrated past the fourth monitoring well.¹² Since the exact extent of the plume was unknown in 2007 and it now extends beyond the most distant monitoring well, its size is still not fully understood. However, the monitoring results show that the plume now stretches at least 6,550 feet from the edge of the pits, an increase of at least 2,385 feet since 2007. Valley Water continues to discharge millions of gallons of wastewater at this facility. The Central Valley Water Board continues to allow discharge at this site.

VI. Updated Recommendations

In the Pits urged the state to adopt an immediate prohibition on open pit disposal, hold polluters accountable for closing the pits and cleaning up contamination, and increase monitoring to detect air and water pollution. As the recommendations in the 2014 report are largely unmet, and new data outlined in this report sheds light on additional issues that need to be addressed, this follow-up provides an expanded set of recommendations to aid in ensuring that the state fulfills its regulatory mandate to protect public health and air and water resources.

1. **Prohibit disposal into open pits.** The urgency of California's water crisis requires more protective policy and enforcement to safeguard valuable water resources. **The first and most important step is to end all disposal into open pits immediately.** The CCST study recommends that, unless the absence of any harmful chemicals can be proven, disposal into unlined pits should be prohibited. Due to the current lack of knowledge, reporting, testing and monitoring that would enable ruling out the presence of harmful chemicals, the only way to implement this recommendation would be to halt this disposal method. The Central Valley and Central Coast Water Boards must adopt a general order that phases out and prohibits the operation of pits. In the absence of adequate protections from the Regional Water Boards, the State Water Board should adopt a statewide order that prohibits open pit disposal.

Actions needed while pits are being phased out. Until dumping into unlined pits is phased out, there are steps that the State can take to aid in pollution prevention, remediation, improved oversight and transparency of these sites:

2. **Enforce existing water quality laws.** The Regional Water Boards have a responsibility to shut down facilities that may be contaminating high quality groundwater. Operators must prove that their facilities are safe in order to

*This monitoring report, and other documentation of this facility is publicly accessible through the State Water Resources Control Board's Geotracker site at: http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=L10007494132

remain open, rather than the current practice that places the burden of proof and enforcement costs on regulators and the public. The following classes of facilities should be shut down immediately:

- Facilities that do not have a WDR permit.
 - Facilities that do not have an up to date WDR permit. Permits issued prior to adoption of the local Basin Plan, or statewide water quality laws and regulations should be considered inadequate and permits should be immediately reviewed.
 - Facilities adjacent to or overlaying beneficial use groundwater. Operating disposal pits in close proximity to high quality groundwater should be prohibited immediately.
 - Facilities that have not demonstrated geologic isolation from any water resources with beneficial uses.
3. **Enforce SB 4 regulations more broadly.** In order to keep well stimulation fluids out of unlined pits, DOGGR's regulations that prohibit open pit disposal of well stimulation wastewater must be applied to any well that has ever been stimulated, not just wells stimulated after adoption of the SB 4 permanent regulations.
 4. **Require complete chemical transparency for all fluids injected or emplaced in oil and gas wells.** Complete chemical disclosure of additives and comprehensive testing of produced water would be necessary in order for regulators at DOGGR and/or the Water Boards to ensure wastewater in unlined pits does not contain harmful chemicals — following the recommendation of the CCST study.
 5. **Ensure that the wastewater reporting mandate established by SB 1281 is thoroughly and accurately implemented.** DOGGR's efforts to collect more complete data under SB 1281 and to publicly post and disseminate this data expeditiously has improved compliance with this law but there are still deficiencies. DOGGR and operators must continue to improve reporting and dissemination of this data.
 6. **Maintain an accurate and up to date database of pits.** The State Water Board has begun to map the locations of pits using the existing Geotracker database. The State Water Board should continue to improve and maintain data on pits in this database. Geotracker can serve as the public tool for gathering and analyzing information on pits, their permit status and monitoring results. The location of disposal pits could also be added to the well finder tool on the DOGGR website.

7. **Greater consistency in investigation and inventory can be achieved through the development of State Water Board guidance for the Regional Water Boards.** The guidance would be used to ensure quality control, data consistency, and to facilitate the public dissemination of information.
8. **Prohibit open pits in the California Air Resources Board's (ARB) new regulations on methane from oil and gas production.** Short of a prohibition, ARB should expedite monitoring of open pits in order to better understand, and mitigate health and climate impacts of open pits.

The state must also address the legacy pollution that may have resulted from historical use of pits. Billions of gallons of toxic wastewater have been dumped all across areas of oil and gas development, yet the state has never attempted to comprehensively measure the impacts on groundwater, surface water, and soil. The State should:

9. **Undertake a thorough investigation of inactive and historical pits to identify potential legacy pollution.** The State Water Board has a clear responsibility under the Porter-Cologne Water Quality Act to launch this effort in order to expeditiously identify and remediate polluted sites and protect communities and drinking water sources. The State Water Board has indicated that it will characterize impacts from disposal pits as part of the SB 4 groundwater monitoring plans, but has not identified a timeline or more specific plan for the regional monitoring plans. It is likely that only a few oil fields will be subject to regional groundwater monitoring plans initially, and it will likely take many years or decades before every area with current or historic pit disposal is examined for legacy pollution under this scheme. Clean Water Action urges a comprehensive program dedicated to legacy pollution from pits that builds on the SB 4 regional monitoring plans.

Endnotes

- 1 California Council on Science and Technology (CCST) "An Independent Assessment of Well Stimulation in California: An Examination of Hydraulic Fracturing and Acid Stimulations in the Oil and Gas Industry" July 2015, Vol. II, Chapter 2, p. 99
- 2 CCST, Vol. II, Chapter 2, p. 110
- 3 CCST, Study Recommendation 4.1, Summary Report p. 43
- 4 Cart, Julie. "Hundreds of illicit oil wastewater pits found in Kern County" Los Angeles Times. Feb 26, 2015. Available at: <http://www.latimes.com/local/lanow/la-me-ln-pits-oil-wastewater-20150226-story.html>
- 5 Baker, David. "Most of the state's fracking waste left in unlined pits, study finds" San Francisco Chronicle. Jul 9, 2015. Available at: <http://www.sfgate.com/business/article/Most-fracking-waste-dumped-in-unlined-pits-in-CA-6375558.php>
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- 7 Central Valley Regional Water Quality Control Board. Order No. R5-2015-0093 Available online at: http://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/kern/r5-2015-0093.pdf
- 8 California Air Resources Board. "Draft Short-Lived Climate Pollution Reduction Strategy" September 2015 p. 53. Available online at: <http://www.arb.ca.gov/cc/shortlived/2015draft.pdf>
- 9 Division of Oil, Gas, and Geothermal Resources. "Well Stimulation Treatment First Annual Report" Dec. 31, 2015. p. 12-15. Available at: <http://www.conservation.ca.gov/index/Documents/Well%20Stimulation%20Treatment%20Report%202015%20-%20FINAL.PDF>
- 10 State Water Resources Control Board. "Model Criteria for Groundwater Monitoring in Areas of Oil and Gas Well Stimulation" Adopted July 7, 2015. p. 23. Available online at: http://www.waterboards.ca.gov/water_issues/programs/groundwater/sb4/docs/model_criteria_final_070715.pdf
- 11 Grinberg, Andrew "In the Pits: Oil and Gas Wastewater Disposal into Open Unlined Pits and the Threat to California's Water and Air" Clean Water Action, November 2014 p. 14-20. Available at: <http://cleanwater.org/files/publications/In%20the%20Pits.pdf>
- 12 Valley Water Management Company "2014 Second Semi Annual Sampling and Analysis Report McKittrick 1 and 1-3 Ponds, Cymric Area" Prepared by Schlumberger Water Services. February 3, 2015 p. 41. Available at: http://geotracker.waterboards.ca.gov/regulators/deliverable_documents/4577610850/VWMC_2nd%20Semi-Annual%202014_Voluntary%20MR_3-12-2015.pdf