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August 4, 2014

Mr. Bruce Wolfe, Executive Officer
California Regional Water Quality Control Board
San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, California 94612

Subject: Tentative Order – Initial Site Cleanup Requirements for
1643 Contra Costa Boulevard Pleasant Hill, CA ("Site 1")
Regional Board File No. 07S0132 (KEB)

Tentative Order – Initial Site Cleanup Requirements for
1705 Contra Costa Boulevard Pleasant Hill, CA ("Site 2")
Regional Board File No. 07S0204 (KEB)

Dear Mr. Wolfe:

I am writing to you with comments on the above tentative orders on behalf of Gregory Village Partners, L.P ("GVP"). GVP has a very specific reason to place its comments on both orders in a single letter: rather than two orders, an inclusive, single order should be drafted that encompasses both the geographic area and all dischargers associated with that area. Thus, the named dischargers on the single order should be the GVP parties, the Chevron parties and Central Contra Costa Sanitary District ("CCCSD").

GVP's comments are organized into two sections. The first section explains why there should be a single order. The second section discusses the legal and technical justifications for naming CCCSD to this single order.

GVP's also wishes to provide detailed remarks on various portions and paragraphs of the tentative orders and the Cleanup Team Staff Report ("Staff Report"). These remarks are attached as Exhibit G.

I. A Single Order Should be Issued for 1643 Contra Costa Blvd., 1705 Contra Costa Blvd., and CCCSD

The Regional Board should issue a single order because the plumes are commingled.

The Staff Report states on page 11:

> There is evidence that the CVOC plume from Site 2 [Chevron] migrated in groundwater to the north and northwest and beneath the Gregory Village Shopping Center, and commingled with the CVOC plume associated with Site 1 [GVP], which has migrated beneath a residential subdivision north of Site 1.

Plumes that commingle from multiple sites are more effectively handled in a single site order because, as a practical matter, the plumes cannot be adequately addressed separately. In the past, this Regional Board has handled similar situations with a single order[1] and we believe that this is the appropriate manner in which to handle the subject sites.

As currently structured, the two orders will lead to inefficiencies in addressing the requirements, disagreements between parties (and enforcement challenges), and far greater Staff time to manage than a single order would. The inefficiencies go beyond whether or not it makes sense to have two sensitive receptor surveys and public participation plans. Most significantly, both parties are required to investigate the vertical and lateral extent of their plume (but with differing degrees of specificity). Two orders would be duplicative, with the GVP parties and Chevron parties independently performing overlapping investigations of commingled plumes, which makes no sense.

The investigation tasks also illustrate the difficulty of attempting to coordinate two different orders, which should be much easier at this stage compared to when issues arise in the field causing delays for one party or another.[2] While both the GVP parties and the Chevron parties are required to define the vertical and lateral extent of their plumes, the GVP parties' order expressly references the deep zone and the neighborhood but the Chevron parties' order does not. The likelihood, if the orders remain separate, is that Chevron will do an investigation that does not include those items and there will be needless delays for both sites, as well as GVP having to perform additional work to prove what the RWQCB has already concluded – the plume is commingled down gradient of

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[1] Order R2-1989-0038 was issued with respect to two sites in Cupertino, CA. Two separate release areas at two separate locations were the subjects of this single order. The Siemens Site had releases of CVOCs from underground waste solvent tanks and an acid dilution basin. The Intersil Site nearby had releases of CVOCs from underground waste handling systems. In a situation very similar to the situation here, the Intersil/Siemens Order states that "[t]he groundwater pollution plumes from Siemens and Intersil have commingled in the A-zone and have migrated to the B-zone and C-zone. The off-site groundwater pollution plume extends approximately 2500 feet down gradient from the sites" (paragraph 6).

[2] On a side note, GVP would like to point out that it has worked very hard with the Staff under the Spills, Leaks, Investigation and Cleanup program and has cooperated to mitigate detections of PCE in the neighborhood north of the GVP site. In light of this fact, we find it disturbing that the GVP parties are the only ones that are being expressly required by an order to work on any off-site matters or the deep aquifer. It does not appear to be an approach that will encourage cooperation from parties in the future.

P&K cleaners and in the neighborhood. There is no justification to place this extra burden on GVP.

In short, a single order is imperative to avoid confusion, higher costs for all parties, and the unnecessary expenditure of valuable Staff resources in mediating disputes between the parties that would occur with separate orders.

II. CCCSD Must Be Named to the Order

Based on the law and the evidence, CCCSD must be named to the two orders or to a single order for the entire area because, as will be described in detail below, CCCSD is a discharger under the Water Code, and a responsible party under a hybrid Water Code/Superfund (CERCLA) analysis, which the Staff has appeared to have adopted. In addition, as will be discussed below, there is strong evidence that the sewers leaked in both the neighborhood and near the Chevron Site and these leaks are sources of PCE that is detected in soil gas and groundwater.

a) CCCSD Is a Discharger Under Section 13304 of the California Water Code

This matter is straightforward. Section 13304 of the Water Code defines a discharger as "(a) Any person who has discharged or discharges waste into the waters of this state … who has caused or permitted, causes or permits, or threatens to cause or permit any waste to be discharged or deposited where it is, or probably will be, discharged into the waters of the state and creates, or threatens to create, a condition of pollution or nuisance..." Further, Section 13030 of the Water Code states that a: "Person includes any city, county, district, the state…" (emphasis added).

Section 13304 is a strict liability statute. Strict liability means that an entity has legal responsibility for damages or injuries even if the entity was neither at fault nor negligent. The statute contains no exceptions or defenses. Simply put, if an entity's actions fit into the definition, it is a discharger.[3]

[3] The Staff Report points out that CERCLA is also a strict liability statute, and that the cases under CERCLA, while "not binding precedent … do provide useful guidance" (footnote 7 on page 12). We agree. However, the Staff report also states that: "courts have refrained from identifying sewer owner/operators as "responsible parties" (the CERCLA rough equivalent of the Water Code's "discharger") merely because they owned or operated a sewer system". This is not a true statement. The Staff Report quotes language from or refers to the *Fireman's Fund, Lincoln Properties* and *Adobe Lumber* cases. In referring to these cases, the Staff Report is misleading and incomplete. For example, the Staff Report is misleading because the quote from *Fireman's Fund* is in fact "dicta" and not a holding (i.e. not binding law). The Staff quoted that case as follows: "["it is doubtful whether Lodi may be considered a PRP merely as a result of operating its municipal sewer system"]". However, the entire quote from the Court of Appeals in *Fireman's Fund* is: "While we decline to decide whether Lodi is a PRP on the record before us, we note that it is doubtful whether Lodi may be considered a PRP merely as a result of operating its municipal sewer system" (emphasis added). After discussing the various cases on the issue, some of which hold that an owner of a sewer lines is liable for discharges of hazardous waste and some of which hold the opposite, the Court of Appeals remanded (i.e. sent back) to the District Court the question of whether Lodi is a PRP. [On remand, the District Court determined that Lodi is a PRP (a holding based on Lodi's admission in open court that it was a PRP)]. Note also that *Lincoln Properties* does not hold what the Staff asserts. In that case, the court held that as an owner of the sewer system: "…as a matter of law, the County may be liable for releases from its facilities – *viz*, its portion of the sewer …" (emphasis added) (823 F. Supp. at 1539). The court then found that the County had an affirmative defense under CERCLA [a portion of that defense was later rejected in *Adobe Lumber]*. The Staff Report is misleading because it references *Adobe Lumber* (659 F. Supp.2d 1188 (E.D. Ca. 2009)) to support its statement that: "courts have refrained from identifying sewer owner/operators as

GVP has made this point to you before in letters dated July 3, 2012, December 18, 2012 and May 28, 2013 ("GVP Letters"). Due to the length of the letters, they are not attached in their entirety to these comments, but the letters and associated exhibits are in the Regional Board's files and on GeoTracker. They are an important part of the administrative record for the sites and are incorporated by this reference.

Rather than reiterate the points that were made in the letters here, we want to highlight the fact that this question was answered many years ago by the Office of the Chief Counsel of the State Water Resources Control Board. In a letter to Walt Pettit, Executive Director of the State Water Resources Control Board dated April 27, 1992, William R. Atwater, Chief Counsel, reviewed testimony of the Central Valley Regional Water Quality Control Board as follows:

> The Staff gave testimony that PCE is discharged to the sewer system by dry-cleaning operations, and that it escapes the sewer collection system by various means, including leaks and permeation as a gas. For purposes of this memorandum, it will be assumed that the testimony of the Regional Water Board staff regarding the movement of PCE through sewer pipes is accurate. Making that assumption, this memorandum will address whether such releases from sewer pipes which are part of the collection system of a POTW are adequate grounds for holding the operator of the POTW responsible for cleanup and abatement of the PCE.

Based on the above facts, Mr. Atwater determined the following:

> These owners and operators have sole control over the collection systems and responsibility for proper operation and maintenance. Water Code Section 13304 authorizes the issuance of cleanup and abatement orders to persons who "cause" or "permit" discharges which cause pollution or threaten pollution of ground water. It is clear that owners and operators of POTWs, from which hazardous wastes such as PCE leak or permeate, have caused or permitted such discharges…
>
> Under Section 13304, both the owner or operator of the POTW, who controls the collection system and has responsibility for discharges therefrom, and the dry cleaner who places the waste into the collection system, may be held responsible.

A copy of this memorandum is attached as Exhibit A.

"responsible parties" (the CERCLA rough equivalent of the Water Code's "discharger") merely because they owned or operated a sewer system." But that premise is never discussed or considered by the court in the case. Rather, the court found that the City of Woodland was a PRP, that its sewers were "facilities" under CERCLA, and that it was a responsible party under CERCLA. The court refused to dismiss the City from the case and allowed the case to go to trial. It did allow the City to try to carry the burden at trial to establish the innocent party defense under CERCLA §9607(b)(3). Finally, the Staff Report is incomplete because it fails to mention *Westfarm Assocs. v. Wash. Suburban Sanitary Comm'n,* 66 F.3d 669, (4th Cir.1995) in which the Court of Appeals held that a municipal operator of a sewer system is liable under CERCLA for the acts of a third party that discharges hazardous waste into the system.

Given the clarity of the law as described by the Chief Counsel (and that there does not appear to be any dispute over whether CCCSD owns the sewers) the only open question in this analysis is whether the sewers leaked. And CCCSD sewers did in fact leak. It is common knowledge that discharges from sanitary sewers into soil and groundwater around and beneath sanitary sewers continuously occur. By their very design and construction, sanitary sewers leak. If PCE from dry cleaners is placed into a sanitary sewer, it will leak out in many different ways. This fact was discussed in detail in "Dry Cleaners - A Major Source of PCE in Ground Water, Regional Water Quality Control Board, Central Valley Region" (1992), the so-called "Izzo Report", and has been generally accepted by experts in the field since that publication was released. The Izzo Report is attached as Exhibit B.

Additionally, in its records, CCCSD has acknowledged that there have indeed been root intrusions, cracks, and sags in the sewer in the Gregory Village area, which make the likelihood and extent of leakage greater. Finally, the data reflect that leakage from the pipes occurred both near the Chevron property and in the neighborhood downgradient of the Gregory Village property.

GVP's letters present a very detailed analysis describing how the sewers leaked; consequently, those details will not be repeated here. However, because of the critical nature of this fact we would like to remind the Regional Board of the following: 1) CCCSD accepted PCE from dry cleaners into its sanitary sewers; 2) CCCSD's sanitary sewer lines were installed with a substantial allowable leakage tolerance; 3) sanitary sewer lines built in the 1950s and 1960s used joint compounds that failed and leaked; 4) over time, sanitary sewer lines sag and break due to local earth movements caused by earthquakes, large vehicles passing over the lines, etc.; and 5) PCE as liquid and as vapor escapes from sanitary sewers in the ways described in the Izzo Report, including through places where roots have penetrated and through the pipes themselves.

Exhibit C is a short presentation of some of the data by Erler & Kalinowski, Inc. ("EKI") that provides strong evidence that the sewers leaked in both the neighborhood and near the Chevron Site and these leaks are sources of PCE that is detected in soil gas and groundwater.

Exhibit D is a declaration from Bonneau Dickson, P.E. a sanitary sewer expert that provides additional background on sewer construction and operation and discusses how sewers leak in general, and how PCE leaves sewer pipes and enters the environment, including PCE migration in backfill and up-slope as vapor.

b) CCCSD Is Liable Under a Hybrid Water Code/CERCLA Analysis When Appropriate Standards of Proof Are Applied

GVP does not believe any further analysis is necessary to find CCCSD liable as a discharger under the Water Code because the Water Code has a strict liability standard and there is evidence that CCCSD's sewers leaked PCE.

However, the Staff proposes four, new, non-statutory criteria that must be met for CCCSD to be named a discharger. These criteria are 1) there was a release from the sewer main that contributed to the plume; 2) the sewer owner/operator knew of leaks and failed to repair them; 3) the sewers were in poor condition and/or were not maintained; and, 4) the sewer owner/operator was aware of/or permitted discharges into a leaking sewer.

From discussions with the Staff, GVP understands that these criteria are based on the City of Lodi case, where the City, as the sanitary system operator, was named as a discharger.[4] To GVP's knowledge, these criteria (or similar criteria) have never been published or publicly used by the Staff to determine whether an entity is a discharger. The criteria do not appear in the City of Lodi Order. The criteria are not in California law or regulations.

The Staff's creation of the four criteria appears to be based on a wayward adoption of some concept of CERCLA defenses as a justification for not naming CCCSD as a discharger. Under CERCLA, once a party has been determined to be an owner or operator of a facility from which a release has occurred, it can only escape liability if it pleads and proves the elements of an affirmative defense.[5] It is not up to a regulatory agency to make the defense for an otherwise responsible party; the party itself must prove its defense by a preponderance of the evidence.

In creating these criteria, the Staff has adopted an approach that has no connection to the concept of a "discharger" in the Water Code. Additionally, the Staff has converted an affirmative defense to be used only by an already responsible party under CERCLA into something wholly different: a methodology used by a regulator as a pretext to discount and avoid evidence. The Staff is forcing other responsible parties to prove the Staff wrong when, in fact, CCCSD should be proving it qualifies for the defense. By its language, the Staff believes that someone else must present some amount of evidence (and the Staff has not shared what that amount is) to support all four criteria before the Staff will name a sanitary district a discharger.

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[4] It should be noted that there is at least one other applicable California precedent that is not mentioned in the Staff Report. The site is located in Sacramento and is under the jurisdiction of the Central Valley Regional Board. In that case a sanitary district recognized that it was responsible for leaks from its sewer system and voluntarily led the effort to clean up PCE that leaked from its sewers. As presented in that Board's Executive Officer's Report dated 23/24 June 2005, the Sacramento County Sanitation District 1 [CSD] "owns and maintains the sewer lines to which wastewater containing PCE was disposed and from which PCE was released to the soil and groundwater. The CSD is cleaning up the soil and groundwater pollution on behalf of itself and all the other responsible parties, including the former owners and operators of Southgate Norge Dry Cleaners."

[5] CERCLA has an affirmative defense (42 USC Sec. 9607(b)(3)) that can be used by an otherwise liable person. This provision provides: "There shall be no liability under subsection (a) of this section for a person otherwise liable who can establish by a preponderance of the evidence that the release or threat of release of a hazardous substance and the damages resulting therefrom were caused solely by (3) an act or omission of a third party other than an employee or agent of the defendant, or than one whose act or omission occurs in connection with a contractual relationship, existing directly or indirectly, with the defendant … if the defendant establishes by a preponderance of the evidence that (a) he exercised due care with respect to the hazardous substance concerned, taking into consideration the characteristics of such hazardous substance, in light of all relevant facts and circumstances, and (b) he took precautions against foreseeable acts or omissions of any such third party and the consequences that could foreseeably result from such acts or omissions…"

i) The Staff has not fairly evaluated the available data and provides no clear standard for its evidentiary burden of proof

If, for arguments sake, one were to accept that the burden was on non-CCCSD parties to prove that the four criteria were met, given the available data, GVP believes that the criteria have been met and believes that the Staff has not performed a fair evaluation. Instead, the Staff has accepted every statement by CCCSD regarding CCCSD's evaluation of the data as true and rejected any interpretation that is inconvenient or contradicts CCCSD's position. (This is an odd approach by the Staff given CCCSD's assertion to the Staff that it never allowed PCE from dry cleaners to be discharged into its system, when in reality it allowed these discharges until 2007. This fact alone should have cast serious doubt on CCCSD's credibility.) Rather than objectively analyzing the evidence, or providing clarity as to how it is analyzing the evidence, the Staff instead uses conclusive and inaccurate statements to dismiss any evidence with which it does not agree.[6]

ii) There is clear evidence to support all four criteria

Even though the burden is clearly on CCCSD to exonerate itself, the GVP Letters and Exhibits B, C and D provide the evidence that CCCSD should be named a discharger because the four criteria have been met. Nevertheless, it is instructive to focus, as an example, on information related to CCCSD's maintenance program, which is the core of two of the Staff's criteria.

CCCSD's maintenance practices regarding sewer blockages and sewer backups, which appear to be reactive, have remained substantially the same over time. A CCCSD outreach document from 1975 describes rodding in response to sewer backups into homes, a purely reactive approach to the problem. A copy of that document is attached as Exhibit E. In 1983, the Regional Board requested CCCSD respond as to how it was addressing maintenance issues due to concerns over sewer backups. Again CCCSD

[6] A review of the Staff's language in Section VI of the Staff Report regarding why CCCSD is not a discharger is revealing. Nowhere is there a clear explanation regarding the amount and type of evidence that is required. What is clear is that burden of proof was mistakenly put on the other responsible parties rather than CCCSD as all the references are to insufficient evidence or lack thereof. More specifically:
- In the second paragraph of the Section, the Staff Report "concludes there is <u>insufficient data to assert that a discharge from CCCSD's sewer lines resulted in the contamination at issue…</u>" (emphasis added).
- In the first paragraph of page 13, the Staff states: "there is <u>no direct evidence that leaking sewer lines under CCCSD ownership have caused or contributed significantly to the groundwater contamination</u>" (emphasis added).
- In item #1 on page 13, the Staff Report states: "While <u>there is evidence of incidental leakage from the sanitary sewer lines, there is no direct evidence the leakage contributed substantially</u> to the creation of the CVOC commingled groundwater plume" (emphasis added).
- On page 14, in the data discussion of Apparent Source Area in the Vicinity of Manhole M46, the Staff Report states: "Staff does not find this single data set to be <u>compelling evidence</u> of a source area…" (emphasis added).
- On page 14, in the data discussion of Suspected Source Area in Linda Drive Along Sewer, the Staff Report states: "There <u>is insufficient soil and groundwater data</u> to reach the conclusion that the older sewer line was a release point" (emphasis added).
- In Instance 2 on page 15, the Staff Report states: "Staff <u>does not find evidence of major repairs</u> [NB: there is no definition of "major repairs"] needed on the CCCSD sewer lines in the area of the groundwater contamination. <u>There is no tangible evidence</u> CCCSD was aware of any needed repair beyond routine maintenance" (emphasis added).

described a reactive maintenance system. A copy of that letter is attached as Exhibit F.

As stated by B. Dixon in his Declaration (Exhibit D, p. 7):

> The CCCSD sewer maintenance program consists of cleaning the sewers at various intervals, responding to blockages and sanitary sewer overflows (SSOs) when they occur, and repairing defects when they are found if the defects are deemed to be significant and to require repair. Root penetrations usually are corrected by cutting out the roots or by chemically treating the roots. These methods of getting rid of the roots do not get rid of the openings through which they entered the pipes, i.e. the maintenance procedures are aimed at restoring flow in the sewers but not at stopping leakage from the sewers…
>
> Cleaning the sewers tends to reduce the number of blockages that occur but does nothing to stop the sewer pipes from leaking. Similarly, clearing blockages merely clears the sewer pipe, but does not address leaks.

Nothing exemplifies this reactive nature better than CCCSD describing the sewer pipe in Linda Drive adjacent to the Chevron Site in 1977 as "in very poor shape has lots of cracks" but taking at least ten years to replace it.

(iii) CCCSD's assertion that the system is currently in good condition and that it has recent awards for operation and maintenance are not relevant in understanding that its sewers released PCE

In its May 28, 2013 response to the Staff's 13267 letter requesting evidence concerning how CCCSD maintained its system, CCCSD provided no material other than the sparse records that had already been produced in response to GVP's Public Records Act request. CCCSD provided no evidence of its operations prior to the 1990's, it merely stated: "the sanitary sewer lines in the Gregory Village area are in good condition, meaning that they were in even better condition in the past…" CCCSD continued: "It is a truism that the capability of sanitary sewer collection systems to retain wastewater does not improve over time and that absent replacement or other major repairs, sewer lines are in the best condition when they are newer" (page 2). "As summarized below, the general condition of the sanitary sewers in the Gregory Village area is good, which means their condition was at least as good, if not better, during the period of time the dry cleaners operated in the area (1956-1991)" (page 3).[7]

However, CCCSD provided no information and attached no records or documents in its letter regarding these earlier time periods to support this "truism" that, incidentally, is not

[7] CCCSD asserts that the "general condition" of the area sewers is "good". In fact, CCCSD's records, including its video logs of the sewers, identify sags, cracks and root penetrations, which calls into question what CCCSD's statement really means.

a "truism." As discussed in Exhibit D (Declaration of B. Dickson), sanitary sewer pipes begin to leak soon after they are installed. The fill in which the pipes were placed settles, causing sags and joint failures in the installed system.

In further response to the Staff's questions concerning maintenance, CCCSD states:

> The District operates an award winning operation and maintenance program for its sanitary sewer collection system. These awards are not given out lightly ... Because these award programs have only been in existence for the past 20-25 years, these awards were received after the dry cleaning operations in the Gregory Village area ceased. However, if awards were available prior, the District is confident that its operation and maintenance programs and personnel would have received them (p. 12).

GVP questions whether the statements that the system is now in good condition and that the program is recently "award winning" has any probative value in this situation. To this day, CCCSD's maintenance system is focused on keeping the sewage flowing, not to prevent leaks from its pipes into the groundwater. Maintenance, short of failure or imminent failure of a pipe, is primarily rodding or chemical treatment to remove roots and other obstructions. These techniques do not repair the cracks or holes created by the roots and, in fact, are reactive – they only address the issue once the roots have substantially penetrated the pipes, long after creating a leakage point (see Exhibit D Declaration of B. Dickson).

iv) Lack of evidence should not be used to CCCSD's benefit

Given the Staff's approach, we note that it is in a sanitary district's best interest to have no evidence or records that may help to establish, under the Staff's criteria, that the district is a discharger. Later in the letter to the Staff, CCCSD admits that it has no maintenance records:

> Up until the early 1990s, maintenance was tracked by a manual card system (cardex system). Although the cardex records were not retained, the system was used to effectively plan and track the maintenance events on individual sanitary sewer lines including the lines in the Gregory Village area.

Given that there is <u>no</u> substantive evidence that the sewers <u>did not</u> leak, the key question remains: What inference should be drawn concerning the behavior of CCCSD and the quality of its operation in the absence of records or where records have been destroyed?

The Staff believes that the lack of records from before 1990 means that it can't be proven that the CCCSD has any liability. However, the Staff has its analysis backward – in the absence of historical evidence, given that the burden of proof is on CCCSD – the Staff must conclude that CCCSD has not met its burden of proof and is thus a discharger.

In short, the evidence is that a) all sanitary sewers leak PCE (see the Izzo Report), b) according to the Staff Report, CCCSD allowed PCE to be discharged to its system (page 16, #4), and c) CCCSD's system leaked. In this circumstance, there should be no controversy: CCCSD should be named a discharger in the order.

c) There are strong policy reasons for holding the CCCSD is a discharger

The Staff has noted that there are policy reasons for not holding CCCSD liable as a discharger, but has failed to enumerate those reasons. It appears that the Staff's policy reason for not holding CCCSD liable is that costs of investigation and cleanup should not be shifted to the taxpayers and ratepayers when there are other parties that might pay.[8] This argument gives little incentive for CCCSD to repair damage caused by root intrusions or heavy traffic rather than just clearing the pipe, which it still does to this day, unless there is an actual or imminent pipe failure.

Another policy argument that could be made is that CCCSD should not be liable a discharger because CCCSD is a mere conveyor of materials doing a public service and that it should not, from a public policy perspective, be held responsible for leaks from its system of material that others placed in its system that subsequently leaked out. But CCCSD is not a "mere conveyor." As noted in the Staff Report (p. 16), CCCSD knowingly accepted CVOCs, including PCE, into its system and thus should be liable for these releases.[9] [10]

To fail to name CCCSD to the order sends a message that sanitary districts are not liable for discharges in violation of the Water Code in the face of clear RWQCB precedent to name sanitary districts for such violations. Sanitary districts are frequently named in orders. Usually this is a result of the sanitary district failing to prevent or control the

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[8] This argument was made in a CERCLA context by another sanitary district that was contesting liability for releases of PCE that had been discharged to that district's sanitary sewer. In that case, the Court of Appeals rejected the argument. See *Westfarm Assocs. v. Wash. Suburban Sanitary Comm'n,* 66 F.3d 669, (4th Cir.1995): "[w]hile the public policy arguments raised by WSSC may be meritorious, we can only presume that those arguments were weighed and rejected by Congress when it enacted CERCLA without including a broad exemption for state and local governments or their POTWs." Similarly, the Water Code contains no "sanitary district" exemption preventing a district from being named a discharger. As noted earlier, "districts" are a "person" subject to Water Code Section 13304. Section 13030 of the Water Code states that a: "Person includes any city, county, district, the state…"(emphasis added).

[9] The Staff has misinterpreted CCCSD's regulations with respect to the amount of PCE it allowed to be discharged into its system. As the Staff correctly states: "Prior to 2007, CCCSD allowed for PCE to be discharged to the sanitary sewer within specified limits. For example, Ordinance No. 99 (adopted on July 11, 1974) allowed the discharge of "Total Identifiable Chlorinated Hydrocarbons" to sanitary sewers at a concentration not exceeding 0.002 mg/L for "50% of time" and not exceeding 0.004 mg/L for "10% of time." But the Staff then incorrectly concludes, with respect to the period prior to 1981: "The allowable PCE discharge concentrations before 2007 were far lower than what would be expected in PCE-impacted wastewater, which would be on the order of 150,000 μg/L." In fact, prior to 1981, CCCSD's restrictions were temporal, which means that extremely high concentrations, including pure PCE, could be discharged to CCCSD's sewers so long as the discharges did not violate the temporal restriction contained in the applicable ordinance.

[10] A close analogy for holding CCCSD liable involves municipal landfills, as stated in *Adobe Lumber*: "*see, e.g., Transportation Leasing Company. v. The State of California (CalTrans),* 861 F. Supp. 931, 939 (C.D.Cal.1993) (holding municipalities liable for contamination from a landfill even though their conduct constituted a "non-contributory exercise of sovereign power")…" Also, the Court of Appeals in *B.F. Goodrich v Murtha, 958 F. 2d 1192, 1199 (2nd Cir.1992)* held that there was no exemption under CERCLA "for municipalities arranging for the disposal of municipal solid waste that contains hazardous substances simply because the municipality undertakes such action in furtherance of its sovereign status."

discharge of sewage or chemicals.[11]

Both the Water Code and CERCLA cleanup provisions were drafted to cast a wide net in order to assure the resources necessary to clean up the environment. By making a policy decision to walk away from one of those sources, the Board is walking away from a resource needed to address the problem as most dry cleaners and the owners of single properties do not have the resources to address the issue alone.[12]

III. Conclusion

Because there is a commingled plume, a single order is not only appropriate, but imperative to avoid confusion, higher costs for all parties, and the unnecessary expenditure of valuable Staff resources. There is clear Board precedent for this approach. Further, the California legislature expressly intended that sanitary districts be strictly liable under Section 13304 of the California Water Code for releases from their facilities. CCCSD owns and operates the sewer pipes from which wastewater containing CVOCs has leaked into the subsurface. In addition to being strictly liable, by designing a system that in its very specifications permitted leakage, in operating a failing system, and in failing to repair the system in a timely manner, CCCSD actively discharged CVOC waste into the waters of the state which have become part of a commingled plume. In these circumstances, it is both appropriate and imperative that CCCSD be named a discharger on the single order that names the GVP parties and the Chevron parties.

Sincerely,

Edward A. Firestone

Exhibits Attached

[11] See, for example, Sanitary District #1 of Marin, R2-2012-055; City of Oakland, R2-2009-0078; and City of Calistoga, R2-2010-0107 (which involved the discharge of chlorodibromomethane and dichlorobromomethane).

[12] It is likely that CCCSD has general liability insurance coverage from the pre-1986 period that could be triggered to help pay for the investigation and remediation of CVOCs released from its system. If these policies were triggered and the investigation and cleanup work were covered losses, the burden would fall on insurance that was paid for by taxpayers and ratepayers.

EXHIBIT A

State of California

M e m o r a n d u m

To : Walt Pettit
Executive Director

Date: APR 27 1992

William R. Attwater
Chief Counsel
OFFICE OF THE CHIEF COUNSEL

From : STATE WATER RESOURCES CONTROL BOARD

Subject: RESPONSIBILITY OF OPERATORS OF PUBLICLY OWNED AND OPERATED SEWER SYSTEMS FOR DISCHARGES FROM THEIR SYSTEMS WHICH POLLUTE GROUND WATER

ISSUE

Is the operator of a publicly owned and operated sanitary sewer system responsible for discharges of waste from its sewer system which pollute or threaten to pollute ground water?[1]

Conclusion

Public agencies which own or operate sanitary sewer systems are responsible for discharges of waste from their collection and treatment systems. If the waste creates or threatens to create a condition of pollution or nuisance, the public agencies may be ordered to clean up the wastes or abate the effects thereof.

Discussion

The Central Valley Regional Water Quality Control Board (Regional Water Board) has requested an opinion concerning whether operators of publicly owned treatment works (POTW) are responsible for releases of waste through their sewer collection systems. The issue arose in the Regional Water Board's

1 *The issue here involves situations where discharges of volatile organics to publicly owned treatment works escape from the collection system prior to treatment. The chemical releases occur prior to the planned discharge from the system, and also do not occur through any outfall established for overflows. Rather, the releases are considered leaks through the collection system.*

consideration of adoption of a cleanup and abatement order (CAO) regarding discharges of solvents used in dry cleaning.

According to testimony of the staff of the Regional Water Board, the use of perchloroethylene (PCE) as a solvent in dry-cleaning operations has resulted in the detection of PCE in ground water and the creation of pollution or threats of pollution of water used for human consumption. The staff gave testimony that PCE is discharged to the sewer system by dry-cleaning operations, and that it escapes the sewer collection system by various means, including leaks and permeation as a gas. The result is that PCE has been detected in ground water and in municipal wells at levels which threaten to exceed drinking water standards.

For purposes of this memorandum, it will be assumed that the testimony of the Regional Water Board staff regarding the movement of PCE through sewer pipes is accurate. Making that assumption, this memorandum will address whether such releases from sewer pipes which are part of the collection system of a POTW are adequate grounds for holding the operator of the POTW responsible for cleanup and abatement of the PCE.

Section 13304(a) of the Water Code describes persons who may be held responsible for cleanup and abatement of pollution or threatened pollution:

> "Any person who has discharged or discharges waste into the waters of this state in violation of any waste discharge requirements or other order or prohibition issued by a regional board or the state board, or who has caused or permitted, causes or permits, or threatens to cause or permit any waste to be discharged or deposited where it is, or probably will be, discharged into the waters of the state and creates, or threatens to create, a condition of pollution or nuisance . ..." (Emphasis added.)

The issue, therefore, is whether operators of POTWs can be found to "cause" or "permit" the discharge of PCE through the sewer pipes and, thence, to ground water where it creates or threatens to create a condition of pollution or nuisance.

The first issue in determining responsibility for discharges from the sewer pipes is whether the operator is the owner of the collection system. POTWs are defined by the federal Environmental Protection Agency (EPA) as:

> "[A]ny device and system which is used in the treatment (including recycling and reclamation) of

> municipal sewage or industrial wastes of a liquid nature which is owned by a 'State' or 'municipality'. This definition includes sewers, pipes, or other conveyances only if they convey wastewater to a POTW providing treatment." 40 CFR Section 122.2.

The language in Section 122.2 clearly includes sewage collection systems within the term "treatment works". Throughout the federal Clean Water Act, responsibilities for such systems is placed upon the public owners of "treatment works". See, e.g., Sections 301(b)(l)(B), 301(h), 402(b)(8). While the PCE in the matter before the Regional Water Board leaked from the sewer pipes prior to treatment, these pipes are clearly intended to convey wastewater to the POTW. See Montgomery Environmental Coalition v. Castle (3d Cir. 1980) 646 F.2d 568 (POTW responsible for discharges from overflow points). It must be concluded that the owner or operator of a POTW is responsible for discharges from the sewer collection system.

The responsibility of owners and operators of POTWs for discharges into the collection system is also reflected in the provisions of the California Water Code. Section 13260 provides that the Regional Water Boards may prescribe waste discharge requirements for all discharges "except discharges into a community sewer system". Section 13260 clearly shifts responsibility to the owner or operator of the POTW once the waste is placed in its system. See State Water Board Order No. WQ 80-2 (permit properly included public entities responsible for conveyance of pollutants to a treatment facility, as well as the public entity responsible for treatment operation). For discharges which are subject to NPDES permits, the POTW owner or operator may in turn place pretreatment requirements upon dischargers to its system. Water Code Section 13370.5. Because owners or operators of POTWs are responsible for discharges into the collection system, it follows that they must be responsible for releases therefrom. These owners and operators have sole control over the collection systems and responsibility for proper operation and maintenance. Water Code Section 13304 authorizes the issuance of cleanup and abatement orders to persons who "cause" or "permit" discharges which cause pollution or threaten pollution of ground water. It is clear that owners and operators of POTWs, from which hazardous wastes such as PCE leak or permeate, have caused or permitted such discharges.

It is important to note that unlike Section 13260, Section 13304 of the Water Code does not restrict its application to dischargers to POTW. Instead, Section 13304 more broadly applies to any person:

> "[W]ho has caused or permitted, causes or permits, or threatens to cause or permit any waste to be

discharged or deposited where it is, or probably will be, discharged into the waters of the state . ..."

Under Section 13304, both the owner or operator of the POTW, who controls the collection system and has responsibility for discharges therefrom, and the dry cleaner who places the waste into the collection system, may be held responsible.

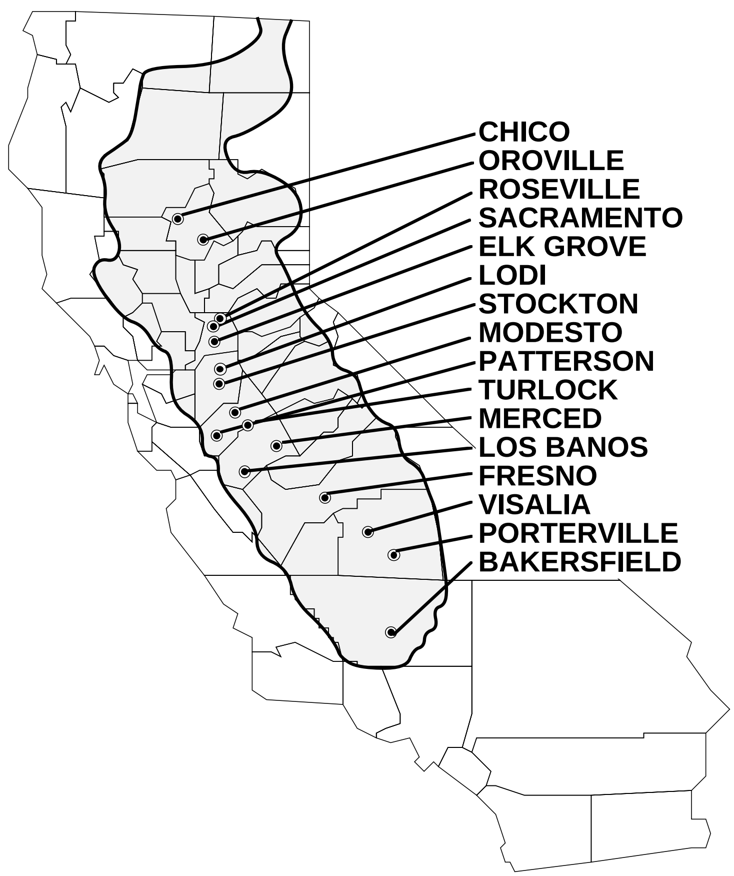
cc: Dale Claypoole, EXEC

EXHIBIT B

DRY CLEANERS— A MAJOR SOURCE OF PCE IN GROUND WATER

27 March 1992

CENTRAL VALLEY
CITIES WHERE MUNICIPAL WELLS ARE AFFECTED BY
TETRACHLOROETHYLENE (PCE)



WELL INVESTIGATION PROGRAM

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DRY CLEANERS—A MAJOR SOURCE OF PCE IN GROUND WATER

VICTOR J. IZZO
Associate Engineering Geologist

Approved by the California Regional Water Quality Control Board, Central Valley Region on 27 March 1992

INDEX

EXECUTIVE SUMMARY

Tetrachloroethylene (PCE), a known carcinogen, has degraded at least 215 wells in the Central Valley of California. Figure 1 illustrates the extent of the problem. The majority of these wells are large system municipal wells of 200 connections of more. The Chico, Sacramento, Modesto, Fresno, Turlock, Lodi and Merced areas all have wells with levels of PCE above 0.8 ppb which is the estimated one in a million incremental cancer risk (8). The Maximum Contaminant Level (MCL) set by the Department of Health Services for drinking water is five ppb. Forty-seven of the 215 wells have PCE levels above the MCL.

The Well Investigation Program of the Central Valley Regional Water Quality Control Board so far has identified the likely PCE sources in 21 of the wells; in 20 of those wells, dry cleaners are the likely source. In areas where PCE well investigations were done, dry cleaners are the only present large quantity users of this volatile organic chemical (VOC). The Halogenated Solvent Industry Alliance 1987 white paper on PCE states that dry cleaners use 56% of the PCE used in United States (5). All dry cleaners in the vicinity of degraded supply wells show evidence of major ground water degradation. Monitoring wells drilled adjacent to dry cleaners had concentration from 120 ppb to 32,000 ppb, well above the MCL.

The main discharge point for dry cleaners is the sewer line. The discharge from most dry cleaning units contains primarily water with dissolved PCE, but also contains some pure cleaning solvent and solids containing PCE. Being heavier than water, PCE settles to the bottom of the sewer line and exfiltrates through it. This liquid can leak through joints and cracks in the line. PCE, being volatile, also turns into gas and penetrates the sewer wall. Sewer lines are not designed to contain gas. The PCE then travels through the vadose zone to the ground water.

Where a source investigation has been done in connection with PCE contamination, the evidence has shown that dry cleaners have degraded the ground water. The data strongly indicate that leakage through the sewer lines is the major avenue through which PCE is introduced to the subsurface. With approximately 285 dry cleaners in just the metropolitan areas of Sacramento, Chico, Lodi, Modesto, Turlock, Stockton and Merced, one would expect that many more wells will be degraded by PCE in the future. Most of the wells degraded by PCE and most of the dry cleaners are in residential and retail areas. Based on the data collected to date and the location of most of the degraded wells with confirmed PCE, a great majority of these wells will have dry cleaners as the source.

The solution to part of the problem is to halt the disposal of waste from dry cleaning units to the sewer line. Regulation of this discharge to the sewer could be achieved through new legislation and city ordinance. Since this problem exists throughout the state, a statewide policy seems appropriate.

The other part of the problem is ground water cleanup

CENTRAL VALLEY
CITIES WHERE MUNICIPAL WELLS ARE AFFECTED BY PCE

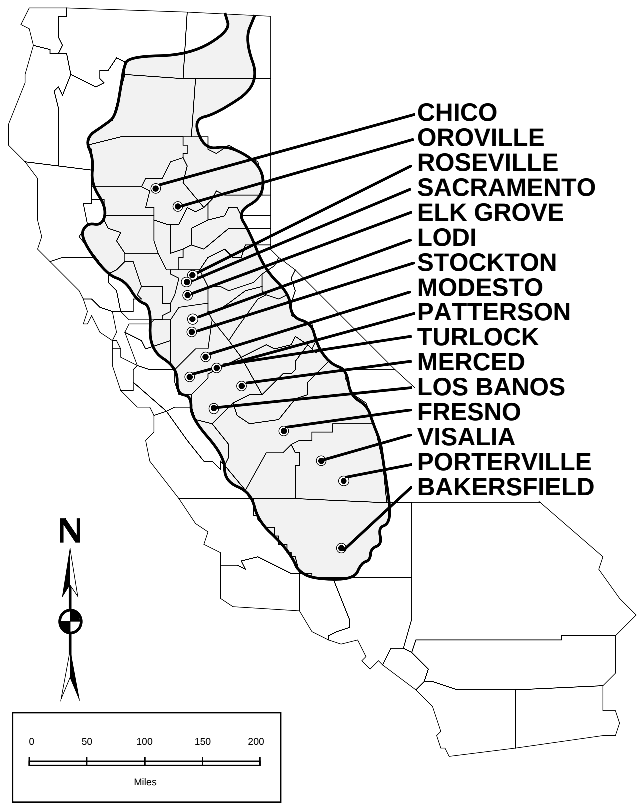


Figure 1

which is required so that cities can continue to provide safe water. A state wide fund may be needed to help pay for cleanup.

INTRODUCTION

Over 750 wells have been reported to the California Regional Water Quality Control Board, Central Valley Region, with confirmed levels of volatile organic chemicals (VOCs). Greater than 35% of the reported wells contain tetrachloroethylene (PCE). Municipal drinking water supplies have been affected by PCE throughout the Central Valley (Figure 1). At least one city is already treating contaminated ground water in order to continue its water supply.

This report discusses some of the data and conclusions about PCE movement to ground water, the source of the PCE, and possible solutions. The report is divided into six sections.

*Introduction

* Tetrachloroethylene (PCE)
  A brief description of the use of PCE and its physical and chemical properties.

* Source Identification for PCE Degraded Wells
  A description of how Board staff determines the source of VOC(s) in a well and the results of PCE source investigations.

* Dry Cleaning Operations and Discharge Locations
  General discussion of dry cleaning operations and waste discharge points.

* Evidence and Theory on How PCE is Leaving the Sewer

* Conclusion and Recommendations

TETRACHLOROETHYLENE (PCE)

PCE was first formulated in 1821 (22). By the 1960's and early 1970's, it had become a widely used solvent in dry cleaning, metal degreasing and other industries (18). In the late 1970's, most industries moved away from the use of PCE. The exception was the dry cleaning industry. By the early 1980's, dry cleaners used the majority of the PCE in this nation (18). In the late l980's, dry cleaners used 56% of the PCE used in United States (5).

Compared to many VOCs, PCE is very mobile, with relatively low solubility and vapor pressure. In its liquid state, it is heavier and less viscous than water and will sink through it. In the vapor phase, PCE's density is greater than air. PCE biodegradability is low in the subsurface. The following are some of the physical and chemical properties of PCE: [3]

Molecular Weight	165.85 g
Solubility	150 mg/l at 25°C
Vapor Pressure	14 torr
Density	1.63 g/cm^3
Boiling Point	121 °C
Kinematic Viscosity	0.54 (water=l)
Henry's Law Constant	0.0131 atm-m^3/mole
Vapor Density	5.83 (air=1)
Specific Gravity	1.63 at 20° (water=l)
Relative Velocity	1.8 (water=l)

PCE is generally found in three phases in the subsurface: liquid, vapor, and dissolved in water. More than one phase usually exists in the subsurface after discharge. Figure 2 shows three possible scenarios at a discharge point.

VOCs will not adsorb to subsurface materials to any significant degree when those materials are nearly pure minerals which contain little organic matter. Most high-yield aquifers are nearly free of organic matter. The majority of fresh water aquifers and the vadose zone in the Central Valley are fan deposits from the Sierra Nevada and the Coast Range, and are composed primarily of low organic soils and substrata. Therefore, retention of VOCs in the Central Valley by soil and subsurface strata probably is very low.

PCE is a known carcinogen. The Water Quality Advisories for a l-in-a-million incremental cancer risk

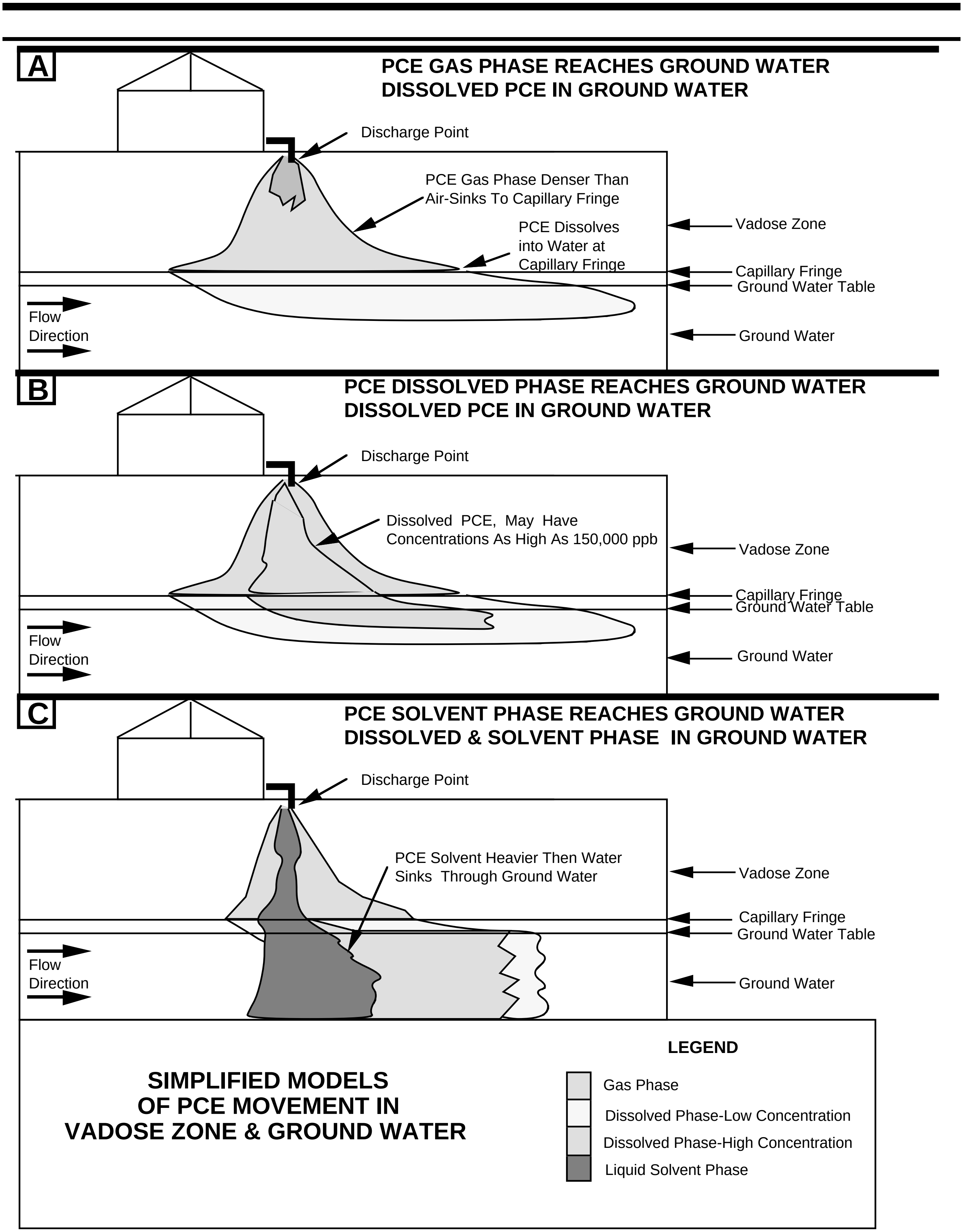

A
PCE GAS PHASE REACHES GROUND WATER
DISSOLVED PCE IN GROUND WATER
Discharge Point
PCE Gas Phase Denser Than Air-Sinks To Capillary Fringe
PCE Dissolves into Water at Capillary Fringe
Vadose Zone
Capillary Fringe
Ground Water Table
Ground Water
Flow Direction
B
PCE DISSOLVED PHASE REACHES GROUND WATER
DISSOLVED PCE IN GROUND WATER
Discharge Point
Dissolved PCE, May Have Concentrations As High As 150,000 ppb
Vadose Zone
Capillary Fringe
Ground Water Table
Ground Water
Flow Direction
C
PCE SOLVENT PHASE REACHES GROUND WATER
DISSOLVED & SOLVENT PHASE IN GROUND WATER
Discharge Point
PCE Solvent Heavier Then Water Sinks Through Ground Water
Vadose Zone
Capillary Fringe
Ground Water Table
Ground Water
Flow Direction
SIMPLIFIED MODELS OF PCE MOVEMENT IN VADOSE ZONE & GROUND WATER
LEGEND
Gas Phase
Dissolved Phase-Low Concentration
Dissolved Phase-High Concentration
Liquid Solvent Phase

Figure 2

estimate is 0.8 ppb (8). The State of California Department of Health Services Maximum Contaminant Level (MCL) for PCE is five ppb.

SOURCE IDENTIFICATION FOR PCE DEGRADED WELLS

A source investigation is conducted by Board staff to identify the source(s) of contaminant found in a drinking water supply well. This section is divided into two parts: a description of the steps in a source investigation and a general discussion of the results of a PCE source investigation.

SOURCE INVESTIGATION

There are five general steps conducted in a source investigation as follows:

1. Well reported degraded by VOCs
2. Identify possible sources of the VOCs
3. Inspect the users of the VOCs
4. Identify ground water characteristics
5. Conduct a soil gas survey

In step 1, a drinking water well is reported degraded by a VOC to the Board. The main sources of this information are the California Department of Health Services, counties, municipalities and private water companies. The information starts the Board's formal source investigation.

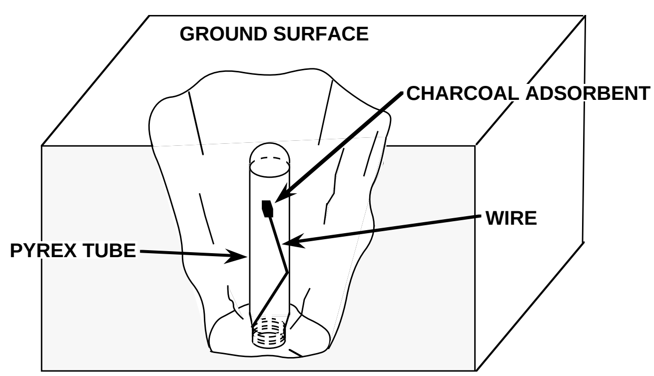
In step 2, staff attempts to identify all possible uses of the VOC(s) of concern. For example, is it used as solvent or refrigerant? Then they identify the type of businesses that would use the VOC(s). At this point staff does research using business directories, phone books, and county and city records to identify those facilities (potential sources) in the past and present that might use or have used the VOC(s) found in the well. This search for potential sources is done for an area approximately 1/2 mile in radius around the well. Some record searches for have gone as far back as the 1930's.

In step 3, inspecting possible sources, a questionnaire is first mailed to potential sources asking the facility operators about their uses of VOCs. This is the initial screening and reduces the quantity of field inspections. For example, if a facility is listed as a dry cleaner in the phone book and the questionnaire response says it is only a transfer station and no solvents are used, then the site would be removed from the potential source list and not inspected.

Staff inspects the facilities that use VOCs and determines if the potential source should be investigated further. If an investigation continues on a facility, then staff samples all discharges leaving the facility (discharges to land, water and sewer).

In step 4, identifying ground water characteristics, staff collects information from government and private ground water studies. The data collected from these studies are correlated to give a general understanding of the stratigraphy and ground water characteristics. This is not site-specific and is done after identifying possible sources so there is not a bias to upgradient sources.

In step 5, the soil gas survey is used to identify areas of VOCs in the soil and ground water. A survey involves placing glass tubes, each containing a carbon coated wire, open end down, 10-12 inches below the soil surface (Figure 3). After placement, the tubes are covered with soil. The evaporating VOC gasses disperse through the soils and reach the survey



SOIL GAS TUBE

Figure 3

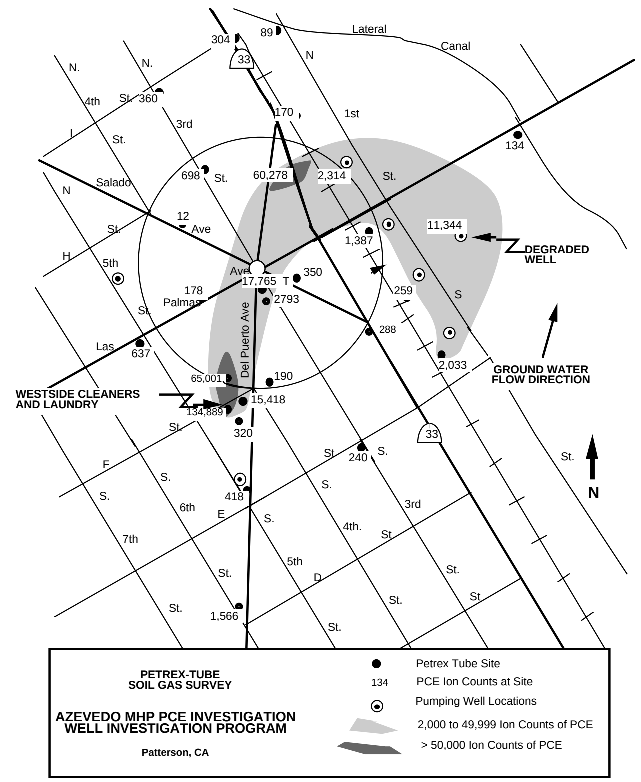


Figure 4

IDENTIFIED SOLVENT USERS

- ***Auto/Boat Industry**
  - Service Stations
  - Auto Dealerships
  - Boat Dealerships
  - Truck Repairs
  - Auto Maintenance Facilities
- ***Telephone Companies**
- **Elevator Service Companies**
- **Public Schools**
- **Mobile Home Parks**
- ***Dry Cleaners**
- **Laundries**
- **Print Shops**
  - Newspapers
  - *Copying and Printing Businesses
- **Machine Shops**
  - Electric Motor Repair
  - Sheet Metal & Welding
- **Lumber/Timber Industry**
- ***Over-the-Counter Products**
- **Furniture**
  - Strippers
  - Antique Shops
  - Upholstery Repair
- **Power Stations**
- **Paint Dealers**

* - Industries where at least one product has PCE

Figure 5

equipment. Approximately six week later, the tubes are removed and sent to the laboratory for VOC analysis. The results are in numbers of a specific VOC molecule retained by the carbon coated wire. The numbers are not concentrations, but are relative to each other. Locations with high counts have more of that VOC in the soil vapor than areas with low counts. Figure 4 is an example of the results of one of these surveys.

At this point the potential sources have been reduced to a few likely sources. It is at this time that site investigations are requested from the likely sources.

RESULTS OF PCE SOURCE INVESTIGATIONS

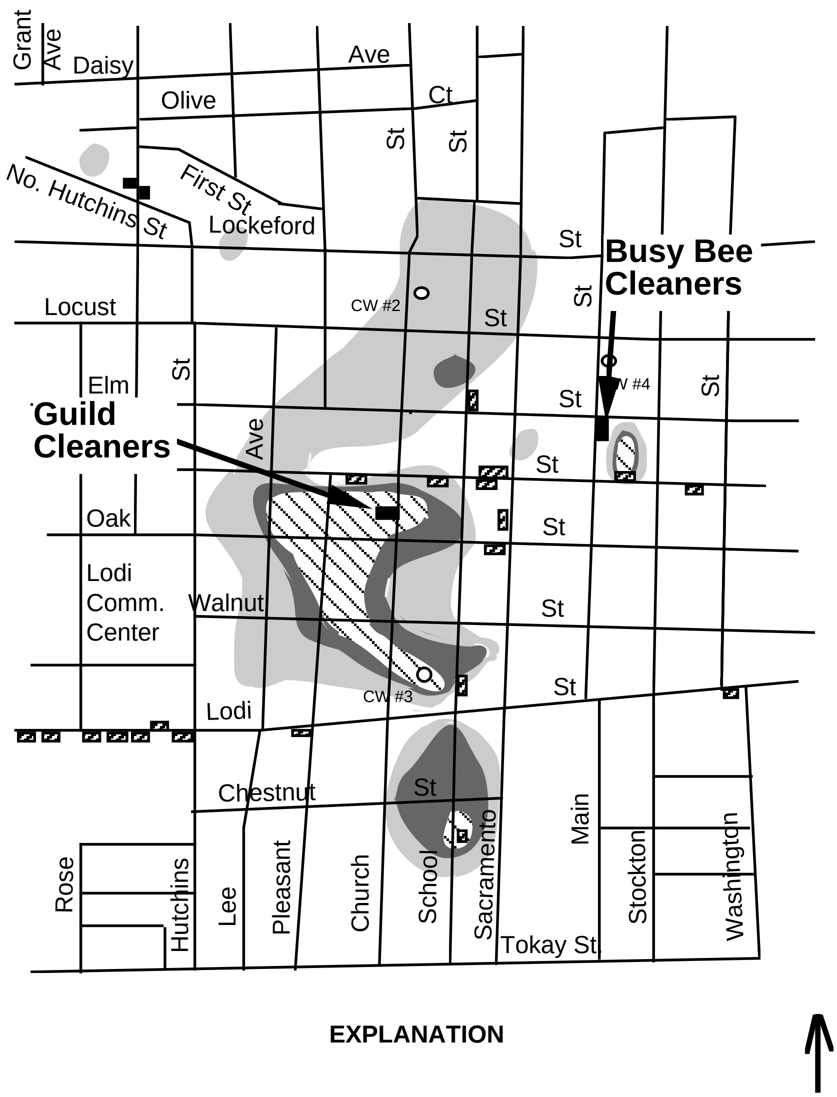
Staff source investigations have found that PCE is used in several industries (Figure 5) and is a component of several over-the-counter products such as brake and carburetor cleaners and spot removers. Staff surveys of industries other than dry cleaners which used these products show that PCE is not the main constituent in most of them. These products are usually less than 30% PCE, while dry cleaning solvent is 100% PCE. Dry cleaning uses a large quantity of PCE solvent compared to other potential sources. The typical cleaner uses between 15 and 40 gallons a month of pure PCE. Many of the other industries also collect the solvent after use for recycling and do not discharge waste liquids to the land or sewer. Also, many of the solvents used that contain PCE are in aerosol cans. The solvent is sprayed on the part to remove grease and as the part dries, the PCE volatilizes into the air. Most industries other than dry cleaners which use solvents have no daily discharge of waste liquids containing PCE.

The staff soil gas surveys, which include all solvent users, show dry cleaners as the source areas. Figures 6 and 7 are two examples. None of the soil gas surveys have shown PCE vapor plumes near other solvent users.

Based on questionnaires, inspections, handling practices and soil gas surveys, staff concludes that dry cleaning is a major source of PCE ground water degradation in the Central Valley.

LODI

SEWER LINES



EXPLANATION

Currently operating dry cleaners

Past dry cleaners

< 10,000 PCE ion counts

100,000 - 200,000 PCE ion counts

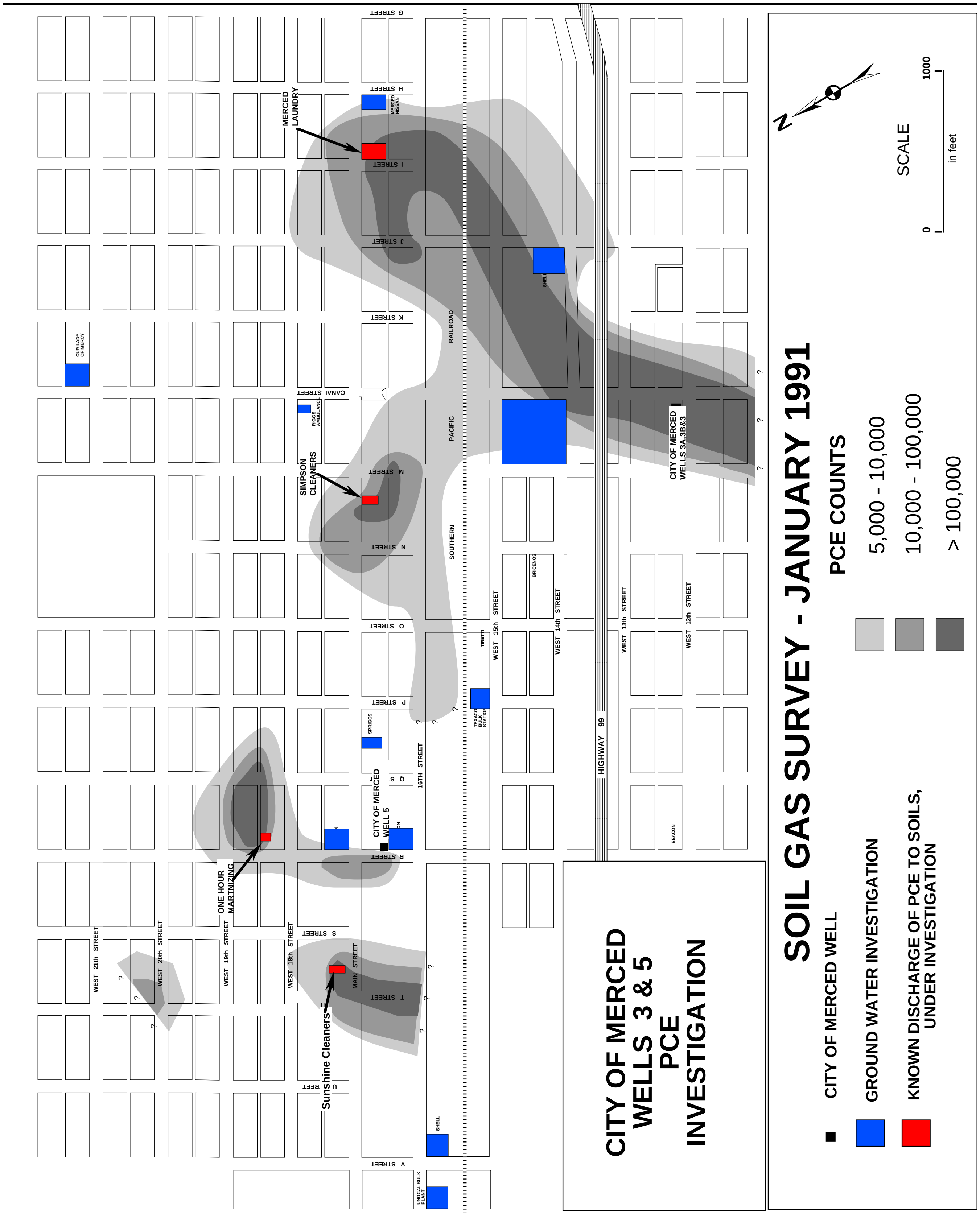
10,000 - 100,000 PCE ion counts

> 200,000 PCE ion counts

SCALE

0.0 0.1 0.2 0.3 0.4 0.5 Miles

Figure 6



SOIL GAS SURVEY - JANUARY 1991
PCE COUNTS
5,000 - 10,000
10,000 - 100,000
> 100,000
CITY OF MERCED WELL
GROUND WATER INVESTIGATION
KNOWN DISCHARGE OF PCE TO SOILS, UNDER INVESTIGATION
CITY OF MERCED WELLS 3 & 5 PCE INVESTIGATION
SCALE
0
1000
in feet
MERCED LAUNDRY
SIMPSON CLEANERS
ONE HOUR MARTINIZING
Sunshine Cleaners
CITY OF MERCED WELL 5
CITY OF MERCED WELLS 3A,3B&3
HIGHWAY 99
RAILROAD
PACIFIC
SOUTHERN
CANAL STREET
MAIN STREET
16TH STREET
WEST 15th STREET
WEST 14th STREET
WEST 13th STREET
WEST 12th STREET
WEST 18th STREET
WEST 19th STREET
WEST 20th STREET
WEST 21th STREET
G STREET
H STREET
I STREET
J STREET
K STREET
M STREET
N STREET
O STREET
P STREET
R STREET
S STREET
T STREET
V STREET

DRY CLEANERS OPERATION AND DISCHARGE LOCATIONS

There are two basic types of dry cleaning machines, transfer and dry-to-dry. Both have similar types of discharges with the dry-to-dry machine being more efficient. The only major difference is that the dry-to-dry unit does the washing and drying of the clothing in the same machine, while a transfer unit use separate machines. The following section is a general description of a facility containing a transfer unit.

Dry cleaning transfer systems include a dry cleaning wash unit, PCE storage tank (generally part of the wash unit), reclaimer (dryer), cooker and vapor condenser (Figure 8). Pure PCE solvent is added directly from the PCE tank to the wash unit. A small amount of water and soap is usually added to remove stains that PCE will not. Most facilities send the spent solvent (after washing cycle) through solid filter canisters to remove solids and then return it to the PCE tank in a closed system. The solvent in the PCE tank also is periodically purified by physical transfer to the cooker, which separates solvent from solids through distillation and forms a sludge at the bottom.

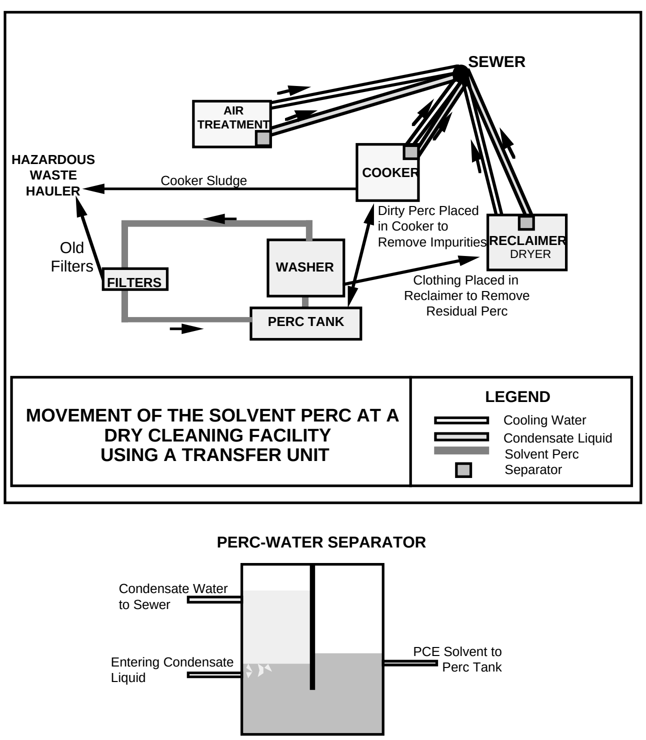


Figure 8

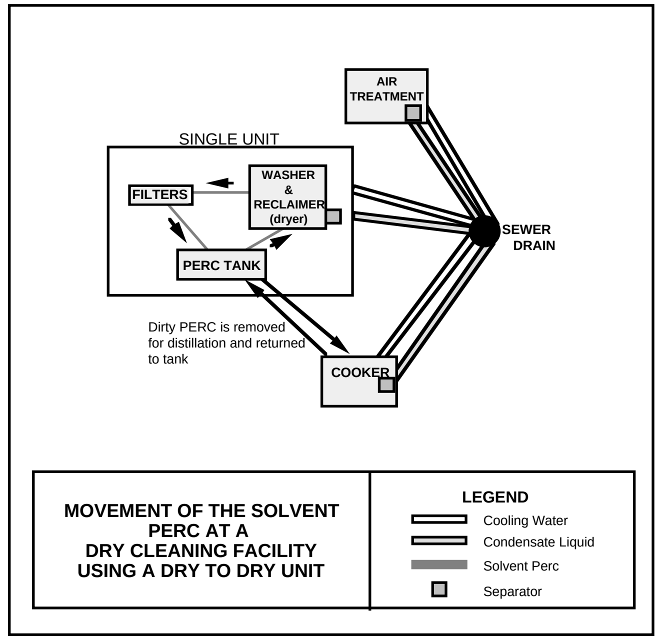
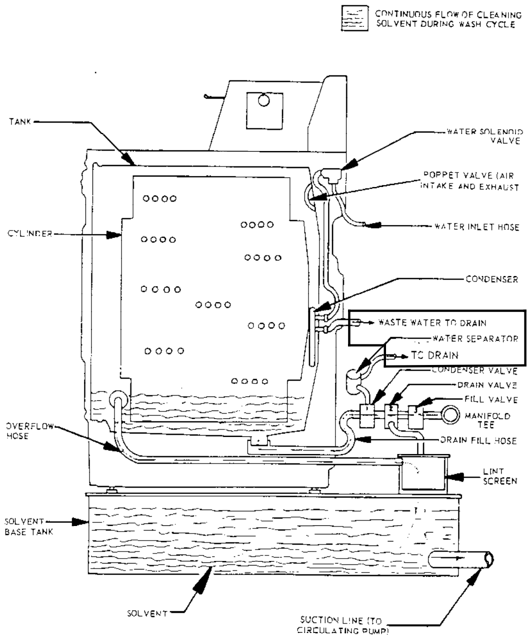


Figure 9

After washing, the clothing is removed from the wash unit and placed in the reclaimer to remove residual solvent. This drying process removes PCE solvent by heating the clothing which causes the solvent and any water to evaporate. The vaporized solvent and water is then removed from the drying portion of the machine and condensed. The PCE-water separator, which is connected to the back of the unit, takes the condensed liquid that contains PCE and water and allows the heavier PCE to settle to the bottom for reuse. The air scrubber (sniffer) extracts and cleans vapors from the other dry cleaning components and the air. These vapors also are condensed and the PCE and water separated.

In general, information provided by dry cleaner operators, inspections done by staff, and manufacturers' service manuals show that dry cleaning equipment is designed to discharge wastewater to the sewer. Figures 8 and 9 are schematics showing the two main types of wastewater discharges from dry cleaning equipment: liquid from the PCE-water separators and cooling water. Figure 10 is a schematic from one manufacturer's service manual that shows that wastewater should be discharged to the drain (11). This is typical of service manuals.



COIN-OP DRY TO DRY UNIT

Graphic From - Norge Sales Corporation, Service Instruction and Parts Catalog, 1961

Figure 10

The water from the PCE-water separators has been in direct contact with PCE. Water samples from separators at some cleaners have had such high concentrations of PCE that after the sample bottle sat for a day, solvent had separated out. As much as 30 percent of some samples has been pure solvent. PCE-water separator waste liquid has had PCE levels up to 1,119,300 ug/l (ppb), with an average of 151,800 ppb and median 64,000 ppb (Figure 11). Cooling water samples at dry cleaners have usually ranged from 3 to 70 ppb PCE, but some have been as high as 4,000 ppb (Figure 12).

EVIDENCE AND THEORY ON HOW PCE IS LEAVING THE SEWER LINES

Based on site inspections, the majority of the cleaners had only one discharge point and that was to the sewer. Because of these discharges, staff investigated sewer lines as a possible discharge point for PCE to the soils. Samples taken from these lines indicated that liquids or sludges with high concentrations of PCE are lying on the bottom of the sewer. Soil gas surveys

DRY CLEANERS SAMPLING RESULTS FROM CONDENSATE LIQUID

CLEANER	CITY	DATE	RESULT in ppb	UNIT
Busy Bee	Lodi	9/11/90	60,699	Reclaimer
Turlock Cleaners	Turlock	4/29/91	62,755	Cooker
Snow White	Turlock	1/26/89	140	Reclaimer
			56	Cooker
Durite Cleaners	Turlock	1/30/89	15,000	Sniffer & Reclaimer II
			150,000	Reclaimer I
Brite Cleaners	Turlock	5/11/89	66,000	Reclaimer
Southgate Norge	Sacramento	3/20/91	247,000	Sniffer & Reclaimer
Tillet Cleaners	Roseville	4/11/89	74,000	Reclaimer
Merced Laundry	Merced	11/29/88	130,000	Sniffer
Modesto Steam	Modesto	4/30/91	1,119,300	Reclaimer
			139,087	Cooker
			8,120	Chiller
			53,618	Recalimer
		Median	64,000	
		Average	151,800	

Figure 11

CONCENTRATION OF ORGANIC CHEMICALS IN COOLING WATER FROM DRY CLEANERS

DRY CLEANERS	CITY	DATE	RESULTS in ppb	
Busy Bee	Lodi	8/24/89	0.66	PCE
			2.1	TCE
			0.69	1.1-DCE
		8/28/90	1.2	PCE
			1	TCE
DuRite	Turlock	11/29/91	6.3	PCE
			4.7	PCE
			1.7	PCE
			5.3	PCE
Turlock	Turlock	5/21/90	0.8	PCE
			1.3	PCE
Bright	Turlock	5/11/89	2.7	PCE
Tillet	Roseville	11/30/88	67	PCE
			32	Chloroform
		2/10/89	1.1	PCE
			23	Chloroform
Deluxe	Roseville	2/26/89	0.8	PCE
			69	Chloroform
Elwood's	Modesto	4/30/91	14	PCE
Parkway	Merced	9/8/88	69	PCE
Simpson	Merced	9/8/88	38	PCE
Southgate Norge	Sacramento	1/12/89	28	PCE
Merced Laundry	Merced	11/29/89	4000	PCE

Figure 12

done by staff and by private consultants illustrate high PCE vapor concentrations along the sewer lines. Work done by the City of Merced shows that intact sewer lines can and have discharged PCE to the soil.

Below are descriptions of sampling done and our interpretation of the data. Following these descriptions is a section on the theories of how PCE escapes from the sewer pipes.

SOIL GAS SURVEYS

Soil gas surveys related to PCE in ground water have been done by Board staff in Sacramento, Lodi, Merced, Modesto, Stockton, Roseville and Turlock. Every place PCE molecules have exceeded 100,000 counts and monitoring wells have been installed, PCE levels in ground water exceeded the MCL. In most cases, the PCE concentration in ground water has exceeded 300 ppb, which is 60 times the MCL. Thus, this survey technique has been very successful.

Figures 13 through 16 are maps showing results of soil gas surveys from Turlock, Modesto, Lodi and Merced which illustrate that PCE vapors are higher along the sewer lines. The highest counts are usually near the cleaners, but the counts continue high from the sites down the sewer line.

Around several dry cleaners near Stockton, a private consultant performed a soil vapor survey for PCE. The consultant extracted a volume of air from the soils

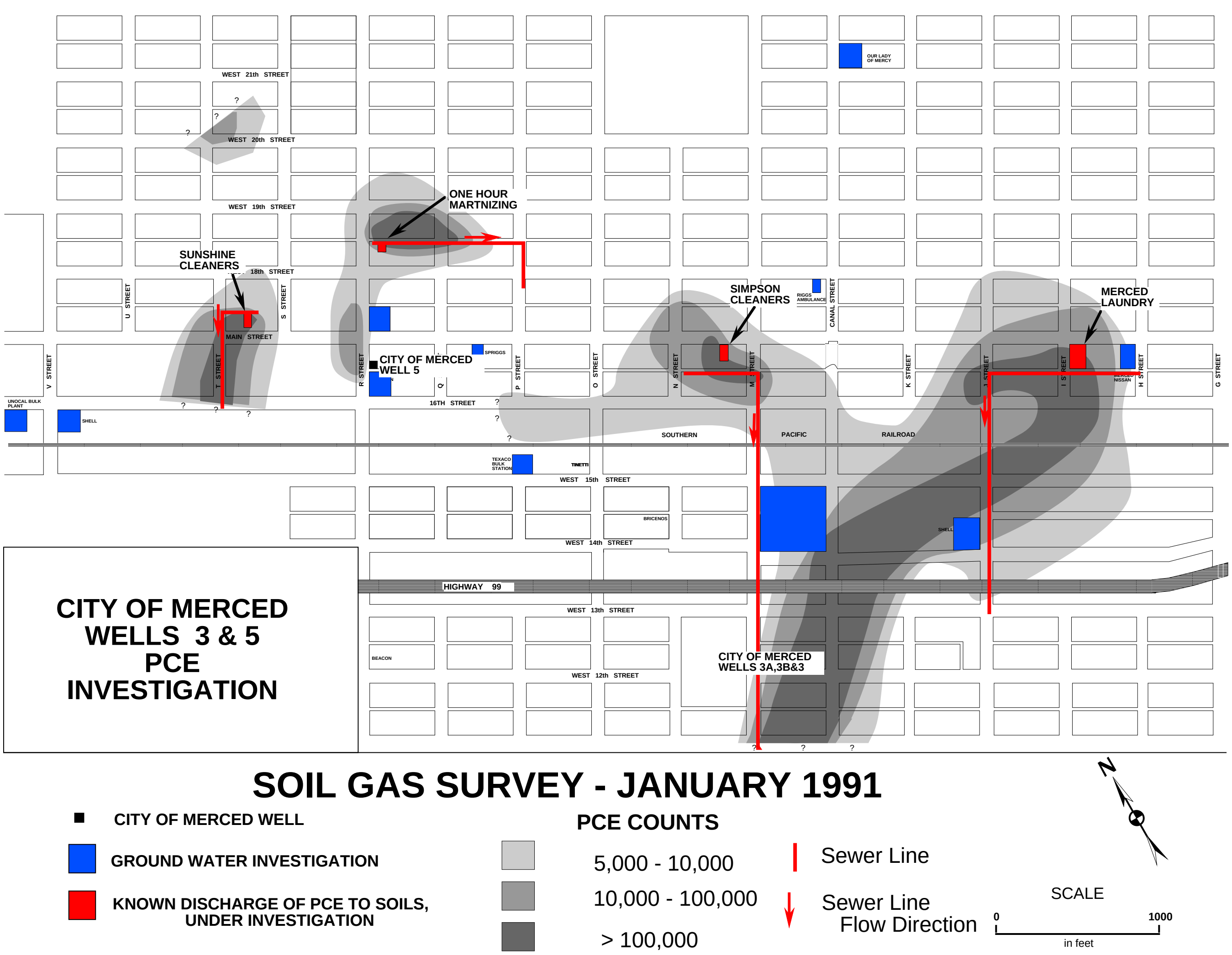


FIGURE 13

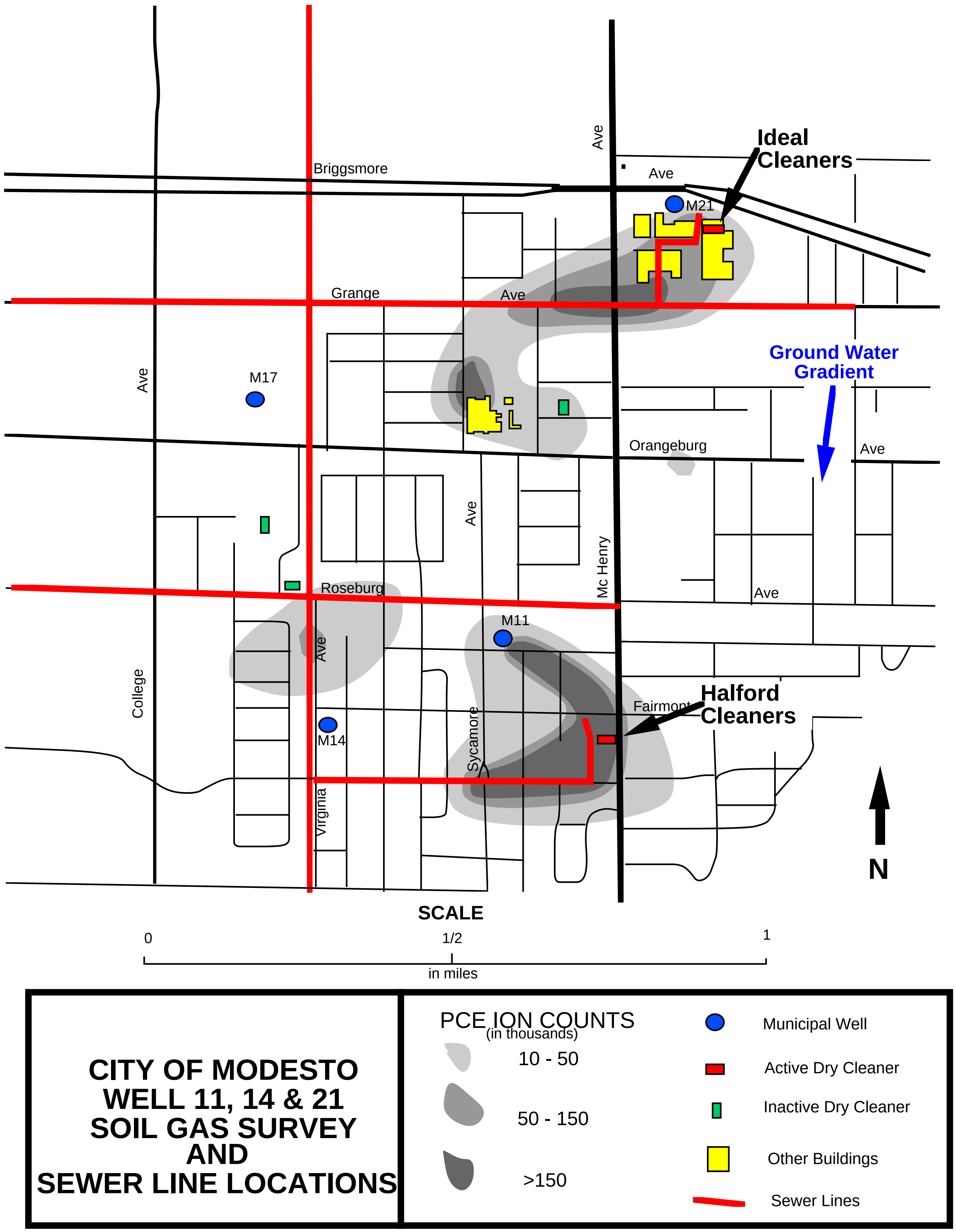

Ideal Cleaners
Briggsmore
Ave
Ave
M21
Grange
Ave
Ground Water Gradient
M17
Ave
Orangeburg
Ave
Ave
Mc Henry
Roseburg
Ave
M11
Ave
College
Fairmont
Halford Cleaners
M14
Sycamore
Virginia
N
SCALE
0
1/2
1
in miles
CITY OF MODESTO
WELL 11, 14 & 21
SOIL GAS SURVEY
AND
SEWER LINE LOCATIONS
PCE ION COUNTS
(in thousands)
10 - 50
50 - 150
>150
Municipal Well
Active Dry Cleaner
Inactive Dry Cleaner
Other Buildings
Sewer Lines

Figure 14

LODI

SEWER LINES

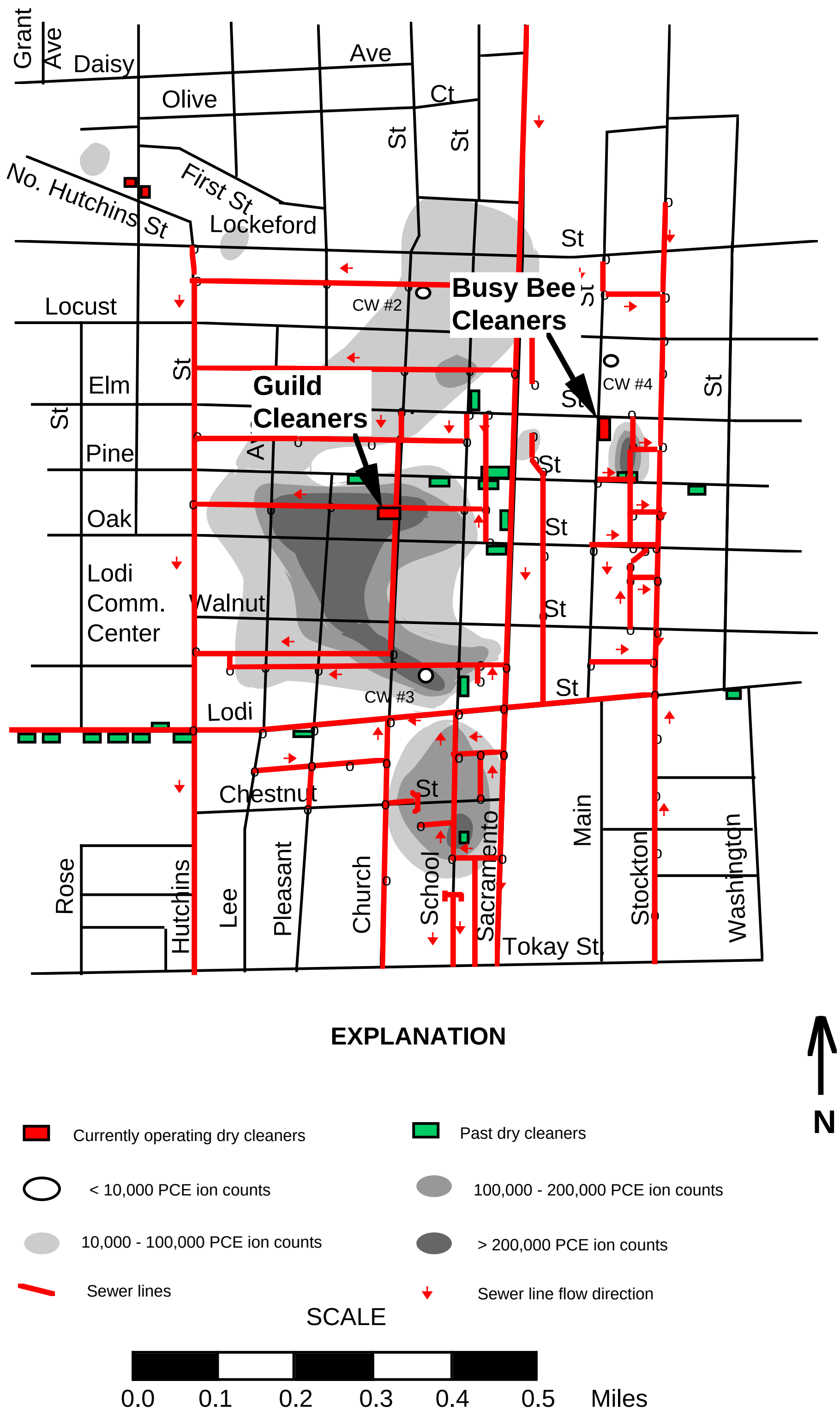


Figure 15

TURLOCK SOIL GAS SURVEY

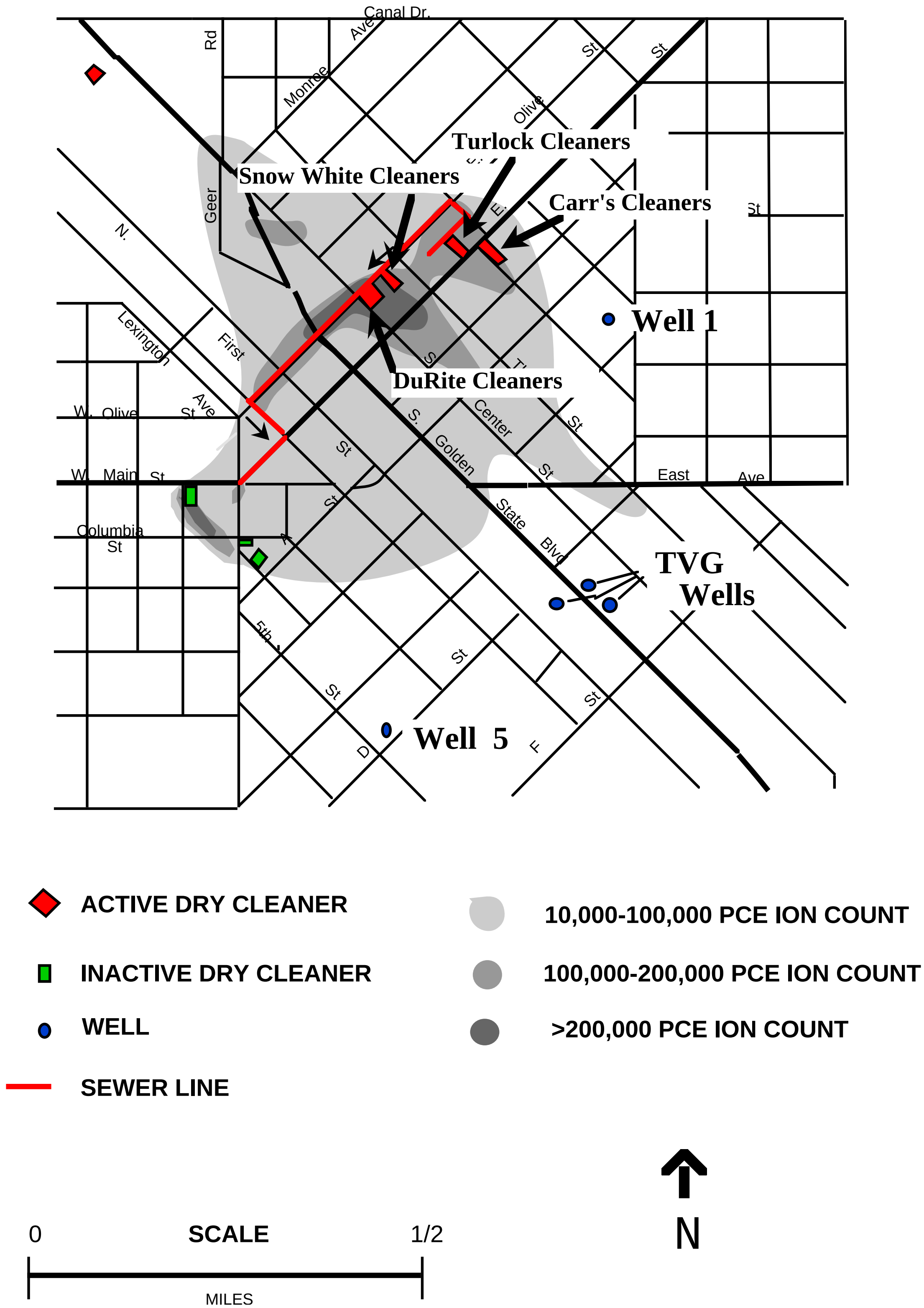


Figure 16

and ran the sample through a gas chromatograph. This survey also indicates high concentrations of PCE vapor along the sewer line (Figure 17). There are similar surveys done by other private consultants with the same results.

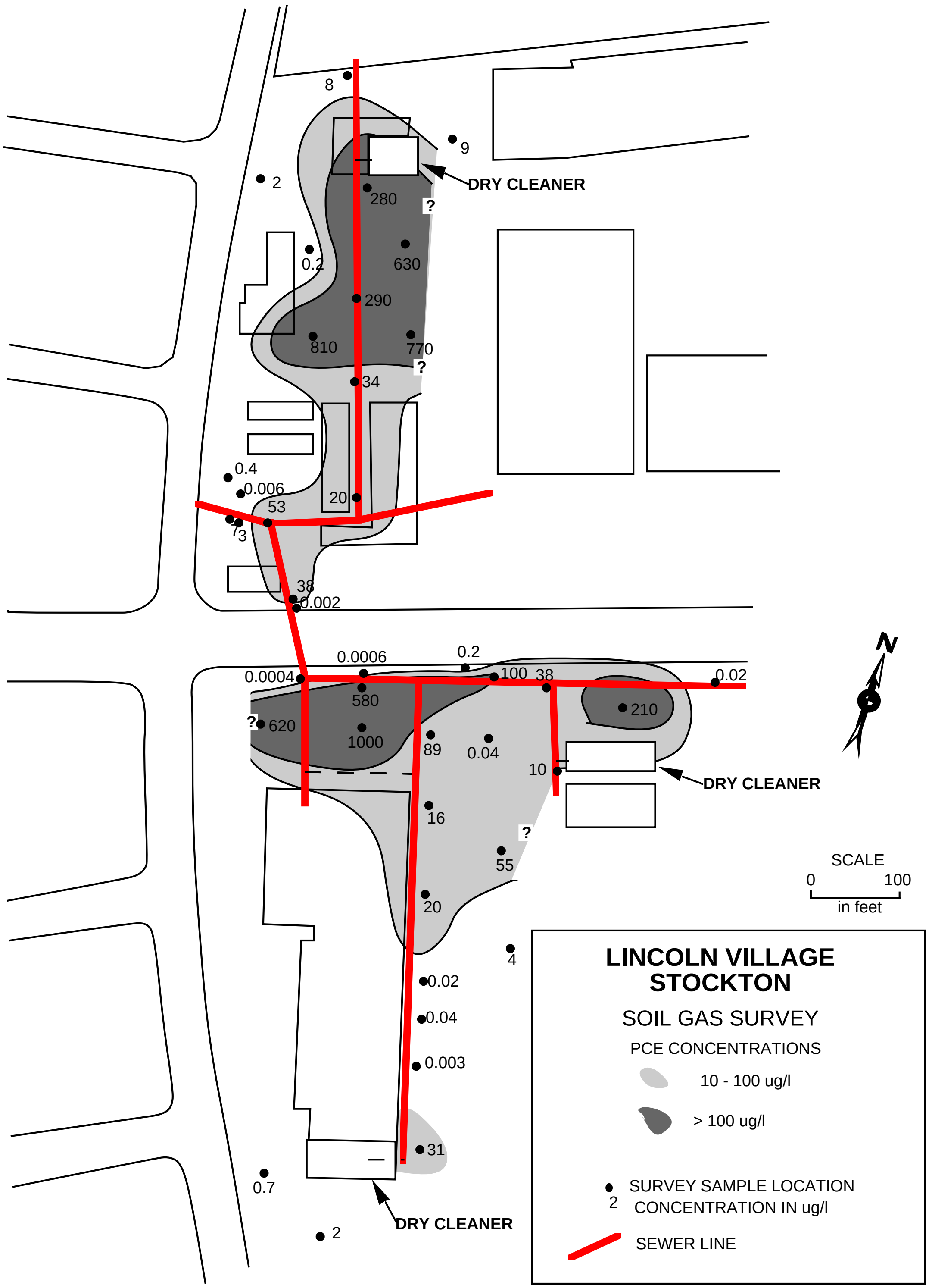


Figure 17

SEWER MAIN SAMPLING

Three samples are usually taken from the sewer: an upgradient, a downgradient and a flush sample. The upgradient (background) and downgradient samples are taken at the sewer access just above and below where the dry cleaner's sewer lateral enters the main (Figure 18). All samples are taken by placing a jar on a pole and scooping liquid into the jar. The liquid is then poured into volatile organic analysis (VOA) bottles and sent to a California certified lab for analysis. The flush sample is taken after stirring up the bottom sediment by adding large quantities of water (and sometimes running a ball down the line). The flush sample is taken at the downgradient sewer access, when an increase of flow is noted (Figure 18).

The concentration of PCE in the downgradient sample has always exceeded that in the upgradient sample, and in most cases PCE in the upgradient sample was not detected. When flush samples were taken, their PCE content almost always exceeded that in the downgradient sample. Since water is being added to the system, one would expect the PCE concentration to decrease in the flush sample because of dilution. Therefore, the increase indicates that PCE liquids or sludges are sitting on the bottom of the sewer line.

CITY OF MERCED

Between 12 January and 2 February 1989, the City of Merced conducted soil sampling near four dry cleaners. The City staff did a video scan of the sewer lines at each of the cleaners to check for possible leaks. After these scans, they drilled a soil boring adjacent to the sewer line downgradient of each facility where a problem was seen on the video tape. If the tape showed no problem, they drilled adjacent to the sewer line near the dry cleaner. In each boring they took several soil samples and had them analyzed for VOCs by EPA Method 8010. They also took soil vapor measurements using a Sensidyne-Gastec system (similar to Draeger tubes) with a detection limit of 400 ppb.

In addition to the City's work, each dry cleaning facility had a monitoring well (MW) drilled as required by staff. Soil samples were taken every five feet during drilling and analyzed for VOCs using EPA Method 8010. One ground water sample was taken from each well and analyzed for VOCs using EPA Method 601.

Parkway Cleaners

Figure l9 contains the data from the Parkway Cleaners site. The MW was drilled approximately 22 feet from Parkway's sewer lateral and 15 feet from the sewer main. Soil samples from the well boring had low levels of PCE (<5 ppb). The concentration of PCE in the ground water was 160 ppb.

The City's video scan of the sewer main showed no breaks in the clay pipe. Because of this, the City arbitrarily selected a soil boring site adjacent to the sewer line, six feet downgradient from Parkway Cleaners' sewer lateral. The PCE concentration in the soil sample in the City soil boring was 120 times

SEWER SAMPLING ADJACENT TO DRY CLEANERS

	Upgradient in ppb	Downgradient in ppb	Flush in ppb
MERCED			
Merced Laundry	-	180	-
One Hour Martinizing "R"	NF	110	23,000
One Hour Martinizing "G"	NF	730	96,000
Simpson Cleaners	-	-	6,300
Sunshine Cleaners	NF	-	167,000
Parkway Cleaners	NF	853	280,000
SACRAMENTO			
Southgate Norge Cleaners	NF	350	830
ROSEVILLE			
Deluxe Cleaners	-	120	260
Tillets Cleaners	NF	28	380
TURLOCK			
Carr's Cleaners	<0.5	14	2.5
Snow White Cleaners	1,800	3,800	220
Turlock Cleaners	NF	3,500	<25
Bright Cleaners	<0.5	0.6	23,000
Durite Cleaners	35	190	<5
LODI			
Busy Bee	NF	700	280,000
Woodlake Cleaners	-	620	210,000
Guild Cleaners	<0.5	24	<5
	Median	190	3,565
	Average	748	67,937

NF - NO FLOW

Figure 18

PARKWAY CLEANERS

MERCED

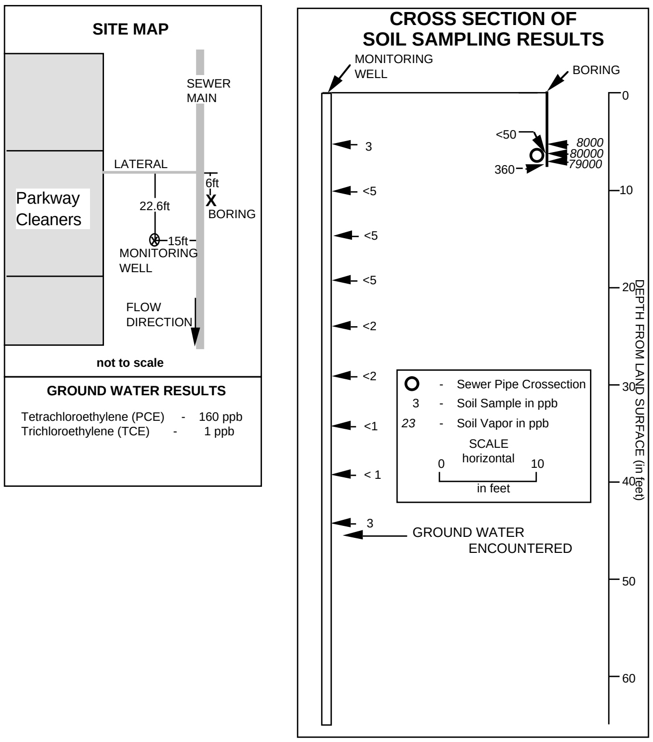


Figure 19

higher than was found in the MW. Also, soil vapor samples in the City boring contained up to 80,000 ppb PCE.

At this location the levels in the soil are much higher adjacent to the sewer line than in the MW. Also the data from the sampling adjacent to the sewer line indicate that PCE has moved from the line into the adjacent soils.

Simpson's C1eaners

Figure 20 illustrates the data from the Simpson's Cleaners site. Soil samples taken during the drilling of the MW at the southwest corner of the facility had PCE levels from non-detect to 71 ppb. The shallow ground water sample had 270 ppb PCE and also contained 29 ppb trichloroethylene (TCE), 65 ppb cis-1,2dichloroethene (DCE), two ppb trans-1,2-DCE, and 6 ppb 1,2-dichloroethane, all of which are breakdown

SIMPSON'S CLEANERS

MERCED

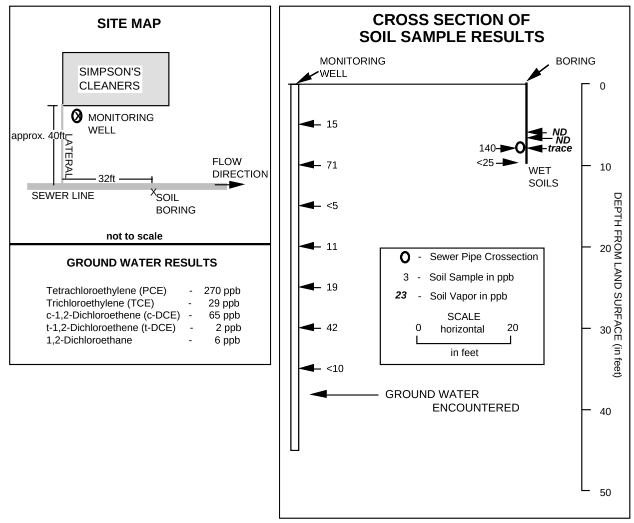


Figure 20

products of PCE. The MCL for TCE is 5 ppb and for DCE is 6 ppb.

The City's video scan of the clay sewer main adjacent to the cleaners showed a break at one of the joints. This break is approximately 40 feet downstream along the sewer line from the southeast corner of Simpson's Cleaners. While drilling alongside this joint the soil became very wet. One of the soil samples had 140 ppb PCE, higher than samples taken from the MW boring. The soil gas measurement readings were non-detect.

Again the soil sample adjacent to the sewer line contained higher PCE levels than samples taken from the MW boring. One probable reason the soil gas measurements were non-detect at the joint was the soils were very wet, which means the soil pores were probably full of water leaving no available room for the soil vapor.

Sunshine C1eaners

Figure 21 contains the data from the Sunshine Cleaners site. The MW was drilled near the northeast corner of the cleaners, 9.5 feet from its sewer lateral. The soil samples from the MW had PCE concentrations up to

SUNSHINE CLEANERS

MERCED

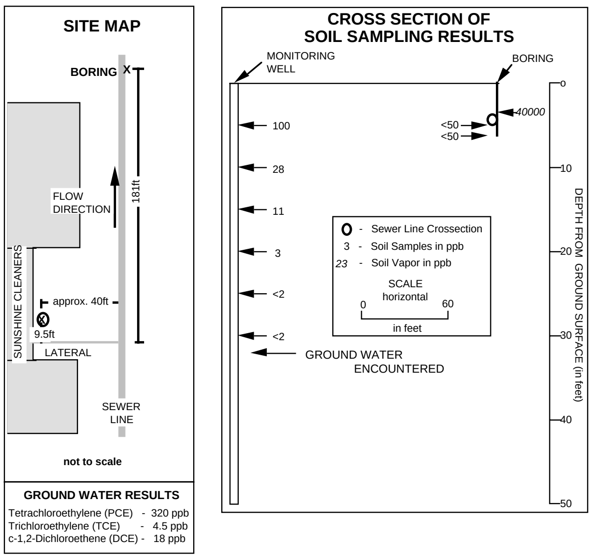


Figure 21

100 ppb. The ground water sample had 320 ppb PCE, 4.5 ppb TCE and 18 ppb DCE.

The City's video scan of the sewer line showed no breaks in the concrete sewer main. The City personnel chose a sag in the sewer main where the water pools for the location of the adjacent soil boring. This site was 181 feet downgradient of the cleaner's sewer lateral. PCE in the soil samples was nondetect, but the detection limit was high at 50 ppb. The Sensidyne-Gastec vapor system had a reading of 40,000 ppb in the boring.

The high levels detected by the Sensidyne-Gastec system indicates even at a distance of 181 feet downgradient from the dry cleaner, the concentration of PCE in the soil gas is significant. No comparison of soil samples between the MW and City's soil boring can be made because of the high detection limit from the City's samples.

One Hour Martinizing "R" Street

Figure 22 shows the data from the One Hour Martinizing "R" Street site. The MW was drilled eight feet northwest of the sewer line approximately 16 feet

ONE HOUR MARTNIZING

R STREET, MERCED

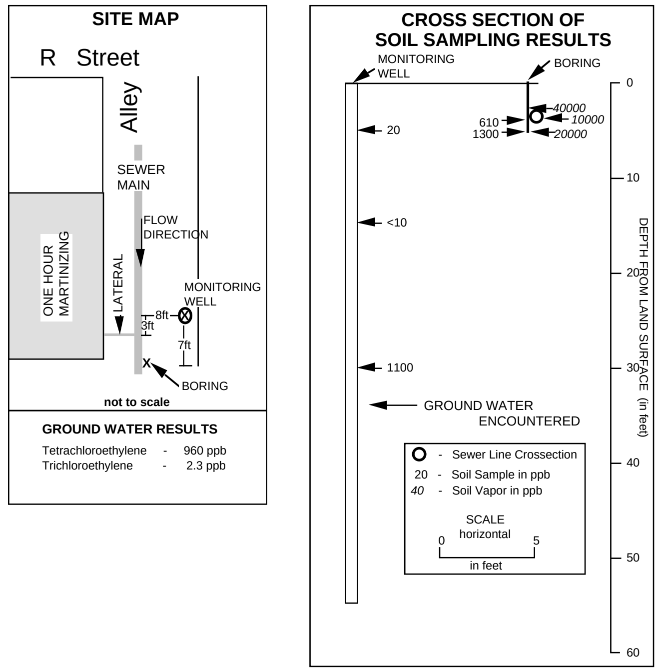


Figure 22

from the cleaner's northwest wall. PCE levels in the soil samples taken during drilling of the MW were low in the upper 20 feet ranging from nondetect to 20 ppb, but near the ground water a soil sample had 1,100 ppb PCE. The ground water sample had PCE and TCE with concentrations of 960 ppb and 2.3 ppb, respectively.

The City's video scan of the clay sewer line showed no breaks. The City personnel decided to drill adjacent to a bell joint four feet downgradient from where the cleaner's sewer lateral intersects the sewer main. Soil samples in this boring had PCE at 610 ppb (depth 461') and 1,300 ppb (depth 63"). The City took three Sensidyne-Gastec system measurements at the following depths from the surface: 361' (above the main), 461' (bottom side of pipe) and 631' (below the main), and the readings were 40,000 ppb, 10,000 ppb and 20,000 ppb, respectively.

Along the sewer main, the soil gas measurements and the soil samples had high levels of PCE, indicating that at this location the sewer main is discharging PCE.

THEORIES ON HOW PCE LEAKS FROM SEWER LINES

Based on staff field work and research, there are five likely methods by which PCE can penetrate the sewer line:

1. Through breaks or cracks in the sewer pipes
2. Through pipe joints and other connections
3. By leaching in liquid form directly through sewer lines into the vadose zone
4. By saturating the bottom of the sewer pipe with a high concentration of PCE-containing liquid and then PCE volatilizing from the outer edge of the pipe into the soils
5. By penetrating the sewer pipe as a gas

The literature indicates that all sewer lines leak to some extent. According to Metcalf and Eddy, Inc., "When designing for presently unsewered areas or relief of overtaxed existing sewers, allowance must be made for unavoidable infiltration..." (6). If the soils become saturated and liquids can infiltrate, then a conclusion can be made that liquids on the inside of the pipe can exfiltrate when soils are not saturated.

Below is a brief description of the five methods.

Methods 1 and 2

Methods 1 and 2 are similar in that leakage of liquid is caused by a failure of the sewer pipe system. The failure could be catastrophic, causing large volumes of liquids to leave the system, or could consist of many small leaks causing constant smaller flow. These discharged liquids then would move down through the vadose zone to the ground water. Methods 1 and 2 also apply to PCE in vapor form which can move easily through breaks, cracks, joints, and other connections.

Many of the sewer lines have low spots in which liquids accumulate. These low spots are caused by settlement or poor construction which causes the sewer line to bend. Sewer pipes are brittle, so when the line bends, fractures are likely to occur, increasing the leakage of the pipe. Since PCE is heavier than water (1.63 times the weight of water at 20°C), it tends to collect in these low spots and then flow through the pipe fractures into the vadose zone.

At pipe joints and other connections, PCE can move out of the sewer as liquid or gas. Also, as the pipes shift after installation, they could separate at the joints, allowing PCE to discharge even more easily to the vadose zone. Current gasket technology and reduction in leakage factors of pipes by the industry has reduced discharges at this point. But most commercial and retail districts in the cities of the Central Valley have pipes that predate this technology.

Method 3

By this method, PCE-containing wastewater or PCE liquid penetrates a sewer pipe without any breaks. In this case liquid leaves the pipe and enters the vadose zone (Figure 23). Sewer pipe is not impermeable to water or PCE. When liquid collects in a low spot of the sewer pipe, it cause an increase in the hydraulic head in the line. This extra head provides a larger driving force downward through the pipe.

From sewer sampling we know that PCE-containing sludges and / or liquids collect on the bottom of the sewer line. Video taping of sewer mains have shown that almost all lines have low points where liquids and sludges collect. Because PCE is heavier than water and is attracted to organic matter, it would have a tendency to collect in these low spots. Also, PCE viscosity is less than that of water (0.9 for PCE versus 1 for water), making it flow easier through a pipe wall than water. This makes the pipe more permeable for PCE.

Method 4

This is similar to Method 3 except that the hydraulic head in the pipe is not large enough to force liquid

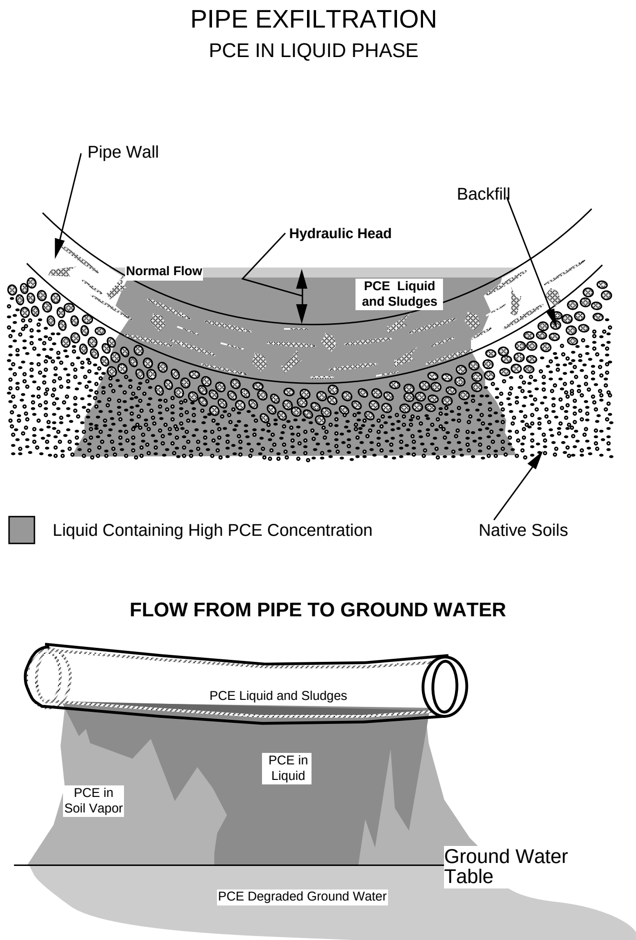


Figure 23

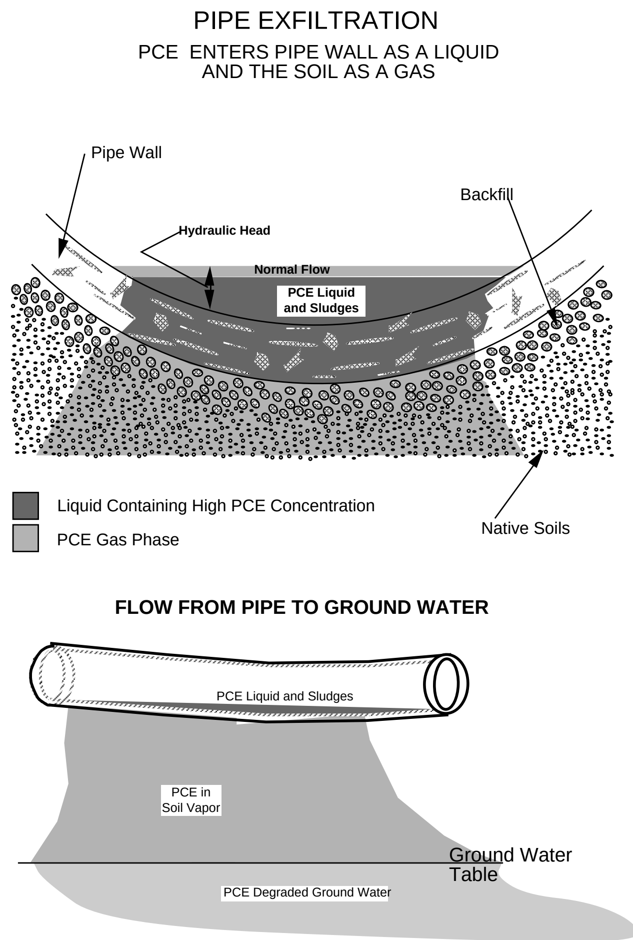


Figure 24

into the vadose zone. In this method, the pipe walls still have a high concentration of PCE-containing liquids (Figure 24). Being volatile, PCE turns into a gas at the liquid-soil vapor interface at the outer edge of the pipe. Since the vapor density of PCE is 5.83 times greater than air, the PCE gas in soil vapor would sink towards ground water, causing ground water degradation.

Method 5

In this method, PCE volatilizes inside the pipe and moves as a gas through the sewer pipe wall (Figure 25). The piping material is not designed to contain gas. The concentration of PCE gas in the pipe is greater than in the surrounding soils causing a concentration gradient. This causes a dispersion through the sewer pipe to the less concentrated area.

Another reason gas will penetrate the pipe is due to pressure. The gasses inside the pipe may increase the pressure above atmospheric. This would cause a pressure gradient from higher pressure in the pipe to lower pressure in the vadose zone. The gradient would force PCE gas into the vadose zone. As described above, PCE gas is heavier than air and so would tend to sink towards ground water.

Summary of Methods

Methods 3, 4 and 5 probably occur in all piping. They would cause a constant influx of PCE into the vadose zone downgradient from a dry cleaner. This liquid containing PCE or PCE in gas form then moves downward and eventually degrades the ground water.

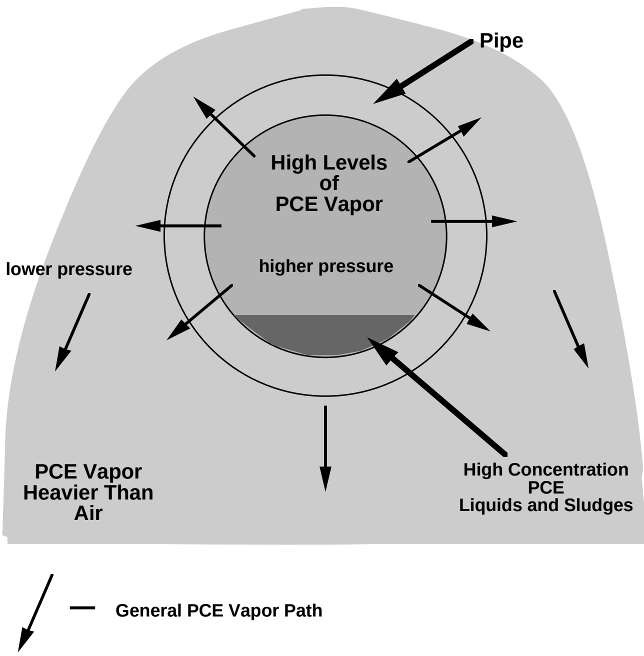


Figure 25

Leakage through small fractures in Method 1 is likely in most of these brittle pipes as they settle. Small fractures occur causing an increase in the permeability of the pipe. This would cause a constant leakage. These small fractures cannot be seen by video taping the inside of the sewer pipe.

CONCLUSION AND RECOMMENDATION

The Board has identified the potential sources of PCE in 21 wells, and 20 of those are affected by one or more dry cleaners. Because of the location of the remaining wells (i.e. in residential and retail areas), the staff expects that the majority of the wells with PCE will have dry cleaners as the source.

The evidence from five years of investigations shows PCE has been found in the ground water and vadose zone near dry cleaners throughout the Central Valley. In most dry cleaners, the only liquid discharge of PCE-containing wastewater is to the sewer line. The substantial evidence collected by dry cleaners' consultants, muncipalities, and staff, shows or demonstrates that PCE has discharged from the sewer lines directly into the vadose zone. The PCE then migrates through the unsaturated subsurface to the ground water. Based on information collected from operators of dry cleaners, dry cleaning literature and staff site inspections, the dry cleaning equipment at most facilities is designed to discharge to sewer lines.

Presently, all the dry cleaners investigated in a well source investigation have been identified as sources of PCE in the ground water. All of the dry cleaners that have drilled monitoring wells have had shallow ground water contamination well above the MCL of 5 ppb set by the State Department of Health Services (monitoring well levels range from 120 - 32,000 ppb). With approximately 285 dry cleaners in the cities of Sacramento, Chico, Lodi, Modesto, Turlock, Stockton and Merced, and numerous more in other cities, staff expects that many more wells will be degraded by PCE in the future.

In conclusion, the PCE discharges from dry cleaners to sewer laterals, then to sewer systems and then to soils have caused soil and ground water degradation.

Two major issues need to be resolved on the dry cleaners' PCE discharges:

1. Who should define the extent of ground water degradation and do the cleanup?

2. How do we prevent further degradation of the ground water by dry cleaners?

Ground water cleanup is required so that water supply agencies can continue to provide safe water. Deciding who should investigate and cleanup ground water is a complex political/legal issue since the PCE discharges from the dry cleaners were all approved, standard practice and those from the sewers were unsuspected. Because most dry cleaners are small businesses, which may not have the financial capability to define the contamination plume and conduct cleanup, other resources may be needed. A statewide cleanup fund may be appropiate. If no one else cleans up the ground water, water supply agencies will have to do it by default.

To prevent further degradation, the most obvious solutions are to set a limit for PCE discharge levels to the sewer line that will protect ground water or to disallow all future discharges to the sewers from dry cleaning. Two possible ways to accomplish this:

1. State legislation to set limits or prohibit discharge of PCE from dry cleaning facilities to sewer systems.

2. City ordinances to set limits or prohibit any discharge of PCE from a dry cleaning facility to the sewer line.

Since dry cleaners exist throughout the state a state-wide policies are needed.

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EXHIBIT C

EXHIBIT C

SOURCE AREAS IN NORTHERN NEIGHBORHOOD AND NEAR CHEVRON SITE

1) Neighborhood Area

a) Source Area Near the Intersection of Shirley Drive and Cynthia Drive

There was a release of CVOCs from the Central Contra Costa Sanitary District ("CCCSD") sewer near the intersection of Shirley Drive and Cynthia Drive. The release source is identified by soil vapor data obtained during investigations completed by Gregory Village Partners, L.P. (see Erler & Kalinowski, Inc.'s *Off-Site Property-Specific Soil Vapor and Sub-Slab Vapor Investigation Repor*t, dated 19 January 2011). The soil vapor results show that the concentrations of PCE are high in the vicinity of Shirley Drive and Cynthia Drive, near manhole M54, i.e., MSVP-6 = 52,100 micrograms per cubic meter ("ug/m^3"), SVP-15 = 35,000 ug/m^3, SVP-16 = 38,000 ug/m^3, and SVP-25 = 21,000 ug/m^3, and that this area is distinguished from areas of lower concentrations that surround it (Exhibit 8 attached).

Importantly, soil vapor samples taken on Cynthia Drive in a line perpendicular to the sewer line demonstrate that the locations of highest vapor concentration are closest to the sewer with diminishing concentrations moving away from the sewer (Exhibit 9 attached). The separation in areas of higher CVOCs in soil vapor concentration between the Shirley Drive / Cynthia Drive area and the P&K Cleaner Site, and the diminishing concentrations of CVOCs in soil vapor with distance from the sewer, both point to the existence of a release from the CCCSD sewer in this area which explains the detected vapor profile.

<u>b) Source Area Near Manhole M46</u>

Both groundwater and soil vapor data establish that there is a source of PCE and other CVOCs in the vicinity of CCCSD manhole M46. The sanitary sewer that enters manhole M46 from the south received waste from both the Chevron Site and the P&K Cleaner Site. Also, this sewer is located at or below the water table and thus any release of CVOCs from it would result in detecting CVOCS at the highest levels in soil vapor nearest to the water table. Of the three soil vapor sample depths at MSVP-17, which is located near manhole M46, the soil vapor sample nearest to the sewer and to the water table had the highest PCE concentration. PCE was detected in a grab groundwater sample at a concentration of nearly 2,000 micrograms per liter ("ug/L"), which is the highest PCE concentration measured to date in groundwater north of the P&K Cleaner Site. Lower PCE and CVOC concentrations near Doray Drive, i.e., between the P&K Cleaner Site and the manhole M46 area, indicate that a separate release or contribution of PCE to groundwater occurred near that manhole (Exhibit 2 attached). In addition, PCE concentrations in soil vapor are higher in the vicinity of manhole M46 (extending to the Shirley Drive and Cynthia Drive area) than in the area between manhole M46 and the P&K Cleaner Site, i.e., within the Doray Drive area (Exhibit 8 attached). The best explanation for the detections of CVOCS near M46 is that there was a CVOC release from the sewer in that area.

2) Linda Drive Adjacent to Chevron Site

a) Source in Linda Drive Near the Sewer

The highest concentration of PCE in groundwater anywhere at the Chevron Site is in Linda Drive near the CCCSD sewer at former monitoring well EA-3 located cross-gradient from the Chevron Site. Chevron's investigations show very high concentrations of PCE and other CVOCs in soil, soil vapor, and groundwater on the Chevron Site and in Linda Drive near the sewer line (*Report of Investigation* by EA Engineering, Science and Technology, Inc., 3 February 1989, and *Additional Site Investigation Report and Site Conceptual Model* by Conestoga-Rovers & Associates, Inc., 2 March 2012). At monitoring well EA-3 in Linda Drive, Chevron detected PCE in soil at 328 micrograms per kilogram from a sample that would have been collected from above the groundwater table and thus resulted from sewer leakage. PCE was detected in groundwater at 5,000 ug/L (Exhibit 10 attached), the highest concentration detected anywhere at Sites 1 and 2, at the same location. A 1977 CCCSD sewer inspection report for Linda Drive describes the sewer as "in very poor shape has lots of cracks," but the replacement apparently did not occur until 10 years later (see Firestone 7/3/2012 letter to B. Wolfe (see Exhibit 23 to that letter)).

Exhibit 8

Separate Areas of High PCE Concentrations in Soil Vapor Indicate Separate Releases

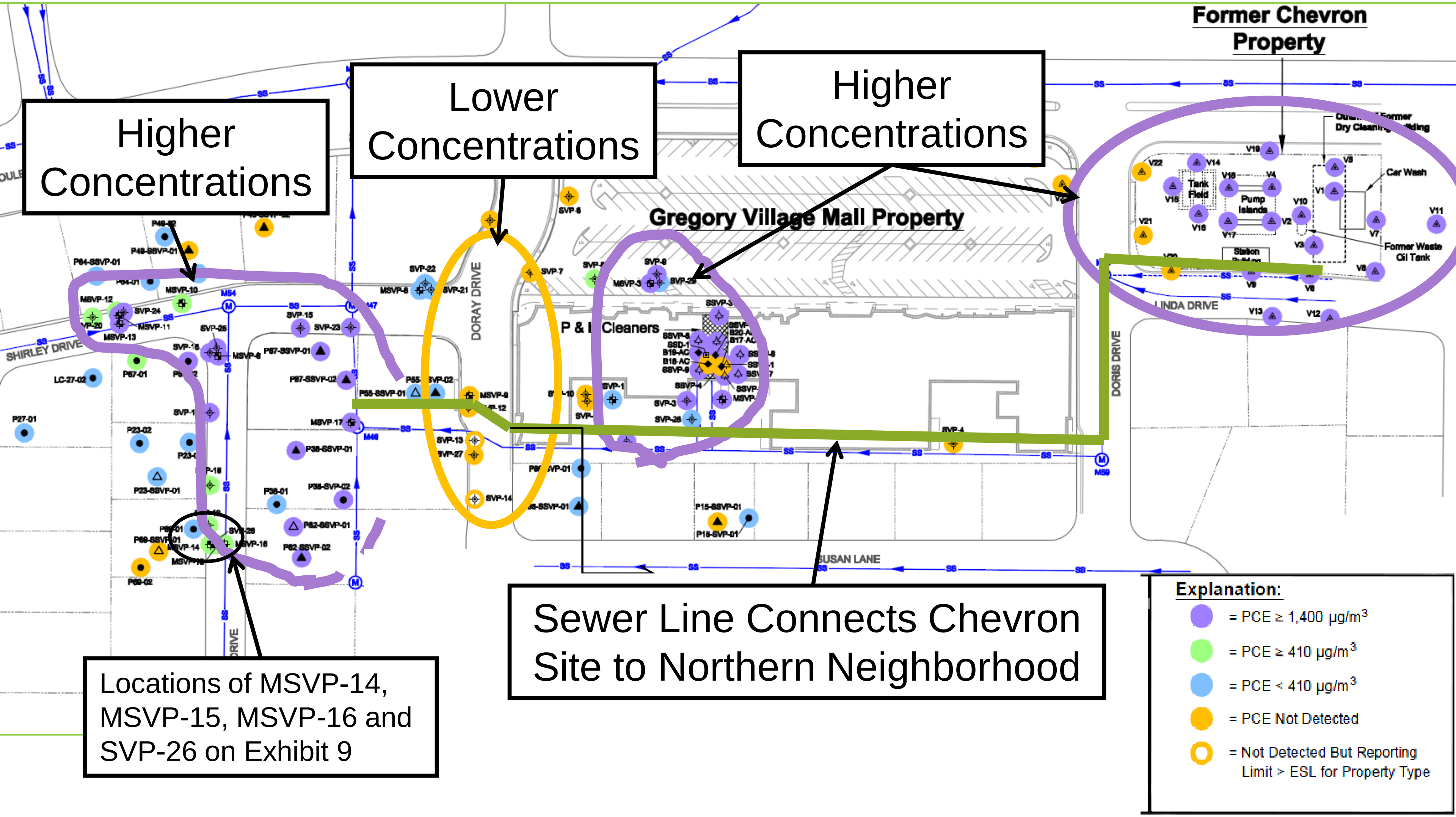


Exhibit 9

CVOC Concentrations In Soil Vapor are Highest Near the Sewer

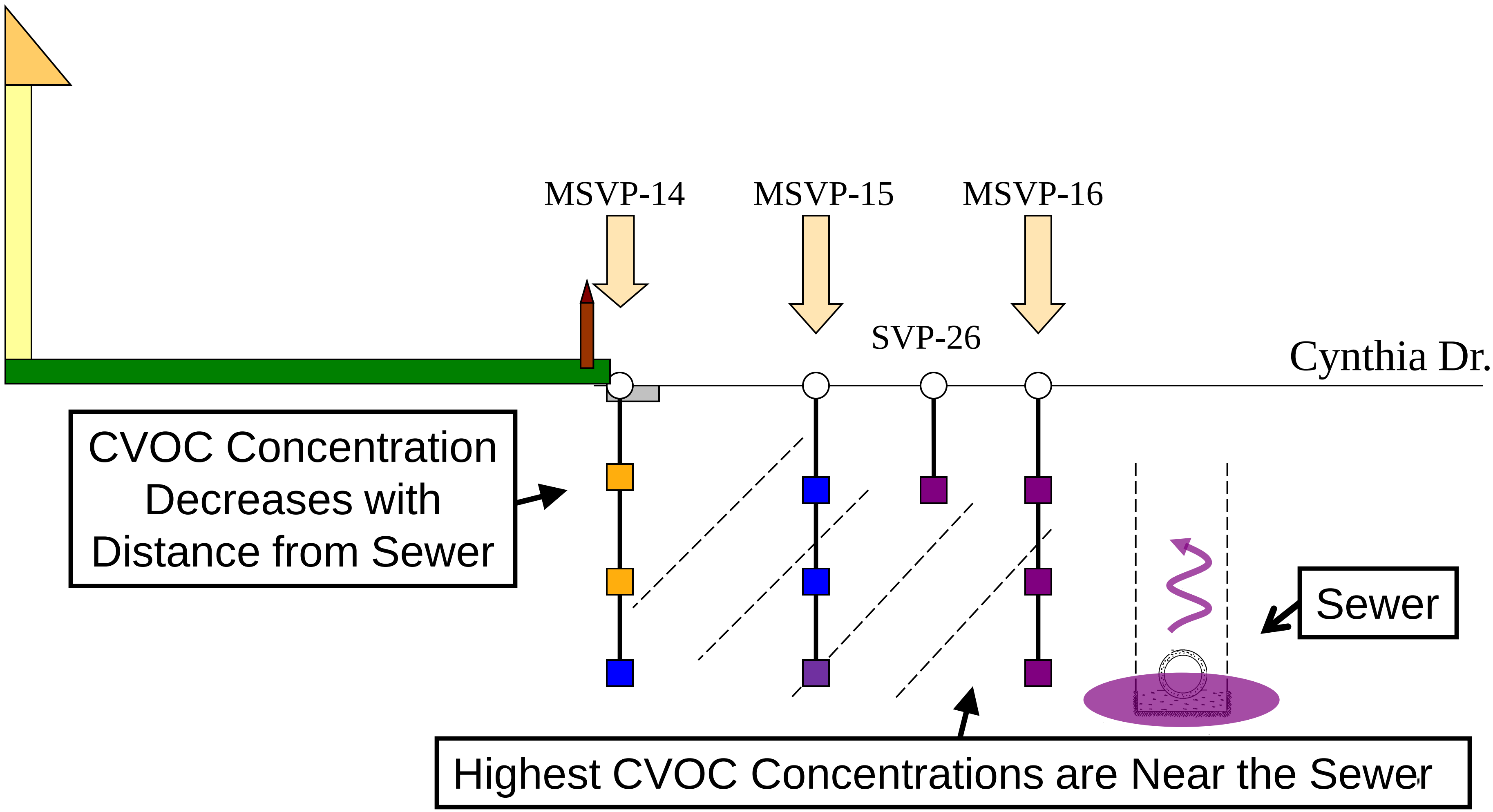
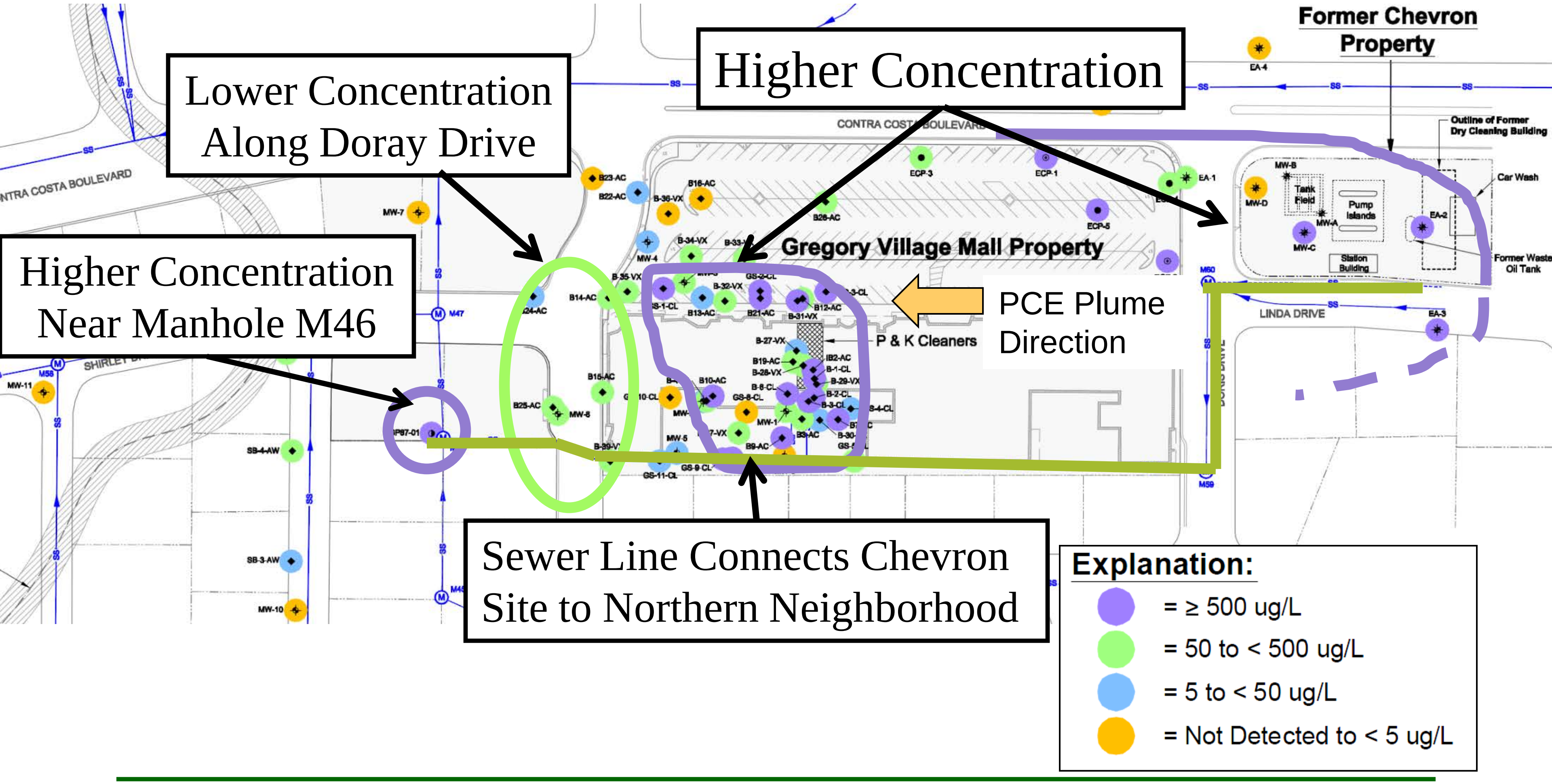
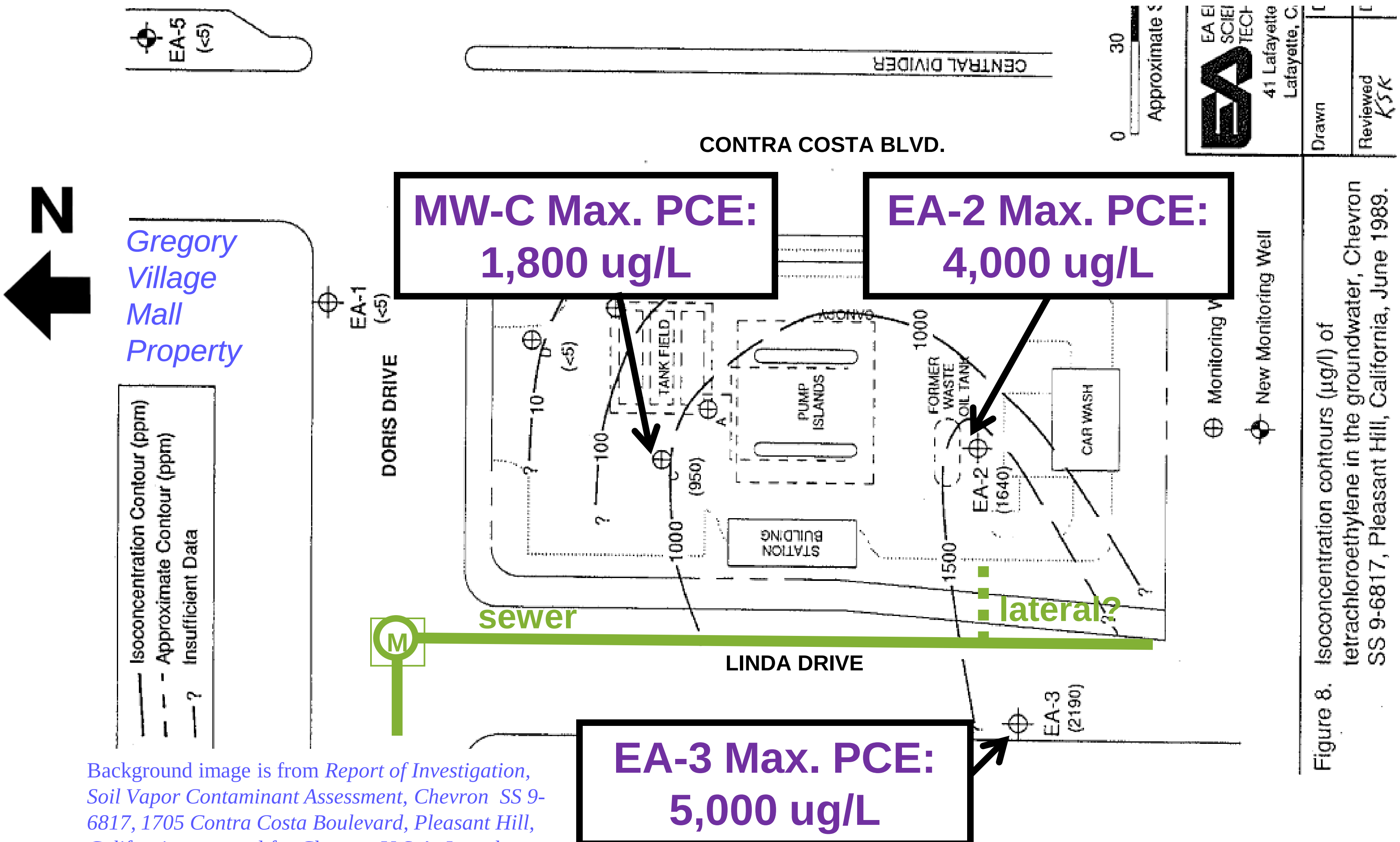


Exhibit 2

Separate Areas of High PCE Concentrations in Groundwater Indicate Separate Releases



PCE in Groundwater in Linda Drive Cross-Gradient from Chevron Site Indicative of a Sewer Leak



Background image is from *Report of Investigation, Soil Vapor Contaminant Assessment, Chevron SS 9-6817, 1705 Contra Costa Boulevard, Pleasant Hill, California*, prepared for Chevron U.S.A, Inc., by EA Engineering, Science, and Technology, Inc., dated 9 August 1989.

EXHIBIT D

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Bonneau Dickson, P.E.

Consulting Sanitary Engineer

DECLARATION OF BONNEAU DICKSON, PE

I, BONNEAU DICKSON, P.E., do declare and state as follows:

1. I am currently a Registered Professional Engineer in the State of California in the area of Civil Engineering. I have over 40 years of experience in the field of Sanitary Engineering. I have participated in the design and/or construction management of approximately 300 water, wastewater and stormwater projects, ranging in size from a single septic tank or well to a 120 MGD pure oxygen wastewater treatment plant and I was the project manager on many of these projects. I have served as a forensic technical consultant, expert witness or claims analyst on over 100 legal cases. Approximately 50 of my cases involved sanitary sewer overflows (SSOs) and approximately ten of my cases have involved PCE contamination.

2. I have a Bachelor of Science Degree in Civil Engineering and a Master of Science Degree in Sanitary Engineering from the Georgia Institute of Technology. I also have a Master of Arts Degree in Sanitary Engineering from Harvard University and a Master of Business Administration from the Harvard Business School. I have been employed by several engineering firms in various engineering capacities. I have been self-employed as a consulting sanitary engineer since 1993.

3. I am a member of the:

Water Environment Federation.
California Water Environment Association.
American Water Works Association.
WateReuse.
Pipe Users Group Of Northern California.
National Onsite Wastewater Association.
California Onsite Wastewater Association.

4. After being retained as an expert consultant in this matter, I have reviewed, among other things, the following documents:

"Off-Site Property-Specific Soil Vapor and Sub-Slab Vapor Investigation Report", Erler & Kalinowski, 1/19/2011.

"Updated Conceptual Site Model For Gregory Village", PowerPoint presentation to the San Francisco Bay Regional Board by Erler & Kalinowski, 2/17/2011.

The letter from Edward A Firestone, Esq. to Bruce Wolfe, Executive Director of the San Francisco Bay Regional Water Quality Control Board, 7/3/2012.

The letter from Leah S. Goldberg, Esq. of Meyers/Nave to Bruce Wolfe, Executive Director of the San Francisco Bay Regional Water Quality Control Board, dated 8/10/2012, responding to Ed Firestone's letter of 7/3/2012.

The letter from Edward A. Firestone, Esq. to Bruce Wolfe, Executive Director of the San Francisco Regional Water Quality Control Board, dated 12/8/2012, responding to Ms. Goldberg's letter of 8/10/2012.

The letter from Mary Haber, Esq. of Gregory Village Partners, L. P. to Bruce Wolfe, Executive Director of the San Francisco Regional Water Quality Control Board, dated 5/28/2013, responding to specific questions posed by the Regional Board.

The letter from Tim Potter of the Central Contra Costa Sanitary District (CCCSD) to Bruce Wolfe of the San Francisco Regional Water Quality Control Board, dated 5/28/2013, responding to specific questions posed by the Regional Board in a letter dated 2/25/2013.

The letter from Curtis W. Swanson, of the Central Contra Costa Sanitary District (CCCSD) to Chuck Headlee of the San Francisco Regional Water Quality Control Board, dated 12/18/2013, responding to specific questions posed by the Regional Board.

The San Francisco Regional Water Quality Control Board Tentative Orders, Self Monitoring Plan, and Cleanup Team Staff Report, July 2, 2014.

"The Evolution Of Jointing Vitrified Clay Pipe", Evans, Jack and Spence, Marlene N., Advances in Underground Pipeline Engineering, Pipeline Division, ASCE/Madison, WI/ August 27-29, 1985.

"Dry Cleaners--A Major Source Of PCE In Ground Water", Victor Izzo, Regional Water Quality Control Board, Central Valley Region, CA, March, 1992.

5. Based upon my experience and my review of documents in this matter, I have developed the following opinions:

LIST OF OPINIONS

Opinion 1. Gravity sewers never were and still are not designed or constructed to be free of leaks.

Opinion 2. Immediately after the sewers were installed in the area of the Gregory Village site and the Chevron site ("sites"), it is likely that the sewer lines sagged and the joints failed.

Opinion 3. The sewers in and around the sites are certain to have had significant infiltration of groundwater and exfiltration of waste from inside the sewers beginning from the time they were built through this day.

Opinion 4. The design and installation of the CCCSD sanitary system in the area of the two sites makes sewer maintenance and sewer cleaning difficult.

Opinion 5. The sanitary sewer industry generally accepts as true the mechanisms described in the Izzo Report relating to the release of PCE from sewer lines.

Opinion 6. The CCCSD operation and maintenance ("O&M") program always was and still is designed to keep the wastewater flowing through the sewers but not to prevent leaks from the sewer system, unless the leaks are significant or catastrophic.

Opinion 7. Varying flows of waste due to minor or major blockages in the CCCSD sewer system could have forced chlorinated volatile organic compounds (CVOCs), either in a pure or dissolved state, upstream into other branches of the sewer system.

Opinion 8. Vapor in the sewer lines, including PCE vapor, can move preferentially upstream in sewers and/or in the backfill around the sewers.

OPINION DETAILS

Opinion 1. Gravity sewers never were and still are not designed or constructed to be free of leaks.

The evidence I have reviewed indicates that the CCCSD sewers in the vicinity of 1643 Contra Costa Boulevard, Pleasant Hill, CA were built no later than the early 1950s and that they are mostly made of vitrified clay pipe ("VCP"). With the exception of a segment in Linda Drive and a segment across Doray Drive, the current configuration of the sewer system has not changed since it was originally built. The configuration of the sewer system and the manhole (MH) numbering system are shown in Exhibit i of this declaration, which was Exhibit 7 of the Firestone 7/3/12 letter.

Leakage problems from sewers that were built with vitrified clay pipe (VCP) in the 1940s-50s are well known among cities and sewerage agencies. The joints of the sewer therefore are likely to be cement mortar or a poured bituminous material, both of which tend to be brittle. See Exhibits 8, 9 and 10 to the Firestone 7/3/12 letter attached here as Exhibits ii, iii, and iv. This type of joint frequently breaks if there is any movement, such as from an earthquake or the passing of a heavy vehicle. Moreover, 8-inch clay pipe usually was furnished in lengths of 3-feet in the 1940s and 1950s, so there are many joints.

Problems with VCP pipes during the 1940s and 1950s are discussed in "The Evolution Of Jointing Vitrified Clay Pipe", Evans, Jack and Spence, Marlene N., Proceedings, Advances In Underground Pipeline Engineering, Pipeline Division, ASCE/Madison, WI/August 27-29, 1985, which is included as Exhibit v of this declaration. At least one of the authors of this article worked for a manufacturer of clay pipes. The article obviously was intended to tout the virtues of VCP, but the discussion of the problems with earlier jointing methods and materials is revealing.

The article discusses that little attention was paid to leakage in sewers until after World War II. On the fourth page, the article says, "Early studies of sewers found problems of infiltration to be widespread. The difficulties and expense encountered with the treatment of this extraneous flow into sewer systems lent a bad name to vitrified clay pipe." On the same page, it is noted that the first ASTM specification for VCP joints with resilient properties was not issued until 1958. (See the underlining). Elastomeric joints for VCP did not become available in California until around 1965. Although the writers were discussing “infiltration”, obviously if water can enter the sewer through the pipe from the outside, water and CVOCs can leave the pipe as “exfiltration”.

Opinion 2. Immediately after the sewers were installed in the area of the Gregory Village site and the Chevron site (“sites”), it is likely that the sewer lines sagged and the joints failed.

Beginning in the 1950s when the sewers were installed, defects and failures in the sewer system were likely similar to the defects and failures reported by CCCSD during the period of 1994 to 2014.

While it is true that sewer systems do tend to deteriorate over time, it is likely that many of the defects that were observed in recent years also existed much earlier.

It is well known in geotechnical engineering that most of the settlement of re-compacted soil takes place in the first year after construction. As discussed above, the type of joints used on VCP sewers during the era when the sewers were built were brittle and would crack and leak if there was the slightest movement of the pipes. Thus it is likely that many of the joints opened very shortly after the initial construction. It is also likely that sags developed shortly after the initial construction.

Moreover, tree roots very rapidly search out sewer pipes as a source of water and nutrients. In many sewer systems, it is necessary to cut out or chemically treat tree roots every two to three years. Thus it is likely that there was significant root intrusion into the pipes within a few years after they were initially laid.

Opinion 3. The sewers in and around the sites are certain to have had significant infiltration of groundwater and exfiltration of waste from inside the sewers beginning from the time they were built through this day.

Factors that would have caused the sewers around the site to leak include: a high leakage allowance at the time of installation; the fact that the sewers were made of vitrified clay pipes (VCP), which comes in short lengths and thus has numerous joints; the brittleness of VCP; the requirement that the clay pipes be unglazed, which allows vapor to pass through the walls more easily than for glazed pipe; and the poor gasketing materials. These factors are summarized well starting on Page 5 of the Firestone 7/3/12 letter. Exhibit ii of this declaration (Exhibit 8 to the Firestone 7/3/2012 letter) presents CCCSD sewer specifications from around 1950 that allowed an exfiltration rate of up to 1,400 gallons per day per inch of diameter per mile. Later versions of the CCCSD specifications also included exfiltration and/or infiltration tolerances, although at lesser rates than the earlier specifications.

To this day, the latest version of the CCCSD specifications (the 2011 Edition) allows some leakage into (and out of) the sewers.

For example, in CCCSD's current specifications, the last paragraph on Page 32, section 4-01 B., (Design Standards) discusses that a groundwater infiltration (GWI) rate of 170 gpd/acre shall be used in estimating the wastewater flow rate for design. Obviously this means that even new sewers are expected to leak. Section 15.02730 3.4 of the current CCCSD specifications discusses air and hydrostatic testing of sewers. Sewers larger than 17-inches in diameter must be tested hydrostatically, i.e. by how much exfiltration occurs.

CCCSD reduced the exfiltration and/or infiltration tolerances over the years, likely due to the infiltration of large volumes of groundwater and stormwater that adversely impacted the wastewater treatment plant.

The topography of the site is relatively flat, so the slopes of the sewers were small to minimize the depths of the sewers. As discussed in the Firestone 7/3/2012 letter, the slopes of the sewers are less than the current standard of 0.0077.

The flat slopes result in low velocities and long residence time in the sewers. The low velocities allow solids to strand, creating small dams. The pools behind these small dams allow undissolved PCE to collect at the bottoms of the pools because undissolved PCE is denser than water. Where there are leaks at the bottoms of the pipes, PCE will leak out even more than water.

Opinion 4. The design and installation of the CCCSD sanitary system in the area of the two sites makes sewer maintenance and sewer cleaning difficult.

A factor that undoubtedly affects maintenance of the sewer system in the area of the sites is the excessive distances between manholes. The longer the distance between manholes, the more difficult it is to clean the sewer segment. The sewer rodding machines or the hydroflushing hoses must be extended out long distances and are more and more difficult to control effectively as they get farther out.

The current CCCSD design standard for manholes requires that the distance between manholes be not more than 500-feet. The sewer segment between MH59 and MH46 is 706-feet long. See Exhibit i of this declaration.

Moreover, this sewer segment has a peculiar jog in alignment where it crosses Doray Drive. Good practice would have been to place manholes at these changes in direction such as was done between MH28 and MH29 on the backlot sewer line between Doris Drive and Kathryn Drive. It is understood that the "jog" part of this segment was replaced with iron pipe rather than VCP when the original pipe collapsed but details of why this was done have not been found.

It is also noted that some of the defect reports noted difficulties in trying to video and/or clean the pipe to and through the jog.

Some of the sewer segments in Luella, Cynthia, Margie, Hazel, Doris, Vivian and Mazie Drives exceed 400-feet in length and some cases are well over 600-feet in length. Maintenance of the sewers in these streets is also made more difficult because many of the sewers are only 6-inches in diameter. Current practice requires a minimum diameter of 8-inches. Accumulations of solids in these sewer lines would eventually move downstream, where they would likely contribute to additional blockages.

A CCCSD record from 1977 describes the original sanitary sewer in Linda Drive as “very poor shape has lots of cracks” (see the Firestone 7/3/2012 letter (see Exhibit 23 to that letter)). Based on the available records, it appears that that line was not replaced for at least ten years after problems in the line were noted. As at the jog at Doray Drive, the older VCP was replaced with iron pipe.

Opinion 5. The sanitary sewer industry generally accepts as true the mechanisms described in the Izzo Report relating to the release of PCE from sewer lines.

The Izzo report is attached as Exhibit B to the Firestone letter dated 8/4/14. Izzo identified five likely methods by which PCE can escape from a sewer line. These were:

1. Through breaks or cracks in the sewer pipes.

2. Through pipe joints and other connections.

3. By leaching in liquid form directly through sewer lines into the vadose zone.

4. By saturating the bottom of the sewer pipe with a high concentration of PCE-containing liquid and the PCE volatilizing from the outer edge of the pipe into the soils.

5. By penetrating the sewer pipe as a gas.

Page 19 of the Izzo report states, "The literature indicates that all sewer lines leak to some extent...allowance must be made for unavoidable infiltration...if...liquids can infiltrate, then a conclusion can be made that liquids on the inside of the pipe can exfiltrate...."

Opinion 6. The CCCSD operation and maintenance (“O&M”) program always was and still is designed to keep the wastewater flowing through the sewers but not to prevent leaks from the sewer system, unless the leaks are significant or catastrophic.

The CCCSD sewer maintenance program consists of cleaning the sewers at various intervals, responding to blockages and sanitary sewer overflows (SSOs) when they occur, and repairing defects when they are found if the defects are deemed to be significant and to require repair. Root penetrations usually are corrected by cutting out the roots or by chemically treating the roots. These methods of getting rid of the roots do not get rid of the openings through which they entered the pipes, i.e. the maintenance procedures are aimed at restoring flow in the sewers but not at stopping leakage from the sewers. As stated by T. Potter, Environmental Compliance Superintendent, CCCSD, in his letter dated 5/2813 to B. Wolfe at the Regional Board (p. 5): “The goal of routine cleaning is keep [sic] the sewer lines clear of obstructions to retain their capacity to convey wastewater to the District’s treatment plant.” Nothing in this statement discusses a goal of correcting leakage.

Cleaning the sewers tends to reduce the number of blockages that occur but does nothing to stop the sewer pipes from leaking. Similarly, clearing blockages merely clears the sewer pipe, but does not address leaks. As noted in Opinion 4, the length of the pipe segments in the area and location of jogs makes maintenance and cleaning difficult.

As discussed the Firestone 7/3/2012 letter, CCCSD's repairs of defects often were not made until years after the defects were discovered. Thus whatever leakage was caused by the blockages or exacerbated by the blockages went on over extended periods of time.

As noted in the Cleanup Team Staff Report (Staff Report), the CCCSD ordinances allowed PCE to be discharged to the sewer system but the CCCSD operation and maintenance program did not prevent leaks of the PCE from the sewer system.

On Page 13 of the Staff Report, the first sentence under Section 1 says, "While there is evidence of incidental leakage from the sanitary sewer lines, there is no direct evidence the leakage contributed substantially to the creation of the CVOC comingled groundwater plume." This statement ignores the fact that a leak in a sewer pipe releasing only a small quantity of PCE is all that is required to create the PCE detected in groundwater in the area. The commingled plumes likely contain only a few dozen gallons of PCE.

The pipe specifications in effect around 1950 would have allowed exfiltration of as much as 2 gallons per day per linear foot of 8-inch pipe. The sewers from Linda Drive to Doray Drive are about 1,000-feet long. Thus the amount of leakage from these segments of the sewers could have been as much as 2,000 gallons per day.

The dry cleaners that used PCE were in operation for approximately 30 years. Many dry cleaning machines piped their separator water directly to the sanitary sewer. As noted by the Staff Report, under CCCSD's regulations, PCE was allowed to be discharged into the sewers. Separator water from dry cleaners contains up to 150,000 ppb of PCE, which is the amount of PCE that can be dissolved in water. Often pure PCE was contained in the separator water if the operator was not careful in the separation. Over the thirty or so years that both cleaners operated, substantial amounts of separator water went into CCCSD's sewers. Given the concentrations of PCE in the separator water, it would not take much of it to leak out to create the concentrations detected in the groundwater in the area.

<u>Opinion 7. Varying flows of waste due to minor or major blockages in the CCCSD sewer system could have forced chlorinated volatile organic compounds (CVOCs), either in a pure or dissolved state, upstream into other branches of the sewer system.</u>

It is likely that blockages occurred in the sewers in the area of the sites because of the flat slopes of the sewer lines or inability to completely clear blockages due to the length of the pipe segments and location of jogs. Such blockages could have surcharged the sewer system until enough depth of water was built up to break the blockages loose. Such occurrences might not have resulted in an overflow to the surface or into buildings or residences; thus no one would be aware that they had occurred. As a result of the blockages, PCE contained in the blocked waste can flow "upstream" in the sewer line to other branches.

<u>Opinion 8. Vapor in the sewer lines, including PCE vapor, can move preferentially upstream in sewers and/or in the backfill around the sewers.</u>

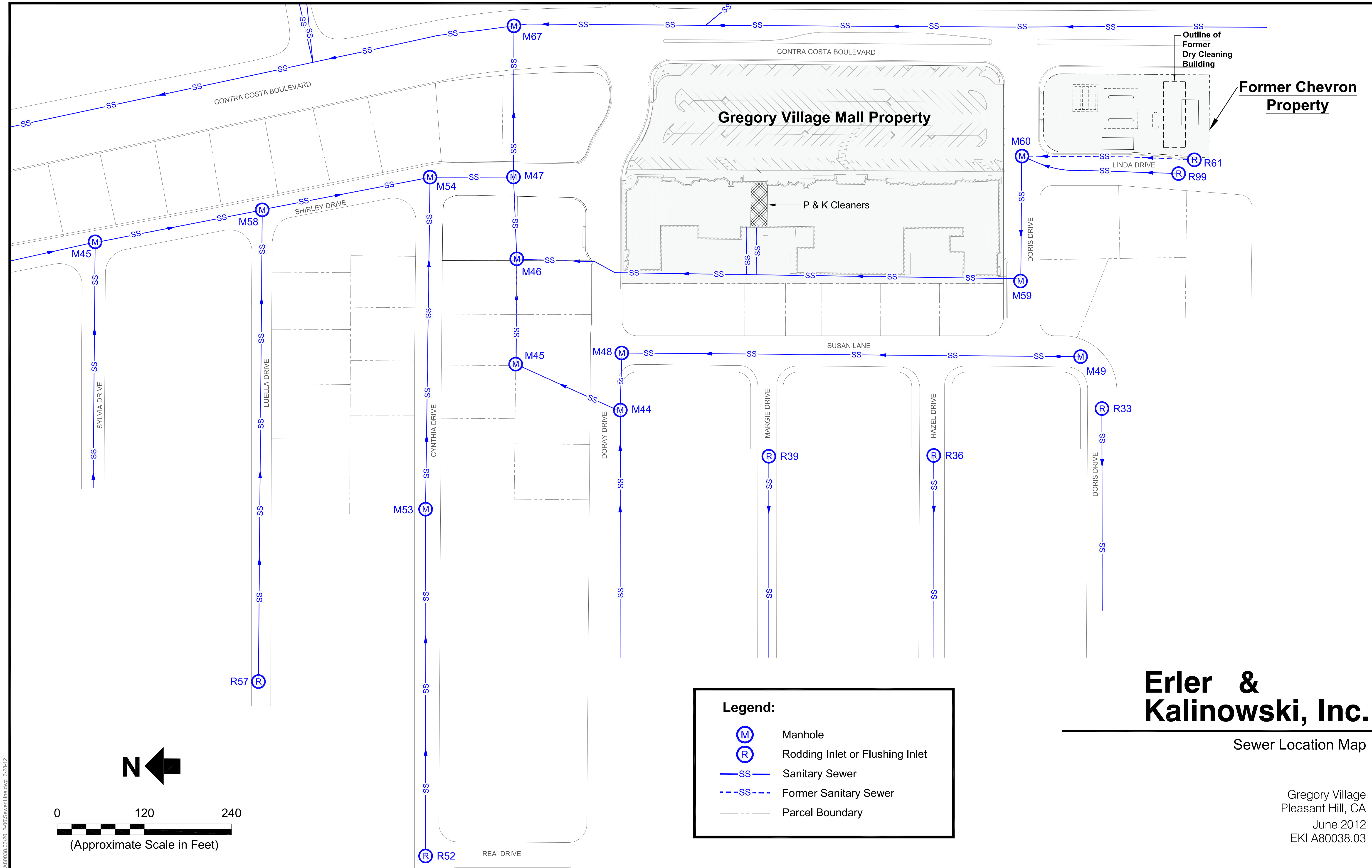
PCE vapor can and does move upstream through gravity sewers and through the backfill in the sewer trenches, which is always more permeable than the surrounding native soil because it was disturbed when the trench was dug. This would be true even if the native soil contained considerable amount of clay. As the sewers slope downward and go below the water table, vapor can no longer pass through the saturated backfill and may preferentially move toward the higher parts of the sewer system either through the pipes or through the unsaturated backfill. Thus, PCE could be detected in soil vapor "upstream" of a sewer line leak or penetration.

For example, in a case in Arizona that I was a consultant on, there were two side-by-side strip malls, separated by a wide driveway and walkway area, but connecting to a common manhole in the driveway area between them. Hydrogen sulfide gas was being generated in the far end of one of the strip malls. This hydrogen sulfide gas made its way down the gravity drains and sewer from the first strip mall, then up the sewer and drains of the second strip mall over a distance of several hundred feet.

August 4, 2014

BONNEAU DICKSON, P.E.

Exhibit i



Gregory Village Mall Property
Former Chevron Property
Outline of Former Dry Cleaning Building
P & K Cleaners
CONTRA COSTA BOULEVARD
SHIRLEY DRIVE
LINDA DRIVE
SUSAN LANE
SYLVIA DRIVE
LUELLA DRIVE
CYNTHIA DRIVE
DORAY DRIVE
MARGIE DRIVE
HAZEL DRIVE
DORIS DRIVE
REA DRIVE
M67
M47
M54
M58
M45
M46
M60
M59
M48
M49
M44
M53
R61
R99
R33
R39
R36
R57
R52
SS
N
0
120
240
(Approximate Scale in Feet)
Legend:
Manhole
Rodding Inlet or Flushing Inlet
Sanitary Sewer
Former Sanitary Sewer
Parcel Boundary
Erler & Kalinowski, Inc.
Sewer Location Map
Gregory Village
Pleasant Hill, CA
June 2012
EKI A80038.03

Exhibit ii

SPECIFICATIONS FOR SEWERING

MAIN LINES

SUBDIVISIONS

SIDE SEWERS

IN THE

Central Contra Costa Sanitary District

1822 MOUNT DIABLO BOULEVARD

WALNUT CREEK, CALIFORNIA

Telephone: Walnut Creek 6727

PRICE 50¢

scribed by the Industrial Accident Commission of the State of California. Sheet piling and other timbering shall be withdrawn in such a manner as to prevent caving of the walls of excavations or damage to piping or other structures. No sheathing or timbering shall be left in the trench. Ladders of sufficient length and number shall be provided to facilitate inspection of the sewer work.

The Contractor shall remove all water which may accumulate in the excavation during the progress of the work so that all work, except the laying of vitrified clay pipe with a rubber compression fitting (or approved equal), can be done dry. Trenches shall be kept free from water while the pipe or other structures are installed, until the joint or structure material is set, and until backfill has progressed to a sufficient height to anchor the work against possible flotation or leakage. Water shall be disposed of in such a manner as to cause no injury to public or private property, or be a menace to the public health. Underdrains shall be installed in trenches as necessary to prevent dangerous accumulation of ground water.

Excavated material shall be laid alongside of the trench, and kept trimmed up so as to cause as little inconvenience as possible to public travel and the normal use of adjacent properties. Free access must be provided to all fire hydrants, mail boxes, water gates, meters and private drives, and means shall be provided whereby storm and waste water can flow in the gutters uninterruptedly.

All material excavated from streets, roadways and rights of way, not required for backfilling, shall be immediately removed and disposed of in a manner satisfactory to the Engineer.

All utility conduits must be properly supported where lying along or crossing the trench. Damaged utility conduits must be reported to the proper utility company immediately by the Contractor.

PIPE FOR SEWERS, WYE BRANCHES, DROP CONNECTIONS, FLUSHING INLETS, ET CETERA

Pipe and wye branches shall be designated by their interior diameter. All pipes for sewers, wye branches, drop connections and flushing inlets shall be first quality, unglazed vitrified clay sewer pipe, sound and well burned throughout their thickness, and shall conform in all respects to the Tentative Specifications for Standard Strength Clay Sewer Pipe, of the American Society for Testing Materials, Serial Designation C13-44T, with subsequent amendments.

VITRIFIED CLAY SEWER JOINT COMPOUNDS

The bituminous sewer joint compound shall be CPI-2 Sewer Joint Compound, manufactured by the Koppers Company (or specifically approved equal) or JC-60 Sewer Joint Compound, manufactured by the Atlas Mineral Products Company (or specifically approved equal). When directed by the Engineer, the pipe joints shall be primed with the proper primer in an approved manner. A sewer joint compound to be acceptable must conform to the performance standards as set by the National Clay Pipe Manufacturers Institute (N.C.P.M.I.) Laboratory.

LAYING PIPE, MAKING JOINTS

The CPI-2 or JC-60 Sewer Joint Compound for the pipe joints shall be heated in a container of sufficient size to hold material for pouring of not less than twenty-five (25) joints for eight (8) inch pipe; said container to be so constructed as to insure a uniform temperature throughout. During the period of melting, the joint compound shall be stirred frequently to prevent local heating. The temperature of the joint compound in the container shall be maintained at from 430 to 460 degrees Fahrenheit for JC-60, and from 375 degrees Fahrenheit in warm weather to 425 degrees Fahrenheit in cold weather for CPI-2. At all times of pouring joints the contractor shall have on the job a thermometer suitable for the above work.

Each section of pipe must be laid to the correct line and grade and the sockets of the pipe shall be laid in the cross-cuts previously cut in the trench. The sewer line shall be laid without break upgrade from structure to structure with the socket or bell end forward, unless otherwise permitted by the Engineer. A string line in the bottom of the ditch shall be used for line and grade.

The pipe must be pressed along into the sockets so that the spigot end will be butted against the shoulder of the socket. After the pipe is properly on grade and line, a gasket of dry untreated jute or oakum shall be tightly caulked into the joint, by use of an approved caulking iron, leaving a depth of not less than two-thirds (2/3) of the bell for the joint compound. This gasket shall be of sufficient length to reach entirely around the pipe and of such thickness as to bring the inverts of the two (2) lengths of pipe to the same grade. A runner treated to prevent adhesion with the joint compound shall then be put around the pipe and forced securely up against the bell to prevent the joint compound from running out of the joint. It shall be clamped at the top so as to leave a small triangular opening through which the joint shall be poured.

PAVEMENT REPLACEMENT

Where repaving of trenches is to be accomplished the repavement shall be equal to that taken out, with the following minimum conditions of replacement applying:

(1) The minimum base shall be a ~~six (6~~ 12) inch crusher base properly compacted with an eight (8) to ten (10) ton roller.

(2) The pavement wearing surface shall be a three (3) course armor coat or two and one-half (2½) inch plant mix as used by the Contra Costa County Road Department.

Repaving of any trench cut in which the backfill has been consolidated by jetting or puddling shall not be done prior to fifteen (15) days after the backfill has been consolidated, nor later than thirty (30) days after consolidation.

Repaving of any trench cut in which the backfill has been consolidated by mechanical tamping or power rolling may be done at any time after the backfill has been consolidated, but not later than forty-five (45) days after installation.

HYDROSTATIC LEAKAGE TEST

If, in the course of thoroughly jetting the sewer trench, as hereunder prescribed, no leakage is observed or if the sewer grade is very steep, the line may not, in the judgment of the Engineer, be given the following described leakage hydrostatic test:

Unless excessive ground water is encountered, each section of the sewer, between two (2) successive structures, shall be tested by closing the lower end of the sewer to be tested and the inlet sewer of the upper structure with stoppers, and filling the pipe and structure with water to a point four (4) feet above the invert of the open sewer in the above structure. However, in no case shall the head of water exceed nine (9) feet, and if such would be the case due to the grade of the sewer, intermediate wyes or tees between successive structures shall be installed and used as testing points.

The allowable leakage will be computed by the formula:

$$Q = 1400\ g\ L/\text{Day}$$

in which Q is the allowable leakage in gallons per inch of diameter, L is the length of the sewer being tested in miles, and does not include the length of house connections entering the sewer being tested, H is the difference in elevation, in feet, between the invert of the closed sewer in the lower structure and the surface of water in the upper structure or intermediate wye or tee.

If the leakage as shown by the test is greater than allowed by the formula, the pipe shall be overhauled, and relaid if necessary, until the joints satisfactorily hold this test. All tests must be completed before trench or street is resurfaced.

Where grades are very steep, if the above test is waived by the Engineer, the Contractor shall "ball" the joints with cement mortar.

TESTS FOR INFILTRATION

If, in the construction of a section of the sewer between structures, excessive ground water is encountered, the test for leakage, described herein, shall not be used, but instead the end of the sewer at the upper structure shall be closed sufficiently to prevent the entrance of water; and pumping of the ground water shall be discontinued for at least three days after which the section shall be tested for infiltration. The infiltration shall not exceed 1400 (fourteen hundred) gallons, per inch of diameter, per mile of main line sewer being tested and does not include the length of house connections entering that section.

Where any infiltration in excess of this amount is discovered before completion and acceptance of the sewer, the sewer shall be immediately uncovered and the amount of infiltration reduced to a quantity within the specified amount before the sewer is accepted.

Should, however, the infiltration or hydrostatic test be less than the specified amount, the Contractor shall stop any individual leaks that may be observed when ordered to do so by the Engineer.

The Contractor shall, at his own expense, furnish all materials for making the tests required under direction of the Engineer.

All tests must be completed before street or trench is resurfaced.

FINAL INSPECTION OF SEWER LINE

Before accepting the sewer line it will be inspected by District personnel with a representative of the Contractor. The line shall be flushed, and where possible, a rubber ball or bladder of proper size passed through the sewer line.

SECTION II

SIDE SEWER SPECIFICATIONS

TRENCHES

Trenches for lateral sewers shall be excavated and backfilled and the pavement restored in the streets in accordance with the laws, ordinances and regulations of the State

Exhibit iii

CENTRAL CONTRA COSTA SANITARY DISTRICT
WALNUT CREEK, CALIFORNIA

STANDARD SPECIFICATIONS

GERRY A. HORSTKOTTE, JR.
ENGINEER

MARCH 1956

PRICE 1.00

CLASS 1. Mortar or grout shall be a one to one mixture of sand and cement.

CLASS 2. Mortar or grout shall be CLASS 1 mortar or grout containing fifteen (15) percent Pozzolan. The Pozzolan shall be of the calcined reactive siliceous type.

CLASS 3. Mortar or grout shall be CLASS 1 mortar or grout containing twenty-five (25) percent Embeco.

Grout shall be composed of mortar diluted with water to flow readily.

No mortar or grout shall be used later than thirty (30) minutes after the water has been introduced into the mix.

2-06. CASTINGS. Castings shall conform to ASTM A-48, Class 30, or better.

2-07. PIPE . All pipe shall be of the size and material shown on plans and as specified herein. The use of new pipe products shall be determined by the Engineer and authorized in writing.

All pipe sizes refer to inside diameter of pipe.

All pipe and pipe joints between structures shall be of the same material and design, unless otherwise specified.

a. Vitrified clay pipe shall be new, first quality bell and spigot, conforming to Federal Specification SS-P-361a extra strength, unglazed pipe and ASTM C-200, except that pipe fittings shall be of a quality equal to the straight pipe.

All pipe and fittings to be installed with rubber rings shall be marked to identify its use with rubber ring joints.

b. Cast iron pipe and fittings for main sewers shall be bell and spigot Class 150 and shall conform to the following specifications: Federal Specification WW-P-421 with Amendment 3 thereto, ASA A 21.6 and ASA A 21.8.

Cast iron pipe and fittings for side sewers shall be new, first quality bell and spigot pipe. The pipe shall withstand not less than forty-three (43) pounds per square inch water-working pressure. The pipe fittings shall be of a quality equal to, The cement lining shall extend to the ends of the pipe.

The cement coating, if required, shall be held back three (3) inches from each end of the pipe.

The ends of pipe shall be clean of all concrete, grease, scale and dirt and ready for making field joints by welding.

A protective shop coating shall be applied to the exposed metal portions of the pipe.

2. CL & C Pipe with rubber gasket type of pipe joints shall conform to Federal Specification SS P 381.

f. Smooth lined corrugated metal sewer pipe shall conform to Armco Specifications for smooth lined asbestos bonded corrugated metal sewer pipe.

g. Corrugated metal pipe fabrication and material shall conform to Section 47 of the State Standard Specifications. The gauge shall be as specified on the plans.

h. Black steel pipe shall be standard weight black seamless steel pipe conforming to ASTM A-120.

2-08. JOINT MATERIALS. Joint materials, as hereinafter referred to, are to be used in conjunction with the jointing of pipe for which the materials or devices were designed. All pipe joint materials shall be as specified herein, unless otherwise specified, and the use of new products or materials for joints shall be submitted to the Engineer and authorization for use be specified by the Engineer in writing.

Rubber rings and/or couplings for pipe joints shall be purchased from or through the firm supplying the pipe.

a. Vitrified clay pipe joint materials are as follows:

1. Hot poured joint compound shall comply with Specifications for Clay Pipe Jointing Compound CPI 2 of the National Clay Pipe Manufacturers Inc., JC 60 Sewer Joint Compound as manufactured by the Atlas Mineral Products Co., or approved equal.

Priming materials for pipe shall be as recommended by the joint compound manufacturer. For joint compound JC 60, use a No. 60 primer. For joint compound CPI 2, use a Bitumastic No. 50 primer.

All caulking yarn used with vitrified clay pipe shall be Sealite Caulking Yarn. Caulking yarn shall be installed in accordance with the manufacturer's prescribed installation procedures. Caulking yarn for pipe shall be one-sixteenth (1/16) inch larger in size than the annular space of the pipe bell. For pipe sizes twenty-one (21) inch through thirty-nine (39) inch, the caulking yarn shall be one-eighth (1/8) inch larger in size than the annular space. The annular space shall be measured at a point one-half (1/2) inch from the bottom of the bell socket. All bell and spigot pipe which is to be laid with hot poured joints shall be primed.

2. Rubber rings for vitrified clay pipe shall be Brant Rings manufactured by R. J. Brant, Inc., or their licensed representative.

3. Tubular joints shall be of the two valve type and shall conform to the design as specified by the Clay Pipe Institute.

b. Cast iron pipe joint materials shall be hot poured lead conforming to ASTM B-29 for pig lead, Grade III common.

Caulking yarn for all bell and spigot cast iron pipe joints shall be approved braided or twisted jute packing yarn of uniform quality and free from tar.

c. Asbestos-cement pipe joint materials shall conform to Johns-Manville Ring-Tite Coupling for sewers when used on main line sewers, or Ring-Tite Couplings for House Connections when used on side sewers.

d. Reinforced concrete pipe joint materials are as follows:

1. The concrete bell and spigot pipe joint material shall consist of a rubber gasket conforming to Section 3.4 of the AWWA C 302.

2. The concrete double spigot pipe joint material shall consist of an approved steel joint sleeve, two rubber gaskets conforming to Section 3.4 of the AWWA C 302, and CLASS 2 mortar

shall be a fire hydrant or a water tank with a pressure of sixty (60) pounds per square inch. All "bridges" in backfill shall be completely broken down during the jetting process. Jet points along the line of the ditch shall be staggered from side to side at intervals not to exceed six (6) feet center to center or as necessary to insure that the backfill takes full possible subsidence while water is being introduced into it through the jet pipe. When this method of consolidation is to be used, the backfill shall be placed in lifts or steps not exceeding ten (10) feet in height and then jetted prior to placement of each succeeding lift.

3-17. <u>CLEANING AND TESTING</u>. The work under this section includes cleaning and testing of sewer lines. This work shall be completed within the fifteen (15) day cleanup period. Any further delay will require the written permission of the Engineer.

All cleaning and testing shall be done in the presence of the Engineer.

Tools, materials, and appurtenances required for testing the sewers as specified shall be furnished by the Contractor.

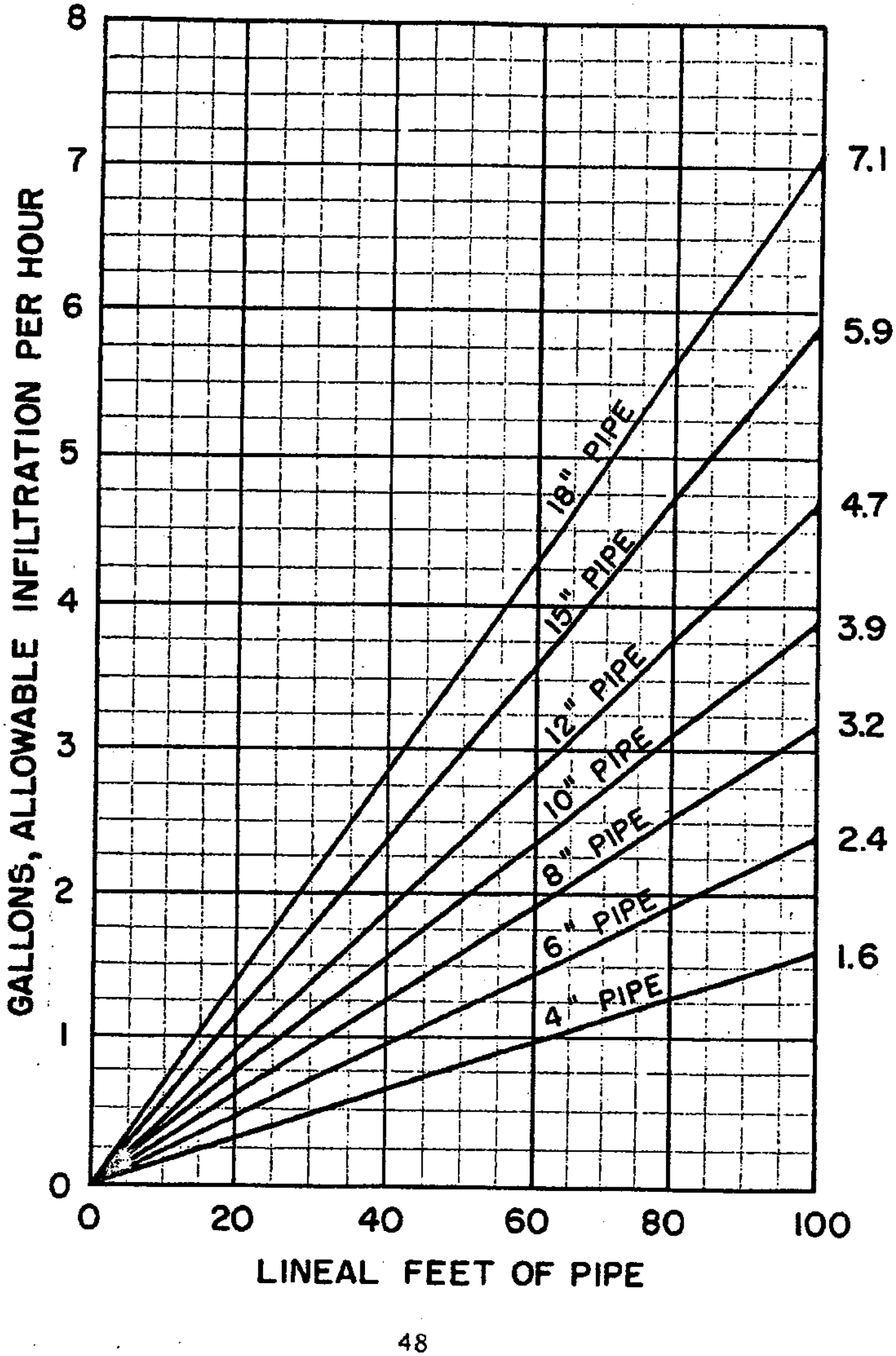
a. Prior to acceptance of sewer lines, other than side sewers, the Contractor shall clean all lines with a Wayne Sewer Cleaning Ball or approved equal. Any stoppage or foreign matter shall be removed in a manner satisfactory to the Engineer.

b. The allowable leakage or infiltration in any individual section or in the entire sewer job shall not exceed five hundred (500) gallons per inch diameter per mile of pipe per day. If the leakage or infiltration exceeds the allowable amount, the test section shall be removed and replaced.

1. <u>Hydrostatic Test</u>. The hydrostatic test shall be made prior to acceptance by closing the lower end of the sewer line to be tested and the inlet or inlets of the next upstream structure with stoppers and filling the sewer line and structure with water to a point four (4) feet above the crown of the open sewer in the structure. The hydrostatic head shall be maintained between a minimum of five (5) feet and a maximum of eighteen (18) feet while testing.

ALLOWABLE INFILTRATION CHART

500 GALS. PER INCH DIA. PER MILE OF PIPE PER DAY



CCCSD 0010359

Exhibit iv

CENTRAL CONTRA COSTA SANITARY DISTRICT
WALNUT CREEK, CALIFORNIA

STANDARD SPECIFICATIONS

GERRY A. HORSTKOTTE, JR.
ENGINEER

1959

14-02. PIPE BEDDING FOR SEWERS OTHER THAN CAST IRON

Main sewers and side sewers other than cast iron shall be embedded in compacted TYPE I backfill material from a level two (2) inches below the barrel of the pipe to a level six (6) inches above the barrel of the pipe. Earth trench dams shall be placed at locations designated by the Engineer. Special pipe bedding for trunk sewers will be as specified in the special provisions or as determined by the Engineer.

14-03. CAST IRON PIPE

All cast iron pipe shall be laid with the barrel of the pipe on firm, undisturbed trench bottom. Pipe bedding around and over cast iron pipe is not required, except where specified for special cover conditions, backfill, or road conditions.

14-04. PAYMENT

Full compensation for performing all work and furnishing all bedding material as specified above shall be considered as included in the prices paid for the various contract items of work in place.

SECTION 15

SEWER PIPE LINES

15-01. DESCRIPTION

Sewer pipe lines shall be installed as shown on the plans or ordered by the Engineer and in accordance with the following provisions:

15-02. MANUFACTURE OF MATERIALS

A. Pipe- All pipe shall be of the size and material shown on plans and as specified herein. The use of new or unapproved pipe products shall be determined by the Engineer and authorized in writing.

All pipe sizes refer to inside diameter of pipe.

All pipe and pipe joints between structures shall be of the same type, design and size unless otherwise specified.

The Contractor shall submit at his own expense shop and material details of all special pipe for approval, before the pipe shall be manufactured or used on the work. All pipes and fittings shall be marked with the trade or brand name of the manufacturer, and inventory identification marks.

1. Vitrified clay pipe and fittings shall be new, first quality pipe and shall conform to ASTM C-200 extra strength, unglazed, except that pipe fittings shall be of a quality equal to the straight pipe.

2. Cast iron pipe and fittings for main sewers shall be bell and spigot Class 150 and shall conform to Fed. Spec. WW-P-421a, and shall include pipe made with Tyton or mechanical joints.

Cast iron pipe and fittings for side sewers shall be new, first quality bell and spigot pipe. The pipe shall withstand not less than forty-three (43) pounds per square inch working pressure.

The cement coating shall be held back three (3) inches from each end of the pipe, unless otherwise specified.

The ends of the pipe shall be clean of all concrete, grease, scale and dirt and ready for making field joints by welding.

A protective shop coating shall be applied to the exposed metal portion of the pipe.

Field replacement of coating at joints shall be to manufacturer's specifications or as directed by the Engineer.

b. Fabrication of CL & C pipe or CL pipe for underground or syphon beams shall conform to the steel cylinder thickness, class, and joints called for on the plans. Concrete lining and/or coating for pipe under twelve (12) inches in diameter shall conform to the above requirements for suspended crossing pipe, except that the minimum cylinder gauge shall be ten (10) gauge.

Special fittings shall be fabricated as shown on the plans and shall have a maximum deflection of fifteen (15) degrees at any one angle break within the fitting.

6. Smooth lined corrugated metal sewer pipe shall conform to Armco Specifications for smooth lined asbestos bonded corrugated metal sewer pipe.

B. Joint Types and Materials- Joint materials, as hereinafter referred to, are to be used in conjunction with the jointing of the pipes for which the materials or devices were designed. All pipe joint materials shall be as specified herein, and the use of new or unapproved products or materials for joints shall be determined by the Engineer and authorized in writing. Care will be exercised in the intermixing of different shipments of materials to insure well-fitted joints. All rubber gaskets and/or couplings for these pipe joints shall be purchased from or through the firms supplying the pipe.

Joint Types- Unless otherwise specified, the approved types of joint materials used with various pipes and fittings shall be as follows:

Types of Pipe	Joint Materials	Types or Trade Names
MAIN SEWERS (6 through 15 inches in diameter)		
Vitrified Clay	Plastisol Gaskets	Plastisol Joint
	Rubber Couplings	Ceramicweld Coupling
Cast Iron (Class 150)	Rubber Gaskets	Tyton Joint
	Rubber Gaskets	Standard Mechanical Joint
TRUNK SEWERS (18 inches and larger in diameter)		
	Plastisol Gaskets	Plastisol Joint
Vitrified Clay	Hot Poured Compounds	CPI 2 Joint Compound
	Hot Poured Compounds	JC 60 Joint Compound
	Rubber Couplings	Ceramicweld Coupling
Reinforced Concrete	Rubber Gaskets	Rubber Joint
SIDE SEWERS (4 inches and larger in diameter)		
Vitrified Clay	Plastisol Gaskets	Plastisol Joint
	Rubber Gaskets	Mechanical Compression
	Rubber Couplings	Ceramicweld Coupling
Cast Iron (Soil-Class 40)	Lead	Lead Joints
Cast Iron (Class 150)	Rubber Gaskets	Tyton Joint
	Rubber Gaskets	Standard Mechanical Joint

Types of Pipe	Joint Materials	Types or Trade Names
Asbestos-Cement	Rubber Gaskets	Ring-Tite or Fluid-Tite Coupling

BY SPECIAL APPROVAL for Main or Trunk Sewer unless otherwise specified above.

Concrete Steel Cylinder)
Reinforced Concrete) Joints for these pipes shall
Asbestos-Cement) be individually approved.
Smooth Lined Corrugated Metal)

Joint Materials-

1. Plastisol Gaskets- Plastisol gaskets for bell and spigot vitrified clay pipe shall consist of an approved type of resilient, interlocking, mechanical compression joint formed on the pipe at the factory. The gaskets formed on the pipe shall be made of plastisol conforming to specifications established by the National Clay Pipe Research Corporation.

2. Rubber Couplings- Rubber Couplings used to join plain end vitrified clay pipe shall conform to the requirements set up by Pacific Clay Products for "Ceramicweld Couplings."

3. Rubber Gaskets-

a. Rubber gaskets used for jointing cast iron pipe having Tyton joints shall conform to the requirements set up by U. S. Pipe and Foundary Company.

b. Rubber gaskets used for jointing cast iron pipe having Standard Mechanical joints shall conform to the requirements of Fed. Spec. WW-P-421a, Section 3.12.

c. Rubber gaskets used for jointing asbestos-cement pipe with Ring-Tite or Fluid-Tite couplings shall conform to the requirements established by Johns-Mansville or Keasbey and Mattison.

d. Rubber gaskets used for jointing reinforced concrete pipe with bell and spigot ends shall conform to Section 3.4 of AWWA C-302. Rubber gaskets conforming to ASTM C-362 require prior written approval of the Engineer.

e. Rubber gaskets used for jointing reinforced concrete pipe with double spigot ends and approved steel joint sleeves shall conform to Section 3.4 of AWWA C-302.

4. Hot Poured Compounds- Hot poured compounds used for jointing vitrified clay bell and spigot pipe shall conform to specifications for Clay Pipe Jointing Compound CPI 2 as established by National Clay Pipe Manufacturers, Inc. or to specifications for JC 60 Sewer Joint Compound as established by Atlas Mineral Products, Co.

All pipe to be jointed with hot poured compound shall be primed prior to being used. Priming materials shall be as recommended by the joint compound manufacturer. When using compound CPI 2, prime with Bitumastic No. 50 primer and when using compound JC 60, prime with No. 60 primer.

All caulking yarn used with vitrified clay pipe shall be 310R Sealite Caulking Yarn. Caulking yarn shall be installed in accordance with the manufacturer's prescribed installation procedures. Caulking yarn for pipe sizes up to twenty-one (21) inches shall be one-sixteenth (1/16) inch larger in size than the annular space of the pipe bell. For pipe sizes twenty-one (21) inches through thirty-nine (39) inches, the caulking yarn shall be one-eighth (1/8) inch larger in size than the annular space. The annular space shall be

1. The Hydrostatic test shall be made by closing the lower end of the sewer line to be tested and the inlet or inlets of the next upstream structure with stoppers and filling the sewer line and structure with water to a point four (4) feet above the crown of the open sewer in the upstream structure. The hydrostatic head shall be maintained between a minimum of four (4) feet and a maximum of eighteen (18) feet while testing. The test period for sewers of reinforced concrete pipe shall be no less than four (4) hours and the pipe shall be filled with water fifteen (15) hours prior to test.

Test tees the full size of the sewer line shall be used when the hydrostatic test cannot be satisfactorily made through pressure relief wyes. The tees shall be kept open until the line meets the requirements of this Section. The hydrostatic test shall be made only after a section of line is complete and has a minimum of three (3) feet of backfill over it. The method of plugging the lines shall be approved by the Engineer prior to testing.

Measured quantities of water shall be added to maintain the level in the test tee or structure to determine the rate of leakage.

2. The Air Pressure Test shall be performed by inserting stoppers and applying regulated air pressure to the section being tested after completion of paving or final backfilling. Maximum permissible drop in pressure related to time and pipe volume shall be determined by the Engineer. Preliminary air loss tests prior to backfilling of pipe shall be made in a similar manner when ordered by the Engineer.

3. Jetting Test- During the normal process of jetting, which shall conform to Section 12, a check shall be made by the Engineer to determine the amount of infiltration through each section of sewer line. The amount of infiltration shall be within the limits prescribed below.

C. Allowable Leakage- The allowable leakage or infiltration in any individual section or in the entire sewer job shall not exceed five hundred (500) gallons per inch of diameter per mile of pipe per day or equivalent air loss. If the leakage or infiltration or air loss exceeds the allowable amount, the test section shall be removed and replaced, or approved corrective measures taken.

D. Cleaning- Prior to acceptance of sewer lines, other than side sewers, the Contractor shall clean all lines with a Wayne Sewer Cleaning Ball, or an approved equal cleaning device, in a manner prescribed by the manufacturer. Any stoppage or foreign matter shall be removed in a manner satisfactory to the Engineer from all lines, including side sewers.

15-06. MEASUREMENT AND PAYMENT

The final determination of the quantity of sewer pipe laid in accordance with the plans and specifications shall be by the following method of measurement.

Sewer lines shall be measured horizontally along the center line of the sewer from the center of structure to the center of structure, without deduction for structure, unless otherwise specified in the special provisions.

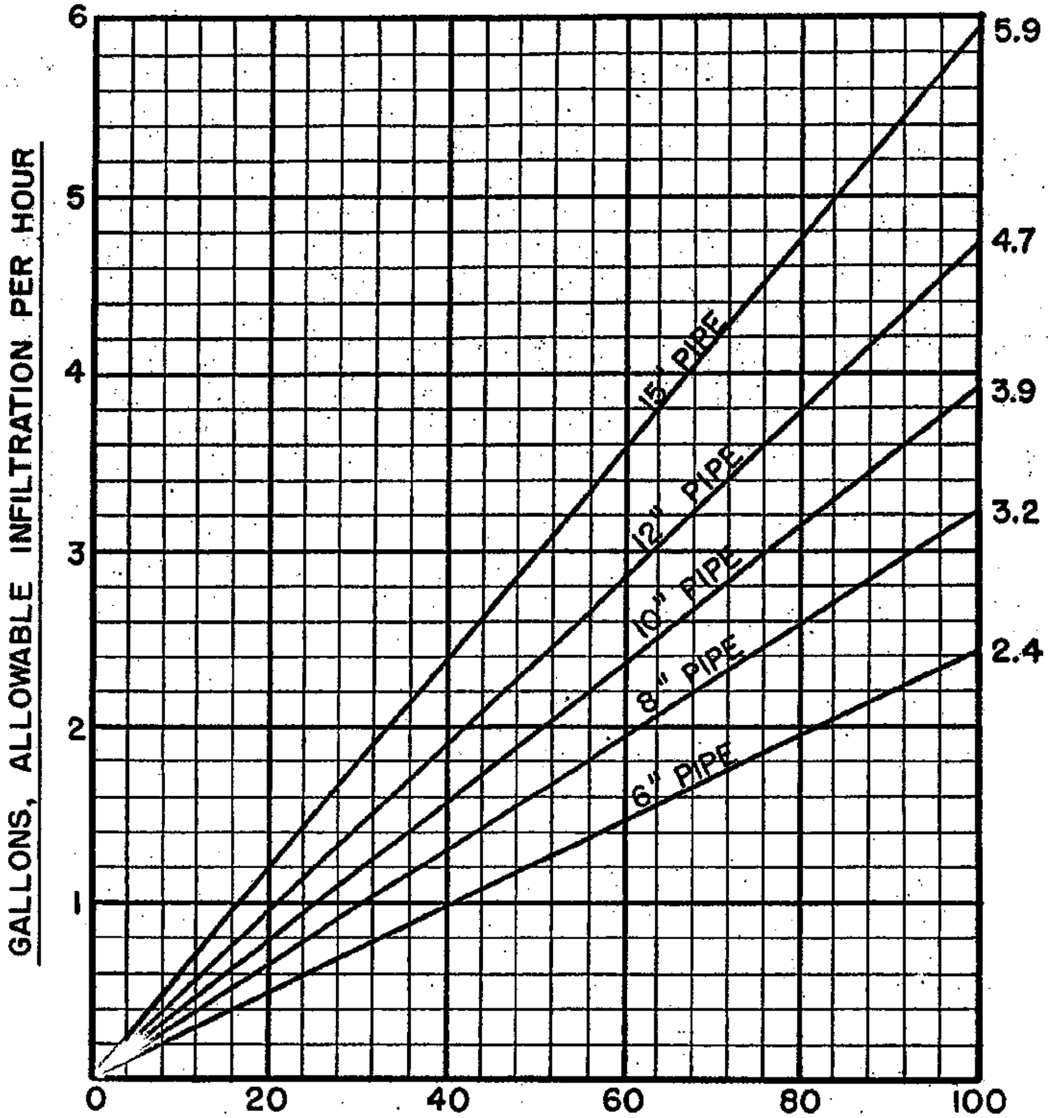
The price paid per linear foot for sewer pipe lines in place shall include full compensation for furnishing all labor, materials, tools, equipment, and doing all work involved in furnishing and installing the sewer line complete in place as herein specified, including excavation, backfill, compaction, cleaning, testing, paving, and any specified or required connections to existing sewers.

CENTRAL CONTRA COSTA SANITARY DISTRICT

WALNUT CREEK, CALIFORNIA

ALLOWABLE INFILTRATION CHART
FOR MAIN SEWERS

ALLOWABLE LEAKAGE– 500 GALS. PER INCH DIA. PER MILE OF PIPE PER DAY



CONVERSION TABLE

DIAMETER OF PIPE OR M.H. IN INCHES	GALLONS PER FOOT OF DEPTH IN PIPE OR M.H.	GALLONS PER INCH OF DEPTH IN PIPE OR M.H.
6 PIPE	1.5 GAL./FT.	.125 GAL./IN.
8 "	2.6 "	.217 "
10 "	4.1 "	.342 "
12 "	5.9 "	.492 "
15 "	9.2 "	.766 "
48 M.H.	94. "	7.83 "
60 "	147. "	12.25 "

Exhibit v

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The Evolution of Jointing Vitrified Clay Pipe

Jack Evans*
Marlene N. Spence**

Abstract

Advances made in the jointing of vitrified clay pipe during the last half century, illustrate the concern of the clay pipe industry to provide top quality jointing methods. Prior to this, the lack of standards for joint integrity meant testing for infiltration and exfiltration was seldom implemented. Sewers were often designed simply to convey surface water, excessive groundwater and untreated sewage to area lakes, rivers, streams, estuaries and bays. Leakage was even designed into the system for cleaning purposes associated with high flow rates.

Early 19th century clay pipe jointing often utilized a field applied cement mortar, or other specialty jointing materials. The watertightness of these rigid joints depended on many factors including the skill of the work force and the stability of the bedding materials.

The need to replace rigid joints to provide a degree of flexibility in the pipe system caused a variety of flexible materials such as tars and mastics to come into use. However, they were not always successful in eliminating infiltration/exfiltration problems.

After World War II, increased population density along with economic and health considerations led to a rise in separate storm and wastewater systems. It was at this time that the watertightness of sewer lines became a requirement.

The clay pipe industry endeavored to meet the challenge of joint integrity. The development of polymers yielded a broad variety of new materials applicable for use in jointing vitrified clay pipe.

Today the clay pipe industry offers choices of many excellent jointing methods. Factory applied compression joints adhere to strict performance standards. The introduction of low profile plain end pipe led to the development of additional jointing alternatives. These along with reducer couplings, adaptors, repair collars, and o-rings are a few of the methods available from the clay pipe industry to meet today's needs of minimal infiltration/exfiltration, ease of installation flexibility, durability and to prevent root intrusion.

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History of Jointing Vitrified Clay Pipe

Prior to 1940 the disposal of sewage in most cities was performed by the most expedient method available. Metcalf and Eddy in American Sewerage Practice, reported; "As late as 1924, 88 percent of the population in cities of 100,000 or over in the United States disposed of their sewage by dilution without prior treatment." The design of sewers was concerned with the conveyance of sewage, surface drainage and in some instances as an acceptable method of eliminating excessive ground water. Infiltration was designed into some systems to increase flow and dilute the contents. Many cities had combined sewers and it was common practice for sewer outfalls to discharge directly into lakes, rivers, streams, estuaries and bays.

It is not surprising; therefore, that the subject of jointing materials for sewer pipe was not high on a list of priorities. Testing for infiltration was not a major factor and when it was exercised, allowances as high as 1500 gallons per inch diameter, per mile, per day, were common.

Prior to World War II the most common and probably the first type or class of jointing clay pipe was with oakum and cement mortar. The joints produced were rigid and not resistant to earth movement. The joints were made in the trench by the workmen and the workmanship could be excellent or it could be poor. Water testing was infrequent, air testing and televising lines unknown.

After World War II rapid population growth and the attendant increase in sewage flow opened new horizons in the design of sewerage systems. The construction of separate sewers was a matter of economic necessity, and sewage treatment plants were a must. It was not long before it was apparent that the increased flows and excessive infiltration would tax the capacities of treatment plants and pumping stations and greatly increase operating costs.

The clay pipe industry was approached by the engineering profession to undertake a study to come up with an improved method of jointing clay pipe. The request did not fall upon deaf ears and the National Clay Pipe Institute made this its number one priority.

The second type or class of joints for vitrified clay pipe was a group known as "Hot-Pour Compounds" put on the market in a number of varieties by numerous compound manufacturers. Recognizing that some of these compounds were failing to fulfill the objective for which they were intended, the Research Laboratory of the National Clay Pipe Manufacturers, Inc., undertook a complete survey of all hot-pour compounds and evaluated them on their ability to meet the following permanent performance requirements:

1) Tightness
2) Root resistance
3) Flexibility
4) Corrosion resistance

All of the compounds examined failed in one or more of the essentials forcing the Research Laboratory to direct its efforts towards developing a compound which would meet all the necessary requirements to qualify as a satisfactory and acceptable hot-pour compound. Such a compound was ultimately developed and its specification made available to all manufacturers of compound material. The name brands most commonly used were bitumastic compounds, CPI-2, GK, and JC-60, a plastic base sewer joint compound.

Hot-pour joints were made by the installer in the trench but were considerably more difficult than the cement mortar joint. It was essential that the kettle for heating the compound be thoroughly cleaned before using. This was particularly true if the kettle had been previously used for sulfur-bearing compounds. The compound was heated to a temperature of from 350 degrees to 450 degrees F, depending upon which compound was used, and the temperature maintained. Before pouring, the joint surfaces had to be clean and dry and a gasket of dry twisted jute caulked in the annular space.

After the joint was properly yarned a suitable runner was placed and the joint poured in a single pour so that the compound ran around the pipe, completely filling the annular space. The compound must (1) melt and flow freely at the pouring temperature, (2) adhere firmly to the surface of the sewer pipe and (3) have sufficient flexibility to permit a slight movement of the pipe without injury to the joint. It was very necessary that the compound be properly heated in order to assure getting a satisfactory joint.

Another joint for bell and spigot pipe introduced to the market about that time was the Tubular Joint which consisted of a specially designed hollow, collapsed, rubber ring capable of fitting within the annular space of a bell and spigot pipe, and of being inflated with a suitable grout mixture (Portland cement, TJ-41 and water) to a pressure of 50 to 60 psi, so as to produce a tight, flexible joint. The gasket (tube) had only one opening, a short tubing, similar in shape to the valve-stem of an inner tube, but of such size as to readily admit the grout mixture. Although the tubular joint had considerable merit it was a slow and cumbersome method of operation involving a relative high labor cost.

Although vast improvement was made over the cement mortar joint, results were still far short of the ultimate goal insofar as requirements for flexibility were concerned.

On the West Coast a rubber ring was introduced; but its success depended on the manufacturer supplying select pipe having both spigot and bell dimensions within small tolerances; it was not found to be economically feasible.

There was considerable activity throughout the entire industry and soon two new types of joint material were made available. The first had a plastic ring bonded to both the bell and spigot, while the second had a rectangular shaped rubber gasket mounted on a bonded plastic spigot ring.

Still not satisfied, the clay pipe industry engaged in further research for a jointing system that would be:

1) factory applied to perform to close tolerances.
2) flexible enough to be unaffected by possible earth movement.
3) resistant to sewer acids.
4) easily assembled.
5) tight enough to eliminate infiltration/exfiltration problems and root penetration.

A plastisol resin ring molded in the bell and on the spigot end was developed. This factory fabricated compression joint came very close to meeting all the performance requirements. Prefabricated compression joints quickly became the standard of the industry. In 1958 the adoption of ASTM C 425, The Tentative Specification for Vitrified Clay Pipe Joints Using Materials Having Resilient Properties, introduced a means to test compliance of joints to both end - users' and manufacturers' requirements.

Early Jointing Systems

There has been confusion about the quality of vitrified clay pipe jointing systems brought on by studies of inflow and infiltration required by the Environmental Protection Agency. In order for many cities to be eligible for sewer grant money from the EPA, there must be compliance with EPA requirements. Early studies of sewers found problems of infiltration to be widespread. The difficulties and expense encountered with the treatment of this extraneous flow into sewer systems lent a bad name to vitrified clay pipe. The erroneous and undeserved correlation of infiltration problems and vitrified clay pipe was to a great extent due to two things. First, as stated earlier, early sewer systems represented the state-of-the-art in their day and were, in many cases not designed to prevent infiltration. Second, since the majority of sewers in the country were vitrified clay pipe, it stood to reason that more problems would be found with clay than any other material.

Modern Jointing of Vitrified Clay Pipe

The development of a prefabricated compression joint underwent many stages of evolution. Various materials and designs were evaluated in research sponsored by members of the National Clay Pipe Manufacturers' Institute. The factory applied compression joint has continued to have widespread industry acceptance.

Today's modern vitrified clay sewer pipe adheres to stringent requirements outlined by the American Society for Testing and Materials. Many manufacturers also have a set of quality standards they follow, as well as those standards set by municipalities across the United States.

ASTM standards were developed to aid in the elimination of infiltration problems. ASTM C 425 addresses several currently used basic joint designs. All are compression joints. One type has sealing elements bonded to the bearing surfaces. Others have independent sealing elements. Elastomeric components used in joints must pass tests of chemical resistance, showing no weight loss when exposed to solutions of sulfuric acid and hydrochloric acid. Rubber components must pass the chemical tests and also meet requirements of tensile strength, ozone resistance, oven aging, water absorption, compression set and hardness. Any metal parts introduced into the joint must be resistant to corrosion.

After the individual materials used in jointing systems are tested for adherence to all specifications, completed joints are tested for performance. In 1958, infiltration of 500 gallons per inch of nominal diameter per mile of line per day, was an acceptable rate. The rate most commonly used today is 60 percent less or 200 gallons per inch diameter per mile per day. Representative specimens of pipe must pass plant tests performed under hydrostatic, misalignment, shear load and combination conditions. Pipe and joints must withstand an internal pressure of 4.3 psi without leaking. A shear load of 150 pounds per inch of nominal diameter with the same internal pressure must also be passed. Misalignment, or deflection, is based upon pipe diameter and length of the specimen. The test is also performed while maintaining hydrostatic pressure. ASTM testing of vitrified clay pipe joints was designed to insure earth loads, pipe line settling and certain degrees of improper bedding would not allow exfiltration of the sewer contents, as well as infiltration of excessive amounts of ground water.

Vitrified clay pipe lines are also examined after installation. Air tests, infiltration tests and/or television checks are standard practice.

Types of Prefabricated Joints

There are a variety of joints available from vitrified clay pipe manufacturers that adhere to the strict requirements of ASTM. Traditional bell and spigot pipe is available with several jointing materials. Through the use of a factory cast polyurethane elastomer, bell and spigot compression joints are formed by an interference fit. A bead molded onto the bell casting insures a tight compression assembly. The assembly of the joint is simply a matter of applying a manufacturer supplied lubricant to the elastomer and pushing the pipe home.

Another system available on bell and spigot pipe is a polyester and o-ring joint. The polyester resin is cast onto the bell portion of the pipe with a lead in taper. The spigot end is cast with a groove or gland. At the job site, the o-ring, a flexible gasket, is positioned into the spigot groove. Joint lubricant is applied and the pipe can be shoved home.

Both the polyurethane and the polyester/o-ring joint are designed and manufactured under rigid dimensional control. Resins of the highest quality are incorporated to yield lasting joints. Both systems have the advantages of being factory applied using thermosetting resins. Cure is induced by combining two components. In some instances, heat is added to economically speed cure of slow catalysts.

Other jointing systems have also been developed. A new low profile joint is based on principles in a design used over 2,000 years ago in ancient Ephesus. Plain end pipe, as it is known, has been made with diverse coupling systems. Fiberglas-reinforced polyester (FRP) bells have been wound directly onto pipe as large as 36 inch inside diameter. Spigots were poured with urethane. These low profile plain end pipe allow longer lengths to be produced.

In some areas, FRP bells have been replaced with a more economical PVC (polyvinyl chloride) collar. Since the load in the ditch is carried by the vitrified clay pipe and not the PVC, ring deflection is not a problem. The PVC collars are cut from extruded tube stock and heat formed to close diametric dimensions. Interference beads are molded during this process. Both ends of the plain end pipe are cast with urethane couplings. The PVC collar is installed with an air bladder and cylinder device on the factory end. The field end is sized to allow ease of field installation through the use of joint lube and a pipe puller or hand shove.

Another type of plain end pipe uses a urethane spigot and PVC bell. In this joint the urethane on the spigot end contains the interference bead and the PVC collar is smooth. The PVC collar is attached to the bell end of the pipe through the combined use of an adhesive and the heat shrinking of the collar.

A system that is in use for both normal installation and repair work of VCP is a flexible rubber coupling with heavy duty shear rings. For normal installations, the pipe is delivered with the factory end of the coupling in place. Stainless steel take up clamps on both ends allow a tight, but flexible, compression seal. This coupling can also be utilized as a repair sleeve with a split stainless steel shear ring around the outside diameter replacing the interior shear ring. This coupling simplifies branching of existing lines.

Connections into existing lines of dissimilar materials have been facilitated through the production of a wide range of fittings, adaptors and transition joints.

The joints in use in today's modern sewer systems provide many benefits. Limited infiltration and exfiltration reduce sewage treatment plant loads, and prevent contamination of ground water supplies. The durable, high compression joints inhibit root penetration, thus reducing maintenance costs. The ease of assembly due to factory prefabrication reduces labor costs in the field, and lessens the possibility of poor field installation. The flexibility of today's vitrified clay pipe joints adjusts to minor trench settlement and pipe movement.

Dedication and modern methodology within the industry have resulted in a tremendous improvement in the jointing of clay pipe. Commitment by the industry continues as research into new jointing elastomers is conducted. Like the profession it serves, vitrified clay sewer pipe joints have advanced from the pre-treatment days to today's scientific age of sewage treatment.

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EXHIBIT E

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RICHARD J. MITCHELL
GEORGE A. RUSTIGIAN

MAILING ADDRESS P.O. BOX 5266
WALNUT CREEK, CALIFORNIA 94596
TEL. 934-6727 AREA CODE 415

Secretary

July 18, 1975

For more information call:
G. A. Horstkotte, Jr.
General Manager-Chief Engineer
934-6727

PLUMBING PROBLEMS

Plumbing problems? Instead of calling a plumber, you might save yourself . bundle by dialing the Central Contra Costa Sanitary District.

Central San is responsible for most of the collector sewage lines that run down central Contra Costa streets. "If the problem is traced to one of these lines, we will make the repairs free," said Bob Hinkson, maintenance chief for the District.

"We have never made it a secret that we offer this service. In fact, we ev advertise in the Yellow Pages, yet many people neglect to call us when they get a collector line problem."

Headquartered in Walnut Creek, Central San serves about 300,000 people in th communities of Danville, Alamo, Martinez, Pleasant Hill, Clayton, Walnut Creek, Orinda, Moraga and Lafayette. Concord sends its sewage to Central San for treat- ment, but maintains its own lines.

"Most problems occur within the household system," Hinkson continued. "Her the resident will have to fix the pipe or remove the obstruction, or call a plumber."

Hinkson listed the following as signs of collector line problems:

--some or all of the drains in a household back up.

--several homes along a block experience sewage problems.

--if you flush the toilet or wash the dishes and the drainage bubbles up i the bathtub or at some other point.

"If you just suspect you have a problem related to the collector lines, gi us a ring," Hinkson advised. "We have a crew on call 24 hours a day, seven day a week, and we will check free anything suspicious. At the least, the resident will know where the problem isn't."

District headquarters are located at 1250 Springbrook Road, phone number 934-6727.

Central San has a fleet of 56 assorted vehicles, including backhoes and du trucks, and 43 people in the maintenance division.

The District services, maps and maintains an 845-mile collection system wo $97.5 million. This figure does not include the $72.8 million treatment plant District is building north of Concord.

"When repairs have to be made, we try to do them as quickly as possible wi the least in convenience to the property owner," Hinkson said.

* "Roots are our biggest headache. They get in between the pipe joints and the lines.

"Next comes grease, mainly the slurry from sink grinders. It coagulates i the lines and catches debris and pretty soon you have a blockage.

"Then there are objects dropped accidently in the toilet or down the drain hair, which can be a real problem. Sometimes kids will drop something down a m hole and cause problems, but we have had relatively little vandalism.

"Occasionally a pipe will just collapse, either because of a flaw or becau it has been eroded by the hydrogen sulfide gas found in sewer lines," Hinkson explained.

*** "A good rodding solves most of our problems. Sometimes we'll have to dig a line.

they clear the line but don't fix the damage to the pipe

"Since 1970 we have been using a small television camera to inspect sewer lines and this has enabled us to head off many small problems before they grow into major ones."

Hinkson emphasized that residents should have no hesitancy about calling the District. "We are a public agency. When we come out to do a job, we are merely doing what you are paying us, through your taxes, to do."

EXHIBIT F

George Deukmejian
Governor

STATE OF CALIFORNIA

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION
1111 JACKSON STREET, ROOM 6040
OAKLAND 94607

Phone: Area Code 415
464-1255

File No. 2119.1008 (FHD)pmh

March 1, 1983

Mr. Roger Dolan, General Manager - Chief Engineer
Central Contra Costa Sanitary District
P.O. Box 5266
Walnut Creek, CA 94596

Dear Mr. Dolan:

This office has been contacted by several residents within the District who claim to have suffered substantial property damage as a result of sewage backing up into their homes from the District collection system. A resident of the District appeared before the Regional Board during the February 16, 1983 meeting public forum and described such a problem and I have been instructed to submit a report at the Board's April 1983 meeting. We request that you provide the Board with information on the following by March 18, 1983:

1. An estimate of the number of homes affected by backups in the last five years and their general locations, and the cause of these backups ie., whether caused by wet weather flows or blockages.

2. A description of the District's program for the prevention of each of these kinds of backups. We understand that this program includes both maintenance of the collection system to minimize blockages and notification of vulnerable residences. We would like details on these programs. If the backups are caused by wet weather flow surcharges, you are requested to report on the District's plans and time schedules for eliminating these problems.

3. A discussion of the nature, extent of use, and effectiveness of backflow devices in use within the District. We are especially interested in your response to a complaint that the device recommended by the District is unreliable.

We wish to make it clear that under the terms of Section F.2 of the District's self-monitoring program, overflows from the collection system whether they are backups into peoples homes or could enter waters of the State that are reported to the District should in turn be reported to the Regional Board.

Please contact me if you have questions.

Sincerely,

FRED H. DIERKER
Executive Officer

J. J. CARNIATO
Counsel for the District
Tel. (415) 283-1552
CLYDE M. HOPKINS
Secretary

CENTRAL CONTRA COSTA SANITARY DISTRICT

ROGER J. DOLAN
General Manager—Chief E
DAVID G. NILES
Deputy General Mana

5019 IMHOFF PLACE
MARTINEZ, CALIFORNIA 94553
(415) 689-3890

April 12, 1983

California Regional Water Quality Control Board
San Francisco Bay Region
Fred H. Dierker, Executive Officer
1111 Jackson Street, Room 6040
Oakland, CA 94607

Dear Mr. Dierker,

Roger Dolan, General Manager-Chief Engineer, of Central Contra Costa Sanitary District, has asked me to prepare the following information for you regarding the complaints to your office from several residents of suffering substantial property damage as a result of sewage backing into their homes from the District's system.

I trust this will be of assistance to you in preparing a report for your Board on the matter.

Yours very truly,

R. H. Hinkson

R. H. Hinkson,
Manager, Collection System Operations

RHH/vg

Enclosure

Central Contra Costa Sanitary District

In the past five years, the District has paid 44 claims for damages as a result of a sewage backup in a residence or building. This averages out to be 8.8 claims per year. The total paid for damages was $75,560. This amounted to an annual claims bill to the District of $14,999, at an average cost per claim of $1,717.

This includes $15,240.55 paid to date to Mr. Ray Horne of 25 Rheem Blvd., in Orinda, who described his problem at your February board meeting. Mr. Horne is suing the District for $50,000 in general damages.

In a large collection system with many small diameter lines such as Central San's, it is not cost effective to maintain the system to a standard of zero overflows. For example, it is not clear that the District could provide a fail-safe system even if the collection system maintenance effort were doubled from 1.8 million to 3.6 million dollars per year. This, assuming it would be possible, would cost over $200,000 per eliminated overflow damage claim. The fail-safe approach is, therefore, difficult to justify from a public funding standpoint when each overflow damage claim now costs less than $2,000.

QUERY #1 An estimate of the number of homes affected by backups in the last five years and their general locations, and the cause of these backups i.e., whether caused by wet weather flows or blockages.

In the last five years, 55 homes or buildings (44 resulted in damage claims) out of the 70,169 connected to the District system were affected by backups. Fifty-three of them were the result of pipeline blockages. On 49 occasions these were caused by root intrusion and on 4 occasions by grease and solids depositions. The final 2 were the result of direct wet weather surcharges. Wet weather has additional influence since most backups occur in those months, 36 of the 55, and the increased flow is a factor in the severity of the property damage. The backups generally take place in the tree covered hills of Walnut Creek, Orinda, Lafayette, Pleasant Hill, and Martinez. **(See Figure I)**

The reason for this is terrain. In hill areas the sewer main serves the homes on both the high and low sides of the street, a stoppage in that line can result in sewage backup in the low side home. Expansive soil prevalent in central Contra Costa County often fractures rigid pipe joints, roots need no further invitation to penetrate the sewer line than a small crack and if not removed will plug it. Almost 90 miles of District clay pipelines are heavily root intruded now. We face the same potential for stoppage in the remaining 290 miles of 6" and 8" clay system in the District. This possibility makes it essential that the District maintain an effective stoppage prevention program.

QUERY #2 A description of the District's program for the prevention of each of these kinds of backups. We understand that this program includes both maintenance of the collection system to minimize blockages and notification of vulnerable residences. We would like details on these programs. If the backups are caused by wet weather flow surcharges, you are requested to report on the District's plan and time schedules for eliminating these problems.

We have an extensive wastewater collection system maintenance program at C.C.C.S.D.. Its most important goal is to minimize pipeline stoppages, to minimize property damage, and to minimize the public's exposure to health hazards.

The maintenance program employs pipeline cleaning by mechanical, hydraulic, and chemical means; pipeline inspection by the C.C.T.V. system; and pipeline correction by repair and replacement.

Since the overwhelming majority of sewage backups are the result of stoppages caused by root intrusion, and to a lesser degree, grease and solids deposition, the program's major component is pipeline cleaning.

This effort is concentrated in our 844 miles of 6" and 8" main line pipes; these sizes are most prone to plug and to which most of the District's homes connect. It is further concentrated on those parts of the system affected by the major source of blockages -- roots and grease.

One thousand, seven hundred, and twelve (1,712) individual sewer mains involving 89.3 miles are heavily intruded by roots and are scheduled for cleaning by mechanical means as frequently as every three months.

We use a chemical root control on 26 miles of the most heavily root intruded pipeline on an annual, bi-annual, and tri-annual basis.

11% of the District's main line system is effected by root intrusion. In 1982, 139 miles of the year's cleaning production (596 miles) was in root lines.

The same basic schedule is maintained for the 48 miles of pipeline affected by grease and solids deposition. This represents another 5% of the main line system. In 1982, grease line cleaning (95 miles) represented 16% of the year's cleaning total.

In the past five years, we have cleaned 2,590 miles of District pipelines. Of those miles cleaned, 1,036 were scheduled root and grease lines. The other 1,554 miles were cleaned in a systematic "routine" manner in order to detect potential blockages due to roots, grease, or pipe defects.

In preventing stoppages and backups, we use C.C.T.V. inspection to tell us the general condition of the pipeline; to identify potential stoppages; to tell us the cause of an actual stoppage; and to assist in establishing repair or replacement priority. In the past five years, we have televised 100 miles of District pipelines.

In some cases, the ultimate solution to a pipeline prone to stoppage is to repair or replace it. We have corrected seven miles by this method in the last five years.

As to the success of the program, only 55 (44 resulted in damage claims) residences had sewer backups in five years, an average of 11 per year. This equates to one residential backup for every 6,379 residential connections in the District.

In order to minimize the public's exposure to health hazards, we have worked with Contra Costa County health authorities to determine clean-up and disinfection techniques to use in homes where sewage backup has taken place. Through this joint effort, the following procedures were developed.

All liquid waste is picked up by wetvac's and disposed of in the sewer system.

Any carpeting not replaced with new, by the District, is professionally cleaned and sanitized.

All floors affected by the spill are throughly cleaned and disinfected with Virex, particular effort is given to flooring seams, baseboards, mouldings, and other difficult to clean areas.

The success of these methods can be measured by the fact that no health related incident as a result of sewage backup or spill has ever been reported to the District.

We are currently pilot testing a public notification program involving handout material, (See Figure II), that describes the potential for damage to the building from sewage backup, and the procedures to follow to prevent it. The warning notice is hand delivered to the occupant of a home or attached to the door latch after department personnel, through a field check at the site, have determined that the home is susceptible to damage from backed up sewage. We estimate the cost to the owner for installing a protective device to run from a low of $75 to a high of $950, and that the median, based on the use of the backwater overflow device, to be $250. Previous experience has shown us that property owners are reluctant to pay the expense of installing a backwater protection device because the odds of it ever being needed at their homes are extremely remote (currently 6,379 to 1).

We believe this program has a better chance for success than any other notification course we might have undertaken. At this time, it's still too early to assess its worth.

A study of two backups caused by wet weather surcharges is underway. There does not appear to be major obstacles to alleviating the surcharge problems which should be corrected by December 1, 1983.

QUERY #3 A discussion of the nature, extent of use, and effectiveness of backflow devices in use within the District. We are especially interested in your response to a complaint that the device recommended by the District is unreliable.

The District allows the use of two backwater overflow devices. (See Figure III) One is an overflow system and the other is a backwater check valve and shut off system. The overflow device is a domed fitting that can be screwed into the top of a building cleanout and has a ball float for odor prevention. The overflow system is required when the floor level of a house to be connected to the main sewer is below a point 12 inches above the top of the nearest upstream sewer manhole or other structure and where sewage can, without serious property damage, overflow.

The other is a backwater check valve and shut off system that uses two cleanouts, a gate valve, and a backwater check valve. This system is reguired where sewage cannot overflow without serious damage. It should be considered for installation wherever additional protection is desired.

In regards to the number of each device in current use, it is my estimate that the overflow device would number in the thousands and the backwater check valve and shut off system in the hundreds.

As to their effectiveness, they are very effective, we have witnessed the backwater overflow device successfully protecting residences and buildings in the District on many occasions, for over 25 years. Of the thousands installed, we know of only three locations where they gave less than total protection. We do not know of any location where they provided a home no protection whatsoever.

The use of this practical and inexpensive device has spread to other sewage agencies in the Bay Area, the State of California and in many other states throughout the country. However, the District makes no claim that either of its backflow prevention systems will provide absolute protection.

As to its reliability, we have just testified to the effectiveness of the overflow devices. The device is as reliable as it is effective but does not guarantee absolute fail-safe protection. We would appreciate more specific evidence of its unreliability, than that of supposition and theory, in order to respond reasonably to this complaint.

We have routinely advised the CRWQCB of sewage spills which were significant in terms of quantities and location. We are willing to consider a reporting system which would inform the CRWQCB of all known instances of sewage overflows should you wish.

The District is acutely aware of the distress, discomfort, and financial burden its residents may suffer as a result of sewage backup in their homes. The District's principal response to the problem has been through its collection system maintenance program.

The department has a 45 person staff, 37 are assigned to field operations, the remainder to shop and administrative tasks. There are 11 field crews, 6 of which have full time pipeline cleaning assignments. They are equipped with 2 power rodders; 2 hydraulic pressure cleaners, with a 3rd on order; a vaporoot chemical applicator; and assorted other hand and power tools. The District's capital investment in C.S.O. department vehicles, equipment, and tools it needs to perform its mission is $1,200,000. Its Springbrook Rd. maintenance facility in Walnut Creek, a complex of offices, shops, warehouse, storage dock, vehicle service facility, parking lot, and pipe yard, is valued at $1,750,000.

Department personnel have been course instructors in the E.P.A. financed Collection System Maintenance Educational Program. They also played an instrumental role in the development of the Sacramento State College course for collection system workers. This is better known as the Professor Ken Kerri course and is the model for the industry.

The District's C.S.O. department staff is experienced, capable, well trained, thoroughly competent, and totally familiar with the District's terrain and pipeline system. They take particular pride in their ability to provide fast and responsive service in emergencies and have received numerous commendations from District residents.

The department's concept of a preventative maintenance program received national recognition in 1981, when the department manager, Robert H. Hinkson, was awarded the Water Pollution Control Federation's Collection System Award for outstanding contributions to the state-of-the-art of wastewater collection.

EXHIBIT G

<u>EXHIBIT G</u>

Gregory Village Partner's Comments, including Erler & Kalinowski, Inc.'s comments, on Tentative Orders Related to the Properties at 1643 Contra Costa Boulevard and 1705 Contra Costa Boulevard, Pleasant Hill, California

- Tentative Order – Site Cleanup Requirements for 1643 Contra Costa Boulevard ("P&K Cleaner Site" or "Site 1"),
- Tentative Order – Site Cleanup Requirements for 1705 Contra Costa Boulevard ("Chevron Site" or "Site 2"), and
- Cleanup Team Staff Report for File Nos. 07S0132 and 07S0204 ("Staff Report").

1) Comments on Order for 1643 Contra Costa Boulevard ("Site 1")

a) Order Finding 3 - Named Dischargers

i) <u>*Discharger Not Named (item 3, third paragraph, page 3):*</u> The Order broadly states that it is "common knowledge that releases occurred during routine dry cleaner operations involving chlorinated solvents" but fails to point out that it is also common knowledge to State of California agencies that dry cleaner operations routinely discharged contaminated wastewaters to sanitary sewers and that it is common knowledge that sewers leak (Exhibit B to Firestone letter to Bruce Wolfe dated 4 August 2014 - *Dry Cleaners – A Major Source of PCE in Groundwater*, by Victor Izzo, dated 27 March 1992). This paragraph in the Order should be modified to add these two points. Both of these points highlight the role of the sanitary sewers and, as explained below, the responsibility of the Central Contra Costa Sanitary District ("CCCSD") for releases from the sewers.

ii) <u>*Sewer Leaks Contributed to the Off-site Groundwater Plume (page 3, item 3, third paragraph):*</u> This paragraph states that the dry cleaner pollutants "are present in groundwater at and downgradient of the former dry cleaner in concentrations that generally diminish with distance" from the P&K Cleaner Site. This statement ignores the fact that groundwater at sewer manhole M46 (sample GGP87-01) had the highest detected concentration of tetrachloroethene ("PCE") in groundwater in the off-site northern neighborhood and higher than the levels found at the well furthest downgradient on the P&K Cleaner Site, a concentration that is due to a sewer leak near manhole M46 (Exhibits 1 and 2). This paragraph in the Order should be modified to acknowledge that sewer leaks are "additional releases" of PCE and have "contributed" to the pollutant plume in groundwater in the northern neighborhood, as well as upgradient of Site 1 in the vicinity of Linda Drive from discharges from Site 2 of PCE containing wastewater to the old sewer in Linda Drive, which was subsequently replaced by CCCSD.

b) Order Finding 4 – Regulatory Status. Although the Site is not subject to a Regional Water Board order, it was voluntarily entered into the Spills, Leaks, Investigations and Cleanup (SLIC) Program in March 2002. This fact should be noted in this paragraph.

c) Order Finding 9 - Nearby Sites

i) *Joint Investigation Needed (page 6, item 9, first paragraph):* The last sentence states that the petroleum and chlorinated volatile organic compound ("CVOC") releases from the Chevron Site have commingled with the CVOC plume from the P&K Cleaner Site. We agree with this RWQCB conclusion and thus a single order should be issued to require the responsible parties for both the P&K Cleaner Site and the Chevron Site to jointly investigate and remediate the commingled plume, including in the northern neighborhood. At a minimum, as stated below, the Order for Site 2 should include Tasks with the same specificity as provided in the Order for Site 1, e.g., requirements for installation and sampling of monitoring wells, soil vapor probes, sub-slab and indoor vapor concentrations, and a deep groundwater investigation, and inclusion of a Self-Monitoring Program for Site 2. In addition, it should be noted that the Chevron Site discharged waste, including dry cleaner separator water containing CVOCs, into the CCCSD sanitary sewer, which is located next to the Chevron Site in Linda Drive and continues north, then east and then north again, adjacent to the Gregory Village Shopping Center (Exhibit 1). P&K Cleaners used the same sewer line for its wastewater disposal. These discharges of wastewaters from both dry cleaners to the same sewer line, which then entered manhole M46 (Exhibit 1) should be noted in this paragraph of the Order.

d) Clarifications and Corrections

i) *2. Site History (first sentence at top of page 2):* CVOCS and benzene were detected in the indoor air at "two" houses not "several."

ii) 7. Remedial Investigation (page 5, table summarizing maximum detected concentrations): The data identified as "Maximum Concentration Detected" include results for chemicals in vapor samples that are listed as not detected with the maximum laboratory report limit shown. Where detected, the maximum concentrations for trichloroethene ("TCE"), cis-1,2 dichloroethene ("cis-1,2-DCE") and vinyl chloride in soil vapor were 6,240 micrograms per cubic meter ("ug/m^{3}"), 947 ug/m^3, and 188 ug/m^3, respectively.

iii) *Self- Monitoring Program, 2. Monitoring:* The current monitoring program at the P&K Cleaner Site includes semi-annual measurement of groundwater elevations, not quarterly. The SMP should continue semi-annual measurement of groundwater elevations in available monitoring wells.

e) B. Tasks

i) The Staff has created unrealistic dates for Tasks 1, 2, and 3. Significant preparatory work needs to be completed in coordination with other responsible parties prior to initiating these tasks. New, appropriate dates need to be negotiated with the Staff, with particular recognition to the facts that the P&K Cleaner Site parties have limited resources and that Gregory Village Partners, L.P. ("GVP") has already voluntarily performed significant work in the neighborhood and on the P&K Cleaner Site in cooperation with the Regional Board. The unrealistic time schedule is punitive and unnecessary, especially in light of the fact that GVP has voluntarily investigated and mitigated potential human health risks in the neighborhood and on the P&K Cleaner Site without assistance from other potentially responsible parties for several years. In addition, the tasks in this tentative order are different than the tasks in the tentative order for the Chevron Site (Site 2). As noted below, there should be a single order for both sites. In the absence of a single order, all task paragraphs and schedules for tasks should be identical in orders for Site 1 and Site 2 with respect to common issues, i.e., deeper groundwater, the northern residential neighborhood, etc.

2) Comments on Order for 1705 Contra Costa Boulevard ("Site 2")

a) Order Finding 3. Named Dischargers: The Chevron Site discharged wastes, including dry cleaner separator water containing CVOCs, into the CCCSD sanitary sewer which is located next to the Chevron Site in Linda Drive. The evidence from the monitoring well on Linda Drive shows that CCCSD's sewers leaked in this area; thus CCCSD should be named as a discharger on this order. This should be noted in this paragraph.

b) Order Finding 7 – Remedial Investigation

i) *Plumes Are Commingled (page 4, item 7, first paragraph):* This paragraph states ambiguously that Chevron Site releases have "likely" commingled with the CVOC groundwater plume associated with the P&K Cleaners Site. However, the Staff Report (Section V) provides clear evidence that Chevron Site plume has traveled onto and through the P&K Cleaner Site and commingled with the P&K Cleaner Site plume and that this commingled plume has migrated to the residential neighborhood north of the P&K Cleaner Site. Because of this fact, the Regional Board should issue a single order for both Sites. In the event it does not do so, the Order for Site 2 should be changed to remove any ambiguity regarding the comingling of the plumes, and it should require that the parties responsible for the Chevron Site participate in any and all investigations and remediation associated with the commingled groundwater plume, including soil vapor that may emanate from it, i.e., Tasks 1 through 6 should read the same in both Orders. Furthermore, CCCSD's sewer leaks have also commingled with both the Chevron Site plume upgradient of the P&K Cleaner Site and commingled with both the Chevron and P&K Cleaner plumes in downgradient areas.

ii) *Many Significant Data Gaps (page 4, item 7, last paragraph):* The RWQCB states that there are several data gaps for the investigation of the Chevron Site with regards to the "vertical and lateral distribution of CVOCs in soil, soil vapor, and groundwater, both on-Site and off-Site." At a minimum, the most important of these data gaps should be identified in the Order and include a) the lack of data regarding CVOCs in soil vapor that may have migrated under the Gregory Village Mall building from releases at Site 2, b) the complete absence of monitoring wells to further assess CVOCs in shallow and deep groundwater from releases on Site 2 on the Gregory Village Mall Property and in the vicinity of Linda Drive, c) an understanding of CVOCs in groundwater and soil vapor in the residential neighborhood areas adjacent to the Chevron Site and upgradient of the P&K Cleaners Site, and d) a requirement that the parties responsible for the Chevron Site participate in the shallow and deep groundwater investigation in the commingled plume area on the Gregory Village Mall Property and in the northern neighborhood.

c) Order Section B, Tasks

i) *Lack of Specific Survey Requirement (page 10, Section B, Task 1):* In Task 1, the RWQCB requires that a sensitive receptors survey and conduit study be conducted but omits this very specific requirement that is included in the P&K

Cleaner Order. Because the RWQCB acknowledges that the Chevron Site plume is commingled with the P&K Cleaner Site plume, the Order for Site 2 should state the same requirements as in the P&K Cleaner Order, which should include the same requirement that "A door-to-door well survey shall be completed in the residential subdivisions to the north and west of the shopping plaza." We also recommend that such a survey be completed by the parties responsible for the Chevron Site in the adjacent residential neighborhood areas and upgradient of the P&K Cleaners Site.

ii) *Lack of Specific Investigation Requirements (page 10, Section B, Task 3):* In Task 2, unlike the P&K Cleaner Order which requires that specific investigations be conducted, the Chevron Order does not identify any specific investigations that must be conducted. A 2011 investigation at the Chevron Site found PCE at 2,500,000 ug/m^3 in soil vapor (VP-1) and the highest detection of PCE in soil (20 mg/kg) was at the deepest depth sampled at the Chevron source (approximately 35 feet bgs at CPT-14) (Exhibit 3.) These data strongly suggest the need to delineate the extent of vapor migration and the impact to deep groundwater, both on and off the Chevron Site. The Chevron Order should specify certain required investigations, including assessment of CVOCs in soil vapor that may have migrated under the Gregory Village Mall building, the installation of monitoring wells to further assess the lateral and vertical extents of CVOCs in shallow and deep groundwater migrating onto the Gregory Village Mall Property and in the vicinity of and downgradient of Linda Drive, and the investigation of shallow and deep groundwater in the commingled plume area on the Gregory Village Mall Property and in the northern neighborhood.

iii) *No Requirement for a Self-Monitoring Program:* Chevron Site releases have significantly impacted groundwater but surprisingly the Chevron Site has no groundwater monitoring wells except for one off-site shallow monitoring well that is located in the wrong place, i.e., so-called "compliance point" well EA-5, which is not located within the path of the CVOC contaminant plume that has migrated from the Chevron Site (Exhibit 4). The Order for Site 2 should require new shallow and deep groundwater monitoring wells that are routinely monitored in accordance with an appropriate Self-Monitoring Program.

3) Comments on Staff Report

a) Report Section III, Substantial Evidence of CVOC Releases from the Former Steel Waste Oil UST and Former Dry Cleaner at Site 2

i) *Extent of Chevron Plume on Gregory Village Mall Not Delineated (page 10, fourth paragraph):* In the Staff Report, the discussion that provides justification for reopening the RWQCB case on the Chevron Site, includes a comment stating that that the groundwater plume from the Chevron Site underlies the eastern part of the shopping center. It is important to point out that the only investigation to date by the parties responsible for the Chevron Site plume on the shopping center property has been on the eastern side of the Gregory Village Mall Property. No investigation of the groundwater plume has been conducted under or on the western side of the mall building, or along the southern side of the building along Doris Drive, even though PCE from the Chevron Site was found at 3,380 micrograms per liter in groundwater on the Mall property a short distance east of the Mall building (sampling location ECP-2 on Exhibit 4). In addition, there has been no investigation by Chevron of soil vapor under the southern end of the Mall building or elsewhere on the southern end of the Gregory Village Mall Property in the areas where the Chevron site plume is known to have migrated onto the Mall property or where likely to have done so.

b) Report Section IV, Basis for Naming Chevron Under The Water Code as a Discharger at Site 2;

i) *Chevron was the Former Landowner Where the Dry Cleaner Operated (page 8)*. In addition to the precedent of State Water Board Orders, there are CERCLA precedents to naming Chevron. In this case, Chevron purchased the dry cleaner property and subsequently built a car wash on that property while it owned it. Chevron's activity was not passive. Chevron graded the dry cleaner property, moved soil, dug utility trenches, excavated for footings and poured foundations in the subsurface. [Note that Chevron analyzed groundwater samples for CVOCs as early as 1988 and was thus aware of significant groundwater contamination during most of the period it owned the property.] Chevron moved that soil around the Site. 42 U.S.C §9607(a)(2) states that a responsible party is "any person who at the time of disposal of any hazardous substance owned or operated any facility at which such hazardous substances were disposed of." CERCLA defines "disposal" through the Solid Waste Disposal Act. See 42 U.S.C. § 9601(29) and 42 U.S.C. § 6903(3). The definition in its entirety reads: "The term "disposal" means the discharge, deposit, injection, dumping, spilling, leaking, or placing of any solid waste or hazardous waste into or on any land or water so that such solid waste or hazardous waste or any constituent thereof may enter the environment or be emitted into the air or discharged into any waters, including ground waters." Courts have held that that the movement or spreading of contaminated soil to uncontaminated portions of the property is a disposal under CERCLA. Chevron is thus a responsible party under CERLCA. See *Carson Harbor Village, Ltd. v. Unocal Corp. 270 F.3d 863 (9th Cir. 2001)*, *Kaiser Aluminum v. Catellus Dev. 976 F.2d 1338 (9th Cir. 1993)*, *Tanglewood East Homeowners v. Charles-Thomas, Inc. 849 F.2d 1568 (5th Cir. 1988)*, *PCE Nitrogen Inc. v. Ashley II of Charleston LLC, 714 F3. 161 (4th Cir. 2013)*. [Note that CCCSD dug up and replaced the sanitary sewer in Linda Drive adjacent to the Chevron Site apparently in about 1988. CCCSD moved PCE contaminated soil during its excavation and pipe replacement making it a responsible party under CERCLA.]

c) Report Section VI, Central Contra Costa Sanitary District is Not a Discharger

i) *Very Limited Sewer Records When Dry Cleaners Operated (page 12, Section VI, second paragraph):* The Staff Report asserts that the sewer lines in the Gregory Village area are in "good condition." However, there is no basis for such a statement that can be relevant to the time when dry cleaner wastewater discharges were occurring from Sites 1 and 2 because the CCCSD has extremely little information concerning the condition of the sewers or how well they were operated and maintained prior to the mid-1990s, which is a data gap of nearly 50 years from the time the sewers were constructed (Exhibit 5). Given the period of dry cleaner operations at the P&K Cleaners Site (approximately 1964 to 1991) and at the Chevron Site (approximately 1956 to 1986), the claims made by CCCSD regarding the conditions of the sewers since the mid-1990s are irrelevant. (See B. Dickson Declaration - Exhibit D to Firestone letter to Bruce Wolfe, dated 4 August 2014.)

ii) *Evidence of Pollutant Releases and Contributions to Plumes from Sewer Leaks (page 12, Section VI, fifth paragraph extending to top of page 13):* The Staff Report states that there is no direct evidence that leaking sewer lines caused or contributed significantly to groundwater contamination. That is not a true statement. On the contrary, there is abundant evidence that such contamination has occurred and the CCCSD should be required to investigate its contributions to pollutant plumes. Evidence shows that a) under its regulations, CCCSD accepted PCE in its system with a temporal, rather than a concentration limit to the discharge, b) both dry cleaner operations discharged to sanitary sewer lines, and c) local CCCSD sewers had cracks, sags, root intrusions, and joints at which leaks undoubtedly occurred. Further, it is clear that the local sewer lines were constructed near, at or below the groundwater table (Exhibit 6). Thus, it is no surprise that soil vapor concentrations have been found to increase with sampling depths nearer to the groundwater table.

iii) _Evidence of Pollutant Releases and Contributions to Plumes from Sewer Leaks (page 13, Section VI, at top of page):_ Investigation results to date provide evidence of leaks of PCE from sewer lines, with particular attention to the evidence near Manhole M46, the intersection of Shirley Drive and Cynthia Drive, and in Linda Drive (Exhibit 5). As pointed out in the Staff Report (page 4, regarding Groundwater Data), "high groundwater concentrations generally reflect a specific release point/area", and such is the case at manhole M46 where the highest off-site concentration of PCE in groundwater was detected at nearly 2,000 ug/L. Thus, it is inconsistent for Staff to state that high concentrations reflect releases / sources on Sites 1 and 2 but not at the "single data set" at manhole M46, for example (Staff Report at top of page 14).

iv) _Evidence of Pollutant Releases and Contributions to Plumes from Sewer Leaks (page 13, Section VI, at top of page) :_ The technical evidence in all available groundwater sampling data and multiple depth soil vapor sampling data shows that there are two contributors to the CVOCs detected in the groundwater and soil vapor plumes in the northern neighborhood area: a) migration of CVOCs in shallow groundwater and b) sewer leaks. In all of our collective past experiences with similar plume conditions at sites overseen by the RWQCB, there is sufficient evidence to name all three parties as dischargers and to task them with the joint responsibility of investigating, remediating, and sharing liability for pollutant plume conditions.

d) Report Section VI.1, No Evidence that the Sewer System Contributed to the Groundwater Plume

i) _Assertion That Sewers Are In Good Condition Is Not Supported by CCCSD's Records (page 13, Section VI.1, second paragraph):_ The Staff assertion that the sewer lines have been well maintained and were, by inference, in generally good condition – in the past – is unsupported by CCCSD records because there are no or sparse records regarding sewer maintenance or conditions over a nearly a 30-year period during which dry cleaning operations resulted in wastewater discharges to the sewers. More to the point, the reason the sewers needed to be in "maintained" is that they have been found to have cracks, sags, root intrusions, and joints that leak. Further, these sewers in the 1940s and 1950s were designed and constructed with a tolerance for leaks (Exhibit

5) even before there were cracks or root penetrations. See the Dickson Declaration in Exhibit D to Firestone letter to Bruce Wolfe, dated 4 August 2014.

ii) *Modeling Does Not Confirm the Source of Contaminants in Groundwater (page 13, Section VI.1, third paragraph):* The Staff Report states that the transport modeling conducted by PES Environmental, Inc. on behalf of the CCCSD "adequately demonstrates that the levels and locations of contamination in the environment resulted from the releases of CVOCs directly from past dry cleaning operations and automotive repair businesses, including releases from private sewers laterals, but not directly from the sewage conveyance system owned and operated by the CCCSD."

This conclusion is an over reach. PES used a relatively simple analytical tool that made broad assumptions regarding general soil properties and that does not preclude other possible and more likely explanations for the presence of PCE in groundwater in the northern neighborhood. The calculations by PES were simple groundwater velocity and retarded pollutant migration velocity estimates calculated assuming uniform soil properties and other generalized hydrologic parameters, i.e., a simple plume velocity under these simplified assumptions. Such calculations are typically highly uncertain and are thus capable of only stating in broad ranges information concerning pollutant releases. For example, such assumptions and calculations produce such a broad range of results as to provide vague or meaningless conclusions: e.g., that the pollutant releases happened 5 to 50 years ago or that the plume migrated 100 to 1000 feet in some assumed period. This calculation does nothing to refute that sewer leaks contributed additional amounts of CVOCs to the plume, e.g., the elevated 2,000 ug/L of PCE found near manhole M46. Thus, the explanations for the CVOCs found in shallow groundwater in the northern neighborhood, i.e., that detected concentrations resulted from both 1) leaks of CVOCs from the CCCSD's sewers and 2) the migration of CVOCs from the releases from sites that that had dry cleaning operations and automotive repair businesses, is completely consistent with PES' calculations.

The following comments elaborate on the limitations to this "modeling" approach:

(1) PES's "fate and transport modeling" is actually only a back-of-the-envelope type calculation using an over simplification of Site hydrogeology and stratigraphy that does not reflect the well-documented geologic complexity found at the Site. Actual site data, however, indicate

a significantly heterogeneous subsurface, both vertically and horizontally, with bedded sands, silts and clays that are laterally and vertically complex.

(2) PES calculates a Darcy-equation analytical seepage velocity that treats the entire subsurface from south of Doris Drive to north of Luella Drive as a uniform fine sand. These calculations assume an ideal homogeneous and isotropic porous media and, based on several assumptions and generalizations, provide an average transport velocity for the "center of mass" of an assumed “slug” of dissolved-phase PCE moving in groundwater.

(3) PES calculation appears to assume a slug of dissolved-phase PCE in groundwater noting a “peak concentration” (a rise, followed by decline) moving past monitoring well MW-8 in approximately 2007 or 2008. The PES figure titled “MW-8 VOC/MTBE Concentrations and Groundwater Elevations” is a logarithmic concentration-versus-time plot over the short period of October 2006 to late 2012 of the aqueous concentrations in monitoring well MW-8 of several chemicals in groundwater more than a decade after both dry cleaning operations ceased. PES interprets these limited data to show “the PCE center of mass migrating through it [the well location] in the 2007-2008 timeframe”. However, the actual time series plot referenced does not support PES’ interpretation, rather it shows a general decline of detected PCE concentrations over the graphed time span. The data are consistent with natural attenuation of dissolved PCE in the groundwater, not a slug of PCE passing through well MW-8.

iii) *CVOC Release from Sewers At or Near Manhole M46 (page 13, Section VI.1, second bullet):* GVP believes that the available data for the manhole M46 area are sufficient for the RWQCB to require the CCCSD to investigate contributions of CVOCs leaked from sewers to the pollutant plume in this area.

(1) The Staff Report points out that the soil gas concentrations near manhole M46 are higher near the water table than at shallow depths and concludes that CVOCs in soil vapor in this area originated from groundwater. However, CVOCs leaked from the sewer to groundwater at or near this location because the sewer and bottom of manhole M46 are located at or below the groundwater table in this area (Exhibits 6 and 7). Leakage of wastewater containing CVOCs from the sewer system in this area would contribute directly to the detected, elevated pollutant concentrations in shallow groundwater and, therefore, the measured CVOC soil vapors are,

at least, in part a consequence of sewer leaks. The potential for CVOCs from a sewer leak entering the groundwater in this area is particularly plausible because wastewaters from both dry cleaners at Site 1 and Site 2 drain directly to manhole M46 (Exhibits 1, 2 and 8).

(2) The Staff concludes that the concentrations of CVOCs in groundwater near manhole M46 are from plumes that have migrated from the P&K Cleaner Site and Chevron Site, dismissing the potential for a separate additional release from the sewer system near manhole M46. As described in prior submittals to the RWQCB (EKI's *Off-Site Property Specific Soil Vapor and Sub-Slab Vapor Investigation Repor*t, dated 19 January 2011 and Exhibit 5), there is a general separation in the specific areas of higher CVOC concentrations in groundwater and soil vapor between the manhole M46 vicinity and upgradient source locations. This separation is evident based on both groundwater data (Exhibit 2) and soil vapor data (Exhibit 8) that is evidence of a separate release / contribution of CVOCs to groundwater and soil vapor near M46.

(3) Regarding the presence of CVOCs detected at the parcels in soil vapor and groundwater between manholes M44 and M46, the Staff Report should also acknowledge migration of CVOCs in soil vapor through sewer pipes and in groundwater from the vicinity of manhole M46 through more permeable backfill associated with the sewer pipe between the two manholes, and hence to downgradient areas under residences.

iv) *CVOC Release from Sewers Near the Intersection of Shirley Drive and Cynthia Drive (page 13, Section VI.1, first bullet):* As previously reported to the RWQCB, investigations in the vicinity of this intersection provide evidence of a release from sewers in this area (EKI's *Off-Site Property Specific Soil Vapor and Sub-Slab Vapor Investigation Repor*t, dated 19 January 2011 and Exhibit 5).

(1) The CCCSD should investigate the occurrence of CVOC releases or migration along permeable backfill material along the sewer, which is nearly flat in this area of Shirley Drive.

(2) The leakage of wastewater containing CVOCs from sewers and the migration of CVOC vapors from sewers is supported by the results of a multi-depth vapor sampling investigation conducted in several locations by GVP. For example, as illustrated on Exhibit 9, soil vapor samples taken on Cynthia Drive in a line perpendicular to the sewer line

demonstrate that the locations of highest vapor concentration are closest to the sewer with diminishing concentrations moving away from the sewer. If the source of the CVOC vapors were only a plume in the groundwater, equivalent CVOC levels would be detected horizontally above the groundwater across the plume. Here, however, the data correlates to a release in the middle of Cynthia Drive and the sewer line located in the middle of Cynthia Drive.

v) *CVOC Release from Sewers in Linda Drive (page 14, Section VI.1, third bullet):* A CCCSD record from 1977 describes the sanitary sewer in Linda Drive as in "very poor shape has lots of cracks" (Exhibit 5 (see Exhibit 23 to that letter)). The dry cleaner and Chevron, both at Site 2, used this sewer line to discharge their waste. The Chevron Site is a site known to have high concentrations of CVOCs in soil, soil vapor, and groundwater due to releases from dry cleaner and auto repair operations, as well as elevated concentrations of PCE and TCE on the far western side of Linda Drive as early as 1988. Groundwater at former monitoring well EA-3 located on the western side of Linda Drive near the sewer, and cross gradient from Site 2, was found to have the highest PCE concentration (5,000 ug/L) of all groundwater samples collected for the early investigations of the Chevron Site (Exhibit 10). The proximity of location EA-3 to the sewer and on the opposite side of the street is evidence that that the sewer leaked waste containing CVOCs. The potential for releases for a sewer line described as having many cracks appears high, and such releases should be investigated by CCCSD and the parties responsible for the Chevron Site. The Staff Report notes the need for investigation of CVOCs in and downgradient of Linda Drive, but the Order for Site 2 fails to specify any such required investigations nor is there any current requirement for CCCSD to do so.

e) Report Section VI.2, No Evidence of the Sewer Operator's Knowledge that the Sewer System is Leaking or Needs Repair

i) *There is Evidence of Sewer leaks Despite Sparse CCCSD Records (page 14, Section VI.2):* The Staff Report states that CCCSD asserts it has no knowledge that its sanitary sewer system leaked significantly in the past. First, with respect to CVOCs, small leaks can create high concentrations of CVOCs in groundwater and extensive plumes. The use of the word "significantly" thus must be called into question. Second, the only arguable evidence to support for this supposed "lack of knowledge" is the lack of records describing the sewer conditions for a period of approximately 50 years, i.e., spanning the years when both dry cleaners discharged wastewater to this sewer system as noted above. Where CCCSD records are available, there are several instances where cracks, sags, root intrusions, and/or potentially leaky joints have been reported, with some repaired many years after discovery. Gregory Village has provided the RWQCB staff with information that describes several potential sewer leaks that CCCSD should be required to investigate (Exhibit 5 and Firestone letter dated 18 December 2012).

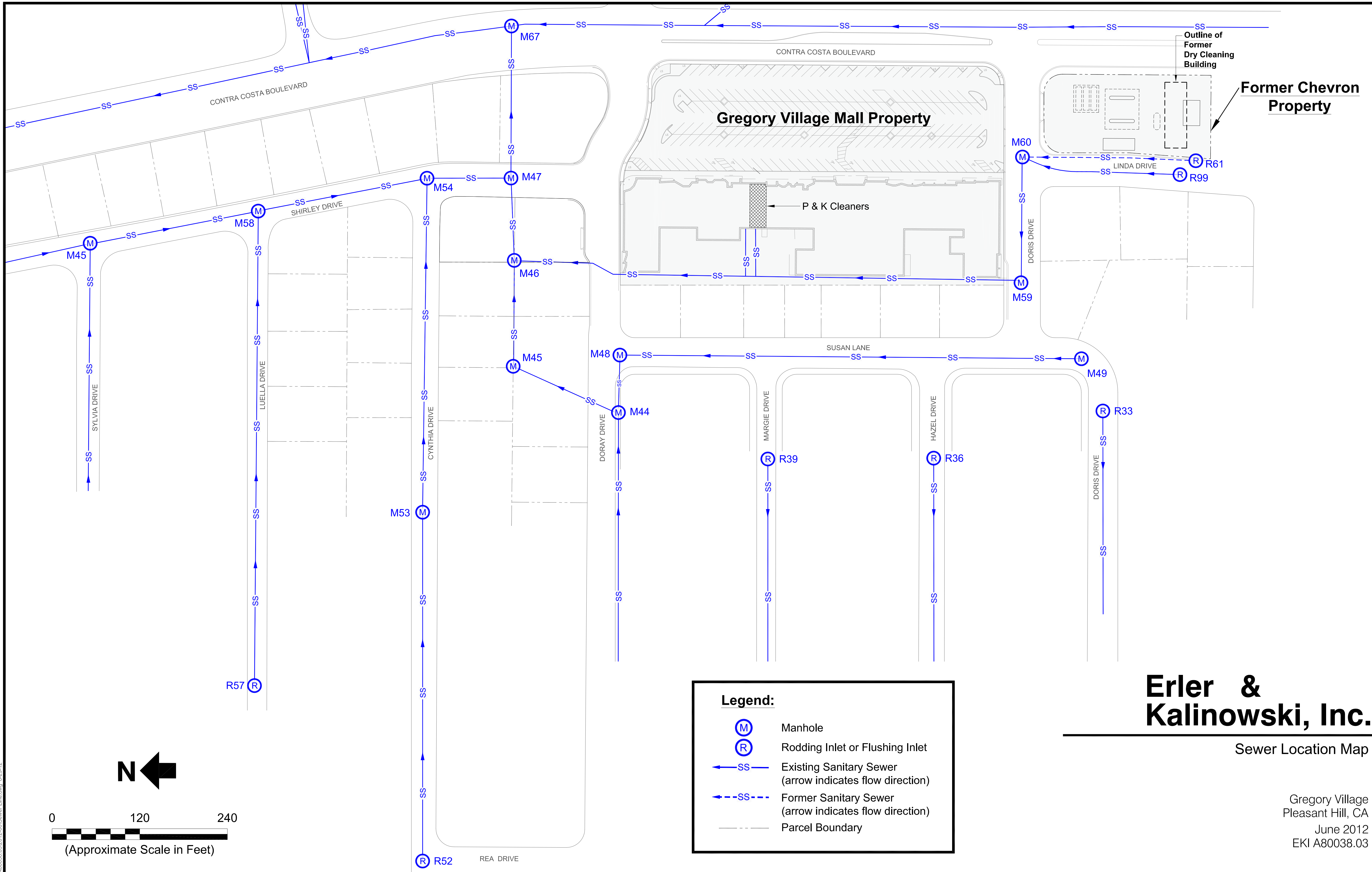
ii) *There is Evidence of Sewer leaks Despite Sparse CCCSD Records (page 14, Section VI.2):* Again, the CCCSD qualification that its knowledge regarding "significant" leaks apparently dismisses leaks it considers insignificant. Given the very low concentration thresholds for CVOCs allowed by the tentative Orders (i.e., drinking water standards and the RWQCB's Environmental Screening Levels), all leaks are potentially significant. The Staff Report points out that there are "many instances were minor leaks in the sewer mains were detected and repaired." It should be noted that not all minor leaks were repaired – tree roots were cleared but the penetration was not repaired. In addition, any repairs would have been made after the leaking condition was discovered, and based on CCCSD records since the mid-1990s, there typically was an interval of a number of years between inspections.

iii) *Lack of Records Does Not Establish That There Were No Leaks (page 15, item V.2):* The Staff Report appears to ignore the significance of the lack of CCCSD records prior to the mid-1990s. The Staff Report responds to two instances that GVP identified as illustrating the poor condition of the sewers (Exhibit 5). As noted in the Izzo Report, sunken or low spots in sewers are locations where PCE leaks from sewer pipes. Instance 1, a sunken spot in the sewer in Shirley Drive at Luella Drive, was repaired in 2003, even though a CCCSD inspection noted the problem in 1994. It thus could have been leaking at that location for more than 9 years! Surprisingly, the Staff Report says this instance suggests reasonable sewer maintenance. Instance 2 is the sewer in Linda Drive next to Chevron site that had many cracks in 1977 as mentioned above. The Staff Report states that the Linda Drive location needs to be investigated, but the RWQCB does not specifically require Chevron or CCCSD to do it.

f) Clarifications and Corrections

i) Groundwater Data (page 4, second paragraph): The January 1989 concentrations of PCE and TCE in groundwater at monitoring well EA-2 were 1,700 micrograms per liter ("ug/L") and 2,900 ug/L, respectively. At the same time, monitoring well EA-3 located in Linda Drive was sampled and had PCE and TCE in groundwater at 5,000 ug/L and 750 ug/L, respectively.

Exhibit 1



Gregory Village Mall Property
Former Chevron Property
Outline of Former Dry Cleaning Building
P & K Cleaners
CONTRA COSTA BOULEVARD
SHIRLEY DRIVE
LINDA DRIVE
SUSAN LANE
SYLVIA DRIVE
LUELLA DRIVE
CYNTHIA DRIVE
DORAY DRIVE
MARGIE DRIVE
HAZEL DRIVE
DORIS DRIVE
REA DRIVE
M67
M47
M54
M58
M45
M46
M60
M59
M48
M49
M44
M53
R61
R99
R33
R39
R36
R57
R52
N
0
120
240
(Approximate Scale in Feet)
Legend:
Manhole
Rodding Inlet or Flushing Inlet
Existing Sanitary Sewer (arrow indicates flow direction)
Former Sanitary Sewer (arrow indicates flow direction)
Parcel Boundary
Erler & Kalinowski, Inc.
Sewer Location Map
Gregory Village
Pleasant Hill, CA
June 2012
EKI A80038.03

Exhibit 2

Separate Areas of High PCE Concentrations in Groundwater Indicate Separate Releases

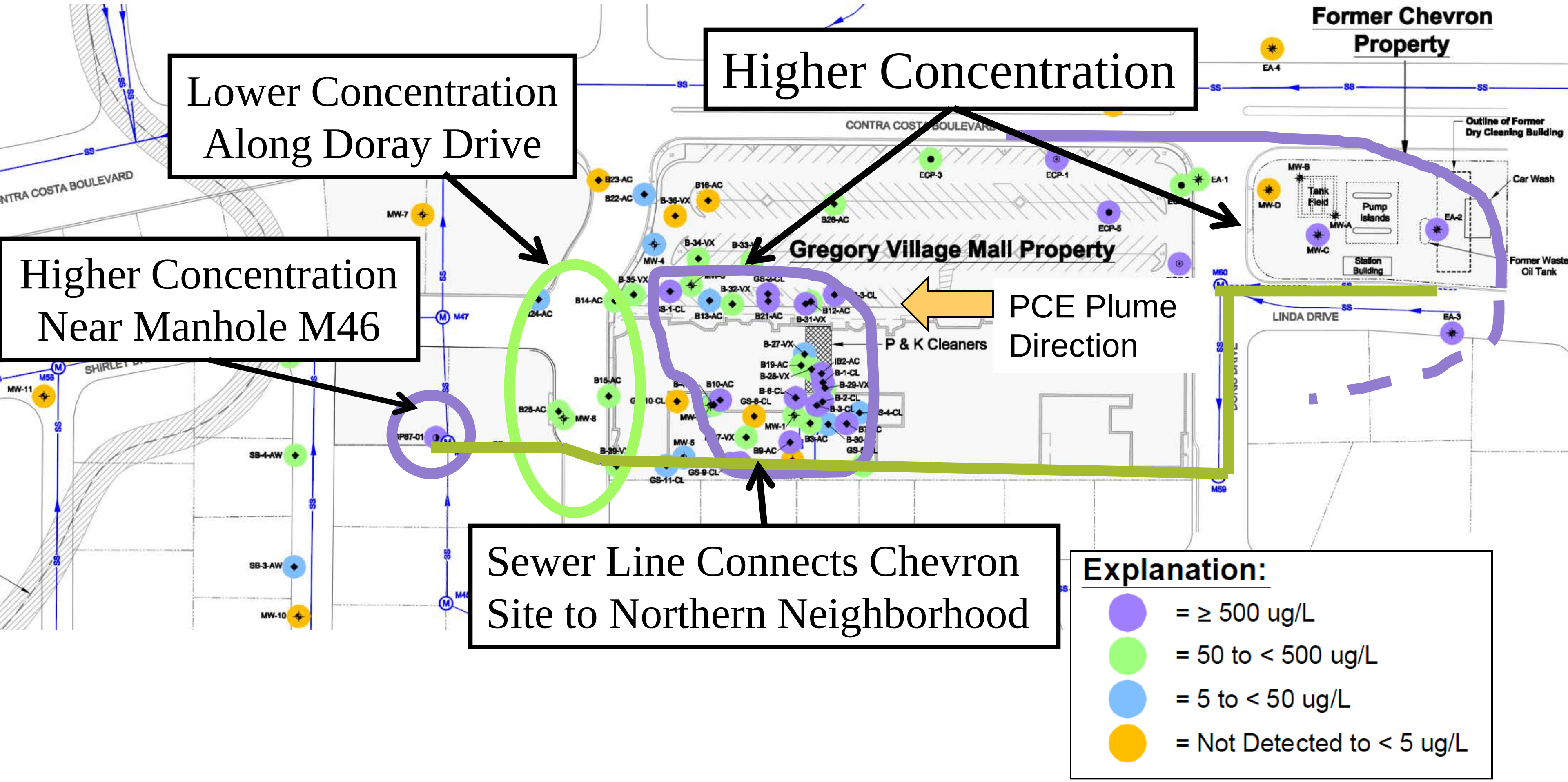


TABLE 2

SOIL ANALYTICAL DATA
CHEVRON SERVICE STATION 96817
1705 CONTRA COSTA BOULEVARD
PLEASANT HILL, CALIFORNIA

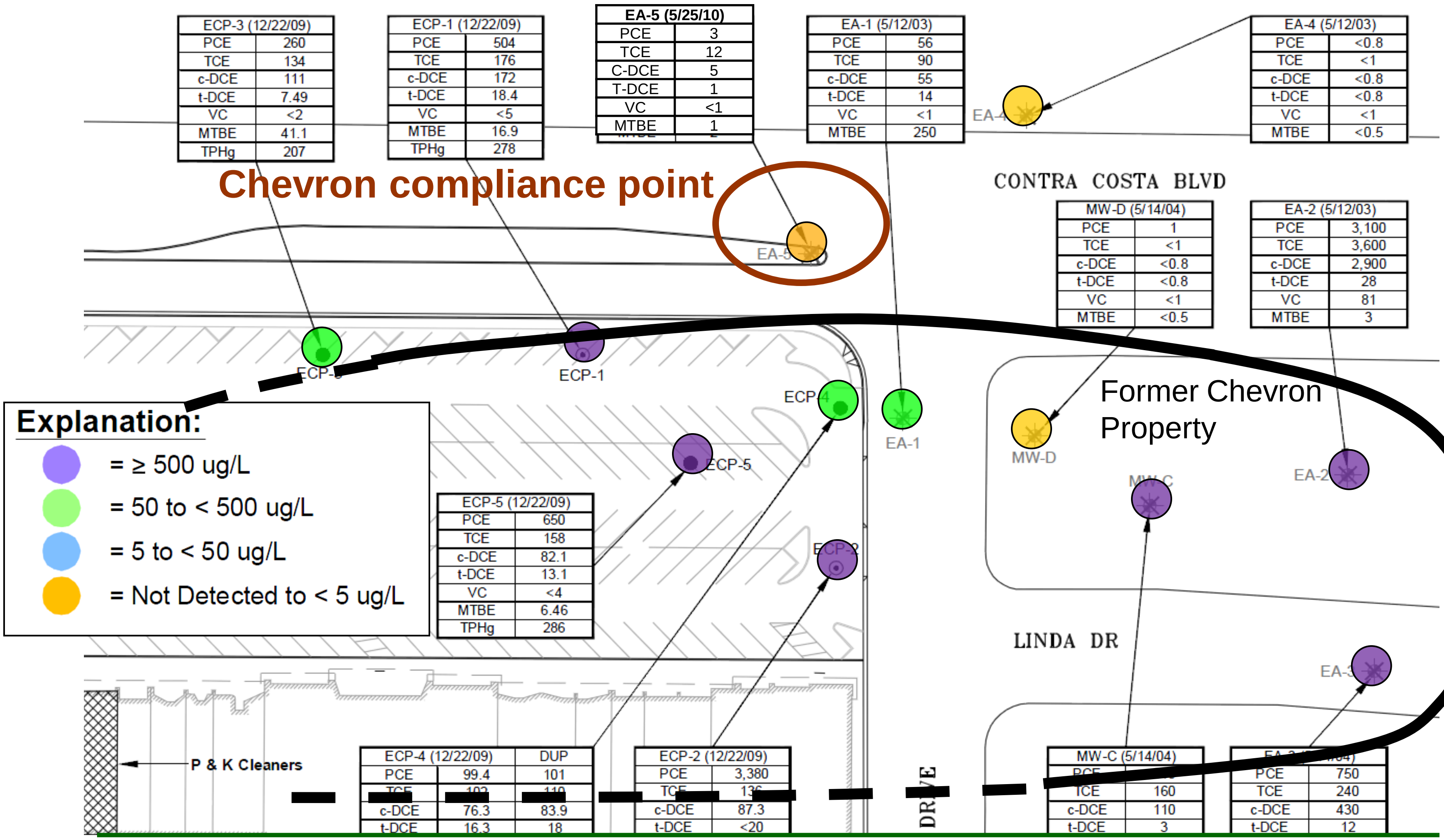
			HYDROCARBONS	*PRIMARY VOCS*											*ADDITIONAL VOCS*										*PAHS*
Location	Date	Depth	*TPH-GRO*	*B*	*T*	*E*	*m&p-Xylenes*	*o-Xylene*	*MTBE by SW8260*	*TBA*	*DIPE*	*ETBE*	*TAME*	*EDB*	*1,1-DCE*	*1,2-DCA*	*CHB*	*CF*	*C-1,2-DCE*	*PCE*	*T-1,2-DCE*	*TCE*	*VC*	*Naphthalene*
	Units	ft	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*	*mg/kg*
CPT-13	**12/20/2011**	**9.5**	**<1**	**<0.0005**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**0.0005**	**<0.020**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**0.18**	**0.34**	**0.009**	**0.21**	**<0.001**	**<0.001**
CPT-13	**12/20/2011**	**20**	**<1**	**<0.0005**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.0005**	**<0.019**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**0.004**	**<0.001**	**<0.001**	**0.002**	**<0.001**	**<0.001**
CPT-13	**12/20/2011**	**29.5**	**<1**	**<0.0005**	**<0.0009**	**<0.0009**	**<0.0009**	**<0.0009**	**<0.0005**	**<0.019**	**<0.0009**	**<0.0009**	**<0.0009**	**<0.0009**	**<0.0009**	**<0.0009**	**<0.0009**	**<0.0009**	**0.004**	**0.002**	**<0.0009**	**0.002**	**<0.0009**	**<0.0009**
CPT-14	**12/19/2011**	**10**	**7.5**	**<0.024**	**<0.048**	**<0.048**	**<0.048**	**<0.048**	**<0.024**	**<0.96**	**<0.048**	**<0.048**	**<0.048**	**<0.048**	**<0.048**	**<0.048**	**<0.048**	**<0.048**	**0.24**	**19**	**<0.048**	**0.27**	**<0.048**	**<0.048**
CPT-14	**12/19/2011**	**20**	**<1**	**<0.0005**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.0005**	**<0.019**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**0.001**	**0.014**	**<0.001**	**<0.001**	**<0.001**	**<0.001**
CPT-14	**12/19/2011**	**34.5**	**6.2**	**<0.023**	**<0.047**	**<0.047**	**<0.047**	**<0.047**	**<0.023**	**<0.94**	**<0.047**	**<0.047**	**<0.047**	**<0.047**	**<0.047**	**<0.047**	**<0.047**	**<0.047**	**<0.047**	**20**	**<0.047**	**0.085**	**<0.047**	**<0.047**
CPT-15	**12/16/2011**	**10**	**44**	**<0.025**	**<0.050**	**<0.050**	**<0.050**	**<0.050**	**<0.025**	**<0.99**	**<0.050**	**<0.050**	**<0.050**	**<0.050**	**<0.050**	**<0.050**	**<0.050**	**<0.050**	**<0.050**	**<0.050**	**<0.050**	**<0.050**	**<0.050**	**0.090**
CPT-15	**12/16/2011**	**19.5**	**<10**	**<0.0005**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.0005**	**<0.020**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**
CPT-15	**12/16/2011**	**34.5**	**<1**	**<0.0005**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.0005**	**<0.020**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**0.002**	**0.009**	**<0.001**	**0.004**	**<0.001**	**<0.001**
CPT-16	**12/19/2011**	**12**	**390**	**0.23**	**<0.047**	**0.39**	**<0.047**	**<0.047**	**<0.024**	**<0.95**	**<0.047**	**<0.047**	**<0.047**	**<0.047**	**<0.047**	**<0.047**	**<0.047**	**<0.047**	**<0.047**	**0.46**	**<0.047**	**<0.047**	**<0.047**	**4.2**
CPT-16	**12/19/2011**	**20.5**	**<1**	**0.001**	**<0.0009**	**<0.0009**	**<0.0009**	**<0.0009**	**<0.0005**	**<0.019**	**<0.0009**	**<0.0009**	**<0.0009**	**<0.0009**	**<0.0009**	**<0.0009**	**<0.0009**	**<0.0009**	**<0.0009**	**0.069**	**<0.0009**	**0.005**	**<0.0009**	**<0.0009**
CPT-16	**12/19/2011**	**34.5**	**<0.9**	**<0.0005**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.0005**	**<0.019**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**0.001**	**0.15**	**<0.001**	**0.042**	**<0.001**	**<0.001**

TABLE 4

SOIL VAPOR ANALYTICAL DATA
CHEVRON SERVICE STATION 96817
1705 CONTRA COSTA BOULEVARD
PLEASANT HILL, CALIFORNIA

		HYDROCARBONS	*PRIMARY VOCS*						*VOCS*														
Location	Date	*TPH-GRO*	*B*	*T*	*E*	*m&p-Xylenes*	*o-Xylene*	*MTBE*	*EDB*	*1,1-DCE*	*1,2-DCA*	*CHB*	*CF*	*C-1,2-DCE*	*PCE*	*T-1,2-DCE*	*TCE*	*VC*	*Naphthalene*	*Ethanol*	*1,1,1-Trichloroethane*	*1,1,2,2-Tetrachloroethane*
	Units	*ug/m3*	*ug/m3*	*ug/m3*	*ug/m3*	*ug/m3*	*ug/m3*	*ug/m3*	*ug/m3*	*ug/m3*	*ug/m3*	*ug/m3*	*ug/m3*	*ug/m3*	*ug/m3*	*ug/m3*	*ug/m3*	*ug/m3*	*ug/m3*	*ug/m3*	*ug/m3*	*ug/m3*
VP-1	**12/13/2011**	**<420,000**	**<6,500**	**<7,700**	**<8,800**	**<8,800**	**<8,800**	**<7,300**	**<16,000**	**<8,100**	**<8,200**	**<9,400**	**<9,900**	**410,000**	**2,500,000**	**19,000**	**2,100,000**	**<5,200**	**<43,000**	**<15,000**	**<11,000**	**<14,000**
VP-1-DUP	**12/13/2011**	**<320,000**	**<5,000**	**<5,800**	**<6,700**	**<6,700**	**<6,700**	**<5,600**	**<12,000**	**<6,100**	**<6,300**	**<7,100**	**<7,600**	**350,000**	**2,200,000**	**10,000**	**1,900,000**	**<4,000**	**<32,000**	**<12,000**	**<8,400**	**<11,000**
VP-2_5	**12/13/2011**	**23,000**	**<2.7**	**7.0**	**<3.7**	**6.7**	**14**	**<3.1**	**<6.6**	**<3.4**	**<3.5**	**7.2**	**22**	**<3.4**	**<5.8**	**<3.4**	**<4.6**	**<2.2**	**<18**	**<6.5**	**<4.7**	**<5.9**
VP-2_7.5	**12/13/2011**	**20,000**	**4.9**	**33**	**4.0**	**5.9**	**24**	**<2.9**	**<6.2**	**<3.2**	**<3.2**	**25**	**31**	**<3.2**	**21**	**<3.2**	**16**	**<2.0**	**<17**	**<6.1**	**<4.4**	**<5.5**
VP-3_5	**12/13/2011**	**<1,200**	**<19**	**<23**	**<26**	**<26**	**<26**	**<22**	**<47**	**<24**	**<25**	**<28**	**<30**	**<24**	**14,000**	**<24**	**850**	**<16**	**<130**	**<46**	**<33**	**<42**
VP-3_7.5	**12/13/2011**	**<4,200**	**<66**	**<78**	**<89**	**<89**	**<89**	**<74**	**<160**	**<82**	**<83**	**<95**	**<100**	**<82**	**53,000**	**<82**	**2,200**	**<53**	**<430**	**<160**	**<110**	**<140**

Chevron Compliance Point and Only Well is NOT in the Chevron Plume



ECP-3 (12/22/09)	
PCE	260
TCE	134
c-DCE	111
t-DCE	7.49
VC	<2
MTBE	41.1
TPHg	207

ECP-1 (12/22/09)	
PCE	504
TCE	176
c-DCE	172
t-DCE	18.4
VC	<5
MTBE	16.9
TPHg	278

EA-5 (5/25/10)	
PCE	3
TCE	12
C-DCE	5
T-DCE	1
VC	<1
MTBE	1

EA-1 (5/12/03)	
PCE	56
TCE	90
c-DCE	55
t-DCE	14
VC	<1
MTBE	250

EA-4 (5/12/03)	
PCE	<0.8
TCE	<1
c-DCE	<0.8
t-DCE	<0.8
VC	<1
MTBE	<0.5

MW-D (5/14/04)	
PCE	1
TCE	<1
c-DCE	<0.8
t-DCE	<0.8
VC	<1
MTBE	<0.5

EA-2 (5/12/03)	
PCE	3,100
TCE	3,600
c-DCE	2,900
t-DCE	28
VC	81
MTBE	3

ECP-5 (12/22/09)	
PCE	650
TCE	158
c-DCE	82.1
t-DCE	13.1
VC	<4
MTBE	6.46
TPHg	286

ECP-4 (12/22/09)		DUP
PCE	99.4	101
TCE	102	110
c-DCE	76.3	83.9
t-DCE	16.3	18

ECP-2 (12/22/09)	
PCE	3,380
TCE	136
c-DCE	87.3
t-DCE	<20

MW-C (5/14/04)	
PCE	[illegible]
TCE	160
c-DCE	110
t-DCE	3

EA-3 ([illegible]/04)	
PCE	750
TCE	240
c-DCE	430
t-DCE	12

Note: Except at the Chevron compliance point (existing well EA-5), the color dots are one time grab sample locations or wells that have been destroyed by Chevron.

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July 3, 2012

Mr. Bruce Wolfe, Executive Officer
California Regional Water Quality Control Board
San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, California 94612

Subject: Central Contra Costa Sanitary District Sanitary Sewer
In Vicinity of 1601-1699 Contra Costa Boulevard
Pleasant Hill, California
Regional Board File No. 07S0132

Dear Mr. Wolfe:

This letter is in response to California Regional Water Quality Control Board, San Francisco Bay Region's ("RWQCB") decision not to issue a Water Code Sec. 13267 letter ("13267 letter") to the Central Contra Costa Sanitary District ("CCCSD") that would request a report regarding the release(s) of hazardous materials from CCCSD's sanitary sewer system in the vicinity of the Gregory Village Mall ("GV Mall") in Pleasant Hill, California ("Site"). Further, should the RWQCB determine that it will issue a Cleanup and Abatement Order ("CAO") for the Site, this letter serves to provide information to support the naming of CCCSD to such a CAO.

It is Gregory Village Partners, L.P.'s ("GVP") understanding that the RWQCB's determination not to issue a 13267 letter was based on discussions with individuals in the Central Valley Regional Water Quality Control Board, Sacramento Office ("Central Valley Board") and information presented by CCCSD to RWQCB staff on March 28, 2011. In what the RWQCB staff reported to us about its discussions with the Central Valley Board, we understand that staff learned that, from the Central Valley Board's perspective, unless a sewer district's behavior is egregious or there is willful misconduct, a sewer district should not be deemed to be a discharger for releases of hazardous materials from its sewer system under the Porter-Cologne Water Quality Control Act, Water Code Secs. 13000, et seq. ("Porter-Cologne"). Based on those conversations with the Central Valley Board and the information provided by CCCSD, the RWQCB decided not to issue a 13267 letter to CCCSD.

However, if what we understood the RWQCB staff's report to us is true, the Central Valley Board's unwritten policy is contrary to law and is in conflict with one of its own issued orders. Additionally, as a result of GVP's research, GVP has learned that CCCSD's representatives made statements to RWQCB staff in its meeting with the staff that were either false, incomplete or misleading concerning whether and when it prohibited tetrachlorethene ("PCE") discharge to its sewers. Further, CCCSD omitted a considerable amount of unfavorable information concerning the construction, operation and maintenance of its sanitary sewer system near the Site. Consequently, GVP requests that the Regional Board reconsider its position.

As discussed in more detail below:

1. Porter-Cologne provides for strict liability for dischargers, and there is no legal basis for treating CCCSD differently from any other discharger regarding the standard required to hold it as a "discharger";

2. Based on the materials provided by CCCSD pursuant to a Public Records Act request, CCCSD regulations appeared to specifically allow the discharge of PCE from dry cleaners into the sewer system until apparently 2007 and apparently continue to allow such discharges from other sources today;

3. CCCSD's specifications for sewer construction by their very nature allowed/permitted the significant discharge of materials* from the sewer into the subsurface (including groundwater);

4. According to CCCSD's own records, the sewers were maintained (or improperly maintained) such that there were various failures of the sewers in the vicinity of the Site; and

5. Groundwater and soil vapor testing results clearly show chlorinated hydrocarbons was released into the waters of the state from the sewer system consistent with findings regarding CCCSD's construction specifications and maintenance procedures.

This letter is based primarily on documents produced by CCCSD as a result of a California Public Records Act request made by GVP, a copy of which is attached for your convenience as Exhibit 1. In all likelihood there is more information that would support GVP's position in that (a) there are likely relevant documents in CCCSD files that CCCSD was not required to produce in order to comply with a Public Records Act request; (b) information needed to interpret the documents (such as the meaning of abbreviations and codes) was not provided; (c) a considerable amount of the information is not legible due to age of documents and copying constraints; and (c) few inspection or maintenance records prior to the mid-1990s were made available.

Strict Liability Under Porter-Cologne

Porter-Cologne states that "any person who has discharged or discharges waste into the waters of the state in violation of any waste discharge requirements or other order or prohibition issued by a regional board or the state board, or who has caused or permitted, causes or permits, or threatens to cause or permit any waste to be discharged or deposited where it is, or probably will be, discharged into the waters of the state," is responsible for the investigation, clean up and abatement of same.[i] The statute expressly includes "districts" in the definition of person, making it clear that the legislature fully intended these semi-governmental agencies to be held to the requirements of the statute.[ii]

CCCSD is a discharger because it operated, and continues to operate, a sewer system that leaks sewage and its constituents into the subsurface as discussed in more detail below. Further, CCCSD knowingly accepted, and continues to accept, hazardous substances, such as PCE, into its sewer system[iii] and permitted those substances to leak into the waters of the state from its pipes. In fact, while CCCSD banned PCE discharges from dry cleaners in 2007, it apparently continues to accept such discharges of chlorinated hydrocarbons from other operations.[iv] Finally, CCCSD is a discharger merely because it owns the sewers, whether or not its actions caused the discharge. State Water Resources Control Board ("SWRCB") and RWQCB orders have long stated that owners of property from which a discharge has

* Trichloroethene (TCE) has also been detected at various concentrations in the vicinity of the Site. The source of TCE is either the result of PCE degradation or TCE that has been discharged into the environment/sanitary sewers by TCE users or a combination of both. TCE and PCE are both chlorinated hydrocarbons and behave similarly in sewers and the environment.

occurred are dischargers because they owned the property during and after the time of the activity that resulted in the discharge, had knowledge of the discharge or the activities that caused the discharge, and had the legal ability to prevent the discharge.[v]

While the Central Valley Board appears to have an unwritten policy that it will not hold a sewer district liable as a discharger chlorinated hydrocarbon wastes unless there has been egregious behavior or willful misconduct, which the RWQCB appears to be adopting, there is no legal basis for treating CCCSD any differently than any other potential discharger. Such a policy contradicts express provisions of the Water Code and its application likely violates provisions of California administrative law as well. It is, however, of interest to note that the CAO in which the Central Valley Board found the City of Lodi to be a discharger does not require egregious behavior or willful misconduct.† Of additional note is that, even if there were a legal basis for the Central Valley Board's unwritten policy, an examination of the facts surrounding CCCSD's sewer system near the Site, as discussed in more detail below, establishes that CCCSD's behavior was both egregious and willful in allowing releases of dry cleaning waste from the sewer system.

Based on current law, (a) given CCCSD's active operation of the sewers, (b) its ability to have prevented the discharges, (c) it's ability to investigate and remediate the releases from the sewers, and (d) its control over the sewer system, the RWQCB should conclude that CCCSD is a discharger.[vi] Further, CCCSD: (a) knowingly accepted PCE into its system from dry cleaners until 2007, (b) constructed a sewer system that allowed for significant exfiltration of liquids (and release of gasses), (c) failed to repair significant known leaks, and (d) knowingly permitted PCE and other chlorinated hydrocarbons to leak from its sewers into

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†*In re City of Lodi*, CAO No. R5-2004-0043. According to the CAO, the City of Lodi owned and operated the City's sanitary sewer system. A portion of the sewer line ran into an alleyway and received PCE waste from a dry cleaner and printer. Groundwater near the sewer contained PCE and its degradation products in excess of water quality objectives. In addition, soil in the vicinity of the sewer line contained PCE that threatened groundwater quality. PCE vapor intrusion to indoor air was documented in two buildings and threatened in others. The City of Lodi was named a discharger. The CAO states as follows:

> 2. The City of Lodi is the owner and operator of Lodi sanitary sewer system, of which the alleyway sewer line is a part. The City of Lodi operates its sanitary sewer system pursuant to an NPDES permit, # CA0079243, issued by the Regional Board. The City of Lodi is subject to this Order because as owner and operator of a waste disposal conveyance system the City has caused or permitted waste to be discharged to waters of the state where it has created and threatens to create a condition of pollution or nuisance. The City has had actual or constructive (legally presumed) knowledge of discharges from its sewers, and the ability to prevent further sewer discharges, since at least 1992.
>
> 12. Regional Board staff also requested that the City of Lodi repair the leaking, sagging sewer line in the area of the pure phase liquid PCE release in the Central Plume pollution source area. Although PCE is not currently being discharged into the sewer in this area, the repair was necessary to prevent sewer leakage from causing further migration of PCE already present in the soil. In response to the Regional Board staff's request, the City recently slipped-lined that section of the sewer.

Nowhere in the CAO is there a provision that states that the City of Lodi is being named because its behavior is in any way egregious or there is willful misconduct. Rather, the CAO simply states:

> 23. Based on the facts stated herein and the evidence referenced in the Staff Report, including the Exhibits attached to the Staff Report, the testimony presented at the hearing, and the technical reports submitted with regard to investigation of the sites subject to this Order, the Regional Board finds that City of Lodi… [has] caused or permitted, or [is] causing or permitting, waste, i.e., PCE, to be discharged or deposited where it is, or probably will be, discharged into the waters of the state, specifically the groundwater beneath the central area of the City of Lodi, and [has] created, or threaten to create, a condition of pollution or nuisance, as provided in Water Code Section 13304.

The fact pattern involving CCCSD at the Site is almost identical to the fact pattern involving the City of Lodi. Under California law, it is only necessary to establish that there has been a discharge and that the entity is a discharger; the behavior of the party is neither relevant nor appropriate for a Regional Board to consider in determining a party's status as a discharger.

the environment. Thus, even if the RWQCB were to follow this misguided unwritten policy of the Central Valley Board, CCCSD would still qualify as a discharger.

CCCSD Regulations Expressly Allowed for the Discharge of PCE Until 2007

In its slide presentation on March 28, 2011, CCCSD representatives informed the RWQCB that "CCCSD has excellent source control program – PCE discharge prohibited" (slide 2); "Adopted ordinance in 1963 prohibiting discharge of harmful substances into the sewer system (e.g. PCE); Further strengthened ordinance in 1974 to address specific pollutants including chlorinated hydrocarbons; Ordinance revisions in 1981 and 1991 to further prohibit discharges such as PCE and TCE into sewers" (slide 8); and "CCCSD acted prudently and has a strong history of: Source control prohibitions, Pollution prevention programs, Excellent sewer maintenance" (slide 21). These statements are false, incomplete or misleading.

At all times during the operation of the dry cleaners at the GV Mall (i.e., until 1992), CCCSD did not prohibit the discharge of PCE from dry cleaners to its sewers. Based on the records provided by CCCSD, it apparently did not put such a prohibition in place until 2007. CCCSD quoted general provisions of its code to the RWQCB in its March 28, 2011 Power Point presentation and ignored specific provisions of its regulations that expressly allowed for the discharge chlorinated hydrocarbons into the sewer. Under rules of statutory construction, all language in a statute must be given meaning and should be read whenever possible so as not to create a conflict between the provisions. The only way to interpret the CCCSD code under this rule is that chlorinated hydrocarbons, in general, and PCE specifically, did not fall within the definitions of prohibited substances prior to 2007. A more detailed discussion of specific regulations follows.

From the 1950s through 2007, CCCSD ordinances are either silent on the issue of PCE discharges or expressly allow anyone, including dry cleaners, to discharge PCE into the sewers.[vii] GVP does not have a copy of the 1963 ordinance referenced in the Power Point materials (slide 8) from CCCSD's presentation to the RWQCB. The 1974 ordinance referenced in those materials, contrary to the assertion of the CCCSD, expressly allows the discharge of chlorinated hydrocarbons within certain concentrations.[viii] The 1981 and 1991 ordinances also provide for and permit the discharge of chlorinated hydrocarbons in general and PCE specifically.[ix] It appears that CCCSD did not prohibit the discharge of PCE from dry cleaners to its sewers until 2007 and it appears that CCCSD continues to permit the discharge of PCE from other sources.[x] (Copies of the ordinances referenced in this paragraph and elsewhere in this letter are provided for the RWQCB's convenience as Exhibit 2.)

In addition, CCCSD itself interpreted its regulations to allow for the discharge of PCE into the sewer. Evidence of this includes a letter sent to all dry cleaners in June 1992 that notifies the dry cleaners of the establishment of a PCE discharge limit of 0.5 parts per million (ppm). Interestingly, CCCSD also notes, "[a] recent study[xi] of groundwater and soil contamination in the Central Valley has shown that perchlorethylene exfiltration from sewer lines may cause contamination of the soil and groundwater." (A copy of this letter and applicable portions of the study ("Izzo Report") are attached for your convenience as Exhibits 3 and 4, respectively.) Thus, in direct contradiction to the statements it made to the RWQCB, CCCSD allowed the discharge of PCE to its sewers, even after it was well aware that sanitary sewers were an important source of PCE detected in the environment.

Finally, additional evidence that the CCCSD allowed discharge of PCE into its sewers can be found in the Annual CCCSD Pretreatment Program Reports (copies of which will be provided upon request) which indicate that the CCCSD knew of, tested for, and consistently found measurable PCE concentrations in influent and/or effluent sampling from 1986 to 2010[xii] (excluding only 2005).

CCCSD Knowingly Built a Leaking Sewer System

CCCSD plans show that the sanitary sewers in the vicinity of the GV Mall were constructed by the 1950s. A Plan of Sanitary Sewers for the Gregory Gardens residential development located adjacent to the GV Mall is dated 1949 and notes that 1) sewers will be clay pipe as specified by the Contra Costa County Sanitation District and 2) all work to be done to Central Contra Costa Sanitary District Specifications (Exhibit 5). Also, a 1950 Plan and Profile of Sanitary Sewer shows the sewer extending from Linda Drive, through Doris Drive and the alley behind the GV Mall to manhole M46 (Exhibit 6). See Exhibit 7 for a map showing locations of streets, manholes ("M"), and rodding inlets ("R") referred to in this letter.

Sewer Specifications, which are undated but appear to be from the early 1950's or earlier, expressly provide for an exfiltration tolerance of 1400 gallons per inch of diameter for the length of the sewer in miles per day (Exhibit 8). The sewer line serving the Linda Drive area through the GV Mall to the northern neighborhood (i.e., R61 to M60 to M59 to M46) is 8-inches in diameter (Exhibit 6). The sewer down pipe of M46 to M67 in Contra Costa Boulevard is 15-inches in diameter. The sewer from M44 to M46 to M47 to M67 is 15-inches in diameter and was in existence in 1949 (Exhibit 5). Applying the specifications to these sewer lines, up to two gallons per day per foot of 8-inch diameter pipe and nearly four gallons per day per foot of 15-inch diameter pipe are allowed to exfiltrate into the subsurface. Subsequent specifications in 1956 (Exhibit 9) and 1959 (Exhibit 10) also expressly allow exfiltration. Later specifications do not provide allowed exfiltration amounts but discuss infiltration allowances and allowable air leaks during testing of up to one pound per square inch during a two minute test period – meaning that, by permitting leakage, the system design requirements still allow exfiltration. Based on these regulations, CCCSD intentionally and knowingly built a sewer system that leaked.

Some sewer pipes appear to have been constructed relatively flat, which increases the potential for the accumulation of waste material as well as leakage and/or back-flow through the pipes. The 8-inch diameter sewer from M58 to M47 in Shirley Drive is shown by plan (Exhibit 11) to have a slope of 0.003 feet/foot (0.3%) and the 8-inch diameter sewer behind GV Mall is shown by plan (Exhibit 6) to be at a slope of 0.005 feet/foot (0.5%); both are less than the current CCCSD recommendation of 0.0077 feet/foot (0.77%) (Exhibit 12).

Additionally, the early Sewer Specifications require all pipes for sewers, wye branches, drop connections and flushing inlets to be "un-glazed vitrified clay sewer pipe (Exhibit 8, 9, and 10)." Bituminous (i.e., asphalt) joint compound was used and gaskets were specified as jute or oakum (Exhibit 8, 9 and 10). The Izzo Report found that PCE was released from sewer pipes including intact pipes, stating "Work done by the City of Merced shows that intact sewer lines can and have discharged PCE to the soil" (Izzo, p. 11). The Izzo Report further states: "In this method, PCE volatilizes inside the pipe and moves as a gas through the sewer pipe wall…The piping material is not designed to contain gas" (Izzo, p. 20). The Izzo Report comments: "Sewer pipe is not impermeable to water or PCE" (Izzo, p. 19). Thus, sewer pipes allow PCE vapor to be transported anywhere along their length where it (and wastewater) can migrate from the pipe into the environment.

In addition, the Izzo Report found that older pipe joints and other connections are one of the five likely methods by which PCE can penetrate the sewer line: "At pipe joints and other connections, PCE can move out of the sewer as liquid or gas. Also, as the pipes shift after installation, they could separate at the joints, allowing PCE to discharge even more easily to the vadose zone. Current gasket technology and reduction in leakage factors of pipes by the industry has reduced discharges at this point. But most commercial and retail districts in the cities of the Central Valley have pipes that predate this technology." (Izzo, p. 19). Also the Izzo Report states "Sewer pipes are brittle, so when the line bends, fractures are likely to occur, increasing the leakage of the pipe. Since PCE is heavier than water (1.63 times the weight of water at 20°C), it tends to collect in these low spots and then flow through the pipe fractures into the vadose zone" (Izzo, p. 19). The potential for leakage is increased where there are low spots in sewer pipes and PCE collects in the low spots (Izzo, p. 19).

CCCSD Operated a Failing Sewer System and Failed to Inspect and/or Maintain the Sewer System in an Appropriate Manner

From the perspective of strict liability for a discharge (as specified by the Water Code), the question of whether a) the sewer system simply failed or b) the failure was due to poor maintenance, are not relevant. But given the RWQCB's reliance on an unwritten policy respecting a sewer district's behavior, CCCSD's records provide evidence that it knowingly operated a failing, leaking sewer system and failed to maintain it properly. Note that this information is based on the limited files that CCCSD provided in response to a Public Records Act request. That request sought records, specifically including maintenance records, from the beginning of CCCSD operations. However, in its response, CCCSD provided sparse information concerning maintenance in early operational timeframes even though the sewers in the area were constructed in the late 1940s and early 1950s. Thus, despite the positive representations of CCCSD in its meeting with RWQCB staff, GVP has little information concerning how well or how poorly the system operated or how well or how poorly CCCSD inspected and maintained the system near the Site prior to the mid-1990s – a gap in history of close to fifty years.

The following information establishes that the sewer system near the Site was not only failing and leaking, but that CCCSD failed to maintain or repair it in a timely fashion. The locations of the sanitary sewer sections discussed below are displayed on Exhibit 7. Copies of the referenced materials are attached, except where noted.

Louella Drive (between R57 and M58; see Exhibit 13)

- A Collection System Operations ("CSO") Maintenance Report for the time period from 1994 through February 2011 for pipes in Louella Drive reflects significant gaps in maintenance including no inspections between February 1995 and October of 1997 and October of 1997 and February of 2003.
- A CSO Work Order reflects knowledge of root intrusion caused by cracked pipes in Shirley Drive ten feet upstream of M58 on October 28, 1997, with the work to repair the cracked pipes not completed until May 22, 2003, over 5½ years from the initial discovery.
- A January 25, 2007 CCTV inspection also reports root penetrations at 19 locations along this sewer.

Shirley Drive (between M45 and M58; see Exhibit 14)

- January 19, 1979 CCCSD inspection notes identify a sunken spot in Shirley Drive at Luella Drive.
- A CCCSD TV Inspection report from 1994 identifies locations with cracks and roots and a low section.

Shirley Drive (between M54 and M58; see Exhibit 15)

- The CSO Maintenance Report for 1985 through 2011 for the pipe on Shirley Drive between Cynthia Drive and Luella Drive reports a trench failure, cracks, and sunken area in 1994 as well as a crack in 1997.

- A CCTV Pipeline Inspection Report performed on December 12, 2006 states that the pipe in Shirley Drive between Luella and Cynthia Drives sags from position 3 to 191.1 and that the camera was underwater from position 8.4 to 191.1.
- An open joint and cracked pipes were discovered in this area and farther north on Shirley Drive in January 13, 1994 along with roots but the CCCSD report remarks "not urgent repairs." Another TV Inspection Daily Work Report of cracks and a "dropped joint" is dated October 10, 1997 and appears to be at the same locations as noted in 1994. The cracks in existence in 1994 do not appear to have been fixed until May 22, 2003, over 9 years after the discovery.

Shirley Drive (between M47 and M54; see Exhibit 16)

- The CSO Maintenance Report establishes that this sewer has required increasingly frequent maintenance by hydroflushing; from once each 4 years from 1994 to 2002, to once each year from 2002 to 2008, then once each 6 months from 2008 to 2010.

Shirley Drive to Contra Costa Drive (between M47 and M67; see Exhibit 17)

- The CSO Maintenance Report identifies only two maintenance events for this sewer, in 1998 and 2006.
- An inspection video for December 19, 2006 shows root penetration at 97 ft from M47.

Cynthia Drive (between R52 and M53; see Exhibit 18)

- CCTV pipeline inspections of the sewer were conducted on March 22, 2004, January 27, 2005, and January 23, 2007 that identified root penetrations into the sewer and an offset joint. No report of sewer repair was received.
- Multiple logs reference sunken trench areas as a result of deteriorating sewer pipes in this area. An April 1, 2005 report indicates that soil was excavated and recompacted but there is no indication of sewer pipe repair.

Cynthia Drive (between M53 and M54; see Exhibit 19)

- The CSO Maintenance Report from 1994 through 2011 indicates no maintenance between August 23, 1996 and March 22, 2004. Additionally, "sunken areas" related to problems with the sewer pipe are recorded on July 23, 1996, March 22, 2004, April 26, 2006, October 13, 2006, and February 23, 2007.
- CCTV Pipeline Inspection Reports indicate separated joint and/or root intrusions on January 27, 2005 and January 23, 2007.
- An inspection on March 22, 2004 indicated sunken trenches all over the street.
- Multiple repairs along this line have occurred including on or about April 26, 2006, March 7, 2007, April 1, 2008, and February 25, 2008. These repairs appear limited to excavation and recompaction of soil, no repair to the pipeline is identified.

Sewer between Doray Drive and Cynthia Drive near Shirley Drive (M44 to M45 to M46 to M47)

- No inspection, maintenance or repair records prior to 2006 were provided by the CCCSD for these sections of pipe.

Doray Drive (between M44 and M48; see Exhibit 20)

- A February 15, 2006 CCTV inspection report found a hole in the sewer pipe. The report states ""“Hole in Pipe" was found around the manhole ring. It was not found in the previous inspection (see below). Therefore, this is not a potential source of contamination." The prior inspection referred to was conducted on May 27, 2005.

Alley Parallel to Susan Lane (between M59 and M46; see Exhibit 21)

- There is a May 3, 2000 CCCSD TV inspection report that states: "pipe out at bend," referring to the bend in the sewer pipe at the south edge of Doray Drive (558 feet down pipe from M59).
- This report also identifies infiltration, roots and/or cracks at four other locations, at 122, 132, 401, and 406 feet down pipe (north) from M59. There is no record for repair of these sections of the pipe.
- Also on May 3, 2000, a CCCSD TV inspection was conducted from M46 south to Doray Drive where a bend in the sewer alignment prevented the inspection from including the pipe under Doray Drive. The inspection report states that at the north edge of Doray Drive (106 feet south of M46) there is a "severe bend and cracks." In addition, the report says that an 11 feet long section of pipe with cracks is located 83 to 94 feet south of M46. There is no record that this cracked pipe was repaired.
- A May 9, 2000 notation on a CCCSD Work Order states that a repair was completed in Doray Drive, on the south side of the street.
- A December 18, 2006 CCTV Pipeline Inspection Report identifies that a "sag begins" at 416 feet from M59. In addition, the video from this inspection shows that a change in pipe material (from vitrified clay to galvanized iron) begins at about 77 feet south of M46 and extends to at least Doray Drive where the video stops due to a bend in the pipe. The change in pipe material suggests that a repair of the sewer pipe was needed and completed, extending approximately 30 feet north of Doray Drive.

Doris Drive (between M59 and M60; see Exhibit 22)

- The CSO Maintenance Report from 1994 to 2010 indicates no maintenance from May 1994 to July 2004. Additionally, an almost three and half year gap exists between February 2005 and July 2008.
- A December 11, 2006 report indicates a sag in this line and that the line is partially under water.

Linda Drive (between M60 and R99/R61; see Exhibit 23)

- The CSO Maintenance Report provided for this area consists solely of the 2004 to 2009 time period.
- A March 10, 1977 Daily Maintenance Report describes the condition of the sewer main in Linda Drive during the installation of a tee connection. The line at the tee connection located "153' up from M.H. at Linda Dr and Doris Dr" is described as "in very poor shape has lots of cracks."
- The CSO Maintenance Report states that the main was replaced in on April 9, 2004. However, the CCCSD also prepared a Sewer Relocation plan, dated March 3, 1988, that has a Record Drawing date of September 12, 2008, more than 20 years later. It is not clear based on the available information whether sewer replacement work was implemented when planned in 1988 or not until much later in 2004, or if there was a need to replace the sewer in both 1988 and 2004.
- A December 12, 2006 CCTV inspection video and a September 2, 2008 CCTV inspection report provide somewhat different results. The 2006 video indicates a sag of approximately 120 feet in this line. The 2008 report does not mention a sag.

Groundwater and Soil Vapor Data Shows Sewers Leaked

Groundwater and soil vapor investigations conducted by GVP identify at least three suspected sewer leakage locations that have resulted in chlorinated hydrocarbon releases and detections in the subsurface. A summary of environmental sampling data that implicates the sewers as a source of chlorinated hydrocarbons to the subsurface follows.

Apparent Source Area Near the Intersection of Shirley Drive and Cynthia Drive

A discussion of this leak area is provided in Section 4.1 of Erler & Kalinowski, Inc.'s ("EKI's") *Off-Site Property-Specific Soil Vapor and Sub-Slab Vapor Investigation Report*, dated 19 January 2011. The data suggest a source and release of PCE and other chlorinated hydrocarbons from the sewer line in the proximity of Shirley Drive and Cynthia Drive, as follows:

- The soil vapor results for sampled off-Site properties and streets indicate that concentrations of PCE and other chlorinated hydrocarbons are high in the vicinity of Shirley Drive and Cynthia Drive, near manhole M54. PCE was measured at high concentrations at several sampling locations in this area; MSVP-6 (at 6 feet below ground surface ("bgs")) = 52,100 micrograms per cubic meter ("ug/m^3"), SVP-15 = 35,000 ug/m^3, SVP-16 = 38,000 ug/m^3, and SVP-25 = 21,000 ug/m^3. This area of higher PCE concentration is distinguished from generally lower concentrations (i.e. below RWQCB Environmental Screening Levels ("ESL")) east of Shirley Drive and north of Cynthia Drive, with the exception of parcel P67 located at the intersection of Shirley and Cynthia Drives. South of the intersection, the subsurface vapor data show a sharp decline in PCE concentrations moving southward on parcel P55, i.e., south of the east-west trending sanitary sewer line that traverses parcel P55/P87. This finding provides support for a separation between elevated soil vapor concentrations detected on-Site at the location of the former P&K Cleaners and the elevated PCE concentrations in subsurface vapor observed in proximity to the suspected off-Site sanitary sewer lines to the north. This separation is illustrated on Figure 5 of the January 2011 EKI report (see Exhibit 24) by the general demarcation of the area found to contain subsurface vapor above the ESL for PCE along the sewer line that traverses parcel P55/P87 and that runs at the southern boundary of parcels P38 and P82.

Apparent Source Area in the Vicinity of Manhole M46

A discussion of the leak area near M46 is also provided in EKI's 19 January 2011 report. The environmental sampling data suggest a source of PCE and other chlorinated hydrocarbons in close proximity to M46 and generally north of the sewer line that runs between M45 and M47, approximately halfway between Cynthia Drive and Doray Drive. This sanitary sewer receives the wastewater flow (at M46) from the sewer lines that serve the GV Mall and the surrounding commercial and residential properties, including the Chevron property located at 1705 Contra Costa Boulevard (locations of former dry cleaning and auto repair facilities). High concentrations of PCE are present (a) in soil vapor and in shallow groundwater near M46 and (b) in soil vapor sampled near the segment of sanitary sewer that is located between M45 and M46 (see Exhibit 24). Data supporting these findings are summarized as follows:

- Concentrations of PCE in soil vapor samples collected from MSVP-17 located near M46 increase with depth, which indicates that chlorinated hydrocarbons found in shallow groundwater are the source of chlorinated hydrocarbons in soil vapor in this area, and the sanitary sewer at this location is generally at the depth of, or just below, the groundwater table.
- The PCE concentration (1,960 micrograms per liter, "ug/L") measured in the grab groundwater sample (GG-P87-01) collected approximately five feet north of MSVP-17 and approximately 13 feet north of M46 is the highest concentration of PCE measured to date in groundwater in the off-Site area north of the GV Mall.
- Coupled with elevated sub-slab and soil vapor concentrations of PCE measured at parcels P38 and P82 located adjacent on the northern side of the sewer from M45 to M46 and the observed lower subsurface vapor concentrations at parcel P55 south of M46, these recent sampling data

indicate the proximity of PCE and chlorinated hydrocarbon releases near M46 with additional releases or migration of chlorinated hydrocarbons along the segment of sewer line and its associated backfill from M46 to M45.

- The sanitary sewer line from M44 to M46, which runs along the back (southern side) of these residential properties is located in the uphill direction from the segment of sanitary sewer entering from the south and into which the former P&K Cleaners discharged; the confluence of these two sewer lines is at M46. The slope of the sewer line between M45 and M46 is relatively shallow, i.e., approximately 0.04 feet per foot. Flow backed up within this segment of sewer line or preferential migration of chlorinated hydrocarbons in shallow groundwater or in vapor phase along the sewer line backfill are plausible explanations for the elevated concentrations of PCE measured in the SSVP samples at parcel P82 and in the soil vapor at P38-SVP-02.
- The soil vapor sample at P38-SVP-02 (PCE = 2,800 ug/m^3) was collected at a depth of approximately 5 feet bgs in a location in the back yard approximately 10 feet north of the sewer line between M45 and M46. The soil vapor sample at P38-SVP-01 (220 ug/m^3 PCE) was collected at a depth of approximately 5 feet bgs in a location in the front yard, approximately 75 feet north of the sewer line between M45 and M46.

Suspected Source Area in Linda Drive Along Sewer

As presented in Chevron site investigation reports dated in 1989 and 2012 (Exhibit 25 and the *Additional Site Investigation Report and Site Conceptual Model Report* by Canestoga-Rovers & Associates, dated 2 March 2012), very high concentrations of chlorinated hydrocarbons have been found on the Chevron property in soil vapor (maximum PCE = 3,250,000 ug/m^3) and in groundwater (maximum PCE = 4,000 ug/L) and high concentrations have migrated off the Chevron property onto the adjoining streets (Linda Drive and Doris Drive) and onto the GV Mall property. In a Chevron site investigation report dated 3 February 1989 (Exhibit 25), groundwater and soil sampling data were reported at former monitoring well EA-3 located in Linda Drive near the sanitary sewer directly west of and across the street from the Chevron site. Chevron reported that PCE and TCE were present in 1988 soil samples collected at location EA-3 at concentrations of 328 micrograms per kilogram ("ug/kg") and 86 ug/kg, respectively, which would have been above the groundwater table at this location and thus may have resulted from leakage from the sewer. Groundwater sampled in monitoring well EA-3, on 3 January 1989, had a reported PCE concentration of 5,000 ug /L and a TCE concentration of 750 ug/L providing further data suggesting a source of PCE and other chlorinated hydrocarbons in the proximity of sewer line in Linda Drive and extending along Linda Drive to the GV property. High concentrations of chlorinated hydrocarbons have migrated in groundwater from the area of the Chevron property onto the GV Mall property (maximum PCE = 3,380 ug/L; EKI's *Quarterly Groundwater Monitoring Report*, Fourth Quarter 2009, dated 16 February 2010).

As shown by the sewer inspection reports provided by the CCCSD, there are many sewer leak locations in Linda Drive, Doris Drive and along the sewer in the alley behind the GV Mall building that would act as release locations for chlorinated hydrocarbons discharged to the sewer from the Chevron property by former dry cleaning and auto repair operations. To summarize, these damaged sewer locations are as follows:

- *Linda Drive (between M60 and R99/R61):* A 1977 report describes the condition of the sewer main in Linda Drive as "in very poor shape has lots of cracks." A 2006 inspection identifies a sag in the sewer line. The sewer line in this area was replaced by CCCSD. The records provided by CCCSD do not discuss why this line was replaced.

- *Doris Drive (between M59 and M60):* A 2006 report identifies a sag in the sewer line.

- *Alley Parallel to Susan Lane (between M59 and M46):* In 2000, inspection reports identify infiltration, roots and/or cracks at 122, 132, 401, and 406 feet down pipe from M59 and "pipe out at bend" at the south edge of Doray Drive at 558 feet from M59. The reports also identified a "severe bend and cracks" at the north edge of Doray Drive (106 feet south of M46) and an 11 feet long section of pipe with cracks located 83 to 94 feet south of M46.

Conclusion

The California legislature expressly intended that districts be strictly liable under the Porter-Cologne Water Quality Control Act for releases from their facilities. CCCSD owns and operates the sewer pipes from which sewage leaks occur or have occurred into the subsurface. In addition to being strictly liable, by designing a system that in its very specifications permitted leakage, in operating a failing system, and in failing to repair the system in a timely manner, CCCSD actively discharged waste into the waters of the state. As such, CCCSD must be named as a discharger.

Please call if you have any questions.

Sincerely,

Edward A. Firestone

Enclosures

cc: K. Alm, Esq. (with enclosures)

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[i] Water Code Secs. 13267 and 13304.

[ii] Water Code Sec. 13050(c).

[iiiiii] The fact that such activity may have been permitted under the laws at the time does not alleviate CCCSD of responsibility for addressing the current issues. *In the Matter of the Petitions of Aluminum Company of America; ALCOA Construction Systems; and Challenge Developments, Inc,* WQ Order No. 93-9.

[iv] Currently, we understand that the discharge of PCE to the sanitary sewer is apparently allowed from some non-dry cleaner operations so long as the amount of Total Toxic Organics ("TTO"), which include PCE, do not exceed 2.10 milligrams per liter. A copy of the "CCCSD List of Total Toxic Organic (TTO) Pollutants Subject To TTO Local Limit Or TTO Management Plan" is the last page of Exhibit 2.

[v] A partial list of the numerous cases supporting this proposition include: *In re Zoecon*, Order No. WQ 86-2 (2/20/86); *In Petition of Southern California Edison Co.* WQ Order 86-11 (7/17.86); and *In the matter of Wenwest, Inc. et al*, Order No. 92-13 (10/22/92); *Ford Aerospace, et al.*, SFRWQCB Order No. R2-2007-0022.

[vi] See v.

[vii] A partial list of ordinances addressing this issue is as follows:

1. Ordinance 23 –Adopted June 4, 1953, prohibits the discharge of any substance other than human excrement in the sewers *unless under permit from CCCSD.*

2. Ordinance 99 – Adopted July 11, 1974 amends Article 4 of Chapter 8 of the Code of the CCCSD relating to Control of Industrial Waste. This amendment permits the discharge of chlorinated hydrocarbons provided that the concentrations not exceed 0.002 mg/l 50% of the time and 0.004 mg/l 10% of the time. Hence, it appears that CCCSD permitted higher concentrations of chlorinated hydrocarbons to be discharged to the sanitary sewer, so long as the time restrictions for such discharges were not violated. Sec 8-403.B(12).
3. Ordinance 147 – Adopted August 27, 1981 replaces the prior Source Control Ordinance. This ordinance expressly allows for the disposal of specific toxics into the sewer within specified limits. Sec 8-402.A4 and D (limit on total chlorinated hydrocarbons plus PCE listed in Appendix A as a toxic for which an effluent limit will set.)
4. Ordinance 147 – Adopted August 27, 1981 replaces the prior Source Control Ordinance. This ordinance expressly allows for the disposal of specific toxics into the sewer within specified limits. Sec 8-402.A4 and D (limit on total chlorinated hydrocarbons plus PCE listed in Appendix A as a toxic for which an effluent limit will set.)
5. Ordinance 176 – Adopted April 18, 1991, provides for the disposal of specific pollutants with specified constituent levels. Sec. 10.80.70. Resolution 91-024 allows for the discharge of Total Identifiable Chlorinated Hydrocarbons with a discharge limit of 0.5 mg/l.
6. Source Control Ordinance, Title 10, Effective July 12, 1991 as amended April 2, 1992, August 3, 1992 (Ordinance 183), August 1, 1996 (Ordinance No. 198), February 15, 2007 (Ordinance 242) and October 2, 2008. A review of the assorted amendments between 1991 and 2008 show that the discharge of PCE into the sewer system by dry cleaners was not prohibited until 2007. (See Sec. 10.080.040.P first added in 2007.)

[viii] See vii 2.

[ix] Ordinance 147 – Adopted August 27, 1981 replaces the prior Source Control Ordinance. This ordinance expressly allows for the disposal of specific toxics into the sewer within specified limits. Sec 8-402.A4 and D (limit on total chlorinated hydrocarbons plus PCE listed in Appendix A as a toxic for which an effluent limit will set). Ordinance 176 – Adopted April 18, 1991, provides for the disposal of specific pollutants with specified constituent levels. Sec. 10.80.70. Resolution 91-024 allows for the discharge of Total Identifiable Chlorinated Hydrocarbons with a discharge limit of 0.5 mg/l.

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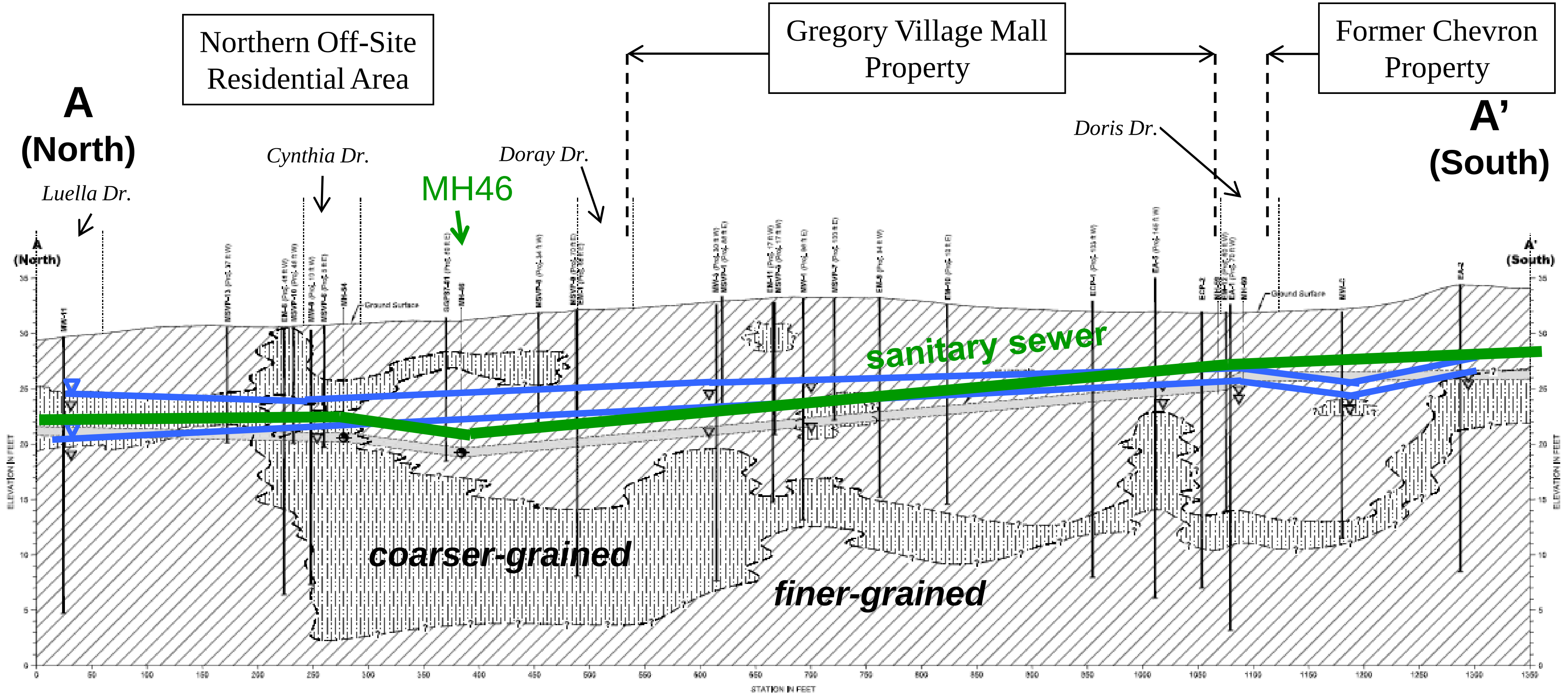
[xi] "Dry Cleaners – A Major Source of PCE in Ground Water", V. I. Izzo, 27 March 1992, p.2 ("Izzo" and "Izzo Report").

[xii] Years 1990-1992 not provided by CCCSD, so cannot verify for that time period.

Exhibit 6

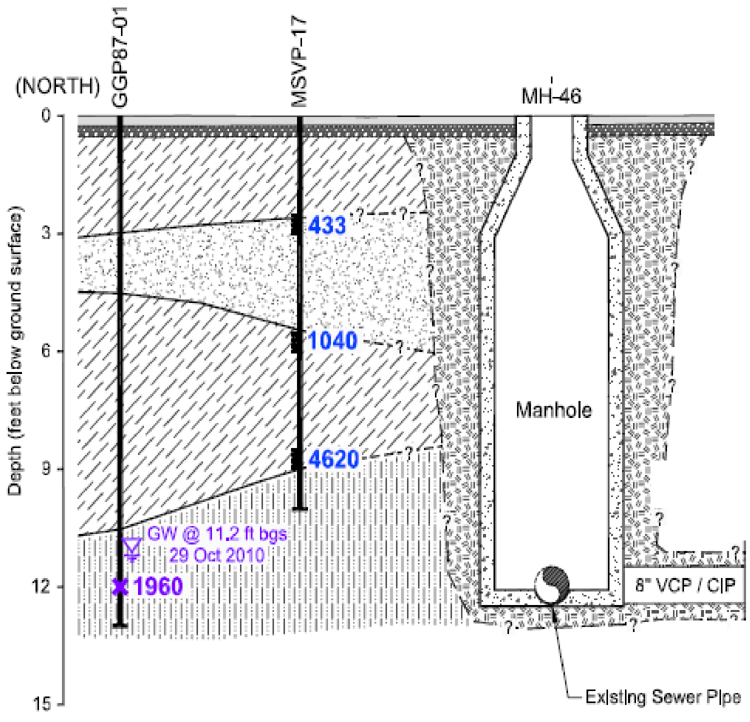
CCCSD's Sanitary Sewer is Installed Near or Below the Water Table



General Direction of Groundwater Flow

Blue lines are the water table range

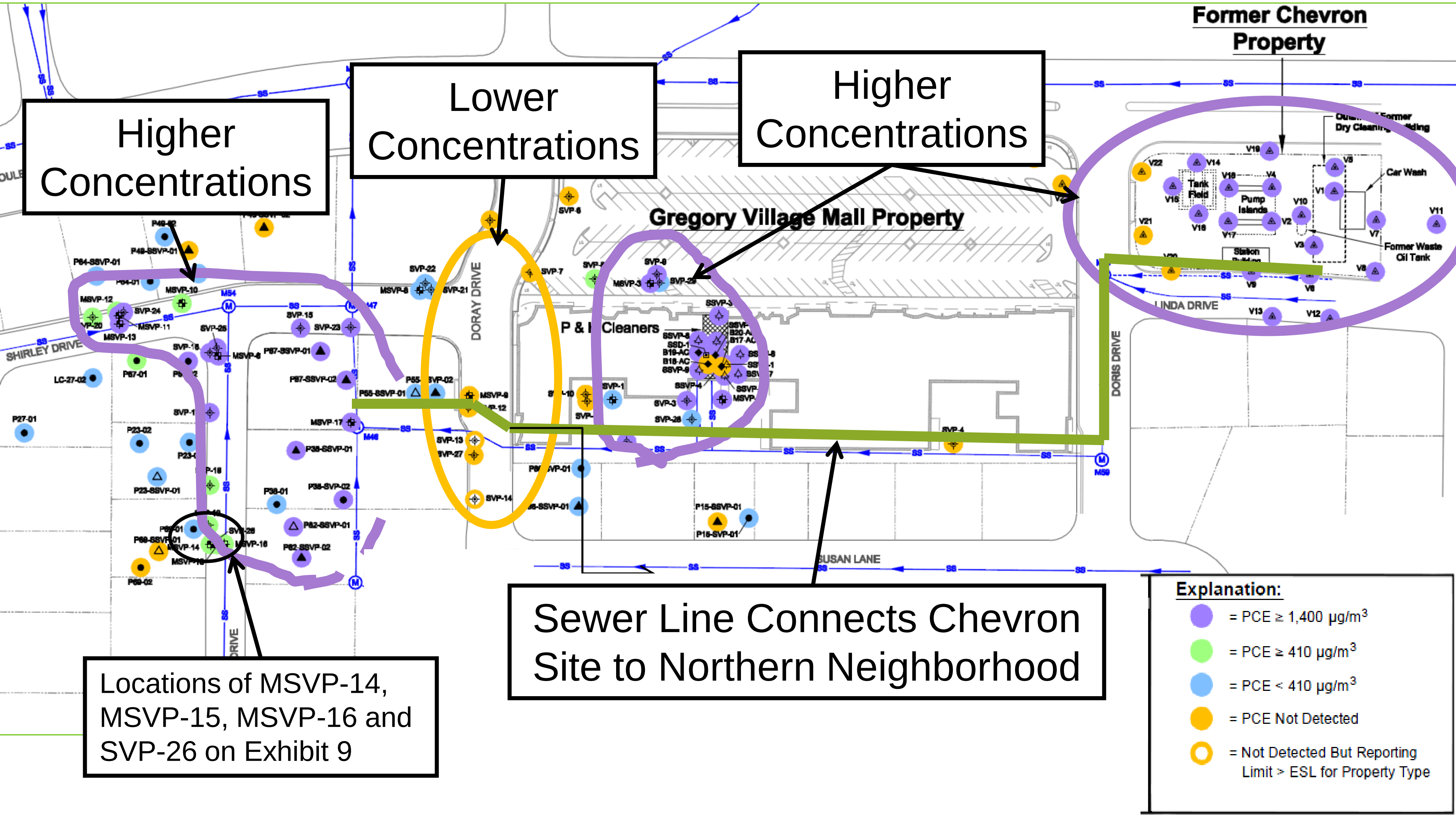
PCE in Soil Vapor and Groundwater Near Manhole M46 is Consistent with a Sewer Leak



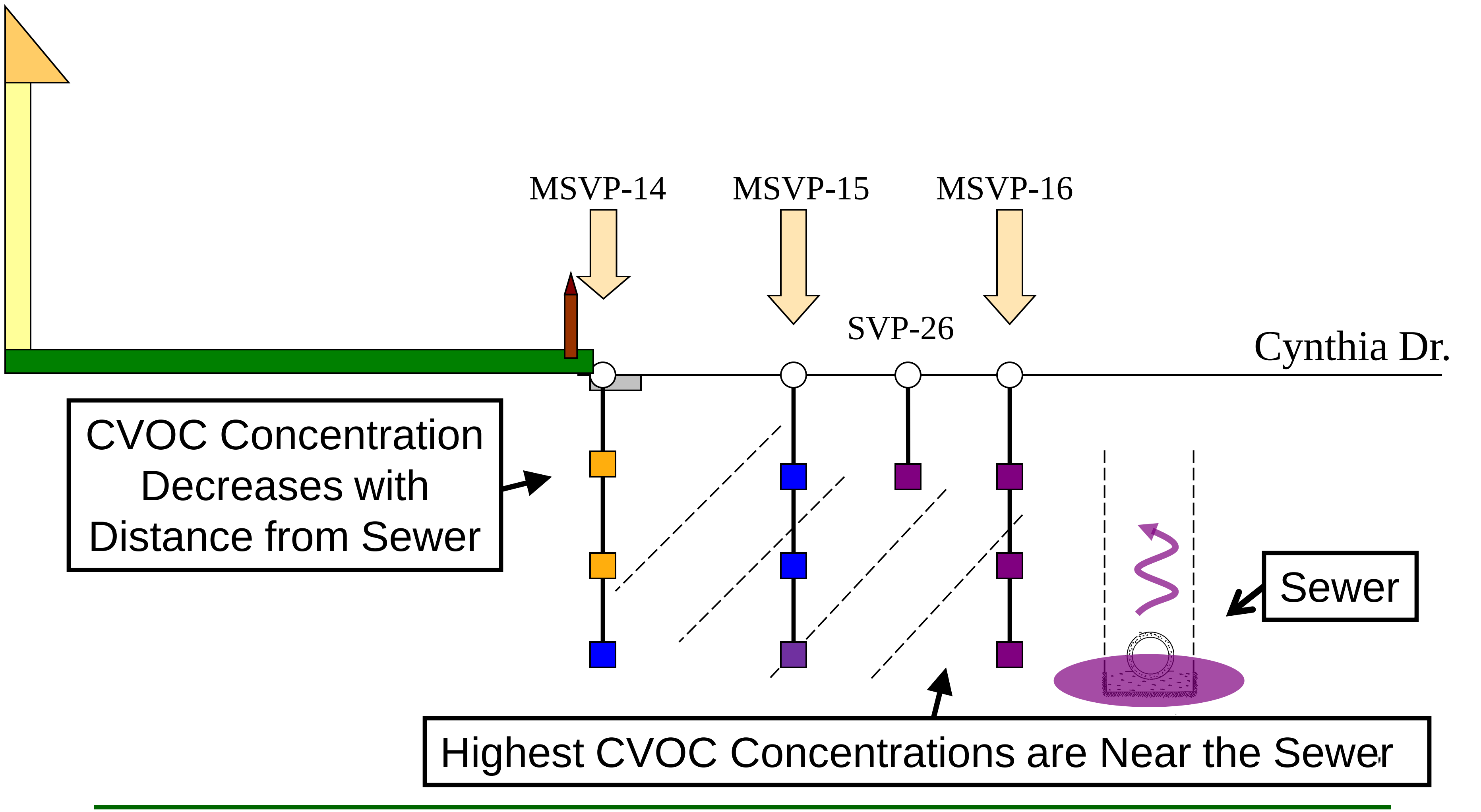
Sewer line and bottom of manhole M46 are at or below the water table

Exhibit 8

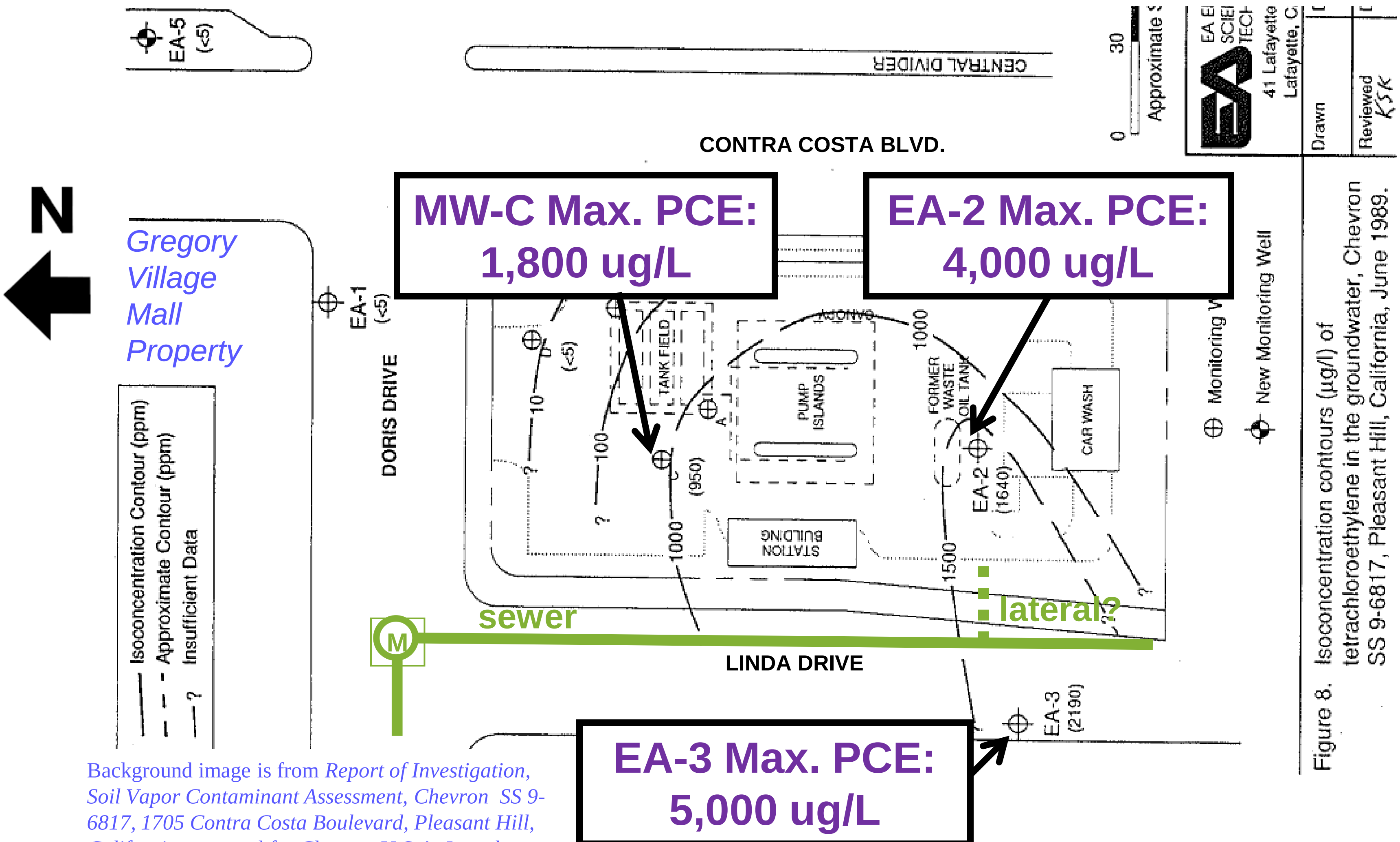
Separate Areas of High PCE Concentrations in Soil Vapor Indicate Separate Releases



CVOC Concentrations In Soil Vapor are Highest Near the Sewer



PCE in Groundwater in Linda Drive Cross-Gradient from Chevron Site Indicative of a Sewer Leak



Background image is from *Report of Investigation, Soil Vapor Contaminant Assessment, Chevron SS 9-6817, 1705 Contra Costa Boulevard, Pleasant Hill, California*, prepared for Chevron U.S.A, Inc., by EA Engineering, Science, and Technology, Inc., dated 9 August 1989.