

**COMMONWEALTH OF MASSACHUSETTS
DIVISION OF ADMINISTRATIVE LAW APPEALS**

May 16, 2008

In the Matter of

Docket No. HW-04-206

JOEL S. LOITHERSTEIN

LSP Docket No. LSP03-05
DH File No. 21865.0

RECOMMENDED DECISION

Proceeding by the Massachusetts Board of Registration of Hazardous Waste Site Cleanup Professionals to confirm a proposed order of the Board determining that sufficient grounds exist for disciplinary action against a licensed hazardous waste site cleanup professional (LSP), Joel S. Loitherstein, for opinions he filed with the Massachusetts Department of Environmental Protection (DEP) regarding seven sites between 1995 and 2001, and adjudicatory appeal by Loitherstein contesting the Board's charges against him. After a hearing, it is determined that sufficient grounds do not exist for disciplinary action against Loitherstein, and that the Board's proposed order should not be made final, because:

(1) The Board did not prove its charges against Loitherstein regarding downgradient property status (DPS) opinions he filed for three sites in 1996.

These DPS opinions were filed by Loitherstein Environmental Engineering (a) on December 19, 1996 regarding a release of chlorinated solvents at 130 Lincoln Street in Brighton; (b) on June 21, 1996 regarding a release of gasoline and gasoline-related volatile organic compounds detected in groundwater at 5 Commonwealth Road in Natick; and (c) on August 16, 1996 regarding gasoline detected in monitoring wells at 1203 Washington Street in Newton.

In each of these DPS opinions, Loitherstein determined the direction of groundwater flow, discussed or explained known, available information suggesting that the site was the source or at least a contributing source of hazardous waste release, and provided sufficient support for his opinion that the site was not the source of any of the contamination found there.

Accordingly, as to each of these DPS opinions, Loitherstein (1) acted with reasonable care and diligence, as required by 309 CMR 4.02(1); (2) followed applicable requirements and procedures prescribed by M.G.L. c. 21E and 310 CMR 40.0000, as required by 309 CMR 4.03(3)(b); and (3) disclosed known, available information regarding site history that may have tended to support or led to a contrary or significantly different opinion, and discussed them sufficiently, thereby satisfying the requirements of 309 CMR 4.03(3)(d).

These DPS opinions, the Board's charges against Loitherstein regarding them, and the disposition of the charges, are discussed below, and the sites in question are shown on maps in the Appendix to this decision, as follows:

- 130 Lincoln Street in Brighton, at 21-44 (see map at Appendix, Sketch 1);
- 5 Commonwealth Road in Natick, at 44-64 (see map at Appendix, Sketch 2); and
- 1203 Washington Street in Newton, at 64-88 (see map at Appendix, Sketch 3).

(2) The Board did not prove its charges against Loitherstein regarding response action outcome (RAO) opinions he filed for four sites between 1995 and 2001.

These RAO opinions were filed by Loitherstein Environmental Engineering (a) on October 19, 1998 regarding a release of hazardous materials at 73 Jeffrey Avenue in Holliston; (b) on June 28, 1995 regarding a release of gasoline and fuel oil at 19 Hawks Avenue in Hanson; (c) on July 25, 2000 regarding a release of gasoline at 262 Sawyer Lane in Hudson; and (d) on October 11, 2001 regarding a release of gasoline and diesel fuel at 83-89 East Cottage Street/5-9 Humphreys Street in Dorchester.

In the RAO opinions that Loitherstein Environmental Engineering filed regarding 73 Jeffrey Avenue in Holliston and 19 Hawks Avenue in Hanson, Loitherstein properly classified groundwater, and did not underestimate risks to drinking water supplies posed by hazardous waste contamination. In the RAO opinions that the firm filed regarding 262 Sawyer Lane in Hudson and 83-89 East Cottage Street and 5-9 Humphreys Street in Dorchester, Loitherstein determined groundwater flow direction, defined the nature and extent of hazardous waste releases, and characterized adequately the risks that these releases posed.

Accordingly, as to each of these RAO opinions, Loitherstein (1) acted with reasonable care and diligence with regard to the site, as required by 309 CMR 4.02(1); (2) followed applicable requirements and procedures of M.G.L. c. 21E and 310 CMR 40.0000, as required by 309 CMR 4.03(3)(b); and (3) collected sufficient data to define the nature and extent of the release at the site and to adequately characterize the risk that this release posed, as required by 309 CMR 4.03(3)(c).

These RAO opinions, the Board's charges against Loitherstein regarding them, and the disposition of the charges, are discussed below, and the sites in question are shown on maps in the appendix to this decision, as follows:

- 73 Jeffrey Avenue in Holliston, at 89-137 (see map at Appendix, Sketch 4);
- 19 Hawks Avenue in Hanson, at 137-162 (see map at Appendix, Sketch 5);
- 262 Sawyer Lane in Hudson, at 162-186 (see map at Appendix, Sketch 6); and
- 83-89 East Cottage Street /5-9 Humphreys Street in Dorchester, at 186-230 (see maps at Appendix, Sketches 7A, 7B and 7C).

Terry L. Wood, Esq., General Counsel, Boston, for complainant Board of Registration of Licensed Site Professionals.

Cheryl A. Waterhouse, Esq. (Donovan Hatem, LLP), Boston, for respondent Joel S. Loitherstein.

MARK L. SILVERSTEIN, Administrative Magistrate.

Introduction

This proceeding concerns downgradient property status (DPS) and response action outcome (RAO) opinions filed with the Massachusetts Department of Environmental Protection (DEP) by respondent Joel S. Loitherstein, a licensed site professional (LSP), between 1995 and 2001 for seven (originally ten) Massachusetts sites contaminated by releases of oil and hazardous waste. The Board of Registration of Hazardous Waste Site Cleanup Professionals (the Board) alleges that Loitherstein's work and opinions were professionally substandard and violated both the rules of professional conduct governing work by LSPs, 309 CMR 4.00, and DEP's hazardous waste regulations (also known as the "Massachusetts Contingency Plan," or "MCP"), 310 CMR 40.0000.

On November 13, 2003, the Board issued an amended order in which it found sufficient grounds for disciplinary action against Loitherstein based upon what it alleged were substandard opinions that violated the Board's Rules of Professional Conduct for LSPs. The Board charged that Loitherstein failed to act with reasonable care and due diligence in preparing DPS opinions because, among other things, (1) he did not support adequately his opinion that the site in question was not the source of the contaminants found there and that the contaminants originated, instead, from an offsite source, and (2) he did not discuss and explain site history information that tended to support a contrary or significantly different opinion about where the contaminants originated. The Board also charged that Loitherstein failed to act with reasonable care and due diligence in preparing RAO opinions because, among other things, (1) he did not classify groundwater properly, (2) he did not determine the direction of groundwater flow, define the nature and extent of contamination caused

by oil or hazardous waste releases sufficiently, or characterize adequately the risks that these releases posed, and (3) he opined without adequate support, in one of the RAO opinions, that vinyl chloride and nonaqueous phase liquid, or “NAPL,”¹ found at the site in question had migrated entirely from an upgradient property and had not originated at an on-site source.

The Board seeks to make its amended proposed order final in this proceeding. Loitherstein responds that as to each of the sites and filings, he exercised reasonable care and diligence based upon an informed, independent exercise of professional judgment.

After a hearing, I find that sufficient grounds do not exist for disciplinary action against Loitherstein as to any of these waste site cleanup activity opinions, and I conclude that the Board’s Amended Proposed Order should not be made final.

Background

a. LSPs and the LSP Board

A person who is responsible under M.G.L. c. 21E, § 5 for assessing and cleaning a site contaminated by a release of oil (including fuel oil or gasoline) or hazardous material (including waste oil or chemicals that may present a threat to human health, safety, or welfare, or to the environment) must retain a licensed hazardous waste site cleanup professional, or “LSP,” to oversee

¹/ NAPL refers to any of a number of liquids that do not mix well with water because they are either lighter than water (LNAPL) or denser than water (DNAPL) and therefore separate out of water and form their own “phase,” much as salad oil poured into a glass of water separates out and floats in a layer at the top of the glass. Examples of NAPLs include hydrocarbons such as oil and gasoline (which are LNAPLs and tend to float below ground atop the water table), and chlorinated solvents such as trichloroethylene (a DNAPL). See 310 CMR 40.0006 (definition of “Nonaqueous phase liquid and NAPL”); for additional information on NAPLs, see U.S. Geological Survey, Toxic Substances Hydrology Program: Definitions: NAPL, at <http://toxics.usgs.gov/definitions/napls.html> and links to web pages that present additional information about LNAPL and DNAPL.

this work and file a written opinion that it meets the requirements of 310 CMR 40.0000. See 310 CMR 40.0169.² The LSP profession is both relatively new and unique to Massachusetts, having been created by state legislation that became effective in 1992. See M.G.L. c. 21A, §§ 19-19J.³ As a result of this legislation, DEP no longer had to oversee every phase of cleanup at the site of oil or hazardous waste contamination; instead, the agency relied upon LSPs to determine what type of cleanup was necessary at an oil or hazardous waste disposal site, how the cleanup should proceed, and whether a cleanup standards were being met.

DEP has prescribed extensive regulations governing the cleanup process known as the “Massachusetts Contingency Plan” or MCP. 310 CMR 40.0000. Among other things, these regulations prescribe how the risk that a disposal site poses to human health, safety and the environment is to be characterized, what must be reported to DEP during the cleanup process, what this reporting must include, and when the required reports must be filed. The regulations require that an LSP report to DEP at various stages of the cleanup process. Where the owner is responsible for cleanup, this reporting may end with an LSP’s downgradient property status (DPS) opinion if the contaminants originated off-site and the owner did not exacerbate the contamination. It may also

^{2/} For definitions of “oil” and “hazardous material,” see 310 CMR 40.0006. Assessing the site of an oil or hazardous material release requires an analysis of site conditions, including air, soil, ground water and surface water, through “investigations, monitoring, surveys, testing, and other information-gathering activities,” and, as well, an identification of “the existence, source, nature and extent of a release or threat of release of oil and/or hazardous material” and “the extent of risk or danger to the public health, safety, welfare and the environment.” See 310 CMR 40.0006 (definition of “assess” or “assessment”). Cleaning up a contaminated site involves the containment or removal of oil or hazardous waste, the requirements for which appear throughout the regulations.

^{3/} The legislation creating the LSP profession was part of a change in how Massachusetts approached the cleanup of contaminated sites—essentially, by privatizing decisionmaking in the cleanup of contaminated sites and relieving DEP of this responsibility, while retaining the agency’s authority to prescribe how these sites were to be evaluated and cleaned and to exercise oversight over the cleanup process, including by way of auditing and enforcement actions.

end with a response action outcome (RAO) opinion that characterizes remaining risk (or the absence of risk), signals the end of the cleanup process, and allows a site to exit the MCP's regulatory process.

Prior to the legislation, the assessment and cleanup of oil and hazardous waste releases was performed in Massachusetts (as it still is in most other states) by professional engineers or by scientists such as geologists or hydrologists, and the ranks of Massachusetts LSPs are drawn from these professions. Regardless of other professional licensing or qualification, however, a separate license is required to practice in Massachusetts as an LSP. Since 1993, LSPs have been licensed and their professional practice has been regulated by the Massachusetts Board of Registration of Hazardous Waste Site Cleanup Professionals ("the Board"), see M.G.L. c. 21A, §§ 19C and 19D, an independent, 11-member board within the Executive Office of Environmental Affairs. See M.G.L. c. 21A, § 19A, first para.⁴

The Board adopted Rules of Professional Conduct for LSPs, 309 CMR 4.00, in 1995, not long before Loitherstein filed several of the opinions at issue here that, according to the Board, fell below the standard of care and due diligence that these Rules required of LSPs. Several of the rules first adopted in 1995 apply here: (1) overall, an LSP must act with "reasonable care and diligence," see 309 CMR 4.02(1); (2) in preparing an opinion, an LSP must make good faith and reasonable efforts to obtain relevant and material facts, data, reports and other information regarding site

^{4/} In 2007, Connecticut created a similar profession, practiced by "licensed environmental professional" (LEPs), whose licensing and practice is unique to that state and is administered by a new independent board known as the Board of Examiners of Environmental Professionals. This was done to facilitate the cleanup of some types of contaminated sites, including those owned by municipalities or defined as "establishments," properties identified on an inventory of contaminated waste sites, and sites with particular groundwater classifications that the statute specifies. Conn. Pub. Acts. 07-81 (eff. Oct. 1, 2007), repealing and replacing Conn. Gen. Stat. §§ 22a-133v(g). This statute may be found online at: <http://www.cga.ct.gov/2007/ACT/PA/2007PA-00081-R00SB-01224-PA.htm>.

conditions, see 310 CMR 4.03(3) (c); and (3) the opinion must disclose and explain material facts, data and other information that would support a contrary or significantly different opinion. See 309 CMR 4.03(3)(d).⁵

LSPs are subject to the Board's disciplinary authority, 309 CMR 7.01(1), and the violation of any provision of its Rules for Professional Conduct (as well as other violations) may prompt discipline. 309 CMR 7.01(2). Discipline "may be by revocation of license, suspension of license for a period of up to five years, public censure, or private censure," 309 CMR 7.02(1), or by assessing a civil administrative penalty, 309 CMR 7.02(2), or through "orders imposing such restraints on or requiring action by licensed site professionals as the Board deems necessary to abate a hazard or the violation of any provision of M.G.L. c. 21A, §§ 19 through 19J, or any provision of

⁵/ 309 CMR 4.02(1) provides that:

In providing Professional Services, a licensed site professional shall act with reasonable care and diligence, and apply the knowledge and skill ordinarily exercised by licensed site professionals in good standing practicing in the Commonwealth at the time the services are performed.

309 CMR 4.03(3)(c) requires that in providing professional services, a license site professional:

make a good faith and reasonable effort to identify and obtain the relevant and material facts, data, reports and other information evidencing conditions at the site that his or her client possesses or that is otherwise readily available, and identify and obtain such additional data and other information as he or she deems necessary to discharge his or her professional obligations under M.G.L. c. 21A, §§ 19 through 19J, and 309 CMR...

309 CMR 4.03(3)(d) provides that in providing professional services, a license site professional shall:

with regard to the rendering of waste site cleanup activity opinions, disclose and explain in the waste site cleanup activity opinion the material facts, data, and other information, and qualifications or limitations known by him or her which may tend to support or lead to a waste site cleanup activity opinion contrary to, or significantly different from, the one expressed.

309 CMR.”

309 CMR 7.07 prescribes when and how the Board may initiate an LSP disciplinary proceeding:

If the Board determines that, based on the preliminary investigation, sufficient grounds exist to initiate disciplinary action or other disposition as described in 309 CMR 7.02, the Board may commence a formal adjudicatory proceeding by providing the respondent with an order to show cause why disciplinary action or other disposition as described in 309 CMR 7.02 should not be taken. The order shall state the grounds for taking disciplinary action or other disposition, including the specific facts relied upon and the statute(s) and/or regulations authorizing the Board to take disciplinary action or other disposition. It shall also explain the respondent’s right to request an adjudicatory hearing to contest the grounds for discipline or other disposition set forth in the order...

The Board commenced a proceeding under 309 CMR 7.07 to confirm its asserted grounds for discipline against Loitherstein, and Loitherstein requested an adjudicatory hearing under the same regulation to contest these grounds. This adjudicatory proceeding resulted. Per 309 CMR 7.08, it is governed by the Standard Adjudicatory Rules of Practice and Procedure, 801 CMR 1.00. The Board concedes its burden to prove the grounds for discipline it asserts by a preponderance of the evidence. Prosecuting Counsel’s Post Hearing Brief (June 21, 2006), at 1, 53; see also Craven v. State Ethics Commission, 390 Mass. 191, 454 N.E.2d 471 (1983).

b. Types of LSP opinions at issue

Two types of hazardous waste site opinions that LSPs prepare are at issue here—“downgradient property status” (DPS) opinions, and “response action outcome” (RAO) opinions. DEP’s regulations prescribe what their purposes are, when they may be filed, and what they should include.

i. Downgradient property status (DPS) opinion

The requirements governing a DPS opinion have been in effect since 1995. Several are relevant here:

(1) A DPS opinion is appropriate when a hazardous waste release on the downgradient property⁶ is the result of hazardous material migrating from an upgradient property, and when no act of the downgradient site owner contributed to the release or caused it to be worse than it would have been otherwise. See 310 CMR 40.0183(2)(b) and (c); and

(2) A DPS opinion consists of a “completed transmittal form” prescribed by DEP, a certification (as prescribed by 310 CMR 40.0009), the applicable fee (prescribed by 310 CMR 4.03), and the opinion itself. The opinion must be prepared in accordance with 310 CMR 40.0015, which requires (among other things) that:

An LSP rendering an LSP Opinion for submittal to DEP

- (a) identify in the LSP opinion the material facts, data and other information known by him or her about the disposal site that is (sic) pertinent to the LSP Opinion; and
- (b) disclose and explain in the LSP Opinion the material facts, data and other information, and qualifications and limitations known by him or her which may tend to support or lead to an LSP Opinion contrary to, or significantly different from, the one expressed.

310 CMR 40.0015(2).

(3) A DPS opinion must also meet a “performance standard” prescribed at 310 CMR 40.0183(4), which states that:

⁶/ 310 CMR 40.0006 defines “downgradient property” as “a parcel of land which is located downgradient of the parcel of land which is the source of a release which has come to be located thereon.” The regulation defines “downgradient” as well; in a nutshell, it refers to water or land at a lower elevation relative to a particular point or area, over a distance that “continuously decreases.” the same regulation defines “upgradient property” as “a parcel of land which is the source of a release which has come to be located on a parcel of land which is located downgradient thereof.” “Upgradient” refers to water or land at a higher elevation relative to a particular point or area, over a distance that “continuously increases.”

A Downgradient Property Status Opinion shall be based on investigative and assessment actions of sufficient scope and level of effort to conclude that the criteria in 310 CMR 40.0183(2)(b) have been met. The Opinion shall include an explanation and documentation of the technical basis for the conclusions stated therein, and be based on the following:

- (a) knowledge of the boundaries of the property which is the subject of the Opinion;
- (b) knowledge of the disposal site boundaries, to the extent they have been defined by assessments conducted to date;
- (c) an evaluation of the known releases of oil and/or hazardous material at the disposal site, to the extent the releases have been identified;
- (d) an evaluation of the relevant hydrogeologic conditions; and
- (e) an evaluation of the need to conduct an Immediate Response Action, as defined in 310 CMR 40.0412.

ii. Response action outcome (RAO) opinions

The requirements governing RAO opinions have also been in effect since 1995. 310 CMR 40.1003(2) requires that persons conducting “response actions at any site for which a release or threat of release of oil and/or hazardous material has been reported....shall achieve a Response Action Outcome and submit a Response Action Outcome Statement” to DEP.

There are several categories of response action outcomes.

(1) Permanent solutions (Class A RAO opinions) are addressed at 310 CMR 40.1035. This category applies where response actions have been conducted to:

- (a) achieve a level of No Significant Risk, as specified at 310 CMR 40.0900;
- (b) eliminate or control any source of oil and/or hazardous material, as specified at 310 CMR 40.1003(5); and
- (c) where feasible, reduce to the extent possible, the level of oil and/or hazardous material concentrations in the environment to background.

310 CMR 40.1035(2). Class A RAO opinions “do not apply” to (meaning that they cannot be filed for) any disposal site where there have been no remedial actions (meaning any containment or removal of oil or hazardous materials; see 310 CMR 40.006), or where the active operation and maintenance of a remedial action is required. 310 CMR 40.1035(3). Various types of Class A RAO opinions are defined at 310 CMR 40.1036(1)-(5).

(2) No remedial action required (Class B RAO opinions) are addressed at 310 CMR 40.1045. This type of RAO opinion applies “to disposal sites where it is determined, as a result of assessment actions, that a level of No Significant Risk exists under 310 CMR 40.0900 and, therefore, no remedial action is necessary.” 310 CMR 40.1045(1). Class B RAO opinions “do not apply” to a disposal site where remedial actions have been conducted. 310 CMR 40.1045(2). Various types of Class B RAO opinions are defined at 310 CMR 40.1046(1)-(5).

(3) Temporary solutions (Class C RAO opinions), which are addressed at 310 CMR 40.1050. A Class C RAO opinion applies to sites where a temporary solution ensuring “the elimination of any substantial hazard at the disposal site” has been achieved. 310 CMR 40.1050(1). This includes:

- (a) disposal sites where Upper Concentration Limits specified in 310 CMR 40.0996 are exceeded in soil and/or groundwater, but all substantial hazards have been eliminated; and/or
- (b) disposal sites where oil and/or hazardous material concentrations exceed any applicable or suitably analogous standard identified pursuant to 310 CMR 40.0993(3), but such concentrations of oil and/or hazardous material do not pose a substantial hazard.

310 CMR 40.1050(2).

310 CMR 40.1056 specifies what must be included in any type of RAO opinion. Several of these specified items are of particular interest here:

- (1) If a release of oil or hazardous materials has not been abated and the concentrations of these substances have not been reduced to “background,” the RAO opinion must identify the method (Methods 1, 2 or 3, also prescribed by the regulations) that was used to characterize

the risk of harm posed by the disposal site to health, public welfare and the environment. See 310 CMR 40.1056(c).

(2) The RAO opinion must identify others that were filed for the same disposal site, and it must also state whether any additional response actions are needed for any other portions of the disposal site. See 310 CMR 40.1056(d).

(3) If a Class C RAO opinion is filed, it must indicate whether a feasible “permanent solution” exists for the disposal site. See 310 CMR 40.1056(1)(e).

(4) The RAO opinion must include a licensed site professional’s “activity and use limitation opinion” if a response action outcome is based upon the implementation of an “Activity and Use Limitation” (basically, a recorded restriction or prohibition of activities at the disposal site that is intended to notify the public of a potential hazard and prevent uses that would result in exposure to oil or hazardous materials or increase the risk of such exposure). See 310 CMR 40.1056(1)(f).

(5) With exceptions that do not apply here, the RAO opinion must include an LSP’s opinion that the requirements of the applicable class of response action outcome specified in 310 CMR 40.1000 have been met. See 310 CMR 40.1056(1)(g).

(i) The RAO opinion must state whether any oil and/or hazardous material at the disposal site exceeds an “upper concentration limit” for that substance in soil or groundwater that the regulations specify. See 310 CMR 40.1056(1)(i).

DEP’s regulations also require that an RAO opinion include supporting documentation. 310 CMR 40.1056(2) states that “[e]xcept where previously submitted, all documentation, plans and/or reports necessary to support the Response Action Outcome shall be submitted to the Department [of Environmental Protection]...”(emphasis added). This includes “a clear and accurate description of the location of the site or the location and boundaries of the disposal site or portion of disposal site to which the RAO applies.” 310 CMR 40.1056(2)(a). It also includes different types of information and documentation for each of the various classes of response action outcomes. 310 CMR 40.1056(2)(b)-(i).

c. The Board's charges against Loitherstein

The Board issued a “Proposed Order Finding Sufficient Grounds for Discipline” to Loitherstein on November 10, 2003, together with an order to show cause. An Amended Proposed Order followed on November 13, 2003. This commenced a two-phase disciplinary process. In the first phase—this adjudicatory proceeding—Loitherstein contests the factual and legal findings recited in the Board’s Amended Proposed Order. If the Board were to find sufficient grounds for disciplinary action after this proceeding (and this recommended decision), the second phase of the disciplinary process would be a proceeding to determine the appropriate discipline against Loitherstein. This could include LSP license revocation or suspension, public or private censure, assessment of a civil administrative penalty, and/or LSP license retention conditioned upon the completion of action required by the Board. See 309 CMR 1.01—7.10.

In its Amended Proposed Order, the Board alleged that Loitherstein had filed with DEP:

- DPS opinions for hazardous waste release sites in which he concluded, without adequate support, that the site in question was not the source of any of the hazardous waste contamination found there, and that did not discuss or explain known available information regarding each site’s history that tended to support or contradict the opinion;
- RAO opinions for hazardous waste release sites that misclassified groundwater and therefore underestimated risks to drinking water supplies; and
- RAO opinions for hazardous waste release sites that did not include a determination of groundwater flow direction, did not define the nature and extent of hazardous waste releases at the site, and did not adequately characterize the risks that these releases posed.

The details of the reporting deficiencies that the Board asserted were these:

- (1) In DPS opinions that he prepared in 1996 regarding (a) a release of chlorinated solvents at 130 Lincoln Street in Brighton, (b) a releases of gasoline and related volatile organic compounds

detected in groundwater at 5 Commonwealth Road in Natick, and (c) gasoline detected in monitoring wells at 1203 Washington Street in Newton, Loitherstein did not determine the direction of groundwater flow, did not discuss or explain known, available information suggesting that the site was the source, or at least a contributing source, of hazardous waste release, and did not provide sufficient support for his opinion that the site was not the source of any of the contamination found there;

(2) In RAO opinions that he prepared (a) in 1994 for 20 Cameron Street in Clinton, a 17-acre industrial and commercial site, (b) in 1995 for 19 Hawks Avenue in Hanson, a 6.8-acre industrial and agricultural site, and (c) in 1998 for 73 Jeffrey Avenue in Holliston, a 2.4-acre site used formerly for the manufacture of coated optical filters, Loitherstein misclassified groundwater and therefore underestimated the risk that the site posed to drinking water supplies; and

(3) In RAO opinions that he prepared (a) in 1995 regarding a release of an unknown quantity of solvents from leaking drums at 14 Tech Circle in Natick, (b) in 1998 regarding a sudden release of approximately 3,000 gallons of fuel oil from a pressurized bleed line in a building at 68 Airport Road in Fitchburg, (c) in 2000 regarding the release of gasoline from underground gasoline storage tanks removed in 1999 at 262 Sawyer Lane in Hudson, and (d) in 2001 regarding possible groundwater contamination from chlorinated solvents at a former bus garage and truck repair facility at 83-89 East Cottage Street and 5-9 Humphreys Street in Dorchester, Loitherstein failed to determine the direction of groundwater flow, define the nature and extent of hazardous waste releases, and/or characterize adequately the risks that these releases posed. The Board also alleged that in the RAO opinion for the Dorchester site, Loitherstein did not provide adequate support for

his conclusion that vinyl chloride and non-aqueous phase liquid (NAPL) detected in wells on this site were migrating onto the site from an upgradient property.

Based upon these assertions, the Board charged Loitherstein with:

(1) Failing to act with reasonable care and due diligence as to each of the hazardous waste disposal sites in question, in violation of 309 CMR 4.02(1) (a provision of the Board's Rules of Professional Conduct);

(2) Failing to "follow the requirements and procedures set forth in applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000," as 309 CMR 4.03(3)(b) requires;

(3) As to the RAO opinions he filed for the Holliston, Natick, Fitchburg, Hudson and Dorchester sites, failing to collect data sufficient to define the nature and extent of the hazardous waste releases and to adequately characterize the risks that they posed, in violation of 309 CMR 4.03(3)(c); and

(4) As to the DPS opinions that he filed for the Brighton, Natick and Newton sites, failing to discuss and explain known available information that may have supported or led to a contrary or significantly different waste site cleanup activity opinion, in violation of 309 CMR 4.03(3)(d).

The Board also suspended Loitherstein's LSP license pursuant to 309 CMR 7.09, on November 10, 2003, based upon what it described as "the poor quality" of his work, his failure to "adhere to the fundamental principles of site assessment or risk characterization," because he was not, and would not be, "in compliance routinely, and on a continuing basis, with all standards and requirements applicable to hazardous waste site cleanup professionals," and because his work indicated that he could pose "an imminent threat to public health or safety or the environment" while

an appeal was pending unless his license was suspended.⁷ However, after a hearing it held in February 2004, the Board rescinded its summary license suspension order and Loitherstein was allowed to resume his practice as an LSP.⁸

d. Loitherstein's answer

Loitherstein filed an answer to the Amended Proposed Order on January 22, 2004 in which he denied the board's conclusions and findings regarding his alleged noncompliance with 309 CMR 4.02 and 4.03 and asserted these specific defenses:

- (1) He exercised reasonable care, diligence and independent judgment in performing services and in preparing the opinions and reports in question, consistent with the standard of care prescribed by 309 CMR 4.02(3) and 4.03(2), and with the reasonable care and skill exercised ordinarily by other LSPs during the same time, and in accordance with the best interests of the environment;
- (2) The DPS opinions in question complied with the requirements set forth at 40 CMR 40.0183(4);
- (3) For several of the hazardous waste disposal sites in question, he relied reasonably upon existing information and, as well, upon reports furnished by other professionals as the Board's Rules of Professional Conduct allowed him to do,⁹ although these proved later to be inaccurate;

⁷/ These grounds for the license suspension are described in the amended proposed order (at 16, paras. 70-72). The suspension itself is not part of the record, apparently because (as noted below) the Board rescinded it subsequently and allowed Loitherstein to continue practicing as an LSP.

⁸/ See Prefiled Direct Testimony of Joel Loitherstein, sworn-to July 18, 2005, at 9. The Board does not deny that it rescinded the license suspension. However, it has not redacted the Amended Proposed Order to delete its recitation of grounds for suspending Loitherstein's LSP license, including the assertion that his continued practice as an LSP posed an "imminent threat to public health or safety or the environment." That charge was no longer viable once the Board restored Loitherstein's license to practice as an LSP.

⁹/ 309 CMR 4.02(3) states that "[i]n providing Professional Services, an LSP may rely in part upon the advice of one or more professionals whom the LSP reasonably determines are qualified by education, training and/or experience."

(4) He was not required to repeat, in his reports, information that was included in prior reports furnished to DEP, per 310 CMR 40.1056(2); and

(5) His opinions complied with 310 CMR 40.1056.

e. Witnesses, prefiled testimony and hearing

Administrative Magistrate Bonney Cashin held prehearing conference sessions on May 12, 2004 and, after the parties were unable to reach a settlement, on January 12, 2005. Magistrate Cashin identified the issues to be decided and the parties' respective witnesses, ordered that testimony be prefiled, and set a schedule for adjudication.

The Board filed testimony by six witnesses:

(1) Edward J. Laughton, who is employed by DEP as an Environmental Analyst III and as an auditor in DEP's Bureau of Waste Site Cleanup.¹⁰ Mr. Laughton has a B.S. degree in chemistry and worked for ten years in the private sector as an environmental consultant and project manager;

(2) James W. Perry, who is employed by DEP as an Environmental Analyst I and as an auditor in DEP's Bureau of Waste Site Cleanup.¹¹ Mr. Perry has a B.S. degree in geology and an M.S. degree in hydrology and has private sector experience in groundwater supply and hazardous waste site investigations and report preparation;

¹⁰/ Prefiled direct testimony of Edward Joseph Laughton, sworn-to April 27, 2005 (Laughton PFT); Prefiled rebuttal testimony of Edward Joseph Laughton, sworn-to August 10, 2005 (Laughton RT).

¹¹/ Prefiled direct testimony of James W. Perry, sworn-to May 2, 2005 (Perry PFT); Prefiled rebuttal testimony of James W. Perry, sworn-to August 11, 2005 (Perry RT).

(3) Patricia M. Donahue, who is employed by DEP as an Environmental Analyst V and who is Chief of the Audit Section in DEP's Bureau of Waste Site Cleanup (Northeast Regional Office).¹² Ms. Donahue has a B.S. degree in biology and an M.S. degree in hydrology;

(4) Joseph A. Cerruti, who is employed by DEP as a hydrogeologist with the agency's Bureau of Resource Protection's Drinking Water Program.¹³ Mr. Cerruti has a B.S. degree in geology.

(5) Michael J. Webster, a licensed site professional and a professional geologist in New Hampshire and Indiana, who is employed privately.¹⁴ Mr. Webster has a B.S. degree in geology and geophysics and an M.S. degree in geology; and

(6) Debra J. Phillips, a licensed site professional who is privately employed and who has also been a member of the Board since 1997.¹⁵ Ms. Phillips has a B.S. degree in chemistry and an M.B.A. degree.

Loitherstein filed testimony by six witnesses:

(1) Himself. In addition to being a licensed site professional, Mr. Loitherstein is also a registered professional engineer in Massachusetts and in each of the other New England states.¹⁶ Mr. Loitherstein has B.S. and M.S. degrees in civil engineering;

¹²/ Prefiled direct testimony of Patricia M. Donahue, sworn-to May 2, 2005 (Donahue PFT).

¹³/ Prefiled direct testimony of Joseph A. Cerruti, sworn-to May 29, 2005 (Cerruti PFT); Prefiled rebuttal testimony of Joseph A. Cerruti, sworn-to August 4, 2005 (Cerruti RT)

¹⁴/ Prefiled direct testimony of Michael J. Webster, sworn-to May 3, 2005 (Webster PFT); Prefiled rebuttal testimony of Michael J. Webster, sworn-to August 8, 2005 (Webster RT).

¹⁵/ Prefiled direct testimony of Debra J. Phillips, sworn-to May 2, 2005; Prefiled rebuttal testimony of Debra J. Phillips, sworn-to August 12, 2005 (Phillips RT).

¹⁶/ Prefiled direct testimony of Joel S. Loitherstein, sworn-to July 18, 2005 (Loitherstein PFT).

(2) Richard J. Hughto, Ph.D., who is a registered professional engineer in Massachusetts and seven other states, a licensed site professional, and a privately-employed environmental consultant.¹⁷ Mr. Hughto holds a B.E. degree in civil and environmental engineering, an M.E. degree in environmental engineering and a doctorate in environmental engineering;

(3) W. Jesse Schwalbaum, a licensed site professional and a certified geologist in Maine and professional geologist in New Hampshire, who is employed privately as a hydrogeologist.¹⁸ Mr. Schwalbaum has a B.A. and M.S. degrees in geology;

(4) David Carls, a trustee of MC Realty Trust, which owns 73 Jeffrey Avenue, one of the sites in question;¹⁹

(5) Nancy E. Schwenker, an environmental scientist employed by Loitherstein Environmental Engineering, Inc.²⁰ Ms. Schwenker has a B.A. degree in environmental science; and

(6) Jonathan R. O'Brien, a licensed site professional and geologist who is employed privately. Mr. O'Brien has a B.A. degree in geology.²¹

I conducted the live portion of the adjudicatory hearing on October 17, 18, 19 and 20, 2005, and on November 1 and 15, 2005. All of the witnesses who filed testimony were cross-examined extensively.

¹⁷/ Prefiled direct testimony of Richard J. Hughto, sworn-to July 11, 2005 (Hughto PFT).

¹⁸/ Prefiled direct testimony of W. Jesse Schwalbaum, sworn-to July ??, 2005 (Schwalbaum PFT).

¹⁹/ Prefiled direct testimony of David Carls, sworn-to July 13, 2005 (Carls PFT).

²⁰/ Prefiled direct testimony of Nancy Schwenker, sworn-to July 18, 2005 (Schwenker PFT).

²¹/ Prefiled direct testimony of Jonathan R. O'Brien, sworn-to July 15, 2005 (O'Brien PFT).

The parties stipulated at the October 17, 2005 hearing session that three of the ten sites mentioned in the Board's Amended Proposed Order are no longer at issue:

- 20 Cameron Street in Clinton, for which Loitherstein filed an RAO opinion in 1994;
- 4 Tech Circle in Natick for which he filed an RAO opinion in 1995; and
- 68 Airport Road in Fitchburg, for which he filed an RAO opinion in 1998.²²

The Board is no longer asserting Loitherstein's opinions for these sites as grounds for disciplinary action against him.

Loitherstein and the Board each filed a post-hearing brief on June 21, 2006. Loitherstein filed a rebuttal brief on July 13, 2006.

Discussion

There remain in issue Loitherstein Environmental Engineering's opinions regarding releases at seven of the ten hazardous waste disposal sites addressed in the Board's Amended Proposed Order. The record as to each site is extensive and includes, in addition to the opinion, supporting laboratory results, earlier site reports by other professionals, and competing testimony regarding the opinion's sufficiency and quality.

Each site posed unique hazardous waste contamination and remediation challenges, and these in turn confronted Loitherstein with issues of professional judgment unique to each site. The sufficiency of his performance must be reviewed site-by-site. Moreover, the alleged violations occurred at different times in years past—ten or more years ago, in several instances. Accordingly, although the Board issued a single order addressing Loitherstein's work at and opinions regarding

²²/ The opinions for these sites and their alleged deficiencies were described above, at 14.

all of these sites (including three sites no longer in issue), I am presented in essence with seven individual cases of alleged professional misfeasance, and each case must be evaluated separately.

Although the seven sites present no common facts, the violations alleged by the Board fall into categories that are each common to several of the sites:

A. Downgradient property status opinions that allegedly lacked support, including a determination of groundwater flow direction, discussion or explanation of known, available information suggesting that the site was the source or at least a contributing source of hazardous waste release, or sufficient support for an opinion that the site was not the source of the contamination found there. The Board's allegations regarding Loitherstein's DPS Opinions for 130 Lincoln Street in Brighton, 5 Commonwealth Road in Natick, and 1203 Washington Street in Newton fall into this category.

B. Response action outcome opinions that allegedly misclassified groundwater at the site in question and therefore underestimated risks to drinking water supplies posed by hazardous waste contamination at the site. The Board's allegations regarding Loitherstein's RAO opinions for 73 Jeffrey Avenue in Holliston and 19 Hawks Avenue in Hanson fall into this category.

C. Response action outcome status opinions that allegedly lacked a determination of groundwater flow direction, did not define the nature and extent of hazardous waste releases at the site, and did not adequately characterize the risks that these releases posed. The board's allegations regarding Loitherstein's RAO opinions for 262 Sawyer Lane in Hudson and at 83-89 East Cottage Street/5-9 Humphreys Street in Dorchester fall into this category.

The discussion below follows this organization.

A. DPS opinions that allegedly lacked support

1. 130 Lincoln Street, Brighton

a.

Lincoln Street runs parallel to the north (westbound) side of the Massachusetts Turnpike in a congested urban area of mixed industrial and residential uses between Cambridge Street and

Market Street in Brighton, and is less than half a mile southeast of the Charles River.²³ 130 Lincoln Street is a 0.9-acre parcel along the north side of the street. The parcel has the shape of a two-step stairs, with the lower step forming its southwestern quadrant (at the corner of Lincoln Street and Litchfield Street) and the upper stair forming its northeastern quadrant (at Ascott Street).²⁴ See Appendix, Sketch 1. There is a 24,000-square-foot building at the center of this parcel, which is located roughly where the “top step” of the parcel’s shape sits upon the “bottom step.” There is a basement with a sump in the northeastern corner of the building. A self-storage facility and rental truck depot was located on this property in 1996.²⁵

On December 19, 1996, Loitherstein Environmental filed a downgradient property status opinion for this site regarding a release of chlorinated solvents, which he attributed to a release of chlorinated volatile organic compounds (CVOCs) at sites upgradient (north) of the site, including a property directly across the Massachusetts Turnpike that was used by an electrical contracting business (Massachusetts Electric Construction Company) and that was a state-listed hazardous waste site. The Board contends that a DPS opinion should not have been filed for 130 Lincoln Street because it was not clear that the chlorinated solvents migrated to this site from an upgradient property, or that the site owner did not contribute to the release or cause it to be worse than it would

^{23/} See Board Exh. B-18 (two documents): (1) Loitherstein Environmental Engineering, Downgradient Property Status Submittal for 130 Lincoln Street, Brighton, Massachusetts, RTN 3-14605, rev. Dec. 9, 1996 (“Loitherstein Environmental DPS Opinion for 130 Lincoln Street”); Fig.1: site locus map (following cover letter/opinion); and (2) Paragon Environmental Services, Inc., Environmental Site Assessment, U-Store-It Self Storage, 130 Lincoln Street, Brighton, Massachusetts, project #96-792, dated June 21, 1996 (“Paragon Report”), at 6, § 3.1.

^{24/} A map of the property appears in the Loitherstein Environmental DPS Opinion for 130 Lincoln Street (Board Exh. B-18) at Fig. 2.

^{25/} Paragon report (Board Exh. B-18), at 2, § 1.3.

have been otherwise. See 310 CMR 40.0183(4)(c) and (d) (quoted above at 6-7, n.7). The Board also asserts that Loitherstein did not provide adequate support for his opinion that VOCs (in particular, chlorinated solvents) detected in groundwater at 130 Lincoln Street originated from an upgradient source and that the site was not the source of this contamination.

In its amended proposed order, the Board charged that Loitherstein did not:

(1) discuss and explain known, available historical information suggesting potential on-site sources of the contaminants found at 130 Lincoln Street in Brighton; or

(2) support adequately his opinion that the site was not the source of the contaminants found there.²⁶

The Board alleged that these omissions comprised the following violations of its Rules of Professional Conduct for LSPs:

(1) failure to act with reasonable care and diligence with regard to the site, in violation of 309 CMR 4.02(1);

(2) failure to follow applicable requirements and procedures of M.G.L. c. 21E and 310 CMR 40.0000, in violation of 309 CMR 4.03(3)(b); and

(3) failure to discuss and explain known, available information regarding site history that may have tended to support or led to a contrary or significantly different opinion, in violation of 309 CMR 4.03(3)(d).²⁷

b.

Loitherstein Environmental's DPS Opinion for 130 Lincoln Street in Brighton followed prior site reports by other environmental consultants that addressed the history of site use, including the use and disposal of fuel oil, gasoline, solvents and other hazardous materials, the removal of

²⁶/Amended Proposed Order, at 16-17; Findings of Noncompliance, item I.i.

²⁷/ Id., at 16-17, Items I.i, II, and IV.

underground and above-ground fuel and gasoline storage tanks, and earlier cleanup efforts. The Board included these earlier site reports as exhibits supporting their case against Loitherstein. None of the experts who testified on the Board's behalf regarding the 130 Lincoln Street DPS Opinion stated why the earlier reports were prepared or what matters they addressed; nor did any of them discuss in any detail what each report found or concluded regarding the direction of groundwater flow at the sites or the presence, location and origin of fuel, gasoline, solvents or other hazardous materials that were found there.

I have reviewed these earlier reports to determine if they indeed show that the Loitherstein Environmental DPS Opinion was deficient as the Board and its witnesses asserted. They do not show this; instead, they furnish factual support for Loitherstein Environmental's DPS Opinion. In addition, because the earlier reports were apparently included with the DPS opinion, Loitherstein Environmental furnished more factual support for its DPS opinion than the Board alleges it did.

I turn first, therefore, to earlier reports that were prepared for 130 Lincoln Street in Brighton.

Prior to Loitherstein's involvement with the site, a commercial lender (Belgravia Capital Corporation) commissioned another, unrelated, firm—Paragon Environmental Services, Inc.—to perform an environmental site assessment at 130 Lincoln Street in 1996.²⁸ The purpose of this private assessment was to determine whether there was “evidence of an existing release, past release, or material threat of release of oil and/or hazardous materials at or in the immediate vicinity of the Site.”²⁹ Paragon inspected the site visually, reviewed historical and agency records, aerial photographs and a prior site assessment prepared in 1991, and obtained groundwater samples from

²⁸/ Paragon Report (Board Exh. B-18), at 1, § 1.0.

²⁹/ Id.

three of seven existing monitoring wells at the site.³⁰ Its assessment report dated June 21, 1996 (“the Paragon Report”) is featured prominently in the Board’s case against Loitherstein regarding 130 Lincoln Street. The Board asserts that the DPS opinion for this site did not discuss the Paragon Report or the information it contained, including the history of site use and possible on-site sources of its contamination.

The Paragon Report described 130 Lincoln Street as within the Charles River Basin, with surface runoff controlled by storm drains, an approximate eight foot depth to groundwater, and a “likely” northward groundwater flow direction, toward the Charles River.³¹ It stated that since 1919 the site “has been predominantly used for industrial manufacturing and produced such items as soda fountains, buttons, automotive piston rings, paints, chemicals and specialized tools”³² and was within ¼ mile of nine state-listed hazardous waste sites.³³ Groundwater analysis had determined that the level of VOCs at the site (specifically, 1-1-Dichloroethene and Trichloroethene) exceeded reportable concentrations, a condition that had to be reported to DEP and that made a site cleanup necessary.³⁴ According to the report, it was “likely that former industrial and manufacturing use of the Site has

^{30/} Id., at 1-2, § 1.2, and at § 1.3 (as to the number of monitoring wells at the site). The results of groundwater sampling are given in the Paragon Report at 24-27, §§ 8.1-8.2.

^{31/} Id., at 24, § 7.3. The report states, in the same section, that Paragon did not actually determine the direction of groundwater flow.

^{32/} Id., at 2, § 1.3, and at 9-12, §§ 4.1-4.5.

^{33/} Id., at 3, § 1.3.

^{34/} Id., at 3, § 1.3, at 4, § 1.4, and at 26-28, §§ 8.1-8.2. The applicable reporting category for dissolved concentrations of oil or hazardous material found in groundwater samples at or in the vicinity of 130 Lincoln Street is “RCGW-2,” per 310 CMR 40.0362(1)(b), which is the category for groundwater samples not taken in areas associated with or at specified distances from public water supplies and public water supply pipelines.

materially affect[ed] subsurface conditions at the Site,” but in addition, it was also “possible that five of the nine state sites have affected subsurface conditions at the Site.”³⁵ These five sites, all identified by the Paragon Report as being upgradient of 130 Lincoln Street, included “MA Electric Construction 180 Guest Street,” which the Paragon Report identified as being 0.1 miles southwest of the 130 Lincoln Street site, and at which there had been a DEP-confirmed release of hazardous waste.³⁶ According to the Paragon Report, “[t]hese properties have the potential to affect subsurface conditions at the Site.”³⁷ However, referring to the VOCs found in groundwater samples collected from three of the seven monitoring wells at the site, the report also stated that “Paragon anticipates that the most likely source of the contaminants is from former on-Site industrial activity.”³⁸ In addition, although it identified the Massachusetts Electric Construction site and four other sites as possible upgradient sources of subsurface contamination at 130 Lincoln Street, Paragon concluded that:

It is unlikely that the State-listed spill sites have materially affected subsurface conditions at the Site since the spills are either down- or cross-gradient. The releases were small in nature and analysis of groundwater at the site did not identify contaminants which were similar to those which were releases from these spill sites.³⁹

³⁵/ Id., at 4, § 1.4. The Paragon Report did not identify the location of any of these four other sites. It did state, however, that the four sites were “either located down or cross-gradient relative to the Site.” Id. Even according to this somewhat oblique description, the upgradient Massachusetts Electric Construction Company site to the south was one of the five sites that, per the Paragon Report, may have affected subsurface conditions at 130 Lincoln Street.

³⁶/ Id., at 15-16, § 5.2.1, including references to the Massachusetts Electric Construction site in the narrative and at Table 3.

³⁷/ Id., at 16, § 5.2.1.

³⁸/ Id., at 27, § 8.1.

³⁹/ Id., at 4, § 1.4.

Curiously, Paragon reached this conclusion before it had reviewed DEP's files on any of the five upgradient properties. The report advises that Paragon had submitted a request to DEP "to review files on these properties" and "[u]pon completion of the file review [it] would notify Client of any relevant information."⁴⁰ Paragon therefore did not have the benefit of the information in DEP's files on the Massachusetts Electric Construction site, or on any of the other upgradient spill sites, when it concluded that these sites could not have materially affected subsurface conditions at 130 Lincoln Street. The report identifies no other source of data supporting this conclusion.

It may be that Paragon intended to confine its conclusion that the state-listed spill sites had not materially affected subsurface conditions at 130 Lincoln Street to the four state-listed sites that were actually downgradient or cross-gradient of it. As to those four sites the conclusion makes at least hydrogeologic sense in view of groundwater flow toward the north. Nonetheless, that is not how the conclusion was worded in the Paragon Report. As the report was drafted, thus, it both suggested and ruled out an offsite, upgradient source of VOC contamination at 130 Lincoln Street. In addition, it described five State-listed hazardous waste spill sites (including the Massachusetts Electric Construction site) as, at the same time, upgradient and downgradient (or cross-gradient) of 130 Lincoln Street, and it concluded (without the benefit of DEP records) that these sites could not have affected subsurface conditions materially at 130 Lincoln Street.

c.

Because the Paragon Report indicated that chlorinated volatile organic compounds (CVOCs) were present at 130 Lincoln Street, the site owner (130 Lincoln Street Trust) retained Loitherstein

⁴⁰/ Id.

Environmental to perform a subsurface evaluation. This included installing an additional groundwater monitoring well, conducting groundwater sampling, conducting a GoreSorber soil gas survey of the site, determining groundwater flow direction (northeasterly, toward the Charles River) and reviewing information on other properties in the vicinity of the site, including a site 600 feet southwest and upgradient of the site owned by Massachusetts Electric Construction Company where there had been documented releases of similar volatile organic compounds.⁴¹

Loitherstein Environmental submitted a DPW opinion to DEP's Northeast Regional Office for the 130 Lincoln Street site dated December 19, 1996. The opinion itself, in letter format, comprised 2¼ single-spaced pages. Supporting data accompanied this letter opinion included a site locus map, a site plan showing the location of monitoring wells, the building, and the building's basement and sump, and a second site plan showing groundwater elevation contours and their location relative to buildings and monitoring wells at the site. The DPW opinion also included tables showing groundwater data from the monitoring wells, an analysis of volatile organics and petroleum hydrocarbons found at the site, and the GoreSorber soil gas survey results (in the form of a report prepared by W.L. Gore & Associates, Inc., which analyzed the "survey modules" that Loitherstein Environmental had submitted).⁴²

The DPS Opinion noted Paragon's prior environmental site assessment "which indicated the

⁴¹/ Loitherstein PFT, at 10-11.

⁴²/ See Board Exh. B-37: GoreSorber "screening surveys," dated November 28, 1996, for 1,1 trichloroethane, trichloroethene, and tetrachloroethane. These show, as full color images, the concentrations of the substance in question throughout the 130 Lincoln Street site (a color scale indicating ranges of concentration for each color appears on the right side of each survey) and, as well, the location of groundwater monitoring wells.

presence of chlorinated solvents in the groundwater at the site.”⁴³ The opinion does not list the Paragon Report as an appendix or attachment. However, the Board filed the DPS Opinion and the Paragon Report as a single exhibit (Board Exh. B-18) that it described thus: “December 19, 1996 Downgradient Property Status Opinion regarding 130 Lincoln Street, Brighton with attachments including June 21, 1996 Environmental Site Assessment by Paragon Environmental Services, Inc.” In addition, Board member and witness Debra J. Phillips testified that the Paragon Report was “attached as an appendix to the DPS submittal” for 130 Lincoln Street.⁴⁴ It is therefore undisputed that Loitherstein Environmental filed the Paragon Report with its DPS Opinion for 130 Lincoln Street. This matters. According to the Board, Loitherstein did not disclose known, available information regarding site history suggesting that the site was the source, or at least a contributing source, of contaminants found there. Because the DPS Opinion included the entire Paragon Report, it disclosed all of the report’s data, findings and conclusions verbatim, including the report’s history of site use and its identification of possible onsite and offsite sources of VOC contamination.

The DPS Opinion stated that Loitherstein Environmental had “performed additional subsurface evaluations at 130 Lincoln Street, including the installation of an additional groundwater monitoring well, groundwater sampling, and a GoreSorber soil gas survey.”⁴⁵ It noted that according to information available at DEP:

a release of chlorinated solvents including trichloroethene (TCE), tetrachloroethane (PCE) and 1,1,1-trichloroethane (1,1, 1-TCA) has occurred at the MECC (Massachusetts Electric Construction Company). Assessment reports prepared by GZA GeoEnvironmental, Inc.

⁴³/ Board Exh. B-18 (Loitherstein Environmental DPS Opinion for 130 Lincoln Street), at 1.

⁴⁴/ Phillips PFT, at 6.

⁴⁵/ Loitherstein Environmental DPS Opinion for 130 Lincoln Street (Board Exh. B-18), at 1.

(GZA) state that the source of the chlorinated solvents may be located upgradient of the MECC property; however, a Tier Classification for this property has been submitted by GZA classifying the MECC property as a Tier II disposal site.⁴⁶

The DPS Opinion continued:

Hydrogeologic data indicate that regional groundwater flow is in a northeasterly direction toward the Charles River. Further, groundwater elevation surveys at the MECC property by GZA and at the Site by Loitherstein Environmental Engineering confirm a northeasterly groundwater flow direction. Therefore, it is the Opinion of Loitherstein Environmental Engineering that the chlorinated solvents documented in groundwater at DEP Site No. 3-0251 (the Massachusetts Electric Construction Company site) have migrated via groundwater to the subject Site...⁴⁷

It was Loitherstein Environmental's opinion that "the source of the chlorinated solvents is located upgradient" of 130 Lincoln Street, specifically, "upgradient of, or at, the Massachusetts Electric Construction Company...property located at 180 Guest Street in Brighton, Massachusetts (DEP Site No. 3-0251)," which was "approximately 600 feet southwest and upgradient of the subject Site."⁴⁸ The opinion stated that it was based upon data obtained from Loitherstein Environmental's additional subsurface evaluations, including groundwater well sampling and the GoreSorber gas survey, and "a review of information for other properties in the vicinity of the Site,"⁴⁹ which the DPS Opinion identified as the Paragon Report⁵⁰ and the assessments and surveys at the Massachusetts Electric Construction Company site performed by GZA.⁵¹

⁴⁶/ Id., at 2, item (c)

⁴⁷/ Id., at 2, item (d).

⁴⁸/ Id., at 1-2.

⁴⁹/ Id.

⁵⁰/ Id., at 1.

⁵¹/ Id., at 2, items (c) and (d)

The DPS Opinion also stated that:

...the chlorinated solvents were being drawn vertically upward on the Site by a basement sump pump which operated near the center of the Site. The sump pump was utilized because the basement floor grade is located below the seasonal high groundwater elevation. Therefore, concentrations of chlorinated solvents at the subject Site have, on occasion, been highest in shallow groundwater monitoring wells located near the sump pump. The sump pump has been deactivated and access to the sump area is restricted via padlock.

This opinion is supported by the GoreSorber survey results, which show elevated concentrations of solvents at the upgradient property boundary, and further elevated concentrations where the solvents are being drawn upwards in the vicinity of the sump pump.⁵²

d.

DEP audited Loitherstein Environmental's DPS for 130 Lincoln Street and issued a notice of this action to the site owner on February 9, 1999.⁵³ On March 2, 1999, DEP Environmental Analyst Allen Wyman conducted a "compliance inspection" at 130 Lincoln Street that was also attended by a representative of the owner (Robert Heavey) and by Scott Bennett of Loitherstein Environmental.⁵⁴ This inspection was described in a notice of audit findings that DEP issued on April 14, 1999, which was signed by Wyman (who did not testify in this proceeding) and by Patricia M. Donahue, Chief of the Audit Branch of DEP's Bureau of Waste Site Cleanup, who testified on the Board's behalf here.

⁵²/ Loitherstein Environmental DPS Opinion for 130 Lincoln Street (Board Exh. B-18), at 2, item (d). Loitherstein testified, consistent with his firm's DPS Opinion, that the groundwater analytical data and the soil gas survey results indicated that CVOCs were present at the upgradient boundary (to the southwest) of 130 Lincoln Street, and that they had migrated onto the property from an offsite source. Loitherstein PFT, at 11-12, and at 13.

⁵³/ Board Exh. B-20: Notice of Audit Findings issued by DEP to U Store It of 130 Lincoln Street, LLC, re 130 Lincoln Street, RTN 3-14605, DPS Opinion ("DEP Audit for 130 Lincoln Street"), dated April 14, 1999, at 1.

⁵⁴/ Id., at 5.

According to DEP’s notice of audit findings, Wyman “indicated that it was the Department’s position that there was insufficient information provided to support the DPS Opinion and, therefore, requested that Mr. Heavey voluntarily terminate the Downgradient Property Status” of 130 Lincoln Street.⁵⁵ During a property walkover, Wyman was shown the location of three floor drains located in the garage bay area of the main building, the location of monitoring well 2 (in the “garage facility,” which was, according to Heavey, “a newer addition to a much older section of the main building located immediately behind the garage bays, rather than in “the older portion of the main building” as the DPS Opinion showed it. He was also showed the location of monitoring well 3 (in the “older portion of the main building”), and “[t]he location of the sump pump located in a basement below the older portion of the main building.”⁵⁶ According to the notice of audit findings:

[t]here was approximately 1 to 2 inches of water with a sheen flooding the basement and the sump was clearly not operational. The sump outfall was not identified. Noted extruding out of the basement ceiling were several various sized pipes cut off at ceiling level. The origins of these pipes were not known. Currently, any discharge from the pipes would impact the basement floor and would likely enter the environment through the sump. Historical discharge of the pipes was not known. A 275-gallon above ground storage tank (AST) was also noted. It was not connected to a fill or vent pipe. An old metal sink was noted, the outfall for which was unknown.⁵⁷

DEP concluded that the DPS Opinion violated 310 CMR 40.0183(4), for these reasons:

⁵⁵/ Id., at 6. The owner withdrew the Downgradient Property Status for 130 Lincoln Street on March 24, 1999. Id., at 1, and at 7. DEP’s notice of audit findings does not state why the owner elected to do so, and the remainder of the record supplies no direct answer. The notice of audit provides what may be a clue as to why the owner might have elected to withdraw the DPS Opinion, however. It states that “[s]ince Mr. Heavey (the owner’s representative) voluntarily terminated the Downgradient Property Status for the Site on March 24, 1999, no additional actions are required” to address the violation of 310 CMR 40.0183(4)—meaning action other than submitting (as the notice of audit findings required) a tier classification submittal for the site and, if applicable, a Tier I permit application, and a Response Action Outcome opinion. Id., at 7.

⁵⁶/ Id.

⁵⁷/ Id., at 6.

[T]here is insufficient information to support the conclusion that the source of the release of chlorinated solvents at 130 Lincoln Street is/was located upgradient of the property, since:

1. The results of a soil/gas survey conducted by Loitherstein Environmental Engineering at the 130 Lincoln Street property indicated that the highest levels of Volatile Organic Compounds (VOCs) were present in the central and downgradient portions of the property;
2. The results of groundwater sampling conducted by Loitherstein at the 130 Lincoln Street property indicated that the highest levels of VOCs were present in the downgradient wells located on the property; and
3. Two VOCs, tetrachlorethylene and trichloroethylene, which were detected in a downgradient well, were not detected in the upgradient wells at the 130 Lincoln Street property.⁵⁸

DEP ordered that the owner file either a Tier Classification submittal for the site, pursuant to 310 CMR 40.0500 (together with a Tier 1 permit application if that was required), or an RAO opinion pursuant to 310 CMR 40.1000.⁵⁹

e.

Board witnesses Debra J. Phillips and Michael J. Webster, both licensed site professionals, addressed the DPS Opinion for 130 Lincoln Street.

In opining that the DPS Opinion was not even “remotely consistent with the standard of care when it was filed in 1996,” Phillips emphasized repeatedly that the opinion was “only two pages long.”⁶⁰ Phillips did not note that the cover letter was single-spaced and counted only the number of pages of Loitherstein Environmental’s cover letter. Nor did Phillips explain why her page count

⁵⁸/ Id., at 7.

⁵⁹/ Id., at 1-2, and at 7.

⁶⁰/ Phillips PFT, at 6, l. 16 (“Mr. Loitherstein’s opinion was only two pages long...”), at 7, l. 10 (“Mr. Loitherstein’s two page DPS opinion...”), at 7, l. 11 (“[i]t was only two pages long...”), and at 8, ll. 1-2 (“...the two-page submittal clearly did not meet either the MCP standard for a DPS submittal or the Board’s standard of care.”).

did not include the attachments and data appendixes that accompanied the cover letter. If this material is included in the page count, the Loitherstein Environmental DPW opinion for 130 Lincoln Street is 84 pages long, even if one does not count the number of pages in the Paragon Report that was submitted with it. More to the point, Phillips stopped short of testifying that the degree to which a DPS opinion conformed to (or deviated from) the applicable standard of care is determined by counting its pages, and none of the Board's other witnesses attested to any such metric. Neither Phillips, nor any of the Board's other witnesses, nor the Board itself, directed my attention to a regulation or other authority requiring any particular page length for a DPS opinion, and I have found none.

Phillips also faulted the DPS Opinion because “[g]roundwater flow direction was not calculated but was inferred, and no explanation was offered in the submittal for the assumed groundwater flow direction.”⁶¹ Webster, similarly, opined that “Mr. Loitherstein did not collect sufficient ground water elevation data at the site to establish the direction of ground water flow at the site,” relying instead upon “three sampling events over a two-month period” without even gauging the northernmost well (monitoring well MW-3)—insufficient, in his view, to “definitively establish ground water flow patterns at the site, and in particular the central portion of the site (near the sump) in the area where ground water impacts were the greatest.”⁶²

The DPS Opinion states, however, that a northeasterly flow of groundwater toward the Charles River was based upon GZA GeoEnvironmental, Inc.’s groundwater elevation surveys at the Massachusetts Electric Contracting Company property and at 130 Lincoln Street by Loitherstein

⁶¹/ Phillips PFT, at 8.

⁶²/ Webster PFT, at 5-6, ll.

Environmental.⁶³ Phillips did not explain why these groundwater elevation surveys, one performed offsite and one at the site itself, do not suffice as a “calculation” (as opposed to an “inference”) of groundwater direction. That said, even if I were to assume that any more confirmation of groundwater flow direction was required by any applicable standard of care required of LSPs (quite a stretch, because this proposition was not proved), faulting the DPS Opinion for not confirming groundwater direction is academic quibbling to a fault. The direction of groundwater flow as given by the Loitherstein Environmental DPS Opinion for 130 Lincoln Street is undisputed by any of the Board’s witnesses, Phillips included.

Equally quibblesome is Phillips’s criticism that the DPS Opinion “failed to demonstrate even which direction was upgradient...” of 130 Lincoln Street.⁶⁴ It is unclear what demonstration of upgradient direction was required, in Phillips’s opinion, or why, for example, the Paragon Report’s discussion of upgradient direction was insufficient support. On account of groundwater flow northward toward the Charles River, the Paragon Report (which accompanied the DPS Opinion) inferred that five state-listed hazardous waste sites located to the southeast and southwest of 130 Lincoln Street, including the Massachusetts Electric Construction Company site, were upgradient of it.⁶⁵ The Board, which relied in significant part upon the Paragon Report, gave no reason for discounting the report as inaccurate in inferring which direction was upgradient of this site. None of the Board’s witnesses, Phillips included, testified that the Massachusetts Electric Construction

⁶³/ Loitherstein Environmental DPS Opinion for 130 Lincoln Street (Board Exh. B-18), at 2, item (d).

⁶⁴/ Phillips PFT, at 8, ll. 13-14.

⁶⁵/ Paragon Report (Board Exh. B-18), at 15-16, § 5.2.1.

Company site to the southwest was not upgradient of 130 Lincoln Street.

A potentially more consequential criticism leveled by both Phillips and Webster was that Loitherstein failed to show adequately that historical activity at 130 Lincoln Street did not contribute to VOC contamination at this site or that this contamination was migrating to the site from an upgradient source.⁶⁶

In addressing this critique, it is useful, first, to note that neither witness faulted Loitherstein Environmental's DPS Opinion for presenting no support for an upgradient source of chlorinated solvents at the site. The DPS Opinion disclosed the factual basis for this conclusion as including groundwater sampling results, the results of the GoreSorber gas survey, and the GZA report on the Massachusetts Electric Construction Company site (see above, at 28-29). It is the adequacy of this factual basis that the Board's witnesses challenged.

Neither witness stated what proof, or quantum of proof, was needed to support an opinion regarding the onsite or offsite origin of contamination at a site. In addition, neither witness testified definitively that the source of chlorinated solvents at 130 Lincoln Street was located at the site, and instead each witness faulted the analytical data presented in the DPS Opinion for not supporting an upgradient, offsite source.⁶⁷

Webster concluded that the DPS Opinion did not support an upgradient source of chlorinated solvents since (1) the highest concentrations of these substances were at the center and downgradient portions of 130 Lincoln Street, and (2) it was improbable that this was the result of pump-induced upwelling of solvents in groundwater near the basement sump.

⁶⁶/ Phillips PFT, at 7, ll. 11-14.

⁶⁷/ Webster PFT, at 6; see also Phillips PFT, at 6-7.

I examine the groundwater monitoring well data first to determine whether it indeed rules out an upgradient, off-site source of the chlorinated VOCs found at the site. Webster testified that:

The highest concentrations of chlorinated solvents were detected in monitoring wells located in the center and downgradient portions of the site and not in the upgradient wells (as one would expect if the contamination was migrating onto the site from some upgradient property). Ground water data also indicated the presence of certain parent volatile organic compounds (tetrachlorethylene and trichloroethylene) in the most downgradient wells that were not detected in the upgradient wells.⁶⁸

There were seven monitoring wells at 130 Lincoln Street. See Appendix, Sketch 1. A 28,000-square-foot building occupied the center of this site. The building's center is the roughly the center of this irregularly-shaped property. Three monitoring wells were near, but not at, this center: MW-2 was located within ten feet of the building's northern (and downgradient) side, and was closest to the basement and sump; MW-1 was located approximately ten feet south of the center of the building's southern (upgradient) side; and another upgradient monitoring well, MW-6, was located approximately 20 feet south of the building.⁶⁹ Only one of the remaining wells was located downgradient of the building—MW-3, located approximately 50 feet north of the building, near the property's northern boundary along Ascott Street. The others were all upgradient of the building: MW-5, located 15-30 feet southwest of the building's southwestern corner; MW-107, near the property's southwestern corner at Lincoln and Litchfield Streets; and MW-4, near the center of the property's southern boundary along Lincoln Street.

Loitherstein Environmental's DPS Opinion for 130 Lincoln Street includes a table summarizing the results of groundwater sampling at several of the on-site monitoring wells. This

⁶⁸/ Webster PFT, at 6 (parentheses in original).

⁶⁹/ See Loitherstein Environmental DPS Opinion for 130 Lincoln Street (Board Exh. B-18), at Fig. 2.

sampling was conducted on one or both of two days, August 2, 1996 and October 2, 1996.⁷⁰ The table shows no results for the most downgradient of the monitoring wells at the site, MW-3 (near the northern boundary of 130 Lincoln Street), or for one of the wells located near the upgradient (southern) side of the building, MW-6. Three of the five monitoring wells for which the table does show VOC-related sampling data can be said to fall within Webster's description of "monitoring wells located in the center and downgradient portions of the site," even though Webster did not identify them specifically: MW-2, near the building's downgradient (northern) side; MW-1, near the building's upgradient (southern) side; and MW-5, located 25-30 feet southwest of the building's southwestern corner.

Webster's testimony was that "[t]he highest concentrations of chlorinated solvents were detected in monitoring wells located in the center and downgradient portions of the site and not in the upgradient wells..." This statement is correct in part. According to table 2 of the DPS Opinion for 130 Lincoln Street, monitoring well MW-2, along the downgradient (northern) side of the building, sampled on October 2, 1996, yielded the highest values of all of the wells sampled for tetrachloroethylene (17 ug/L, compared with none shown in samples taken at the other monitoring wells), trichloroethylene (510 ug/L, compared with none shown in samples taken at the other monitoring wells), and 1,1,1-trichloroethane—2,900 ug/L, well above the concentration of 1,1,1-trichloroethane found in samples taken from the other monitoring wells. However, the next highest concentration of 1,1,1-trichloroethane was not found at a monitoring well near the center of the

⁷⁰/ Loitherstein Environmental DPS Opinion for 130 Lincoln Street (Board Exh. B-18), at Table 2, entitled "Summary of Groundwater Analytical Results, 310 Lincoln Street, Brighton, Massachusetts." The locations of the monitoring wells are shown in the DPS Opinion at Figure 2 (entitled "Site Plan") and also at Figure 3 (entitled "Groundwater Contours").

property or downgradient of the building. That concentration—900 ug/L—was found, instead, in samples taken on August 2, 1996 from upgradient monitoring well MW-4, located near the property’s southern boundary. The third highest concentration of 1,1,1-trichloroethane—280 ug/L—was also found in samples taken from an upgradient monitoring well— MW-1, located near the building’s south side—on August 2, 1996.

The analytical data presented in the Loitherstein Environmental DPS Opinion for 130 Lincoln Street showed the highest concentrations of VOCs in one downgradient and two upgradient onsite monitoring wells, rather than, as Webster stated, “in monitoring wells located in the center and downgradient portions of the site and not in the upgradient wells...” Applying Webster’s opinion to what the data actually showed, the presence of high concentrations in the upgradient monitoring wells was consistent with what “one would expect if the contamination was migrating onto the site from some upgradient property.”⁷¹ If this contamination had originated at the sump or at another point within the building, it would not have migrated uphill (southward) toward upgradient monitoring wells (MW-1, MW-5, MW-6, or even further to the south, MW-107) absent some means of conveyance against the direction of groundwater flow, of which there was no evidence.

The groundwater monitoring data also suggests strongly that VOCs were migrating in a downgradient (northerly) direction across the property. VOC concentrations in groundwater samples taken at monitoring well MW-4, along the southern boundary of 130 Lincoln Street upgradient of the building and the property’s center, were noticeably lower on October 2, 1996 than they were on August 2, 1996. Table 2 of the DPS Opinion shows that the concentration of 1,1,1-trichloroethane had decreased from 280 ug/L to 140 ug/L by October 2, 1996. The October 2, 1996

⁷¹/ Webster PFT, at 6.

samples also showed 18 ug/L of 1,1, dichloroethane compared with 32 ug/L found in samples taken from this well on August 2, 1996, as well as 8 ug/L of 1,1-dichloroethylene compared with 55 ug/L found in the August 2, 1996 samples. In contrast, the concentrations of these VOCs in the groundwater samples taken at downgradient monitoring well GW-2 on October 2, 1996 was much higher. These figures suggest that VOC concentrations that were found upgradient of the building on August 2, 1996 had moved toward, and downgradient of, the property's center two months later.

The analytical data included in the DPS Opinion for 130 Lincoln Street also included the GoreSorber soil/gas survey results. Webster testified that the GoreSorber survey results showed the highest concentrations of chlorinated solvents beneath and downgradient of the building, and “[t]he lowest concentrations ...on the upgradient side of the property” and therefore “do not support [Loitherstein’s] theory that the contaminants were migrating onto the property from off-site.”⁷²

The Gore/Sorber surveys show the heaviest concentrations of 1,1 trichloroethane, trichloroethene, and tetrachloroethane (shown as areas ranging in color from light orange to purple)⁷³ extending from roughly the center of the site in a northeastern direction to the site's northern, downgradient boundary,⁷⁴ but this does not by itself establish an onsite source of this contamination. Heavier concentrations of 1,1 trichloroethane (areas shown as yellow to dark orange) appear as well along the site's entire southern, upgradient boundary, along Lincoln Street, with the heaviest areas of concentration (dark orange) at the boundary itself. The surveys also show, at the center of the

⁷²/ Webster PFT, at 9.

⁷³/ On the GoreSorber surveys, lowest concentrations are in the dark to light blue range, then dark to light green, light to dark yellow, light to dark orange, and then light to dark purple, which shows the highest concentrations of the particular analyte. The specific concentrations (in micrograms per liter) shown by each color varies from analyte to analyte.

⁷⁴/ See Board Exh. B-37.

southern boundary, circular areas of heavy concentrations of trichloroethene (in orange, with the darkest areas at the southern boundary itself) and tetrachloroethane (an area of yellow with a light orange area at the center of the southern boundary).

The Gore/Sorber surveys show, thus, increasing concentrations of these VOCs at 130 Lincoln Street as one moves downgradient and to the north, particularly toward the site's northern boundary, and a possible secondary plume of each of these VOCs moving onto the property from a source upgradient of the site's southern boundary. Although heavy concentrations appear in the area of the building basement and the sump, heavy concentrations also appear south and upgradient of it, contrary to Webster's description. Unless one assumes that groundwater flows uphill, these concentrations cannot be attributed to a downgradient source of VOC contamination near the center of the site or, more specifically, to a source in the building. The evidence contradicts Webster's opinion, thus, that the Gore/Sorber surveys "do not support" an opinion of contaminant migration onto the property from an upgradient, offsite source.

I turn next to Webster's criticism of Loitherstein's opinion that an upwelling at the sump near the center of the site was responsible for higher concentrations in monitoring wells near that area. Webster described this "upwelling" explanation as unsupported by technical data; it was also, in his view, based upon an assumption of atypical hydraulic conditions since "[u]pward vertical gradients at a site are not common (unless located near a ground water discharge feature, such as a surface water body or wetlands—none of which are located at this site)..."⁷⁵ Webster explained that "[g]enerally, significant use of such a sump (both in duration and in pumping rate/volume of water removed) would be required to create the 'upwelling' plume," but he concluded that the sump pump

⁷⁵/ Id. (parentheses in original).

in the basement at 130 Lincoln Street was not clearly not operational because DEP personnel observed water in the basement during DEP's March 2, 1999 inspection (see above, at 32).⁷⁶

There is no reason to doubt Webster's opinion that an upwelling of chlorinated VOCs would be highly unusual, and therefore difficult to justify, if the sump pump was not operational when the upwelling occurred. There is no evidence that the sump pump was operational when Loitherstein Environmental prepared its DPS Opinion for this site in December 1996. But Loitherstein Environmental's DPS Opinion did not state that upwelling was occurring at that time. It stated, instead, that "that the chlorinated solvents were being drawn vertically upward on the Site by a basement sump which operated near the center of the site."⁷⁷ This statement is read reasonably as describing a phenomenon that occurred when the sump pump was operating, whenever that had occurred. Although the DPS Opinion did not state when the pump had been operational, its prior operation is not disputed. There is no basis in the record for assuming that the pump was not operational at any time when chlorinated VOCs were discharged at other sites upgradient of 130 Lincoln Street or, thus, that no pump-induced upward vertical plume could have occurred at the site at any time when chlorinated VOCs were discharged upgradient of it. That assumption is particularly unreasonable since the pump was located in a basement below the seasonal high groundwater elevation⁷⁸—a very good reason to have a sump pump there in the first place, and indicative of at least periodic basement flooding. In addition, DEP Environmental Analyst Wyman

⁷⁶/ Id., at 7 (parentheses in original).

⁷⁷/ Loitherstein Environmental DPS Opinion for 130 Lincoln Street (Board Exh. B-18), at 2, item (d).

⁷⁸/ Id.

saw only 1-2 inches of water on the basement floor when he inspected 130 Lincoln Street in March 1999,⁷⁹ which suggests that the pump may have been operational not long before.

The record does not show when the pump had last operated before the DEP inspection or whether there was in fact an onsite source of VOC contamination at the site. Neither of these matters requires resolution to resolve the issue before me, however, which is whether there was adequate data support for Loitherstein Environmental's opinion that the contamination had migrated from an upgradient source rather than from an on-site source. It did, and this support was presented in the DPS Opinion for 130 Lincoln Street. The opinion was thus reasonable. A consensus of LSPs on this point was not required; indeed, as the competing testimony shows, LSPs may (and in this instance, do) disagree about the origins of contaminants found at a site and about the significance of analytical data in reaching their respective opinions. That other LSPs disagree or would reach a different conclusion does not show, however, that the LSP in question performed substandard work or failed to exercise reasonable care.

f.

As to the DPS Opinion that Loitherstein Environmental filed for 130 Lincoln Street in Brighton, I find that Loitherstein (a) discussed and explained known, available historical information suggesting potential on-site sources of the contaminants found at 130 Lincoln Street in Brighton; and (b) supported adequately his opinion that the site was not the source of the contaminants found there.

I conclude, therefore, that Loitherstein:

(1) acted with reasonable care and diligence, as required by 309 CMR 4.02(1);

⁷⁹/ DEP Audit for 130 Lincoln Street (Board Exh. 20), at 6.

(2) followed applicable requirements and procedures prescribed by M.G.L. c. 21E and 310 CMR 40.0000, as required by 309 CMR 4.03(3)(b); and

(3) disclosed known, available information regarding site history that may have tended to support, or that may have led to, a contrary or significantly different opinion, and discussed this information sufficiently, thereby satisfying the requirements of 309 CMR 4.03(3)(d).

2. 5 Commonwealth Road, Natick

a.

5 Commonwealth Road is a trapezoidal-shaped parcel (widest along its northern side and narrowest along its southern side) located west of Lake Cochituate and Cochituate State Park, and east of the intersection of Speen Street and Commonwealth Road (Route 30) in Natick.⁸⁰ See Appendix, Sketch 2. Route 30 forms the parcel's northern boundary, Cochituate State Park adjoins the property along its eastern boundary, and a railroad right-of-way owned by ConRail forms the parcel's diagonally-shaped western boundary. The western and eastern boundaries of this parcel would intersect, if they were extended, just to the south of the parcel, and the parcel's southern boundary is therefore relatively short.

A fuel oil depot at 5 Commonwealth Road closed in the 1970s, and a gasoline station at the property along Commonwealth Road closed in 1984.⁸¹ By 1996, the property was the site of an office building located in the property's northern half, with paved parking along the building's west

⁸⁰/ See Board Exh. B-25: Loitherstein Environmental Engineering, Downgradient Property Status Submittal for 5 Commonwealth Road, Natick, Massachusetts, RTN Unassigned, dated May 29, 1996 ("Loitherstein Environmental DPS Opinion for 5 Commonwealth Road"), at Fig. 2 ("site plan").

⁸¹/ Loitherstein Environmental DPS Opinion for 5 Commonwealth Avenue (Board Exh. B-25); narrative letter, at 2.

side and in the parcel's southern half.⁸² The property directly across Route 30, to the north, was occupied by a TJX building, and the parcel adjacent to the west side of TJX was a New England Sand and Gravel site. A large parcel directly across the railroad right-of-way to the west was occupied formerly by a Trailways bus station (it is the site of a Home Depot retail store today), and gasoline stations occupied three of the four corners at the Speen Street/Route 30 intersection approximately 200 feet to the west.⁸³

On June 21, 1996, Loitherstein Environmental filed a downgradient property status (DPS) opinion for 5 Commonwealth Road (dated May 29, 1996) regarding a release of gasoline and gasoline-related volatile organic compounds (benzene and 1,2,4-trichlorobenzene) whose presence was detected at this property. Loitherstein Environmental concluded that the release had occurred at any of several upgradient properties, including three occupied by gasoline stations. It reasoned that although 5 Commonwealth Road had itself been the site of a gasoline station and fuel oil storage depot, these uses had ended in 1984 and in the 1970s, respectively; in addition, prior subsurface evaluations detected no petroleum hydrocarbons in groundwater at the site, and the contaminants that Loitherstein Environmental detected from a monitoring well at the site was consistent with a recent gasoline-related release.

⁸²/ Loitherstein Environmental DPS Opinion for 5 Commonwealth Avenue (Board Exh. B-25); Fig. 2 ("site plan").

⁸³/ Id. The gasoline stations were a Mobil Oil service station at 696 Cochituate Road (at the northwest corner of the Route 30-Speen Street intersection), approximately 240 feet west of 5 Commonwealth Road, a Getty Oil service station at 701 Cochituate Road (at the southwest corner of the Route 30-Speen Street intersection), approximately 200 feet from 5 Commonwealth Road, and an Exxon service station at 730 Cochituate Road (at the northeast corner of the Route 30-Speen Street intersection), approximately 160 feet from 5 Commonwealth Road. See Loitherstein Environmental DPS Opinion for 5 Commonwealth Avenue (Board Exh. B-25); attached notices of submittal of downgradient property status opinion sent by Loitherstein Environmental to business managers of the three service stations, all dated May 29, 1996.

In its amended proposed order, the Board charged that Loitherstein did not:

- (1) discuss and explain known, available historical information suggesting potential on-site sources of the contaminants found at 5 Commonwealth Road in Natick; or
- (2) support adequately his opinion that the site was not the source of the contaminants found there.⁸⁴

The Board alleged that these omissions comprised the following violations of its Rules of Professional Conduct for LSPs:

- (1) failure to act with reasonable care and diligence with regard to the site, in violation of 309 CMR 4.02(1);
- (2) failure to follow applicable requirements and procedures of M.G.L. c. 21E and 310 CMR 40.0000, in violation of 309 CMR 4.03(3)(b); and
- (3) failure to discuss and explain known, available information regarding site history that may have tended to support or led to a contrary or significantly different opinion, in violation of 309 CMR 4.03(3)(d).⁸⁵

b.

Prior to Loitherstein's involvement with 5 Commonwealth Road, an unrelated firm, IEP, Inc. prepared a "21E Site Assessment" for this property in August 1984 for R.D. Smith, Inc. in Weston, Massachusetts ("the 1984 IEP Site Assessment").⁸⁶ The property was known at the time as 3-5 Commonwealth Road because it consisted of two lots formed roughly by bisecting the property from north to south.⁸⁷ The 1984 IEP Assessment included a diagram showing a gasoline station with two

⁸⁴/Amended Proposed Order, at 16-17; Findings of Noncompliance, item I.i.

⁸⁵/ Id., at 16-17, Items I.i, II, and IV.

⁸⁶/ Board Exh. B-38: "21E Site Assessment, 3-5 Commonwealth Road, Natick MA 01760, August 1984," prepared by IEP, Inc. ("1984 IEP Assessment").

⁸⁷/ Id., at Fig. 3 (preceding p. 2), entitled "Site Plan."

gas pump islands and four underground gasoline tanks holding a total of 15,000 gallons at the property's northeastern corner, along Commonwealth Road, and, several feet to the east, "former storage tanks" near the boundary with Cochituate State Park.⁸⁸ The Assessment described the site's eastern lot (lot 2, then known as 5 Commonwealth Road) as having been the site of a gasoline station and auto repair shop since 1949, although by 1984 car repairs were no longer being performed there, and the site's western lot (lot 3, then known as 3 Commonwealth Road) as "idle," with a vacant house, after having been the site of a real estate company's office and as an office for New England Sand and Gravel Company.⁸⁹

IEP performed test borings between the gasoline station and the site's southern end, sampled surface and subsurface sediments, and collected groundwater samples and analyzed them in the field for VOCs using an HNU photo-ionizer.⁹⁰ The photo-ionizer "showed strong concentration (40-100 ppm) in bore holes 3 and 4," at the center of the site, primarily "on the surface of the groundwater."⁹¹ Based upon laboratory analysis, the contamination at bore hole 3, the easternmost of these two bore holes (on the same lot as the gas station), was "likely" Number 2 fuel oil, consistent with the owner's recollection that the site was "formerly used to store fuel oil for a truck depot," although the tanks had not been used for approximately 20 years and were removed in 1983.⁹² IEP concluded that:

In summary, contamination on the site is restricted to the central portion of the site and is probably fuel oil. The contamination exists as a film on the surface of the water table and

⁸⁸/ Id.

⁸⁹/ Id., at 2-4.

⁹⁰/ Id., at 6, and attached boring logs.

⁹¹/ Id., at 6.

⁹²/ Id., at 8A.

in the capillary zone just above the water table. The most likely source of this contamination is a spill associated with the fuel oil tanks which were located on this site. The spill most likely occurred many years ago. No records exist of any spills in the area.

Because this contamination is of a limited extent and does not appear to be moving off site it should not present a problem to future development of the site. The fuel oil tanks located on the site have been removed, thereby removing any potential source of further fuel oil contamination. Should cleanup be desired, this would be relatively easy to conduct because of the localized nature of the contamination and high permeability of the soils...⁹³

A second assessment of the site was also prepared prior to Loitherstein's involvement, this one in June 1991, by an unrelated firm, Diagnostic Engineering, Inc. ("the 1991 Diagnostic Audit").⁹⁴ The 1991 Diagnostic Audit included a summary of public records showing the history of uses at 5 Commonwealth Road and nearby sites. Natick Building Department records showed that preparatory to constructing an office building at 5 Commonwealth Road, the owner or developer at the time (Progressive Development Limited Partnership) "obtained a permit to remove three gasoline tanks" on December 28, 1984.⁹⁵ Records of the Natick and Framingham Fire Departments showed that there were also large-sized diesel fuel and gasoline tanks at seven other sites nearby along Route 30 that the 1991 Diagnostic Audit described as being "in the vicinity" of 5 Commonwealth Road, and that similar tanks had been removed from those sites recently. The nearby sites included a TJX Companies office building at 770 Cochituate Road and a New England Sand and Gravel site at 760 Cochituate Road, both across from 5 Commonwealth Road (on the north side of Route 30). They also included three gasoline service stations to the west, at the corner of Route 30 and Speen Street:

⁹³/ Id.

⁹⁴/ Board Exh. B-39: "Environmental Acquisition Audit for Old Stone Bank, 5 Commonwealth Road, Natick, Massachusetts, Project Number PD1022AD1" prepared by Diagnostic Engineering, Inc., dated June 22, 1991 ("the 1991 Diagnostic Audit").

⁹⁵/ 1991 Diagnostic Audit (Board Exh. B-39), at 4.

Mobil, at 696 Cochituate Road; Exxon, at 730 Cochituate Road; and Getty, at 701 Cochituate Road.⁹⁶

⁹⁶/ The 1991 Diagnostic Audit (Board Exh. B-39, at 4-5) presented the following information regarding gasoline and diesel fuel tanks at sites in the vicinity of 5 Commonwealth Road:

760 Cochituate Road (Rte. 30), Natick (New England Sand and Gravel):

- 1,000-gallon diesel tank, installed in 1951.
- (2) 2,500- gallon diesel tanks, removed in 1988.
- 1,000-gallon gasoline tank, removed in 1988.

696 Cochituate Road, Framingham (Mobil):

- (3) 10,000-gallon gasoline tanks, removed in October, 1990.
- 1,000-gallon diesel tank, removed in October, 1990.
- 1,000-waste oil tank, removed in October, 1990.
- 12,000-gallon gasoline tank, installed in December 1990.
- (2) 10,000-gallon gasoline tanks, installed in December, 1990.
- 8,000-gallon diesel tank, installed in December, 1990.
- 500-gallon waste oil tank, installed in December, 1990.

MWRA, approximately 300 yards northeast of Project Area on Commonwealth Road:

- 1,000-gallon gasoline tank, installed in 1979.

730 Cochituate Road, Framingham (Exxon):

- 12,000-gallon gasoline tank, installed in 1987.
- (2) 10,000-gallon gasoline tanks, installed in 1987.
- 8,000-gallon diesel tank, installed in 1987.

701 Cochituate Road, Framingham (Getty):

- (2) 800 gallon gasoline tanks, installed in 1966.
- (2) 800 gallon diesel tanks, installed 1966.
- (3) 3,000 gallon gasoline tanks, installed in 1985.
- 4,000 gallon diesel tank, installed in 1985.

770 Cochituate Road, Natick (TJX Companies - Office Building):

- (2) 10,000-gallon gasoline tanks, installed in 1979
- (2) 10,000-gallon gasoline tanks, removed in 1987.

The 1991 Diagnostic Audit also noted that DEP records showed the removal of three abandoned, but leaking, underground storage tanks in 1988 from the New England Sand and Gravel site across Route 30 from 5 Commonwealth Road, and gave this description of what had occurred there:

The removal of the tanks revealed several holes in the two 2,500 gallon diesel tanks, and one hole in the 1,000 gallon gasoline tank. Evidence of prior leakage of fuel was noted by the presence of fuel odors and high photoionization detector readings performed by Zecco Inc. personnel on-site during the removal. Also noted were patches of dark, free floating product on the groundwater immediately adjacent to the tanks, and high volatile organic compound (VOC) levels in the surrounding soil. On June 17, 1988 approximately 85 cubic yards of soil was removed and stockpiled on-site. The free floating product was removed from the groundwater and did not re-charge. DEP personnel sampled the soil prior to backfilling for total petroleum hydrocarbons (TPH).⁹⁷

The 1991 Diagnostic Audit described 5 Commonwealth Road itself as occupied by an office building with parking and lawn areas that showed “[v]ery little evidence to suggest past usage” visibly, although “several roadboxes...typical of those used for the construction of groundwater monitoring wells” were observed.⁹⁸ It reported that “[r]egional groundwater flow direction is presumably eastward, toward Lake Cochituate, though a small hill located just to the east of the Project Area” (meaning 5 Commonwealth Road) produces a westward flow of runoff.”⁹⁹ It also reported that “[n]o known petroleum or hazardous material underground storage tanks presently exist at the Project Area” but that there were several underground storage tanks “at properties in close proximity to the Project Area, including three gasoline stations...” that could pose a future

⁹⁷/ 1991 Diagnostic Audit (Board Exh. B-39), at 5-6.

⁹⁸/ Id., at 12.

⁹⁹/ Id.

environmental threat to 5 Commonwealth Road due to tank failure.¹⁰⁰ Another potential threat to 5 Commonwealth Road was “[t]etrachloroethylene contamination...found in the groundwater supply several hundred feet to the west of the Project Area,” whose potential source was identified as a drycleaner.¹⁰¹

The 1991 Diagnostic Audit identified “[t]he largest area of concern” as the location of four former above-ground oil tanks at 5 Commonwealth Road “that may have been in use as recently as the mid 1970’s.”¹⁰² It did not state why this was the “largest” area of concern. The omission is curious in view of extensive, ongoing fuel storage, and the presence of oil and hazardous waste contamination, at nearby sites to the north and west. The 1991 Diagnostic Audit also presented no soil or groundwater data that would tend to support its expressed concern. There may have been none, since the report recommended “further assessment of subsurface conditions at the Project Area through the establishment of soil borings and installation of groundwater monitoring wells...to ascertain the levels and extent of potential subsurface contamination due to the location of former above ground petroleum and underground gasoline storage tanks” there.¹⁰³

c.

Loitherstein Environmental filed a downgradient property status opinion on May 29, 1996 regarding volatile organic compounds detected in groundwater at 5 Commonwealth Road. The DPS Opinion described the site’s past and present uses, and identified both of the earlier site assessments.

¹⁰⁰/ Id.

¹⁰¹/ Id.

¹⁰²/ Id.

¹⁰³/ Id.

It described the 1984 IEP Assessment as having reported “minor petroleum contaminated groundwater...in the area of the former fuel oil aboveground storage tanks...” but as having found no contaminants elsewhere on the site and, as well, no underground or above-ground storage tanks.¹⁰⁴ According to the DPS Opinion, “[s]ubsurface evaluations performed by others in 1984 and 1985 indicate that PHCs (petroleum hydrocarbons) were not detected in the groundwater” in the area of the site occupied formerly by the fuel oil storage depot and gasoline station.¹⁰⁵ The DPS Opinion also identified a prior “Environmental Acquisition Audit” of the site, dated June 22, 1991, and described its findings thus:

The 1991 assessment references a Site Restoration Study conducted in 1985. Elevated volatile organic compounds (VOCs), using a photoionization detector (PID), were detected in soil from the gasoline underground storage tank (UST) removal area. Elevated VOCs were not detected elsewhere on the Site. A subsurface evaluation was not conducted during the 1991 assessment of the Site.¹⁰⁶

The DPS Opinion stated that “[g]roundwater flow in the vicinity of the Site appears to be in an easterly to southeasterly direction,” meaning that 5 Commonwealth Road was downgradient of the TJX property across Route 30 to the north and of the three gasoline stations to the west at the intersection of Route 30 and Speen Street.¹⁰⁷ Loitherstein Environmental “obtained one groundwater sample from a monitoring well at the Site,”¹⁰⁸ which showed the presence of “[p]etroleum hydrocarbons...consistent with fuels stored” at these properties” and, as well, “with a recent gasoline-

¹⁰⁴/ Loitherstein Environmental DPS Opinion for 5 Commonwealth Avenue (Board Exh. B-25); narrative letter, at 1-2.

¹⁰⁵/ Id., at 2.

¹⁰⁶/ Id., at 1.

¹⁰⁷/ Id., at 1-2.

¹⁰⁸/ Id., at 1.

related release,”¹⁰⁹ in concentrations that had to be reported to DEP.¹¹⁰

In view of (1) the groundwater well sampling result, (2) the location of 5 Commonwealth Road downgradient of the TJX property and the gasoline stations at Route 30 and Speen Street, (3) no detection of petroleum hydrocarbons during the 1984-85 subsurface evaluations where a former gasoline station and fuel oil depot had been located at the site, (4) the absence of on-site petroleum storage tanks, and (5) the site’s occupation by an office building and paved parking areas since 1985, Loitherstein Environmental concluded in its 1996 DPS Opinion that:

(a) the release of petroleum hydrocarbons whose presence was detected in the groundwater monitoring well sample taken at 5 Commonwealth Road appeared to be from “any” of the identified upgradient properties (TJX and the three gasoline stations);

(b) the off-site release was “recent;” and

(c) “[a]vailable data do not indicate the need to perform an immediate Response Action” at 5 Commonwealth Road.¹¹¹

d.

Board witnesses Debra J. Phillips and Michael J. Webster, both licensed site professionals,

¹⁰⁹/ Id., at 2.

¹¹⁰/ See Loitherstein Environmental DPS Opinion for 5 Commonwealth Avenue (Board Exh. B-25); attached notices of submittal of downgradient property status opinion sent by Loitherstein Environmental to business managers of the three service stations, all dated May 29, 1996. Because 5 Commonwealth Road was in a “Zone II aquifer protection area” associated with a public water supply (a town well adjacent to Lake Cochituate; see 1991 Diagnostic Audit (Board Exh. B-39), at 4), the applicable reporting category for dissolved concentrations of oil or hazardous material found in groundwater samples at or in the vicinity of this property was “RCGW-1,” per 310 CMR 40.0362(1)(a).

¹¹¹/ Loitherstein Environmental DPS Opinion for 5 Commonwealth Avenue (Board Exh. B-25); narrative letter, at 2.

addressed the DPS Opinion for 5 Commonwealth Road.¹¹² In Webster’s opinion, Loitherstein did not have “sufficient information to demonstrate the absence of an on-site source(s) and sufficient information to demonstrate a hydrological connection for the observed ground water impacts to an upgradient source/property,” and his report “failed to support either factor,” as a result of which he did not have enough information to file a DPS opinion for 5 Commonwealth Road.¹¹³ Phillips offered a concurring opinion.¹¹⁴ I have reviewed the many grounds on which they fault the DPS Opinion but find none of them to demonstrate, individually or collectively, that the DPS Opinion was substandard as the Board asserts.

i.

As was true of their testimony regarding Loitherstein Environmental’s DPS Opinion for 130 Lincoln Street in Brighton, both witnesses criticized the brevity of the DPS Opinion for 5 Commonwealth Road based upon its page count. Both testified that the DPS Opinion was “only two pages long.”¹¹⁵ Neither witness included, in this page count, the figures and site maps that accompanied the opinion, although doing so raises the count only by a few more pages. More to the point, as was true of the DPS Opinion for 130 Lincoln Street in Brighton, there is no metric for

¹¹²/ Board witness Patricia J. Donahue, Chief of the Audit Section in DEP’s Bureau of Waste Site Cleanup, mentioned the DPS for 5 Commonwealth Road briefly in her prefiled direct testimony, but offered no opinion testimony about its sufficiency. Donahue identified the DPS, confirmed that DEP received it on June 24, 1996, and stated that DEP conducted a “screening level review” of the DPS but did not audit it. Donahue PFT, at 8. She did not explain what a “screening level review” was or whether the review generated any written findings. The record includes no DEP review or audit of the Loitherstein Environmental DPS Opinion for 5 Commonwealth Road.

¹¹³/ Webster PFT, at 12.

¹¹⁴/ Phillips PFT, at 8.

¹¹⁵/ Webster PFT, at 12; Phillips PFT at 8. Both witnesses used this phrase.

evaluating DPS Opinion sufficiency based upon page count.

Of greater significance—and not because it would raise the page count further—is whether the DPS Opinion for 5 Commonwealth Road included a copy of the earlier reports to which it refers (the 1984 IEP Assessment and the 1991 Diagnostic Audit). Again, this matters; the inclusion of the earlier reports would have added, at the least, a significant quantum of data regarding prior site use and potential on-site sources of contamination—information that, per the Board’s charges, Loitherstein allegedly did not discuss or explain. Loitherstein Environmental’s DPS Opinion clearly discussed the earlier reports; it identified them and summarized their findings (see above, at 51-52), which transforms the asserted failure to “discuss or explain” data regarding prior site use and potential on-site sources of contamination at all into an alleged failure to discuss or explain this data sufficiently. Whether it did depends, at least in part, on whether the DPS Opinion for 5 Commonwealth Road included the earlier reports.

On this point the record is unclear. If the Board sought a finding that the prior reports were not included with Loitherstein Environmental’s DPS Opinion, it was required to show that omission affirmatively in view of its burden of proving the violations it alleges against Loitherstein, one of which is failure to discuss or explain material information. The Board has not done so, and I cannot simply infer that these reports were omitted from the DPS Opinion. Indeed, the Board has said nothing about whether or not the reports were included with Loitherstein Environmental’s DPS Opinion. That does not make the point disappear. Instead, I must determine, as best as I can from whatever the record reveals, whether it is more likely than not that the DPS Opinion included the prior reports regarding 5 Commonwealth Road, or whether it is more likely than not that they were omitted.

As was true of Loitherstein Environmental's DPS Opinion for 130 Lincoln Street in Brighton, the DPS Opinion for 5 Commonwealth Road did not list any earlier report as an appendix or attachment. The Board's exhibit list described the DPS Opinion for 130 Lincoln Street in Brighton as including a copy of the earlier Paragon Report to which the opinion referred; in contrast, it did not include the 1984 IEP Assessment or the 1991 Diagnostic Audit as part of the DPS Opinion for 5 Commonwealth Road. Instead, the 1984 IEP Assessment and the 1991 Diagnostic Audit were filed as separate exhibits with Webster's prefiled testimony.

Webster testified that Loitherstein "did not attach either of the previous assessment reports in his DPS submittal."¹¹⁶ He did not state, however, whether he knew this to be the case personally, whether he learned this second-hand from others, or whether the 1984 IEP Assessment and the 1991 Diagnostic Audit were simply not part of the file he reviewed on the Board's behalf.¹¹⁷ The Board itself does not state that neither of the two prior reports accompanied the DPW opinion for 5 Commonwealth Road.

Webster testified that he reviewed both reports¹¹⁸ and that he was "sponsoring" them (among other exhibits),¹¹⁹ but he did not state where he obtained them. The DPS Opinion suggests that Loitherstein Environmental obtained these earlier reports from its client, the landowner (Omni

¹¹⁶/ Webster PFT, at 13.

¹¹⁷/ As Webster did not testify to working as a Board or DEP employee and instead had "no prior involvement with the LSP Board as an expert witness" prior to this matter, Webster PFT, at 1, I cannot assume that he knew firsthand whether the DPS Opinion for 5 Commonwealth Road was filed with or without the 1984 IEP Assessment or the 1991 Diagnostic Audit.

¹¹⁸/ Webster PFT, at 13.

¹¹⁹/ Id., at 2.

Realty Trust).¹²⁰ Because these reports were prepared privately for the site owners of the time, it is not at all clear that Webster would have had access to the 1984 IEP Assessment or the 1991 Diagnostic Audit unless these reports accompanied the DPS Opinion for 5 Commonwealth Road.¹²¹ There is no direct evidence that the DPS Opinion included these two reports. However, including the earlier reports with the DPS Opinion would have been consistent with what Loitherstein Environmental did, later in the same year, when it filed the DPS Opinion for 130 Lincoln Street.

The Board had the burden of showing that the DPS Opinion was deficient as it alleges. It was for the Board to show, therefore, what Loitherstein Environmental's DPS Opinion for 5 Commonwealth Road did or did not include. The Board did not show, and does not argue, that the DPS Opinion did not include a copy of the 1984 IEP Assessment or the 1991 Diagnostic Audit. Webster, the Board witness who testified that he reviewed these prior reports, did not state where he obtained them. There is at least some evidence in the record—another DPS opinion that the firm filed during the same year, for 130 Lincoln Street in Brighton—that it was Loitherstein Environmental's practice to include copies of prior site reports that its DPS Opinion identified.

Accordingly, in evaluating the Board's testimony regarding the alleged deficiency of the DPS Opinion for 5 Commonwealth Road in Natick, I will not assume that the opinion was filed without a copy of the 1984 IEP Assessment and the 1991 Diagnostic Audit to which it referred. I will infer, instead, that copies of these reports accompanied the DPS Opinion.

¹²⁰/ See Loitherstein Environmental DPS Opinion for 5 Commonwealth Avenue (Board Exh. B-25); narrative letter, at 1-2.

¹²¹/ In contrast, Loitherstein Environmental had access to these reports from its client, the site owner. Webster does not claim that he ever performed work on the site owner's behalf.

ii.

As was true of their testimony regarding the DPS Opinion for 130 Lincoln Street in Brighton, both witnesses fault Loitherstein for not substantiating the direction of groundwater flow or which direction was upgradient of 5 Commonwealth Road.¹²² As was also true of their critique of the Brighton DPS Opinion, however, neither witness contests the easterly-southeasterly direction of groundwater flow given by the DPS Opinion for 5 Commonwealth Road or its description of the site as downgradient of the property across Route 30 to the north (see above, at 52). There is also no evidence in the record that this information was incorrect.

It merits mention, nonetheless, that Loitherstein did not simply guess at the direction of groundwater flow. He testified that more information was considered than the DPS Opinion indicated, including information on groundwater direction that his firm had developed in performing assessments for other properties in the area.¹²³ “I recognize now,” he continued, “that I should have stated this in the DPS opinion,” adding that this was “one of the first DPS opinions” he filed.”¹²⁴ He appears to have adopted a different practice on his own not long after Loitherstein Environmental filed the DPS Opinion for 5 Commonwealth Road. The DPS Opinion for 130 Lincoln Street in Brighton, filed in December 1996, included a figure showing groundwater contours at the site and referred to prior groundwater elevation surveys both at the site in question and at another site

¹²²/ Phillips PFT, at 8; Webster PFT, at 12. Webster testified that the estimated direction of groundwater flow “was not scientifically calculated by the collection of on-site ground water elevation data” and that “Mr. Loitherstein also did not include regional ground water elevation data or ground water elevation data from the properties surrounding the site to support his assumed direction of ground water flow.” Webster PFT, at 12.

¹²³/ Loitherstein PFT, at 17.

¹²⁴/ Id.

upgradient of it.

Without question, the DPS Opinion for 5 Commonwealth Road could have included the information about groundwater flow direction in the vicinity of 5 Commonwealth Road that Loitherstein and his firm had gleaned from previous work. The question is, however, whether omitting this information violated 310 CMR 40.0015(2) (quoted and discussed above, at 9). I am not convinced that it did.

310 CMR 40.0015(2)(a) requires that the LSP opinion “identify the material facts, data and other information known by him or her about the disposal site that is pertinent to the LSP Opinion...” The DPS Opinion for 5 Commonwealth Road supplied this information. It identified groundwater flow direction as south-southeast and the location of properties to the north and west as upgradient of the site. Both of these facts were also identified as relevant to evaluating the origin of petroleum hydrocarbons found in the groundwater monitoring well sample and, thus, to the opinion that the gasoline release detected in the groundwater monitoring well was recent and had originated from an offsite source, and that there was no need to perform an immediate response action at the site.

In contrast, the regulation does not plainly require that each item of disclosed fact, data or information pertinent to the opinion itself be justified with underlying supporting facts, data or pertinent information. It may be that this level of detail in a DPS Opinion is advisable in particular circumstances, but that is a call for the LSP to make as a matter of professional judgment rather than a clear regulatory requirement. If it were a regulatory requirement, there would be no end to the detail this would require, even for facts that are not typically disputed such as the direction of north, or, in this case, for a fact that was not genuinely disputed or disputed at all—the direction of groundwater flow. There is no assertion by any of the Board’s witnesses, and there is no evidence

in the record, that groundwater flow direction at the site was other than the DPS Opinion stated it to be (see above, at 52). The direction of groundwater flow direction at the site may have been too obvious to warrant a detailed explanation by any of the several reports analyzing it. One cannot help noting, for example, that the 1984 IEP Assessment (which was not an LSP opinion but was prepared for purposes related to M.G.L. c. 21E) analyzed and discussed the significance of VOC contamination in groundwater samples taken at 5 Commonwealth Road but did not state the direction of groundwater flow. The 1991 Diagnostic Audit presented no independent determination of groundwater flow, and reported, instead, that “[r]egional groundwater flow direction is presumably eastward, toward Lake Cochituate...” (emphasis added; see above, at 50).

I conclude, therefore, that the absence of backup for the direction of groundwater flow direction given by the DPS Opinion did not violate 310 CMR 40.0015(2)(a).

310 CMR 40.0015(2)(b) requires the disclosure of information that would support or lead to a contrary, or significantly different, opinion than the LSP expressed. Because the groundwater flow direction given by the DPS Opinion is not disputed, the information supporting this flow direction cannot be said to support a contrary or significantly different opinion about the origin or age of gasoline detected in the groundwater monitoring sample taken at 5 Commonwealth Road or about the absence of need for an immediate response action at this site. I conclude, therefore, that the absence of backup for the direction of groundwater flow direction given by the DPS Opinion did not violate 310 CMR 40.0015(2)(b).

It is possible, of course, that including in a DPS opinion no more than what the regulations plainly require still does not meet a standard of care established by professional practice. However, the Board did not show that omitting data supporting the assumed groundwater flow direction given

in the DPS Opinion for 5 Commonwealth Road was contrary to established practice among LSPs when the Opinion was filed (May 29, 1996). Neither Phillips nor Webster testified, for example, that it was the practice of LSPs at that time to always include data supporting groundwater flow direction in a DPS opinion. There is no basis in the record for finding, therefore, that the omission of data supporting the groundwater flow direction presented by the DPS Opinion for 5 Commonwealth Road deviated from acceptable LSP practice at the time in question.

iii.

It was the opinion of both Phillips and Webster that Loitherstein did not have sufficient information to rule out an on-site source for petroleum hydrocarbons detected in groundwater at 5 Commonwealth Road and conclude that they had migrated, instead, from an upgradient source. Both witnesses emphasized that the DPS Opinion was based upon groundwater analytical data from a single monitoring well located in the center of the site, where there had been a gas station building, downgradient of where there had once been gasoline pumps and underground storage tanks, which they viewed as significant potential sources of the contamination found on the site.¹²⁵ Both witnesses also noted historical data confirming that the site had been used as a gasoline station and auto repair shop beginning in 1949.¹²⁶ Webster emphasized that there were no monitoring wells on the assumed upgradient portion of the property, which meant that there was no analytical data available to show that petroleum hydrocarbons on the site were migrating from an upgradient source.¹²⁷ He also stated

¹²⁵/ Webster PFT, at 13; Phillips PFT, at 8.

¹²⁶/ Id.

¹²⁷/ Webster PFT, at 13-14.

that the 1991 Diagnostic Audit “indicated...that the areas of concern at the site were the location of four 20 foot high vertical above ground oil tanks that may have been used at the site up until the mid 1970s and the location of former underground storage tanks.”¹²⁸

Loitherstein Environmental concluded, in its DPS Opinion, that the release of petroleum hydrocarbons detected in the 1996 groundwater monitoring well sample at 5 Commonwealth Road appeared to be from any of the identified upgradient properties—TJX, across Route 30 from the site, to the north, and the three gasoline stations west of the site at the intersection of Route 30 and Speen Street—in view of (1) the groundwater well sampling result at 5 Commonwealth Road, (2) the location of 5 Commonwealth Road downgradient of the TJX property and the gasoline stations at Route 30 and Speen Street, (3) no detection of petroleum hydrocarbons during the 1984-85 subsurface evaluations where a former gasoline station and fuel oil depot had been located at the site, (4) the absence of on-site petroleum storage tanks, and (5) the site’s occupation by an office building and paved parking areas since 1985 (for eleven years prior to the DPS Opinion, in other words). The 1984 IEP Assessment, to which the Loitherstein Environmental DPS Opinion referred, presented data showing fuel oil (rather than gasoline) contamination on the surface of groundwater in the area of the former gas station at 5 Commonwealth Road, most likely from a spill many years earlier because the former fuel oil tanks at the site had not been used for 20 years and were removed in 1983 (see above, at 47). The 1991 Diagnostic Audit, to which the Loitherstein Environmental DPS also referred, presented data showing a significant number of large-sized diesel fuel and gasoline tanks in use at seven other nearby, upgradient sites along Route 30 (see above, at 48-49), all of which were potential, active sources of petroleum hydrocarbon contamination detected downgradient of these

¹²⁸/ Id., at 13.

sites. These factors sufficed, in Loitherstein Environmental's view, to rule out an on-site source for the petroleum hydrocarbon (as opposed to fuel oil) contamination detected in the 1996 groundwater monitoring well sample.

Without question, Webster and Phillips were not convinced that Loitherstein had ruled out an on-site source of the petroleum hydrocarbon contamination, but that does not prove the DPS Opinion to have been deficient. It shows, instead, that LSPs may reach different conclusions about the source of an oil or hazardous materials release when they evaluate available information. Among other things, they may disagree as to whether particular aspects of site use history and current uses in the surrounding area make it more or less likely that contaminants detected at the site originated from an off-site release. They may also disagree as to whether there is enough information to decide whether the contaminants originated from an offsite source or from the site itself. But 310 CMR 40.0183(2)(b) does not require consensus among LSPs before one of them may issue an opinion regarding the origin of contaminants detected at the site. Nor does it require that any possibility of an on-site origin be ruled out absolutely, or even to a particular degree, before an LSP may opine that a contaminant found at the site migrated from an offsite source.

The Loitherstein Environmental DPW Opinion for 5 Commonwealth Road presented a reasoned basis for concluding that the petroleum contamination found in the groundwater monitoring well sample was recent and had an offsite origin. The data reported in the 1984 IEP Assessment and in the 1991 Diagnostic Audit furnished strong support for this opinion as well. The data presented in these two prior reports showed that the likelihood of an on-site origin of petroleum hydrocarbon (as opposed to fuel oil) contamination at 5 Commonwealth Road was remote, even in 1984. The Board's testimony did not show that it was any less remote in May 1996, when Loitherstein

Environmental filed its DPS Opinion for this site. Neither the Board nor its witnesses assert that the owners of 5 Commonwealth Road introduced a new on-site source of petroleum contamination (or even fuel oil contamination) at this site after the 1991 Diagnostic Audit, or even after the 1984 IEP Assessment. 310 CMR 40.0183(2)(b) does not bar the use of a DPS opinion when site history, current conditions and prior studies show little likelihood that a contaminant originated from an on-site source.

e.

As to the DPS Opinion that Loitherstein Environmental filed for 5 Commonwealth Road in Natick, I find that Loitherstein (a) discussed and explained known, available historical information suggesting potential on-site sources of the contaminants found at this site; and (b) supported adequately his opinion that the petroleum hydrocarbon contamination found there was of recent origin and had migrated from an upgradient property. I conclude, therefore, that Loitherstein:

- (1) acted with reasonable care and diligence, as required by 309 CMR 4.02(1);
- (2) followed applicable requirements and procedures prescribed by M.G.L. c. 21E and 310 CMR 40.0000, as required by 309 CMR 4.03(3)(b); and
- (3) disclosed known, available information regarding site history that may have tended to support, or that may have led to, a contrary or significantly different opinion, and discussed this information sufficiently, thereby satisfying the requirements of 309 CMR 4.03(3)(d).

3. 1203 Washington Street, Newton

a.

The third DPS opinion at issue here, prepared by Loitherstein Environmental in August 1996,

concerned a site along the north side of Washington Street in Newton.

From West Newton Square eastward, toward Newtonville, Washington Street runs parallel to and north of the Massachusetts Turnpike and the railroad tracks along its westbound lanes.¹²⁹ This busy four-lane stretch of Washington Street is developed on both sides with small office buildings, service stations, auto dealerships and other businesses. Along this stretch, less than a quarter mile east of Chestnut Street and along Washington Street's south side (the side closest to the Turnpike), are two gasoline stations. One of these was a Gulf station in August 1996 (West Newton Gulf, at 1200 Washington Street). The site in question, 1203 Washington Street, is directly across from (and north of) the Gulf station. See Appendix, Sketch 3.

1203 Washington Street is an irregularly-shaped parcel roughly in the form of an inverted "T." Washington Street forms its southern boundary along the head of the "T," and the leg of the "T" extends roughly two tenths of a mile northward to a stream that forms its northern boundary. In 1996, three adjoining buildings occupied most of the site's frontage along Washington Street, and one of the buildings extended roughly half-way into the site's interior, and the areas behind the buildings and to the east of them were mostly paved. The buildings housed a horse stable and a turnaround for horse-drawn trolleys, at least through 1918, and the site was occupied by an auto dealership owned by West Newton Motor Mart beginning in 1940 and continuing until

¹²⁹/ For descriptions of the site and the surrounding area, see Board Exh. B-26: Loitherstein Environmental Engineering, Downgradient Property Status Opinion, 1230 Washington Street, Newton, Massachusetts, RTN 3-13304, RTH 3-12944 and LTBI NO. 3-3703, dated August 16, 1996 ("Loitherstein Environmental DPS Opinion for 1203 Washington Street"), at Fig. 1 ("site locus"), Fig. 2 ("site plan"), Fig. 3 ("monitoring well location plan"); see also Board Exh. B-41: "Environmental Site Assessment Update, 1203 Washington Street, Newton, Massachusetts," prepared by TGG Environmental, Inc., August 1990 ("the 1990 TGGE Report"), at 4, and at Fig. 2 following p. 10.

approximately July 1990.¹³⁰ A Pontiac and GMC dealership with a mechanical and body repair shop was operating at the site in May 1996, when Loitherstein Environmental first became involved with 1203 Washington Street.¹³¹

The stream forming the site's northern boundary—Cheesecake Brook—flowed, as it still does, eastward within a municipal easement defined mostly by stone and concrete-lined banks, roughly parallel with Washington Street, before turning north in Newtonville and running to the Charles River. The area north of Cheesecake Brook was occupied then, as now, primarily by single-family homes.

b.

As was the case with 130 Lincoln Street in Brighton and 5 Commonwealth Road in Natick, 1203 Washington Street in Newton was described extensively in reports prepared by other environmental consultants several years before Loitherstein Environmental prepared its DPS Opinion for this site. The Board included two of these reports, prepared in 1990 and 1991 respectively, as exhibits supporting its case as to the Loitherstein DPS Opinion for 1203 Washington Street (Board Exhibits B-40 and B-41). I review both reports to determine what they show about the location and remediation of oil and hazardous waste at the site. In doing so, I pay particular attention to where petroleum hydrocarbons were, and were not, found when the reports were prepared, and what on-site

¹³⁰/ 1990 TGGE Report, at 4.

¹³¹/ See Board Exh. B-42: DEP memorandum on “front-end compliance inspection” relative to “File 3-12944,” dated July 8, 1996, at 3. File 3-12944 was the “release tracking number” assigned by DEP after gasoline was discovered in a monitoring well at the site near Washington Street on September 18, 1995. Loitherstein Environmental DPS Opinion for 1203 Washington Street (Board Exh. B-26), at 1.

and offsite sources of petroleum hydrocarbons remained when their author-consultants completed their work.

i.

In August 1990, TGG Environmental, Inc. (TGGE) prepared a site assessment report regarding 1203 Washington Street in Newton for Development Specialists, the site owner or developer at the time (“the 1990 TGGE Report”).¹³² Its purpose was “to assess the physical characteristics of the subject site with respect to the presence in the environment of hazardous material or oil, as defined in Massachusetts General Laws Chapter 21E, prior to the last assessment.”¹³³

The Report described work that TGGE performed or supervised, including the removal of three tanks in April 1988:¹³⁴ a 250-gallon waste oil tank located immediately behind the building extending to the center of the site,¹³⁵ and two 3,000-gallon underground gasoline storage tanks located in front of the buildings along Washington Street,¹³⁶ at roughly the midpoint of the site’s southern property line. It stated that “small amounts of gasoline were noted in the soil excavated from around” the two gasoline storage tanks.¹³⁷ This soil was removed, and the excavated area was

¹³²/ The client’s name appears to have been obliterated on the first page of the Report’s cover letter dated August 22, 1990 and in the contract between TGGE and the client that appears at Appendix A of the Report. It is mentioned, however, on the first page of the Report, in the first paragraph.

¹³³/ 1990 TGGE Report, at Appendix A, first page.

¹³⁴/ Id., at Fig. 2 (following p. 10).

¹³⁵/ Id., Fig. 2 (following p. 10), showing location of borings and observation wells at the site.

¹³⁶/ Id., at 4.

¹³⁷/ Id.

backfilled with DEP's approval.¹³⁸ TGGE did not remove an approximately 14-year-old 1,000-gallon underground storage tank containing #2 fuel oil located behind the buildings, approximately at the center of the site.¹³⁹

No volatile organic compounds were detected in soil samples that TGGE obtained from the site.¹⁴⁰ TGGE also obtained groundwater samples from monitoring well B-2, installed in 1988 behind the buildings at roughly the center of the site, and from seven monitoring wells installed on August 9, 1990—monitoring wells B-101, B-102, B-103 and B-104 (behind the buildings), B-105 (along the site's eastern boundary at the lower end of the head of the property's "T" section), B-106 (near the southeastern corner of the buildings), and B-107, in front of the buildings along Washington Street, roughly where the two underground gasoline storage tanks had been located.¹⁴¹ Gas chromatograph screening of these samples showed that VOCs were present in monitoring well B-107, and further testing for VOCs showed the presence of ethylbenzene, xylene and toluene—compounds associated with gasoline—in samples from B-107, as well as acetone, a solvent associated with lubricating oils or cleaning fluids.¹⁴² According to the 1990 TGGE Report, it was "possible" that this represented "residual contamination from the previous tanks, or even regional conditions."¹⁴³

¹³⁸/ Id.

¹³⁹/ Id., at 9, and at Fig. 2 following p. 10.

¹⁴⁰/ Id., at 8.

¹⁴¹/ Id., at 7, and at Fig. 2 (following p. 10).

¹⁴²/ Id., at 8, 9.

¹⁴³/ Id., at 10.

The “regional conditions” mentioned by the Report included nine “environmental incidents” within a half-mile radius of the site, among them two that occurred at properties identified by the 1990 TGGE Report as upgradient of 1203 Washington Street. One incident involved a leaking underground waste oil storage tank approximately 250 feet to the southwest, at 1232 Washington Street; another involved high concentrations of petroleum hydrocarbons in groundwater approximately 350 feet to the southwest, at 1250 Washington Street (along the same side of the street as was 1203 Washington Street), where groundwater flow direction had been determined by well survey to be “to the southeast,”¹⁴⁴ meaning toward the Massachusetts Turnpike rather than toward 1203 Washington Street or Cheesecake Brook.

The 1990 TGGE Report also noted, however, an earlier report in DEP’s records showing that “an underground 1,000 gallon heating oil and 500 gallon waste oil tank were removed from West Newton Auto Service located at 1200 Washington Street”¹⁴⁵—the Gulf Station—which was located 100 feet to the south of 1203 Washington Street and “appear[ed] to be upgradient” of that property.¹⁴⁶ DEP’s records also showed a leak of approximately 200-300 gallons of gasoline in 1988 from an underground tank at 1229 Washington Street, the property abutting the west side of 1203 Washington Street, where groundwater flow had been determined by well survey to be to the northeast, toward Cheesecake Brook.¹⁴⁷

This information is significant. First, it shows that groundwater flow direction was

¹⁴⁴/ Id., at 5.

¹⁴⁵/ Id.

¹⁴⁶/ Id.

¹⁴⁷/ Id.

determined by other consultants in the vicinity of 1203 Washington Street before Loitherstein Environmental's involvement with this site. In addition, it shows that of two competing groundwater flow directions on the same side of Washington Street, the direction determined closest to 1203 Washington Street (at the property adjoining its western side, as opposed to the property 350 feet to the southwest) was downgradient away from Washington Street to the northeast and toward Cheesecake Brook, and not from the brook toward Washington Street. It also shows that the Gulf Station across Washington Street to the south was considered to be upgradient of 1203 Washington Street before Loitherstein Environmental prepared its DPS Opinion.

Petroleum hydrocarbons were also found in sediment samples taken from two floor drains in the buildings¹⁴⁸ that TGGE believed were connected to Cheesecake Brook via underground piping.¹⁴⁹ TGGE recommended that the sediment and standing liquid in the floor drains be removed by a licensed contractor and that the drains be capped.¹⁵⁰

ii.

In 1991, William Kirker, on behalf of West Newton Motor Mart, retained Environmental Restoration Engineering, Inc. (ERE) to follow up on previous environmental assessments of this site and perform remediation work including removal of the remaining tanks. This firm prepared a report on the site in July 1991 ("the 1991 ERE Report").¹⁵¹

¹⁴⁸/ Id., at 8.

¹⁴⁹/ Id., at 9.

¹⁵⁰/ Id.

¹⁵¹/ Board Exh. B-40: "Report on Environmental Services for 1203 Washington Street Site, Newton MA," prepared by Environmental Restoration Engineering, July 1991 ("the 1991 ERE Report").

The Report stated that on June 5, 1991, ERE and an affiliated company (Ashland Industrial Fuel Oil Corporation) removed the 1,000-gallon underground storage tank located behind the buildings at the site, which “showed no signs of corrosion and appeared to be intact,” and a 250-gallon above-ground waste oil tank.¹⁵² According to the 1991 ERE Report, “[n]o contaminated soil or groundwater was encountered during the tank removals.”¹⁵³

The 1991 ERE Report also described a stormwater outfall near the site’s northern boundary where “[a] 6-inch-diameter drain-pipe from the property was observed to be discharging stormwater free of oily sheen to Cheesecake Brook” following rainfall.¹⁵⁴ It mentioned a “collapsed catch basin” whose location was not given but appears to have been at the inlet end of the pipe draining to the brook, meaning roughly at the center of the site, behind the buildings.¹⁵⁵ Excavation of the area “immediately near” the catch basin to a 2-3-foot depth encountered water “and evidence of oil sheen and petroleum hydrocarbon odor was detected.”¹⁵⁶ ERE excavated the area in the vicinity of the collapsed catch basin on June 10, 1991, pumped “water with a trace petroleum hydrocarbon sheen” to a vacuum truck and transported it from the site, and removed contaminated soil from the

¹⁵²/ 1991 ERE Report (Board Exh. B-40), at 5, and Sketches at Appendixes A (following page 13), D and F. These sketches also show the location of two former 3,000-gallon gasoline tanks at the front of the buildings along Washington Street, roughly at the center of the site’s southern boundary, whose removal was described in the 1990 TGGE Report.

¹⁵³/ Id., “Executive Summary,” at ii, para. 6.

¹⁵⁴/ Id., at 3-4.

¹⁵⁵/ Id., at 3-4, 7-8, and Sketches at Appendixes A, D and F, each of which shows a small square at the center of the “remediation area” behind the buildings, from which a hatched line runs to a “drain outlet” at the site’s northern boundary.

¹⁵⁶/ Id., at 4.

excavated area.¹⁵⁷ Laboratory analysis of soil samples taken subsequently in the excavated area “indicate[d] that the area was remediated to background TPH (total petroleum hydrocarbon) levels as all samples contained less than 40 ppm TPH,”¹⁵⁸ leading ERE to conclude that “[t]he site would probably be considered in an area of low environmental impact.”¹⁵⁹ The 1991 ERE Report stated that cleanup levels in the vicinity of the collapsed catch basin “were documented and meet the cleanup goals under the DEP Policy WSC-400-89.”¹⁶⁰ The catch basin was repaired, the inlet pipe from the building and the outlet pipe to Cheesecake Brook were “restored,” and “[t]he inlet pipe was plugged at the catch basin by the client pending a determination of the need of re-establishing this connection.”¹⁶¹

The Report said nothing about the building floor drains that TGGE identified as containing petroleum hydrocarbon-contaminated sediments and liquid (see above, at 70). However, the site sketch accompanying the 1990 TGGE Report shows one pipe leading from the building to the catch basin, and another leading from the north side of the building to the pipe running from the catch basin to Cheesecake Brook,¹⁶² while the sketches accompanying the 1991 ERE Report show only

¹⁵⁷/ Id., at 7.

¹⁵⁸/ Id. ERE compared this to “the clean-up goal of 100 ppm TPH” set by DEP Policy WSC-400-89 “for areas of high environmental impact and 300 ppm TPH for areas of low environmental impact.” Id.

¹⁵⁹/ Id., at 8. This sentence appears to be constructed awkwardly. Absent any assertion to the contrary, it should probably read “[t]he site would probably be considered to be in an area of low environmental impact.” (underlined words added).

¹⁶⁰/ Id.; “Executive Summary” at ii, para. 7.

¹⁶¹/ Id.

¹⁶²/ 1990 TGGE Report (Board Exh. B-41), at Fig. 2 (following p. 10).

the pipe leading from the building to the catch basin.¹⁶³ There is no reason to believe that ERE omitted the second pipe from the sketches inadvertently. Absent any evidence to the contrary, it is more likely that the sketches show no second pipe leading from the building catch basins because it was removed when ERE repaired the catch basin, cleaned the area in its vicinity, and plugged the inlet pipe.

It is also more likely than not, consequently, that ERE's remediation work eliminated the building floor drains as on-site sources of petroleum hydrocarbon contamination. Even if the floor drains remained as potential on-site sources, however, they would have been an on-site source of contaminants for areas downgradient of them (meaning areas between the floor drains and Cheesecake Brook, the site's northern, downgradient boundary). The 1990 TGGE Report described groundwater flow direction on abutting properties to the west and east of 1203 Washington Street as being to the northeast. This suggests strongly that petroleum hydrocarbon contaminants from the floor drains would have migrated northward, away from the buildings at 1203 Washington Street toward Cheesecake Brook, rather than southward toward the front of the buildings and Washington Street where monitoring well MW-107 was located.

The 1991 ERE Report also identified another area of concern at the site, "an oil-stained area on the asphalt paving to the rear of the building adjacent to the ramp."¹⁶⁴ This area was scraped up with a backhoe; no detectable vapors or evidence of visual contamination or odor were found in soil samples taken under the asphalt from depths of 6, 18 and 36 inches, and "[t]he oil-stained area

¹⁶³/ 1991 ERE Report (Board Exh. B-40), at Appendixes A, D and E.

¹⁶⁴/ Id., at 3.

appeared to be limited to the asphalt surface.”¹⁶⁵

ERE also sampled nine groundwater monitoring wells located at various points along the site’s perimeter (MW-101, MW-102, MW-104, and MW-105), behind the building near the site’s center (MW-2 and MW-103), behind the building near the site’s eastern boundary (MW-1), in front of the building near its southeastern corner (MW-106) and near its center (MW-107), and a new monitoring well (MW-201) installed near MW-107, also near the center of the building’s front.¹⁶⁶ No oily sheen was found in samples taken from monitoring wells MW-1 and 2, or monitoring wells MW-101—105.¹⁶⁷ The sample obtained from monitoring well MW-106, near the building’s southeastern corner, revealed low levels of total organic vapors that “were most likely due to septage vapors.”¹⁶⁸ The sample obtained from monitoring well MW-107, near the location of the two former gasoline tanks along Washington Street, “appeared to be composed of petroleum hydrocarbons, most likely gasoline due to its odor and its appearance.”¹⁶⁹ “Petroleum hydrocarbon product” was detected in monitoring well MW-107 when it was again sampled on June 5, 10 and 18, 1991, and “each time about 16 ounces were bailed from the well.”¹⁷⁰ Petroleum hydrocarbon product was also detected

¹⁶⁵/ Id., at 4.

¹⁶⁶/ Id., at 2 and at Sketches at Appendixes A, D and F. The 1991 ERE Report referred to the monitoring wells with two different prefixes, e.g. B-101 (for “boring” 101) or MW-101 (for “monitoring well” 101), but they refer to the same wells. The 1990 TGGE Report (Board Exh. B-41) referred to the monitoring wells using only the prefix “B.” I use only the numbers of these monitoring wells to avoid confusion.

¹⁶⁷/ Id., at 2.

¹⁶⁸/ Id.

¹⁶⁹/ Id.

¹⁷⁰/ Id., at 3.

in monitoring well MW-201 (located very close to monitoring well MW-107).¹⁷¹

ERE was unable to determine the origin of the petroleum hydrocarbon in these two monitoring wells and recommended further investigation.¹⁷² Representatives from DEP and the Newton Fire Department visited the site on June 3, 1991 after ERE notified DEP of the petroleum hydrocarbon discovery at monitoring well MW-107); using an explosion meter and an HNU meter, they checked nearby catch basins and manholes to the south and west along Washington Street for petroleum hydrocarbon product but found no none, and neither DEP nor the Newton Fire Department could determine the origin of this product in monitoring well MW-107.¹⁷³ The 1991 ERE Report relates that “[t]he representatives of DEP and the Newton Fire Department stated that several parties in the area were actively recovering petroleum hydrocarbons as a result of previous releases.”¹⁷⁴ In addition, Newton Fire Department Captain Joseph LeCroix “spoke to the owner of the Gulf Station immediately opposite the site and was informed that the existing USTs (underground storage tanks] installed around 1976 were due to be replaced in the near future.”¹⁷⁵

ERE followed up with telephone calls to DEP on June 13 and 20, 1991. These conversations:

confirmed that there [was] much site investigation/product recovery being conducted along Washington Street in Newton in the vicinity of the site. DEP mentioned several parties including Mobil, Avis/Beacon Oil and a former gasoline station now being operated as a flower shop. Another potential responsible party (PRP) could be the Gulf Station scheduled

¹⁷¹/ Id., at 10.

¹⁷²/ Id.

¹⁷³/ Id., at 11-12.

¹⁷⁴/ Id., at 12.

¹⁷⁵/ Id.

to pull its tanks. As of July 18 the tanks still had not been replaced.¹⁷⁶

c.

The record does not show what further investigation of petroleum product contamination (if any) was undertaken at or near the site between late June 1991 and early September 1995. A DEP memorandum in the record (Board Exh. B-42, dated July 8, 1996) relates that on September 19, 1995, Charles O'Connell, an attorney representing the Estate of Harold M. Snow (which owned the stock of West Newton Motor Mart, Inc.), notified DEP that "during assessment activities" at 1203 Washington Street, "more than one-half-inch of gasoline [was] observed in a monitoring well at the site."¹⁷⁷ The Estate retained Loitherstein Environmental, which notified DEP "of the presence of subsurface NAPL" (non-aqueous phase liquid, meaning, in this case, gasoline) "in two recently installed monitoring wells at the site" on January 2, 1996.¹⁷⁸ DEP issued a notice of responsibility for this release to the Estate of Harold M. Snow on January 22, 1996.¹⁷⁹

The memorandum's author, DEP staffer Chris Bresnahan (who was not a witness for the Board) met with Attorney O'Connell and Loitherstein at the site on May 23, 1996, and observed Loitherstein open and withdraw "clear bailers" from a monitoring well installed "immediately outside the walk up entrance to the dealership...and adjacent to the sidewalk,"¹⁸⁰ which, considering

¹⁷⁶/ Id.

¹⁷⁷/ See Board Exh. B-42: DEP Memorandum "Re: Front End Compliance Inspection" relative to "File 3-12944," dated July 8, 1996, at 1.

¹⁷⁸/ Id., at 2-3.

¹⁷⁹/ Id.

¹⁸⁰/ Id., at 3.

this location, was most likely monitoring well MW-107. Bresnahan's memorandum, dated six weeks after the site visit, described what Loitherstein withdrew from this monitoring well with the bailer as containing "about three inches of product with odor and visual appearance resembling that of weathered gasoline."¹⁸¹ He described samples bailed from two other monitoring wells—one installed "about fifteen feet" away, in the westbound parking lane of Washington Street (referred-to in the DPS Opinion for 1203 Washington Street as monitoring well MW-301¹⁸²) and the other "installed directly across Washington Street in the Eastbound parking lane" (monitoring well MW-302)—as each containing "approximately three feet (33 inches) of product with an appearance consistent with the product observed" in the monitoring well near the entrance to the dealership.¹⁸³ Bresnahan checked for measurable volatile and explosive vapors in sewer and electrical manholes in Washington Street but found none.¹⁸⁴ His memorandum noted, however, that there were several DEP-designated sites of gasoline releases in the area that were "potential sources of gasoline" found in the three monitoring wells, including the Gulf Station across from 1203 Washington Street, an Exxon Station to the east at 1169 Washington Street, Radiant Fuel (formerly Avis) west of the site at 1229 Washington Street, a Mobil Station at 1232 Washington Street (along its south side), and an unnamed gasoline station at 1235 Washington Street.¹⁸⁵ Bresnahan concluded that a "substantial

¹⁸¹/ Id.

¹⁸²/ See Loitherstein Environmental DPS Opinion for 1203 Washington Street (Board Exh. B-26), at Figures 2 and 3, which show the location of these monitoring wells relative to 1203 Washington Street and the Gulf Station across the street to the south.

¹⁸³/ DEP Memorandum "Re: Front End Compliance Inspection" relative to "File 3-12944," dated July 8, 1996 (Board Exh. B-42), at 3.

¹⁸⁴/ Id.

¹⁸⁵/ Id.

pocket of weathered petroleum resembling gasoline appear[ed] to have impacted soils and groundwater located below Washington Street” in the areas of the three monitoring wells.¹⁸⁶

In Bresnahan’s opinion, Loitherstein had not shown that the product observed in the monitoring wells (including the monitoring well across Washington Street to the south, near the Gulf Station) lacked an on-site origin at 1203 Washington Street, such as “a former UST (underground storage tank) grave located about twenty feet” from monitoring well MW-107 “inside the building.”¹⁸⁷ He concluded that as the potentially responsible party, the Estate of Harold M. Snow was required “to properly assess NAPL conditions identified around” monitoring well 107, and contain and manage any petroleum product found in the monitoring wells at 1203 Washington Street.¹⁸⁸ However, Bresnahan continued, “there is a good chance that some other source has contributed to this condition” and that in view of the “large number of possible sources in the immediate vicinity of the site,” it was “not likely” that the Estate “will be willing or able” to undertake an investigation of them to determine the source of the gasoline plume detected in the monitoring wells.¹⁸⁹ In view of this, and considering the number of known disposal sites in the area, as well as the involvement of a public street (Washington Street) with an extensive network of utilities and conduits, Bresnahan recommended that DEP “provide oversight (sic) to coordinate assessment activities, along with local officials, among other possible RPs (responsible parties) in

¹⁸⁶/ Id., at 4.

¹⁸⁷/ Id.

¹⁸⁸/ Id., at 5.

¹⁸⁹/ Id., at 4-5.

the area.”¹⁹⁰

d.

The record does not show whether DEP did what Bresnahan suggested. Loitherstein remained concerned about the quantity of gasoline detected in the three monitoring wells along Washington Street, and wanted to prompt DEP to do something about it.¹⁹¹ Partly for this reason,¹⁹² Loitherstein Environmental filed, on August 16, 1996, a downgradient property status opinion for 1203 Washington Street in Newton regarding the gasoline detected in the three monitoring wells.¹⁹³ According to the DPS Opinion, “[h]ydrogeologic data suggest that regional groundwater flow is in a northerly direction toward Cheesecake brook”; in addition, “[s]ources of gasoline” had been removed from the site, and gasoline had not been stored there “for many years,” there were “at least six DEP-listed sites located in the immediate vicinity” of the site, “the NAPL appear[ed] to be fresh and unweathered gasoline,” and “NAPL ha[d] been found floating on the groundwater at the southern, upgradient boundary of the subject Site, and in Washington Street just north, and downgradient, of the Gulf property.”¹⁹⁴ It was therefore the opinion of Loitherstein Environmental

¹⁹⁰/ Id., at 6.

¹⁹¹/ Loitherstein PFT, at 20.

¹⁹²/ Id., at 23.

¹⁹³/ Loitherstein Environmental DPS Opinion for 1203 Washington Street (Board Exh. B-26), at 1. The DPS Opinion described this as a release of subsurface non-aqueous phased liquid (NAPL) “equal to or greater than one-half inch in a monitoring well (MW-107) adjacent to Washington Street on September 18, 1995 which resulted in the assignment of a Release Tracking Number (RTN) 3-12944,” and NAPL that was detected on January 2, 1996 in two other monitoring wells installed in Washington Street upgradient of the Site (RTN 3-13304). Id.

¹⁹⁴/ Id., at 2, paras. (c) and (d).

that “[t]he release(s) appear to be from the West Newton Gulf property located at 1200 Washington Street in Newton, immediately south of the subject Site” for which its client (the Estate of Harold M. Snow) was not responsible.¹⁹⁵

e.

In its amended proposed order, the Board charged that Loitherstein did not:

(1) discuss and explain known, available historical information suggesting potential on-site sources of the contaminants found at 1203 Washington Street in Newton; or

(2) support adequately his opinion that the site was not the source of the contaminants found there.¹⁹⁶

The Board alleged that these omissions comprised the following violations of its Rules of Professional Conduct for LSPs:

(1) failure to act with reasonable care and diligence with regard to the site, in violation of 309 CMR 4.02(1);

(2) failure to follow applicable requirements and procedures of M.G.L. c. 21E and 310 CMR 40.0000, in violation of 309 CMR 4.03(3)(b); and

(3) failure to discuss and explain known, available information regarding site history that may have tended to support or led to a contrary or significantly different opinion, in violation of 309 CMR 4.03(3)(d).¹⁹⁷

The Board’s witnesses relative to the DPS Opinion for 1203 Washington Street were LSPs Michael J. Webster and Debra J. Phillips. Although Webster relied in part upon DEP staffer Chris Bresnahan’s 1996 memorandum regarding this site, in particular his description of gasoline in the May 23, 1996 monitoring well samples as “weathered” (see above, at 77), the Board filed no

¹⁹⁵/ Id., at 2, para. (c), and at the unnumbered paragraph following para. (e).

¹⁹⁶/Amended Proposed Order, at 16-17; Findings of Noncompliance, item I.i.

¹⁹⁷/ Id., at 16-17, Items I.i, II, and IV.

testimony by Bresnahan and did not explain why it chose not to do so.

Webster and Phillips testified that Loitherstein did not have adequate support for his DPS Opinion regarding 1203 Washington Street. As with the Loitherstein Environmental DPS Opinions for 130 Lincoln Street in Brighton and 5 Commonwealth Road in Natick, both witnesses faulted the DPS Opinion for comprising “only two pages,”¹⁹⁸ and once again did not count the maps and other figures accompanying the report or cite a requirement regarding DPS opinion page length.

As they did regarding the other two DPS opinions at issue, both witnesses also faulted Loitherstein for not substantiating groundwater flow direction, although for different reasons: Phillips stated that “groundwater flow direction was not scientifically calculated,”¹⁹⁹ while Webster stated that the DPS Opinion “did not include site-specific data and information regarding the direction of ground water flow.”²⁰⁰ Once again, however, neither witness disputed that groundwater flow direction at the site was as the DPS Opinion presented it—in this instance, northward toward Cheesecake Brook—and the record contains no evidence that groundwater flow at the site was in a different direction. The 1990 TGGE Report gave the same groundwater flow direction based upon data collected by others at adjoining sites, a fact not mentioned by either of the Board’s witnesses, one of whom (Webster) asserted that he reviewed this earlier report.

As I noted with respect to the DPS Opinion for 5 Commonwealth Road, omitting information supporting groundwater flow direction from the DPS Opinion itself does not violate 310 CMR 40.0015(2)(a) so long as the given direction of groundwater flow was not concocted out of thin air,

¹⁹⁸/ Webster PFT, at 14; Phillips PFT, at 10.

¹⁹⁹/ Phillips PFT, at 10.

²⁰⁰/ Webster PFT, at 14.

which is not the case when the supporting information (such as a prior site report) is filed with the DPS Opinion. That was the case here as well. The direction of groundwater flow given in the DPS Opinion for 1203 Washington Street reflected earlier determinations relied upon by other environmental professionals who assessed and cleaned the site, and the two prior site reports containing this information—the 1990 TGGE Report and the 1991 ERE Report—accompanied the DPS Opinion.

As I also noted with respect to the DPS Opinion for 5 Commonwealth Road in Natick, omitting supporting data for groundwater flow direction may still fall below acceptable practice among LSPs even if it does not violate 310 CMR 40.0015(2)(a), but a finding to that effect must be based upon proof of what the acceptable practice actually was at the time in question. However, neither Webster nor Phillips testified that it was the standard practice among LSPs to include data supporting groundwater flow direction in the DPS Opinion itself at the time in question (August 1996). There is no basis in the record for finding, therefore, that the DPS Opinion for 1203 Washington Street deviated from standard LSP practice at the time because it stated the direction of groundwater flow without also including, in the Opinion itself, supporting data showing groundwater flow direction at the site.

Two other deficiencies asserted by the Board's witnesses—absence of site history and failure to identify or discuss information suggesting an on-site source of contamination²⁰¹—were also similar to criticism they directed at Loitherstein Environmental's other DPS Opinions. Here, too, whether the DPS Opinion for 1203 Washington Street in Newton included prior site reports makes a difference between an alleged failure to discuss or explain data regarding prior site use and

²⁰¹/ Webster PFT, at 15; Phillips PFT, at 10.

potential on-site sources of contamination at all, and an alleged failure to discuss or explain this data sufficiently.

As was true of the DPS opinion for 5 Commonwealth Road in Natick, the DPS Opinion for 1203 Washington Street did not identify prior site reports as attachments, but neither the Board nor its witnesses asserted that previous reports were not filed with the DPS Opinion, and the witness who reviewed the prior reports (Webster) did not state where he obtained them. Loitherstein testified that the DPS Opinion “was based, in part, on findings from prior assessments of the property in 1990 and 1991,” meaning the 1990 TGGE Report and the 1991 ERE Report, which he “did not specifically repeat in the DPS opinion.”²⁰² He did not volunteer whether the DPS Opinion included a copy of either of these earlier reports, but that may be because nobody asked him this on direct or cross-examination.

Because it was the Board’s burden to prove what the DPS Opinion did and did not include, I cannot simply infer that the DPS Opinion was filed without copies of prior reports; moreover, there is some evidence in the record that it was Loitherstein Environmental’s practice in 1996 to include copies of prior site reports prepared for its client (or the client’s predecessor) with its DPS Opinion (see above, at 57). I will infer, therefore, that it was more likely than not that a copy of the 1990 TGGE Report and the 1991 ERE Report accompanied Loitherstein Environmental’s DPS Opinion for 1203 Washington Street.

With those reports included, and in view of (a) the extensive information they presented regarding site history, tank removal and other remediation-related work, and (b) the results of monitoring well and soil sampling and testing, there can be no tenable assertion that Loitherstein

²⁰²/ Loitherstein PFT, at 20, 23.

failed to “identify the material facts, data and other information known by him or her about the disposal site that is pertinent to the LSP Opinion...” as 310 CMR 40.0015(2)(a) requires. The DPS Opinion for 1203 Washington Street identified the information that Loitherstein Environmental found most persuasive in concluding that the petroleum hydrocarbons found in monitoring well MW-107 originated at an off-site source (see above, at 79). With the prior reports included, the DPS Opinion disclosed all of the pertinent information from which it selected the information it found most persuasive.

I find nothing in the plain language of 310 CMR 40.0015(2) or of any other applicable regulation that obligated Loitherstein Environmental to repeat, in its DPS Opinion, the information presented in the 1990 TGGE Report and in the 1991 ERE Report. The Board did not assert, and neither did its witnesses, that the two prior reports were in any way unclear, difficult to read or omissive in any material way, or that persons reviewing Loitherstein Environmental’s DPS Opinion (most likely regulatory personnel and other LSPs and professionals) could not readily check the DPS Opinion against the data presented by the 1990 TGGE Report and the 1991 ERE Report. In addition, neither Webster nor Phillips testified that omitting the information presented by the earlier reports from the DPS Opinion was contrary to established practice among LSPs at the time in question (August 1996). There is no basis in the record for finding, therefore, that omitting this information from the DPS Opinion itself, but including the earlier reports containing the information as appendixes to the Opinion, deviated from acceptable practice among LSPs in August 1996.

Phillips and Webster also criticized Loitherstein for asserting “without technical support” that LNAPL (light non-aqueous phase liquid) found in the “lone on-site monitoring well” (meaning monitoring well MW-107) was “fresh,” for including no supporting analytical data, and for not

noting in the DPS Opinion for 1203 Washington Street that monitoring well MW-107 was located where two 3,000-gallon USTs, including one that had leaked, were removed in 1988.²⁰³ Webster (but not Phillips) also faulted Loitherstein for not demonstrating that “the property across the street” (meaning, presumably, the Gulf station), “was in fact hydraulically upgradient” of 1203 Washington Street, and noted that a DEP staffperson (meaning, presumably, Bresnahan) “believed the petroleum in the onsite well appeared weathered and not fresh as alleged by Mr. Loitherstein in the DPS opinion.”²⁰⁴

Citing Bresnahan’s opinion as evidence of the gasoline’s age poses serious hearsay problems. Bresnahan’s memorandum is not a contemporaneous recording of his impression, and instead post-dated his observations of the monitoring well samples by six weeks. More critically, he filed no testimony and was not available for cross-examination, which left Loitherstein unable to question him—for example, about how he determined that the gasoline taken from the monitoring well samples was “weathered,” and how long gasoline would need to be floating on groundwater before it could be so characterized. In contrast, Loitherstein was available for cross-examination probing the DPS Opinion’s characterization of the gasoline as “fresh.” I accord Bresnahan’s characterization of the gasoline as “weathered” no weight, consequently, and as a result it furnishes no support for Webster’s testimony.

That aside, Bresnahan’s characterization of gasoline found in samples from the three monitoring wells as “weathered” does not rule out the Gulf station across the street as the source of

²⁰³/ Phillips PFT, at 10; Webster PFT, at 15-16, and at 17.

²⁰⁴/ Id., at 16; see also DEP Memorandum “Re: Front End Compliance Inspection” relative to “File 3-12944,” dated July 8, 1996 (Board Exh. B-42), at 3.

this LNAPL, and nor does it show with any reasonable degree of certainty that the source was on-site, at 1203 Washington Street. Fresh-smelling gasoline may have been a more dramatic indicator of a very recent source than weathered gasoline would be, underscoring that the source was not at the site, where fresh gasoline had not been stored at least since the underground tanks were removed eight years earlier, in 1988. Weathered gasoline would not establish an on-site source as more likely, however. The Gulf Station across the street was operating in 1990, when TGGE prepared its site assessment report, as well as six years later when Loitherstein Environmental prepared its DPS Opinion—long enough for gasoline originating from the Gulf Station to have aged and “weathered” by the time it was detected in downgradient monitoring wells.

But Loitherstein Environmental did not base its conclusion on finding “fresh” gasoline alone. It also cited regional groundwater flow in a northerly direction toward Cheesecake Brook, the prior removal of sources of gasoline from the site, the fact that gasoline was not being stored on-site in 1996 and had not been stored there for many years, the presence of six DEP-listed sites in the immediate vicinity of 1203 Washington Street, and the presence of NAPL floating on the groundwater at this site’s upgradient (southern) boundary along Washington Street, as well as in monitoring wells on both sides of Washington Street including one alongside the Gulf Station. The quantity of gasoline found upgradient of monitoring well MW-107 and immediately downgradient of the Gulf Station—a floating mass more than three feet deep—was particularly notable. With groundwater flow direction toward the north (meaning from the Gulf Station toward 1203 Washington Street, and then to Cheesecake Brook), and with no gasoline storage tanks having been on-site for eight years, an opinion that gasoline found in groundwater originated at the Gulf Station rather than at an on-site source was practically self-evident, let alone sufficiently supported.

There was no testimony by the Board's witnesses that this opinion was incorrect or that a different origin of the gasoline found in monitoring well MW-107 was ever found. There is no evidence in the record that the opinion was ever shown to have been wrong in any respect. In hindsight, one can fault the DPS Opinion for not having been sufficiently descriptive about material information supporting its conclusion as to the gasoline's offsite origin. There was much to repeat in the DPS Opinion, had Loitherstein wished to do so. All of it was stated in the 1990 TGGE Report and the 1991 ERE Report, however. The data in both reports furnishes substantial support for the DPS Opinion, including not only the removal of the gasoline tanks near monitoring well MW-107 in 1988 but also TGGE's finding of only "small amounts of gasoline" in this excavated soil (see above, at 67). Another supporting factor that could have been repeated in the DPS Opinion was ERE's remediation of the catch basin area and neutralization of the building floor drains as sources of migrating petroleum hydrocarbons, and the fact that if any such contaminants remained they would have migrated northward toward Cheesecake Brook rather than southward (and upgradient) toward monitoring well MW-107 along Washington Street (see above, at 73). Still another factor supporting an offsite source of gasoline that could have been repeated in the DPS Opinion was, per the 1991 ERE Report, the ongoing recovery of petroleum hydrocarbons at the time from several sources in the vicinity of 1203 Washington Street (see above, at 75). There was, as well, ERE's recovery of notable quantities of petroleum hydrocarbon from monitoring well MW-107 in June 1991, and the information it obtained from the Newton Fire Department Captain that the Gulf Station was supposed to have replaced its underground gasoline storage tanks but had not yet done so (see above, at 75-76).

Omitting specific mention of these factors left Loitherstein Environmental's DPS Opinion

thinner than it could have been. Without question, these factors could have been discussed in the Opinion itself, even though they were disclosed in the two prior site reports that accompanied it. What is critical here, however, is that even if the DPS Opinion had discussed it, this additional information would have furnished no support for an on-site source; indeed, neither of the Board's witnesses testified affirmatively that it would have. Instead, this additional information supported an offsite origin of the gasoline detected in the monitoring wells. Accordingly, the DPS cannot be faulted for omitting "historical information suggesting potential on-site sources of the contaminants found at 1203 Washington Street in Newton," as the Board alleges. Nor was there, as the Board also alleges, a "failure to discuss and explain known, available information regarding site history that may have tended to support or led to a contrary or significantly different opinion," in violation of 309 CMR 4.03(3)(d). In short, nothing contrary to the DPS Opinion was omitted from it.

f.

As to the DPS Opinion that Loitherstein Environmental filed for 1203 Washington Street in Newton, I find that Loitherstein (a) discussed and explained known, available historical information suggesting potential on-site sources of the contaminants found at this site; and (b) supported adequately his opinion that the petroleum hydrocarbon contamination found there was of recent origin and had migrated from an upgradient property. I conclude, therefore, that Loitherstein:

- (1) acted with reasonable care and diligence, as required by 309 CMR 4.02(1);
- (2) followed applicable requirements and procedures prescribed by M.G.L. c. 21E and 310 CMR 40.0000, as required by 309 CMR 4.03(3)(b); and
- (3) disclosed known, available information regarding site history that may have tended to support, or that may have led to, a contrary or significantly different opinion, and discussed them sufficiently, thereby satisfying the requirements of 309 CMR 4.03(3)(d).

*B. RAO opinions that allegedly misclassified groundwater
and underestimated risks to drinking water supplies*

1. 73 Jeffrey Avenue, Holliston

a.

i.

73 Jeffrey Avenue is a 2.4-acre site in Holliston located approximately three-fifths of a mile east of the intersection of Routes 16 (Washington Street) and 126 (Concord Street), in an area known as East Holliston where several industrial and commercial businesses were located during the late 1990s, including an industrial park on the other side of Jeffrey Avenue.²⁰⁵ The site and its surrounding area are relatively flat.²⁰⁶ A railroad line runs in a north-south direction approximately 300-400 west of Jeffrey Avenue.²⁰⁷ There is a residential community beyond the railroad line, to the

^{205/} See Board Exh. B-3: “Loitherstein Environmental Engineering, Release Abatement Measure Completion Report and Response Action Outcome Statement, Former Corion Facility, 73 Jeffrey Avenue, Holliston, Massachusetts, RTN 2-11053,” dated October 19, 1998 (“Loitherstein Environmental RAO Opinion for 73 Jeffrey Avenue”); Fig. 1 (map entitled “site locus”), and Fig. 2 (map entitled “site plan”). See also Board Exh. B-31: “Numerical Groundwater Flow Modeling and Zone II Delineations for wells No. 1, 2, 3, 4, 5 and 6, Holliston, Massachusetts, Prepared for Board of Water Commissioners, Holliston Water Department,” Whitman & Howard, Inc., March 1996 (“the 1996 Whitman & Howard Report”), at Fig. 6-3, following p. 6-1 (entitled “Land Use and Potential Sources of Contamination within Zone II, Holliston, Massachusetts”); map on right side of diagram entitled “Bogastow Brook Model.”

^{206/} Board Exh. B-33: “Phase I Limited Site Investigation and tier Classification for 73 Jeffrey Avenue, Holliston, Massachusetts, RTN 2-11053,” dated December 18, 1996 (“Loitherstein Environmental 1996 Phase I Report for 73 Jeffrey Avenue”); narrative report, at 8.

^{207/} See 1996 Whitman & Howard Report (Board Exh. B-31), at Fig. 3-1, following p. 3-1 (entitled “Surficial Geology of Study Area, Holliston, Massachusetts”), right-hand map entitled “Bogastow Brook Aquifer.”

west and toward Route 16, more than 500 feet from the site.²⁰⁸

The site was owned in 1998 by MC Realty Trust. Between 1973 and 1996, Corion Corporation leased 73 Jeffrey Avenue, where it manufactured coated optical filters.²⁰⁹ Corion's single-story, rectangular-shaped facility occupied most of the property's western side and center and comprised two buildings—one closer to Jeffrey Avenue, built in 1975, and an adjoining addition in the rear, built in 1984²¹⁰—with a parking area adjacent to the facility's southeastern corner, a walkway in front (along the eastern half of the facility's southern side), and a lawn between the facility and Jeffrey Avenue.²¹¹ See Appendix, Sketch 4. There was an abandoned septic tank and leach field beneath this lawn and, as well, an “existing” (meaning “active”) septic tank and pump chamber to which Corion (listed by DEP as a “small quantity hazardous waste generator”) was authorized to discharge treated industrial wastewater under a DEP wastewater discharge permit issued in August 1987, with an associated leaching field that was located “beneath the lawn on the northeast side of the building.”²¹² Near the center of the site, there was a catch basin at what had been a truck loading dock behind the older front building.²¹³ The catch basin was abandoned and

²⁰⁸/ See Loitherstein Environmental 1996 Phase I Report for 73 Jeffrey Avenue (Board Exh. B-33); narrative report, at 2.

²⁰⁹/ Id.; narrative report, at 1, 2 and 4; see also Carls PFT, at 1-2. Carls was one of the two trustees of MC Realty Trust, the site owner.

²¹⁰/ Loitherstein Environmental RAO Opinion for 73 Jeffrey Avenue (Board Exh. B-3); narrative opinion, at 1, and Fig. 2 (entitled “site plan”).

²¹¹/ Id.

²¹²/ Loitherstein Environmental 1996 Phase I Report for 73 Jeffrey Avenue (Board Exh. B-33); narrative report, at 5.

²¹³/ Loitherstein Environmental RAO Opinion for 73 Jeffrey Avenue (Board Exh. B-3); narrative opinion, at 3; and Fig. 2 (site plan).

a concrete cover was placed over it in 1984, before the building addition was built over it with a roof that drained to the catch basin.²¹⁴

In August 1986, IEP, Inc., an environmental consulting firm, drilled several monitoring wells at the site, and detected in two of them “very low concentrations” of Trichloroethene (TCE) and 1,2-Dichloroethane (1,2-DCA), whose source they believed to be a property across the street.²¹⁵ IEP found “no significant change” in contaminant levels in the same wells when it performed a Phase I site assessment in April 1991, but sampling detected a “breakdown products of these contaminants,” suggesting, in turn, “a continuing source, possibly off-site and up hydrologic gradient from the site.”²¹⁶

73 Jeffrey Avenue was again assessed in late 1995, this time by ERM, an environmental consultant retained by Corion Corporation’s prospective buyer or by the prospective buyer’s lender.²¹⁷ According to David Carls, one of the owner’s trustees, ERM “opined that the contamination on-site was not coming from across the street.”²¹⁸ Carls retained Loitherstein in

²¹⁴/ Id.; narrative opinion, at 3.

²¹⁵/ Loitherstein Environmental 1996 Phase I Report for 73 Jeffrey Avenue (Board Exh. B-33); narrative report, at 2, last para. (at subheading entitled “Assessment and Release History”).

²¹⁶/ Id., at 3, quoting IEP’s 1991 Phase I site assessment. Neither party introduced this report or any report that IEP may have generated in 1986. Loitherstein Environmental’s description of IEP’s findings and conclusions in 1986 or in 1991 is unchallenged, however. See Loitherstein Environmental 1996 Phase I Report for 73 Jeffrey Avenue (Board Exh. B-33); narrative report, at 2-4, and at 5 (under subheading 4.10, entitled “Subsurface Evaluation”). The record does include a copy of soil sampling results that were furnished to IEP in July 1986 by Carr-Dee Corp. Carr-Dee’s sampling results were attached as Appendix D to Loitherstein Environmental’s 1996 Phase I Report (Board Exh. B-33).

²¹⁷/ Loitherstein Environmental RAO Opinion for 73 Jeffrey Avenue (Board Exh. B-3); narrative opinion, at 3.

²¹⁸/ Carls PFT, at 2. It is unclear whether ERM presented this opinion verbally or in a written report. The record includes no report by this firm.

December 1995 to “further address the situation.”²¹⁹ Toward the end of December 1995, the trust filed a “release notification form” (RNF) with DEP regarding the presence at this site of reportable concentrations of two chlorinated volatile organic compounds (CVOCs) at the site—Trichloroethene (TCE) and 1,1-Dichloroethane (1,1, DCA).²²⁰ DEP issued an “release tracking number” (RTN) for 73 Jeffrey Avenue (RTN 2-11053) on January 5, 1996,²²¹ making it a listed hazardous waste site.

Between April 10, 1996 and June 18, 1996, Loitherstein Environmental installed ten groundwater monitoring wells at various points both within the building complex at 73 Jeffrey Avenue and around its perimeter; in addition, as a “release abatement measure,” or “RAM”, the firm installed six air sparge and vapor extraction wells near the building’s southeastern corner and near its south side in August 1996.²²²

Loitherstein Environmental’s December 18, 1996 report to the owner’s trustee, David Carls—the “Loitherstein Environmental 1996 Phase I Report for 73 Jeffrey Avenue” (Board Exh. B-33)—recommended a “Tier I” classification for this site.²²³ This 238-page document was filed with DEP on December 26, 1996. Although the Board’s charges against Loitherstein regarding 73

²¹⁹/ Id.

²²⁰/ Id. See also Loitherstein Environmental 1996 Phase I Report for 73 Jeffrey Avenue (Board Exh. B-33); cover letter, at 1.

²²¹/ Loitherstein Environmental 1996 Phase I Report for 73 Jeffrey Avenue (Board Exh. B-33); cover letter at 1.

²²²/ Id.; narrative report, at 6.

²²³/ A Phase I initial site investigation report such as this one is required by 310 CMR 40.0481 and shows “the results of Preliminary Response Actions undertaken at a disposal site...” 310 CMR 40.0481(1). It was also submitted to DEP in support of the site’s “Tier II classification,” meaning, essentially, that it was less contaminated than a Tier I site and a response action undertaken to remediate contamination did not require a DEP permit allowing it pursuant to 310 CMR 40.0700.

Jeffrey Avenue concern the October 19, 1998 RAO Opinion only, the RAO Opinion (and its assessment of remaining risk to health, public welfare and the environment) built upon the information that Loitherstein Environmental included in its earlier Phase I Report. The 1996 Phase I Report presented information on the geology, hydrology and topography of the site, the history of its use, surrounding land use and resource location, and the nature, extent and source of hazardous materials contamination at the site. According to the 1996 Phase I report:

(1) Groundwater at 73 Jeffrey Avenue “appears to flow in a southerly direction” based upon depth to groundwater measured on August 28, 1996 and groundwater elevations in monitoring wells at the site,²²⁴ and this data was presented in a table accompanying the Phase I report;²²⁵

(2) The site was surrounded by commercial and manufacturing facilities to the north, south and (across Jeffrey Avenue) to the east; to the west, there were undeveloped woodlands, an abandoned railroad, and beyond that, residential properties that were more than 500 feet from the site; and the building at the site had been vacant since Corion ceased manufacturing operations at the site in 1995;²²⁶

(3) At Loitherstein Environmental’s request, Weston Geophysical Corporation conducted a seismic refraction survey on May 17, 1996 beneath and around the building to evaluate depth to bedrock and groundwater “and to identify anomalous geologic features to aid in the placement of

²²⁴/ Loitherstein Environmental 1996 Phase I Report for 73 Jeffrey Avenue (Board Exh. B-33); narrative report, at 8, and at 11. At page 2, the Phase I report states that groundwater at the site “appears to flow south toward an unnamed pond, which is located in a gravel pit, approximately 700 feet southwest of the site.”

²²⁵/ Id., at Appendix E, Table 1.

²²⁶/ Id.; narrative report, at 2.

groundwater treatment wells.” The seismic refraction survey “indicated that the rock slopes from the rear (northwest) of the Site down toward the front (southeast), but there [did] not appear to be pockets in the bedrock surface where the DNAPL (dense non-aqueous phase liquid) could accumulate”,²²⁷

(4) Bedrock was encountered in groundwater monitoring wells at depths ranging between 17 feet at the rear of the building (near its northeastern corner) to 30.5 feet at the front of the building (alongside the front walkway, near the building’s southeastern corner), and groundwater was encountered at depths of between 7.4 and 12 feet;²²⁸

(5) VOCs and petroleum hydrocarbons were present in groundwater at a concentration above the applicable “Category GW-1 Cleanup Standard” in groundwater sampled at monitoring well MW-102, close to and south of the former catch basin, now beneath the building—in particular, the concentration of 1,1,1-trichloroethane detected in this monitoring well was 130,000 ug/l, compared with the regulatory limit of 200 ug/l. A sample taken from a groundwater monitoring well in front of the building (MW-103D, near the building’s south side) showed, in contrast, low concentrations of chlorinated solvents, while no detectable concentrations were found in samples from a nearby shallow well (MW-103S, very close to MW-103D);²²⁹

²²⁷/ Id., at 6. Weston Geophysical’s May 30, 1996 report on its seismic refraction survey was included in Loitherstein Environmental’s 1996 Phase 1 Report for 73 Jeffrey Avenue (Board Exh. B-33), at Appendix C.

²²⁸/ Id., at 8.

²²⁹/ Loitherstein Environmental 1996 Phase I Report for 73 Jeffrey Avenue (Board Exh. B-33); narrative report, at 9; see also Fig. 2 (“General Well Location Plan”) for the location of this and other monitoring wells at 73 Jeffrey Avenue.

(6) The former catch basin was the source of these contaminants,²³⁰

(7) Based upon field observations and the results of subsurface evaluations, “the depth of soil containing VOCs appears to be the ten foot thickness of fine silty sand that exists at and below the groundwater in the vicinity of” the former catch basin, but “the concentrations of VOCs in the soil are well below their associated Category S-1 Cleanup Standards;” in addition, “[g]roundwater containing the highest concentrations of the solvent related VOCs appears to be concentrated in the fine sand stratum in the vicinity of the former leaching catch basin, which is located beneath the building,” while lower concentrations of these substances appeared to extend “under the southeastern portion of the building and beneath the southeastern Site lawn area.” These VOCs had a specific gravity greater than water and therefore tended to sink; nonetheless, their concentrations “were much lower in the groundwater from the deep monitoring wells screened within the gravely till stratum” (at monitoring well MW-103D, in front of the building, and at monitoring wells MW-105D and MW-A1 along the building’s eastern side, near its southeastern corner). In addition, DNAPL (dense non-aqueous phase liquid) “was not encountered in the monitoring wells at the Site”;²³¹

(8) The October 1996 MassGIS Resource Map for the Holliston area showed that the site was within a “potentially productive aquifer,” and “[t]herefore, Category GW-1 Cleanup Standards apply to groundwater” and “[i]n accordance with 310 CMR 40.0933, the soil at the Site is classified as Category S-1”;²³²

²³⁰/ Id., at 3, and at 10-11. See also Loitherstein Environmental RAO Opinion for 73 Jeffrey Avenue (Board Exh. B-3); narrative report, at 3.

²³¹/ Loitherstein Environmental 1996 Phase I Report for 73 Jeffrey Avenue (Board Exh. B-33); narrative report, at 9-10.

²³²/ Id., at 2.

(9) Based upon DEP Bureau of Waste Site Cleanup maps dated October 1, 1996, the site was “located within a Potentially Productive Medium Yield Aquifer which is a groundwater resource area, but it was not located in a Zone II or upgradient of a public well within an Interim Wellhead Protection Area,” and the nearest public water supply well was “located more than one mile southeast of the Site,” which led Loitherstein Environmental to conclude that “there is a low potential for VOCs from the Site to have an impact on the drinking water supply well”;²³³

(10) Direct exposure to VOCs in groundwater was possible during “groundwater monitoring events,” and there was also “the potential for groundwater to affect indoor ambient air quality at the Site building” because the depth to groundwater from the building floor was less than 15 feet and the building was less than 30 feet from the catch basin and the VOCs within it.²³⁴ However, the building’s concrete floor and the vapor extraction system installed at the site made contaminant migration into the building unlikely, and migration to outdoor areas was not anticipated unless excavation was carried out below the groundwater table;²³⁵

(11) There was a low potential for VOCs to be detected in the nearest surface water body (an unnamed pond located approximately 700 feet southeast of the site), because although groundwater flow direction was southerly, analytical results from the three downgradient monitoring wells showed VOCs at lower concentrations than at the source area (the former catch basin);²³⁶ and

(12) The site was approximately 500 feet south of a mapped wetland and potential wildlife

²³³/ Id., at 11.

²³⁴/ Id.

²³⁵/ Id., at 12.

²³⁶/ Id., at 11-12.

habitat, but because these environmentally sensitive were upgradient of the site, the release of petroleum-related products to soil or groundwater at the site was not likely to affect them.²³⁷

ii.

Loitherstein Environmental's next tasks were to remediate the contamination found at 73 Jeffrey Avenue and evaluate the remaining risk that it posed. Before describing how the firm addressed remediation and risk, I turn first to an overview of how risk is characterized under DEP's regulations.

Risk Assessment Methods. The regulations prescribe three methods for determining "the need for a remedial action or to demonstrate that a level of no significant risk of harm to health, public welfare and the environment exists or has been achieved." 310 CMR 40.0941(3). One of these is "Method 1" (also referred-to as "MCP Method 1") which is "the characterization of risk through the use of promulgated standards...described in 310 CMR 40.0970 through 40.0979." 310 CMR 30.0941(3)(a). Method 2 characterizes risk "through the application of promulgated standards supplemented by site-specific information," 310 CMR 40.0941(3)(b). Method 3 characterizes risk "through the application of site-specific methodologies..." 310 CMR 40.0941(3)(c).

Loitherstein Environmental selected Method 1 as appropriate for assessing risk at 73 Jeffrey Avenue under the regulations. Neither the Board nor its witnesses asserted that Method 2 or Method 3 should have been used instead. Method 3 figures here because DEP challenged Loitherstein Environmental's filing of a "Class A2" Response Action Outcome opinion rather than a Class C RAO opinion for a "temporary solution," and the use of a Class C RAO opinion implicates a

²³⁷/ Id., at 12.

different set of limits for concentrations of oil and hazardous materials in soil and groundwater (known as “Upper Concentrations”) that apply when Method 3 is used.

Method 1 compares concentrations of oil and hazardous materials (including volatile organic compounds) that are detected at a site with numerical “standards” for such substances that appear in tables at 310 CMR 40.0974(2)-40.0975(6)(c). The standards are concentrations of oil and hazardous materials in soil and in groundwater that are considered to pose a risk to health, safety or the environment if they are exceeded. The values for these maximum concentrations differ depending upon whether groundwater is classified as GW-1, GW-2 or GW-3, and upon how soils are classified.

Distilling the complexities of risk analysis under the regulations to what actually matters here, it is important to know that Method 1 Risk Characterization “compares the conditions at the disposal site” to the MCP Method 1 standards and assesses risk at “[e]xposure points in groundwater and soil for all current and foreseeable Site Activities and Uses,” and also compares concentrations of oil and/or hazardous materials at “exposure points” in groundwater and soil to applicable MCP Method 1 Standards. See 310 CMR 40.0973. “A condition of no significant risk of harm to health, public welfare and the environment exists if no Exposure Point Concentration is greater than the applicable MCP Method 1 Soil or Groundwater Standard.” 310 CMR 40.0973(7).

Groundwater and Soil Classification. Groundwater and soil classification are important factors in “evaluating the risks posed by oil and/or hazardous material at disposal sites” to health, safety, public welfare and the environment. See 310 CMR 40.0990. The regulations prescribe categories of groundwater and soil “for use in the characterization of risk posed by disposal sites.” 310 CMR 40.0931, first para. The category (or categories) of groundwater and soil where oil or

hazardous waste was released determines how the risk of harm to health, safety, public welfare and the environment is evaluated, and which methodology must be used to perform this evaluation. See 310 CMR 40.0941.

Groundwater at a disposal site is considered to be “a potential source of discharge to surface water” and must therefore be classified “at a minimum” as “GW-3,” 310 CMR 40.0932(2). This category is not defined and appears to be, thus, a default categorization to be used when other groundwater categories do not apply.

One category that the regulations do define is “GW-1.” It applies to groundwater within areas associated with public or private water supplies that the regulations specify at 310 CMR 40.0932(4)(a)-(f).²³⁸ Groundwater within any of these areas is considered to be a current or future drinking water source. One of these areas, specified at 310 CMR 40.0932(4)(a), is a “Zone II,” which the regulations define as:

that area of an aquifer which contributes water to a well under the most severe pumping and recharge conditions that can be realistically anticipated, as approved by the Department’s Division of Water Supply pursuant to 310 CMR 22.00.

310 CMR 40.0006. Another area in which groundwater must be classified as GW-1 is a “potentially productive aquifer.” 310 CMR 40.0932(4)(c). 310 CMR 40.0006 defines “potentially productive aquifer” as:

(a) all aquifers delineated by the U.S. Geological Survey (USGS) as a high or medium yield aquifer, except for any portion of a high or medium yield aquifer that is located in a municipality with a population density equal to or greater than 4,400 persons per square mile (based on the most recent U.S. Census); and

²³⁸/ The other category defined by the regulations is “GW-2,” which applies to groundwater “located within 30 feet of an existing occupied building or structure, and the average depth to groundwater is 15 feet or less,” which makes this category of groundwater “a potential source of vapors of oil and/or hazardous material to indoor air.” 310 CMR 40.0932(6).

(b) all aquifers located east of the Cape Cod Canal (Cape Cod), on the Elizabeth Islands, on Martha's Vineyard, or on Nantucket.²³⁹

Soils at an oil or hazardous waste disposal site must be classified as either S-1, S-2 or S-3.

310 CMR 40.0933, first para. The three soil categories “describe a range of the potential for exposure to that soil,” with Category S-1 soils having the highest potential for exposure” and Category S-3 soils having the lowest potential for exposure. 310 CMR 40.0933(2). The regulations explain, at 310 CMR 40.0933(4), that “[t]he potential for exposure...is described by a quantitative analysis...” taking into account (1) “frequency of use,” which focuses upon how frequently children and adults are present at or use the site, see 310 CMR 40.0933(4)(a), (2) “intensity of use,” which focuses upon site activities and uses that could potentially result in exposure to contaminated soils, and whether these activities or uses have the potential to disturb soil, resulting in direct soil contact or inhalation of soil-derived dust, see 310 CMR 40.0933(4)(b), and (3) “accessibility of the soil to potential receptors,” which focuses upon how close the soil in question is to the surface and whether it is covered by pavement or by a building or other permanent structure. See 310 CMR 40.0933(4)

c). Soil is to be classified as:

- Category S-1 if (a) the soil is accessible, and is either used for growing fruits or vegetables for human consumption, or is likely to be put to such use, or the frequency or intensity of use by children or adults is high, or (b) the soil is potentially accessible and the frequency and intensity of use by children is high, see 310 CMR 40.0933(5);
- Category S-2 if (a) the soil is accessible, and either frequency and intensity of use by children is low (or nonexistent, because children are not present at the disposal site), and

²³⁹/ Other areas within which groundwater must be classified as GW-1 are an “interim wellhead protection area,” “the Zone A of a Class A Surface Water Body,” an area that is “500 feet or more from a public water system distribution pipeline,” or an area that is “within 500 feet of a private water supply well that was in use at the time of notification pursuant to 310 CMR 40.0300 and was installed in conformance with any applicable laws, by-laws or regulations.” 310 CMR 40.0932(4).

adults' frequency and intensity of use is high, or (b) the soil is potentially accessible, and either frequency and intensity of use by children is high, or children are not present at the disposal site and the frequency and intensity of use by adults is high, see 310 CMR 40.0933(6); or

- Category S-3 if (a) the soil is accessible, the frequency and intensity of use by adults is high, and children are either not present at the site, or the frequency and intensity of use by children is low, or (b) the soil is “isolated,” meaning, pursuant to 310 CMR 40.0933(4)(c)(3), that “it is located at a depth greater than 15 feet below the surface, or...is covered completely by a building or other permanent structure which does not have earthen floors, regardless of depth,” or is “located at a depth greater than three feet below the earthen floor of a building or other permanent structure...” See 310 CMR 40.0933(7).

Applying MCP Method 1 and the applicable Standards to 73 Jeffrey Avenue. The MCP Method 1 Standards vary depending upon how groundwater and soil at the exposure points are categorized. For example, for 1,1-Dichloroethane—one of the contaminants found in groundwater at 73 Jeffrey Avenue—the standard is 70 ug/L for groundwater categorized as GW-1 and much higher for groundwater characterized as GW-2 (9,000 ug/L) or as GW-3 (50,000 ug/L). See 310 CMR 40.0974(2), Table 1. The concentration of 1,1-Dichloroethane (also known as 1,1-Dichloroethylene) found at 73 Jeffrey Avenue on May 1, 1998 was 200 ug/l at monitoring well MW-101, near the catch basin. ²⁴⁰ This was well above the MCP Method 1 standard for this material (70 ug/l) if groundwater were characterized as GW-1, but below Method 1 standards applicable to groundwater classified as GW-2 or and GW-3. Therefore, if groundwater at the site was characterized appropriately as GW-2 or GW-3, the concentration of 1,1-Dichloroethane at monitoring well 101 would have justified a conclusion that what remained of this substance at the site posed “no significant risk of harm to health, public welfare and the environment,” per 310 CMR

²⁴⁰/ Loitherstein Environmental RAO Opinion for 73 Jeffrey Avenue (Board Exh. B-3), at Table 2 (entitled “Summary of Groundwater Analytical Results”)

40.0973(7). In contrast, a “no significant risk” conclusion under that regulation was unjustified if the appropriate groundwater classification was GW-1, because in that case the concentration of 1,1-Dichloroethane would have exceeded the MCP Method 1 standard for this hazardous material.

Because 73 Jeffrey Avenue had been mapped as a site within a “potentially productive aquifer,” Loitherstein Environmental sought first to reduce VOC concentrations so as to meet Method 1 standards for GW-1 groundwater. This goal proved to be unattainable, leading to a misplaced effort by the firm to weigh the remaining VOC concentrations against the less-stringent GW-2 and GW-3 groundwater standards. This effort was unnecessary; although concentrations of some VOCs at several groundwater monitoring wells exceeded Method 1 GW-1 groundwater standards, the site did not pose a significant risk and a permanent solution had been reached, and filing a Class A-2 RAO opinion for the site (as Loitherstein Environmental did) was therefore justified.

I discuss this further below (starting at 111). Before I do so, however, I return to Loitherstein Environmental’s efforts, between 1996 and 1998, to reduce the concentration of chlorinated solvents to what GW-1 standards allowed and to close out 73 Jeffrey Avenue as a hazardous waste site, including the VOC concentrations it detected after these efforts and what risk-characterizing document it decided to file with DEP.

iii.

The firm’s initial approach was to drill through the building’s slab, take soil borings, install monitoring wells in the vicinity of the former catch basin (behind, in front of, and along the eastern side of, the building complex), and install an air sparging and soil vapor extracting system along the

building's eastern side, close to its southeastern corner.²⁴¹ It determined that the former catch basin was still leaching solvent-laden sludge particularly after it rained, because the roof of the building complex was still draining directly into the old catch basin structure, causing more solvent-laden water to leach out of it. The firm exposed the catch basin that had been covered with a concrete cap and built-over previously, removed approximately 330 gallons of water and sludge from it, disconnected the roof drains from the catch basin and connected them instead to an outgoing pipe that bypassed the catch basin that was now properly abandoned, and reactivated the air sparger and soil vapor extraction system.²⁴² Loitherstein Environmental observed a decrease in CVOC levels over the next six months, but not to the point where these levels met Method 1 Groundwater Standards for GW-1 groundwater and the site could be closed out as a hazardous waste site.²⁴³ CVOC levels could not be reduced further, no matter what was tried. One method ("pulsing the system") appeared to worsen the situation by spreading contaminants further outward.²⁴⁴

After consulting with other LSPs and with a DEP employee named Russ Clifton, Loitherstein decided that the only viable solution was to classify (or reclassify) the site as being outside the Zone II of a potentially productive aquifer.²⁴⁵ This solution became unworkable, however, when Clifton

²⁴¹/ Carls PFT, at 2-3; Loitherstein PFT, at 40-41. See also Loitherstein Environmental RAO Opinion for 73 Jeffrey Avenue (Board Exh. B-3); narrative opinion, at 3, and Fig. 2 (site plan), showing the location of the sparge well and monitoring wells.

²⁴²/ Loitherstein PFT, at 41; see also Loitherstein Environmental RAO Opinion for 73 Jeffrey Avenue (Board Exh. B-3); Appendix B (Release and Utility-Related Abatement Measure (RAM & URAM) Transmittal Form), at 2, part D.

²⁴³/ Loitherstein PFT, at 2-3; Carls PFT at 2-3.

²⁴⁴/ Id.

²⁴⁵/ Id., at 41-42.

called Loitherstein “to let [him] know that the Town of Holliston had recently approved a Zone II area and the site appeared to be included in it.”²⁴⁶

Loitherstein testified that he asked Clifton what his options were, and Clifton suggested trying “to reclassify the site by redoing the groundwater model and showing the original one was incorrect.”²⁴⁷ Loitherstein then obtained from Earth Tech (which had acquired Whitman & Howard) the original computer model report for the area’s Zone II. He discussed with Earth Tech personnel the model’s underlying assumptions, the data on which it was based, and how it was calibrated, and determined that based upon the model, the site was beyond the edge of the “technical Zone II,” in an “area of stagnation” that “does not flow toward either of the municipal wells.”²⁴⁸ Loitherstein found it significant that these wells were not contaminated, that the site was either on the edge of or outside the wells’ associated Zone II, that the area of the site was “unlikely to contribute significantly to the water supply wells” absent “a great deal of dilution,” and that the site posed little or no risk to the wells.²⁴⁹ In view of this, he and Carls decided to file an RAO opinion stating that the site was in an approved Zone II but making, as well, a “reasonable argument that the Zone II should be changed or did not apply.”²⁵⁰ He discussed this with Clifton, and “understood him to indicate that

²⁴⁶/ Id., at 42. As of October 1996, in contrast, DEP maps showed that the site was within a potentially productive medium yield aquifer but not within a “Zone II” associated with a public or private drinking water source. See above, at 95-96.

²⁴⁷/ Id.

²⁴⁸/ Id., at 42-43.

²⁴⁹/ Id., at 45-46.

²⁵⁰/ Loitherstein PFT, at 42-43; see also Carls PFT, at 3-4

[he] should go forward with this approach.”²⁵¹

On October 19, 1998, Loitherstein Environmental filed a Class A-2 RAO opinion for this site.²⁵² This filing signaled, to DEP, “the end point” for 73 Jeffrey Avenue as a hazardous waste disposal site, and as a Class A RAO opinion, it was also (according to DEP witness and Environmental analyst Edward J. Laughton) a representation that “response actions were conducted at the site to achieve a ‘permanent solution,’” which he described as “a condition where ‘no significant risk’ exists.”²⁵³

iv.

Filing a Class A opinion is appropriate when a “permanent solution” to site contamination has been achieved. 310 CMR 40.1035(1). A “permanent solution” is:

a measure or combination of measures which will, when implemented, ensure attainment of a level of control of each identified substance of concern at a disposal site or in the surrounding environment such that no substance of concern will present a significant risk of damage to health, safety, public welfare, or the environment during any foreseeable period of time.

310 CMR 40.0006 (definition of “permanent solution”) (emphasis added). A Class A RAO opinion cannot be filed for a disposal site where “one or more remedial actions” have not been conducted

²⁵¹/ Loitherstein PFT, at 43. Neither Loitherstein nor the Board filed any testimony from Clifton. Board Witness Edward J. Laughton testified that he did not know Clifton but believed that he worked in DEP’s Bureau of Resource Protection rather than in DEP’s Bureau of Waste Site Cleanup, which audits hazardous waste site filings, and opined that Loitherstein should have sought advice from that bureau instead and knew or should have known, at any rate, that he could not reclassify groundwater within a Zone II. Laughton Rebuttal Testimony, at 1-2.

²⁵²/ Loitherstein Environmental RAO Opinion for 73 Jeffrey Avenue (Board Exh. B-3); Appendix B (RAO statement and downgradient property status transmittal form), at 2, where “Class A-2” is checked.

²⁵³/ See Laughton PFT, at 2-3.

or where “active operation and maintenance” of a remedial action is required. 310 CMR 40.1035(3). A Class A RAO opinion is the correct filing, however, when “response actions” have been “conducted at the site to achieve a level of No Significant Risk, as specified at 310 CMR 40.0900,” have eliminated or controlled any source of oil or hazardous waste as specified at 310 CMR 40.1003(5), and “where feasible,” have reduced “to the extent possible, the level of oil and/or hazardous material concentrations in the environment to “background.” 310 CMR 40.1035(2). The regulations define “no significant risk” as:

a level of control of each identified substance of concern at a site or in the surrounding environment such that no substance of concern shall present a significant risk of harm to health, safety, public welfare or the environment during any foreseeable period of time.

310 CMR 40.0006.

Although achieving a current condition of “no significant risk” unquestionably achieves a “permanent solution” to oil or hazardous waste contamination, it does not follow that a “permanent solution” cannot be achieved unless a current condition of “no significant risk” is achieved as well. A “permanent solution” occurs “when,” per 310 CMR 40.0006, measures are implemented that “will...ensure attainment” of a level of control of the oil or hazardous substances in question such that none of them “will present” a “significant risk of damage to health, safety, public welfare, or the environment during any foreseeable period of time.” The regulations express the achievement of “no significant risk” in the future tense. Therefore, a “permanent solution” may be reached not only when “no significant risk” has already been achieved, but also if its achievement is expected to occur at some point in the future if specified measures are used to control oil or hazardous waste contamination.

“Permanent solution” and “condition of no significant risk” are not synonymous, therefore.

Although there may be instances where both are achieved simultaneously, achieving both a “permanent solution” and a “condition of no significant risk” at the same time is not required for a Class A Response Action Outcome to apply to a disposal site. For each of the three categories of Class A RAO opinions, the regulations require that “a Permanent Solution has been achieved,” but they do not require that a “condition of no significant risk” has been achieved. See 310 CMR 40.1036(1)(a) (as to Class A-1 RAO opinions), 40.1036(2)(a) (as to Class A-2 RAO opinions), and 40.1036(3)(a) (as to Class A-3 RAO opinions).

If a permanent solution has been achieved at a disposal site, the category of RAO opinion that applies is Class A-1 if, in addition, “the level of oil and hazardous material in the environment has been reduced to background”²⁵⁴ or if “response actions have eliminated all threats of release and no release of oil and/or hazardous material to the environment has occurred.” 310 CMR 40.1036(1). If a permanent solution has been achieved but the level of oil and/or hazardous material has not been reduced to background, the applicable category is Class A-2 if an “activity and use limitation”²⁵⁵ is not required “to maintain a level of No Significant Risk, 310 CMR 40.1036(2), and Class A-3 if one or more activity and use limitations “have been implemented pursuant to 310 CMR 40.1012 to maintain a level of No Significant Risk.” 310 CMR 40.1036(3).

Class A RAO opinions do not apply to an oil or hazardous materials disposal site (such as 73 Jeffrey Avenue), and therefore neither a Class A-1, A-2 or A-3 RAO opinion may be filed, if

²⁵⁴/ “Background” is basically a level of oil and/or hazardous material that would exist if the site were not a disposal site, e.g., due to geologic or ecologic conditions or atmospheric deposition. See 310 CMR 40.0006 (definition of “background”).

²⁵⁵/ An “Activity and Use Limitation” (AUL) is used to give notice of the existence and location of oil and/or hazardous materials at a property comprising all or part of a disposal site, and to limit site use or activities so as to minimize exposure to these substances. See 310 CMR 40.1012.

“groundwater or soil concentrations of oil and/or hazardous material exceed Upper Concentration Limits specified in 310 CMR 40.0996, except in those cases where the concentrations are shown to be consistent with background” or if “groundwater concentrations exceed an applicable or suitably analogous standard listed in 310 CMR 40.0993(3) where the groundwater is categorized as GW-1 pursuant to 310 CMR 40.0932.” 310 CMR 40.1036(4) (emphases added). The Upper Concentration Limits specified at 310 CMR 40.0996 apply where MCP Method 3 is used to characterize risk of harm to health, public welfare and the environment at a disposal site. These limits are generally much higher than the groundwater and soil standards that apply where MCP Method 1 is used to characterize risk.²⁵⁶ 310 CMR 40.0993 describes how the risk of harm to human health is characterized under Method 3, and 310 CMR 40.0993(3) gives examples of health standards that may be used to characterize this risk (e.g., the Massachusetts Drinking Water Quality, Air Quality and Surface Water Quality Standards).

As Method 3 was not used to characterize risk at 73 Jeffrey Avenue, the standards listed at 310 CMR 40.0993(3) are not applicable here, and none of the concentrations of oil and VOCs detected in groundwater and soil samples at the site exceeded the Upper Concentration Limits specified at 310 CMR 40.0996 (see Tables 1 and 2 below, at 114-115).

In contrast, the regulations recite no exception to the use of Class A-1, A-2 or A-3 RAO opinions when Method 1 is used or if concentrations of oil and/or hazardous materials exceed a Method 1-related standard recited at 310 CMR 40.0974 or at 310 CMR 40.0975.

^{256/} See 310 CMR 40.0974(2), Table 1 (MCP Method 1 groundwater standards for areas where groundwater is classified as GW-1, GW-2 or GW-3), 310 CMR 40.0975(6)(a), Table 2 (MCP Method 1, soil category S-1 standards), 310 CMR 40.0975(6)(b), Table 3 (MCP Method 1, soil category S-2 standards), and 310 CMR 40.0975(6)(c), Table 4 (MCP Method 1, soil category S-3 standards). Method 1 is discussed above, at 99-102.

The other two categories of RAO opinions—Class B and Class C—do not require the achievement of a “permanent solution” at a disposal site and therefore apply if one has not been achieved.

A Class B RAO opinion may be filed “where it is determined as a result of assessment actions that a level of No Significant Risk exists under 310 CMR 40.0900 and, therefore, no remedial actions are necessary.” 310 CMR 40.1045(1). A Class B RAO opinion cannot be filed if remedial action has been conducted at a site, 310 CMR 40.1045(2), as was the case at 73 Jeffrey Avenue.

A Class C RAO opinion is filed where a “temporary solution” has been achieved that “ensure[s] the elimination of any substantial hazard at the disposal site.” 310 CMR 40.1050(1). As will be seen below, DEP faulted Loitherstein Environmental for filing a Class A-2 RAO opinion and took the position that a Class C RAO opinion should have been filed instead. The regulations state that Class C RAO opinions “shall apply, without limitation” to:

(a) disposal sites where Upper Concentration Limits specified in 310 CMR 40.0996 (see below, at 112-113, Tables 1 and 2, right-hand column) “are exceeded in soil and/or groundwater, but all substantial hazards have been eliminated; and/or

(b) disposal sites where oil and/or hazardous material concentrations exceed any applicable or suitably analogous standard identified pursuant to 310 CMR 40.0993(3), but such concentrations of oil and/or hazardous material do not pose a substantial hazard.

310 CMR 40.1050(2) (emphasis added).

310 CMR 40.0996 specifies “Method 3 Upper Concentration Limits” for oil and hazardous materials in soil and in groundwater “which, if exceeded, indicate the potential for significant risk of harm to public welfare and the environment under future conditions.” 310 CMR 40.0996(1), first sentence (emphasis added). These “Upper Concentration Limits” are shown in a Table (Table 6) at

310 CMR 40.0996(5). I underscore “exceeded” because none of the concentrations that Loitherstein Environmental detected in soil and groundwater samples at 73 Jeffrey Avenue exceeded “Upper Concentration Limits” specified at 310 CMR 40.0996 (see Tables 1 and 2 below, at 113-14).

310 CMR 40.0996 also instructs that “[i]f a condition of No Significant Risk has not been achieved for future conditions but all substantial hazards have been eliminated, then the site may be eligible for a Class C RAO opinion described in 310 CMR 10.50.” 310 CMR 40.0996(1), second sentence. Because this sentence appears in a regulation that addresses “Upper Concentration Limits,” it is read reasonably as equating concentrations of oil or hazardous substances that exceed those upper limits with failure to achieve a condition of “no significant risk,” and as making a Class C RAO opinion the appropriate filing, thus, if upper concentration limits are exceeded. It is also read reasonably as applying only when Method 3 is used to analyze risk. If Method 3 is used, “[a] level of No Significant Risk of harm to public welfare and to the environment exists or has been achieved for both current and future conditions if no concentration of oil and/or hazardous material exceeds an applicable Upper Concentration Limit.” 310 CMR 40.0996(2)(a). None of the VOC concentrations that Loitherstein Environmental detected in soil or groundwater samples at 73 Jeffrey Avenue did.

Had it been the appropriate filing for this site (as DEP believed was the case), a Class C RAO opinion would have signified that a condition of “no significant risk” had been achieved through a “temporary solution,” based upon the VOC concentrations detected at the site. But that was not what Loitherstein Environmental filed, and in addition, at least one other environmental consultant (Weston & Sampson; see below, at 123-24) concluded later that a Class C RAO opinion was not “viable.”

v.

The Loitherstein Environmental RAO Opinion for 73 Jeffrey Avenue consisted of a narrative report with attached figures and laboratory analysis data, and, in an attached appendix, two completed DEP forms. One of these forms was entitled “Response Action Outcome (RAO) Statement & Downgradient Property Status Transmittal Form” (“the RAO form”) and a “Release & Utility-Related Abatement Measure (RAM & URAM) Transmittal Form” (“the RAM form”). The RAO form included a checked-off box identified the submittal as a Class A-2 RAO opinion. The RAM form stated that “response action measures” at the site had been completed.²⁵⁷ It identified the hazardous material released at the site as “chlorinated solvents,” and the affected “media and receptors affected” as soil and groundwater.²⁵⁸ The response actions checked off as having been completed were “soil vapor extraction,” “groundwater treatment systems,” “air sparging” and “removal of other contaminated media” (described as the removal of 300 gallons of water and sludge at the catch basin).²⁵⁹

The RAO Opinion’s narrative opinion identified the site as being “within an approved Zone II area,”²⁶⁰ meaning that it was in “that area of an aquifer which contributes water to a well under the most severe pumping and recharge conditions that can be realistically anticipated, as approved by [DEP]’s Division of Water Supply pursuant to 310 CMR 22.00.” 310 CMR 40.0006. It also stated that the site was located in “a PPA” (potentially productive aquifer) and in “the Holliston Water

²⁵⁷/ Id.; Appendix B: Release and Utility-Related Abatement Measure (RAM & URAM) Transmittal Form, at 1, Part B.

²⁵⁸/ Id., at 1, Part C.

²⁵⁹/ Id., at 1, Part D.

²⁶⁰/ Id.; narrative report, at 1 (last para.).

Protection District.”²⁶¹ It described the release abatement measures that Loitherstein Environmental had completed at the site, including soil borings and the installation of monitoring wells, a passive gas soil survey, installation of an air sparging and vapor extraction system, and closure of the catch basin that contained VOCs.²⁶² It also stated that “[b]ased on assessments and reports on file at the DEP, contaminants have not migrated from beneath the building, let alone the Site, in more than 20 years.”²⁶³

Loitherstein Environmental had taken soil samples from borings at 73 Jeffrey Avenue on March 19 and April 11, 1996, and samples from groundwater monitoring wells at the site on May 1, 1998. The RAO Opinion included laboratory testing results for these samples and, as well, two tables summarizing these results. Detectable concentrations of three types of VOCs—1,1-Dichloroethane, cis-1,2-Dichloroethene (referred to in the regulations as cis-1,2-Dichloethylene, which is the same substance) and Ethylbenzene—were found near the catch basin, in soil sample location P1 (several feet northeast of the catch basin), and in groundwater monitoring wells MW-101 (located several feet northeast of the catch basin) and MW-102, located several feet southeast of the catch basin.²⁶⁴ VOCs were also detected in monitoring well MW-104, to the southwest of the catch basin.

These results are material to several decisions that Loitherstein Environmental needed to

²⁶¹/ Id., at 4, first full para.

²⁶²/ Id., at 3, fourth para. (at subheading entitled “Release Abatement Measure Completion Report”).

²⁶³/ Id., at 3, first para (under subheading entitled “Lack of Contaminant Transport”).

²⁶⁴/ See Loitherstein Environmental RAO Opinion for 73 Jeffrey Avenue (Board Exh. B-3); Figure 2 (site plan showing the location of soil borings and groundwater monitoring wells), Table 1 (“Summary of Soil Analytical Results”), and Table 2 (“Summary of Groundwater Analytical Results”).

make: was it appropriate to file an RAO Opinion for this site and, if so, which type of RAO Opinion? The answer depended, in a large measure, upon how groundwater and soil were classified, what MCP Method was used to assess risk, and whether the concentrations of VOCs that were detected via sampling exceeded regulatory limits.

I compare these various limits to the VOC concentrations that Loitherstein Environmental's sampling detected in the tables below.

[continued]

Table 1

Results for Selected VOCs in Soil Samples at Location P1 at 73 Jeffrey Avenue, Holliston, MA Compared to Various Regulatory Limits

Type of VOC	Result from sample at P1 (ug/g)	Regulatory Limit On VOC If Using:						any ground water category (ug/g)
		MCP Method 1, S-1 Soil			MCP Method 1, S-3 Soil			
		and GW-1 (ug/g)	and GW-2 (ug/g)	and GW-3 (ug/g)	and GW-1 (ug/g)	and GW-2 (ug/g)	and GW-3 (ug/g)	
1,1 Dichloroethane	0.008	3	100	100	3	400	500	5,000
cis-1,2-Dichloroethylene	0.012	2	100	100	2	500	500	5,000
Ethylbenzene	0.007	80	500	500	80	2,500	500	10,000

Notes:

(1) Sample Location P-1 concentrations are taken from Loitherstein Environmental RAO Opinion for 73 Jeffrey Avenue (Board Exh. B-3); Table 1 (“Summary of Soil Analytical Results”).

(2) Concentrations are expressed in the units that DEP’s regulations use—in micrograms per gram (ug/g). RAO Opinion Table 1 expressed concentrations as milligrams per kilogram (mg/kg). Because concentrations are ratios, and there are 1,000 micrograms per gram and 1,000 milligrams per kilogram, converting from mg/kg to ug/g (or vice versa) would yield the same number. The concentrations are therefore the same whether expressed in ug/g or mg/kg.

(3) RAO Opinion Table 1 refers to cis-1,2-Dichloroethene. This is the same substance as cis-1,2-Dichloroethylene, which is the name used in the regulations. I use the regulatory name.

(4) MCP Method 1, Soil Category S-1 Standards are from 310 CMR 40.0975(6)(a), Table 2 (1995 rev.).

(5) MCP Method 1, Soil Category S-3 Standards are from 310 CMR 40.0975(6)(c), Table 4 (1995 rev.)

(6) Method 3 standards are “upper concentration limits” in soil from 310 CMR 40.0996(5), Table 6 (1995 rev.).

Table 2

Results for Selected VOCs in Groundwater Samples at Monitoring Wells MW-101, 102 and 104 Compared to Various Regulatory Limits

<i>VOC (ug/l)</i>	Result from sample at			Groundwater Standards- MCP Method 1			Upper Concentration Limit- MCP Method 3
	<i>MW-101</i>	<i>MW-102</i>	<i>MW-104</i>	<i>GW-1</i>	<i>GW-2</i>	<i>GW-3</i>	<i>any groundwater category</i>
1,1 Dichloroethane	200	3	ND	5	20	50,000	100,000
cis-1,2-Dichloroethylene	81	ND	ND	70	NA	50,000	100,000
Tetrachloroethylene	1	ND	ND	5	3,000	5,000	50,000
1,1,1-Trichloroethane	ND	130	29	200	4,000	50,000	100,000
Trichloroethylene	110	47	19	5	300	20,000	100,000
Xylenes	23	ND	ND	10,000	6,000	50,000	100,000

Notes:

1. ND means “not detected.”
2. Groundwater sample location concentrations are from Loitherstein Environmental RAO Opinion for 73 Jeffrey Avenue (Board Exh. B-3); Table 2 (“Summary of Groundwater Analytical Results”).
3. Concentrations are given in both the regulations and RAO Opinion Table 2 as ug/L.
4. MCP Method 1 Groundwater Standards are from 310 CMR 40.0974(2), Table 1 (1995 rev.).
5. MCP Method 3 Groundwater Standards are upper concentration limits in groundwater from 310 CMR 40.0996(5), Table 6 (1995 rev.).

vi.

The RAO Opinion narrative turned next to the characterization of remaining risk to health, welfare and the environment. This is where, according to DEP and the Board, Loitherstein “reclassified” or “misclassified” groundwater at the site. I review this section to determine not only whether this was the case but also whether Loitherstein Environmental accurately characterized the risk remaining at the site from the VOCs in question and justified filing a Class A-2 RAO Opinion.

First, the RAO Opinion identified the appropriate risk characterization method under 310 CMR 40.0900 as MCP Method 1.²⁶⁵ Next, it identified the appropriate soil classification as Category S-3 (the category for soils having the lowest potential for exposure), because the site was “potentially accessible,” “children’s frequency and intensity of use are low,” and frequency of use by adults “is high and intensity of use is low.”²⁶⁶ Even so, the RAO Opinion compared concentrations of VOCs found in soil samples to Category S-1 soil standards (the category for soils with the highest potential for exposure; see above, at 100), and found they were not exceeded.²⁶⁷

With MCP Method 1 selected for characterizing risk from VOCs at the site, the next step was to select the appropriate groundwater classification (see above, at 98-100). Groundwater within a “Zone II” area of contribution to a drinking water supply must be classified as GW-1, as must groundwater within a potentially productive aquifer. 310 CMR 40.0932(4). If groundwater at the point of discharge at the site were classified as GW-1, however, the results from the three

²⁶⁵/ Loitherstein Environmental RAO Opinion for 73 Jeffrey Avenue (Board Exh. B-3); narrative report, at 3, bottom para. (at subheading entitled “Method 1 Risk Characterization”).

²⁶⁶/ Id., at 3-4.

²⁶⁷/ Id.; see also above, at 114, Table 1, and Loitherstein Environmental RAO Opinion for 73 Jeffrey Avenue (Board Exh. B-3); Table 1 (“Summary of Soil Analytical Results”).

groundwater monitoring well samples closest to the source of VOCs at the site (the former catch basin) would have exceeded GW-1 groundwater standards for 1,1-Dichloroethane and for cis-1,2-Dichloroethylene at one of three wells (MW-101), and for Trichloroethylene at all three of these monitoring wells. In that circumstance, it could not be said that “no Exposure Point Concentration is greater than the applicable MCP Method 1 Soil or Groundwater Standard” or, thus, that there existed a “condition of no significant risk to health, public welfare and the environment...” See 310 40.0973(7).

This posed a quandary for Loitherstein Environmental: was an RAO Opinion filing appropriate and, if so, which type?

A Class B RAO Opinion could not be filed because remedial action had been conducted at 73 Jeffrey Avenue. See 310 CMR 40.1045(2). A Class C RAO Opinion for a “temporary solution” could not be filed, per 310 CMR 40.1050, because the concentrations of none of the volatile organic compounds detected in soil or groundwater samples exceeded the “Upper Concentration Limits” for these substances specified in 310 CMR 40.0996 (see above at 114-15, Tables 1 and 2); nor did any of these detected VOC concentrations exceed “any applicable or suitably analogous standard identified pursuant to 310 CMR 40.0993(3),” as no such standard was identified.

That left a Class A RAO Opinion as the only possible option, assuming that a “permanent solution” had been achieved. I reemphasize here that the regulations furnish different definitions for “permanent solution” (see 310 CMR 40.0006) and “condition of no significant risk” (see 310 CMR 40.0973(7)), and they are not necessarily synonymous terms. See above, at 105-07. A “condition of no significant risk” under Method 1 risk analysis is achieved if no oil or hazardous material concentration exceeds a prescribed numerical standard or upper limit— meaning currently, or at least

when the risk posed by oil or hazardous materials at a disposal site is characterized. A “permanent solution” is based not upon current conditions (or conditions existing when risk is characterized) but, instead, upon a future event that is expected to occur “when” control measures are implemented, at which point “no substance of concern will present a significant risk of damage to health, safety, public welfare, or the environment during any foreseeable period of time.” 310 CMR 40.0006 (definition of “permanent solution”) (emphasis added). Significantly, the definition of “permanent solution” does not use the term “condition of no significant risk” or refer to prescribed numerical standards or upper limits for oil or hazardous materials. Significantly, too, the regulatory predicate for a Class A-2 RAO Opinion is the achievement of a “permanent solution” rather than the achievement of a “condition of no significant risk.” See 310 CMR 40.1036(2).

Accordingly, I cannot conclude that filing a Class A-2 RAO Opinion for 73 Jeffrey Avenue was proscribed because an “Exposure Point Concentration” (for example, a detected concentration of a VOC in a sample taken from a soil boring or groundwater monitoring well) “exceeded “the applicable MCP Method 1 Soil or Groundwater Standard,” ruling out a finding that there existed at this site a “condition of no significant risk to health, public welfare and the environment...” A Class A-2 RAO Opinion was proscribed only if a “permanent solution” had not been achieved at the site. What Loitherstein Environmental’s RAO Opinion needed to do, then, was to show that it had indeed achieved a “permanent solution” looking prospectively, meaning that although a “condition of no significant risk,” as 310 40.0973(7) defined it, had not yet been achieved, this condition was expected to be achieved in the future if specified measures were used to control oil or hazardous waste contamination at the site.

vii.

What Loitherstein Environmental did was attempt to show that “Method 1 GW-1 Cleanup Standards do not apply to the Site,” and that, instead, groundwater at the site should be “categorized as GW-2 and GW-3 pursuant to 310 CMR 40.0932,” even though the site was “located within an approved Zone II, a PPA (potentially productive aquifer), and the Holliston Water Protection District.”²⁶⁸

Loitherstein Environmental was convinced that the site was “incorrectly included within the Zone II delineation,”²⁶⁹ and it stated in the RAO Opinion that “the boundary of the Zone II is incorrect and should be modified based on model flaws, Site geology, and lack of contaminant transport” from beneath the building complex on the site.²⁷⁰ According to the RAO Opinion, the 1996 Whitman & Howard Report (Board Exh. B-31) showed that the site was located “within an area of stagnation beyond the influences” of the two closest town wells (Well Nos. 5 and 6), demonstrating in turn that “groundwater underlying the site will not reach either well under the modeled pumping conditions (i.e., maximum pumping for 180 days with no recharge from precipitation).”²⁷¹ In addition, water particle modeling employed by Whitman & Howard using “flow paths extrapolated backward in time 100 years” showed that “particle paths do not cross or originate at the Site.”²⁷²

The RAO Opinion also stated that (1) because “[t]he land area of the industrial area that

²⁶⁸/ Loitherstein Environmental RAO Opinion for 73 Jeffrey Avenue (Board Exh. B-3); narrative report, at 4.

²⁶⁹/ Id.

²⁷⁰/ Id.; narrative report, at 2 (top para.), 3 (top para.), and 4 (first full para.).

²⁷¹/ Id., at 2 (at section entitled “Model Flaws”).

²⁷²/ Id.

includes the site is 335 acres, which is greater than 100 acres,” 73 Jeffrey Avenue met the criteria for a “UL-Light Industry,” a type of “non-potential drinking water source area,” under DEP Policy WSC-97-701; (2) because the site was in a portion of a potentially productive aquifer (PPA) that was not in the Zone II, it could be excluded from the potentially productive aquifer; and (3) accordingly, “the groundwater beneath the Site does not have to meet Category GW-1 criteria, including MCP Method 1 Category GW-1 Cleanup Standards.”²⁷³

If groundwater was classified as GW-2 or GW-3, the concentrations of none of the volatile organic compounds detected in soil and groundwater monitoring well samples exceeded standards or upper limits for these substances prescribed by the regulations, and, per 310 CMR 40.0973(7), a

²⁷³ / Id. For a discussion of groundwater and soil characterization to assess risks to health, welfare and the environment posed by oil and hazardous materials, including the circumstances under which groundwater is categorized as “GW-1” and risk assessment employs Method 1 and Method 1-related standards for contaminants such as 1,1-Dichloroethane, see above at 97-102.

DEP Policy WSC-97-701, entitled “Determining Non-Potential Drinking Water Source Areas (Based on Definition found in 310 CMR 40.0006), became effective on April 30, 1997 and was therefore in effect when Loitherstein Environmental filed its RAO Opinion for 73 Jeffrey Avenue. Its stated purpose is to “offe[r] guidance for identifying Non-Potential Drinking Water Source Areas”—specifically, “how to apply the definition of NPDWSAs” (non-potential drinking water source areas) “within Potentially Productive Aquifers (PPAs).” The Policy explains that “NPDWSAs include land that has been developed for specific urbanized uses and/or is so densely populated that installation of a new public water supply there is highly unlikely. NPDWSAs are not considered to be potential drinking water source areas. Therefore, groundwater cleanups in these areas do not need to meet Massachusetts Drinking Water Standards (provided other GW-1 criteria defining Current or Potential Drinking Water Source Areas do not apply).” DEP Policy WSC-97-701, at 1.0 (“Purpose”).

The Policy “applies to land overlying any Potentially Productive Aquifer or “PPA”(as defined by the MCP) or portion thereof provided the area meets the criteria found in the definition of NPDWSA,” but it also states:

Please note: The NPDWSA criteria and this policy are not applicable within a Current or Potential Drinking Water Source Area as defined in the MCP (310 CMR 40.0006).

DEP Policy WSC-97-701, at 2.0 (“Applicability”).

condition of no significant risk of harm to health, public welfare and the environment existed at the site. That is how the RAO Opinion reasoned, and that was what it concluded.²⁷⁴

The RAO Opinion next addressed the status of remediation at 73 Jeffrey Avenue. It reported that the opening, cleaning and closing of the former catch basin in 1997 had eliminated or controlled “all uncontrolled sources associated with the assigned Release Tracking Numbers;” in addition, no soil contamination was encountered “in Site explorations” and groundwater had been remediated “such that residual groundwater concentrations meet the criteria of No Significant Risk.”²⁷⁵ The RAO Opinion also stated that although concentrations of VOCs had been “reduced to below their applicable Method 1 Cleanup Standards,” it was not feasible to reduce these levels to “background,” and that “[b]ased upon the industrial setting of the Site, the lack of sensitive environmental receptors, and the anticipated continued future Site use as an industrial facility...any incremental benefit of further reducing Site VOC concentrations would be significantly outweighed by associated costs.”²⁷⁶ The RAO Opinion concluded that “an Activity and Use Limitation²⁷⁷ is not required to maintain the condition of No Significant Risk,” “a permanent Solution has been achieved for the release,” and “the requirements for a Class A-2 RAO Opinion have been met for the Site in accordance with 310 CMR 40.1000.”²⁷⁸

²⁷⁴/ Loitherstein Environmental RAO Opinion for 73 Jeffrey Avenue (Board Exh. B-3), at 4, last para.

²⁷⁵/ Id., at 5, first para.

²⁷⁶/ Id., at 5, second para.

²⁷⁷/ For the definition of an “activity and use limitation,” see above at 107, n. 255.

²⁷⁸/ Loitherstein Environmental RAO Opinion for 73 Jeffrey Avenue (Board Exh. B-3), at 5, last para.

viii.

In November 1999, DEP Environmental Analyst Edward J. Laughton received a telephone call from an unidentified environmental consultant who had reviewed Loitherstein Environmental's RAO Opinion in the course of working on another project in the vicinity of 73 Jeffrey Avenue, and who questioned Loitherstein's conclusion that a condition of "no significant risk" had been achieved at this site.²⁷⁹ DEP then audited the RAO Opinion and determined that it was not in compliance with the Massachusetts Contingency Plan, for the following reasons:

(1) The RAO Opinion misclassified groundwater at the site. The site was located within a Zone II Wellhead Protection Area approved by DEP in 1997, and within both a Holliston Aquifer Protection District and a potentially productive aquifer.²⁸⁰ Therefore, groundwater at the site should have been classified as GW-1, but Loitherstein classified it as GW-2 and GW-3 in violation of 310 CMR 40.0932(4).²⁸¹

(2) The RAO Opinion improperly reclassified groundwater at the site. It stated that the site should not be included in the Zone II Wellhead Protection Area (a potentially productive aquifer) because of alleged flaws in the Zone II delineation model. However, 310 CMR 40.0000 "does not allow LSPs to reclassify groundwater within a Zone II," and DEP alone could decide "whether the original Zone II delineation should be modified."²⁸² Therefore, an LSP may not opine within an RAO

²⁷⁹/ Lawton PFT, at 7.

²⁸⁰/ Id., at 4, 6.

²⁸¹/ Id., at 4, and at 6-7. For a discussion of groundwater classification under 310 CMR 40.0932, see above, at 99-100.

²⁸²/ Laughton PFT, at 4.

Opinion that a Zone II delineation is incorrect.²⁸³

(3) Submitting an RAO Opinion was improper. Because the RAO Opinion showed that several chlorinated solvents were detected in groundwater at levels exceeding standards for groundwater classified as GW-1, a condition of “no significant risk” for future use of the site had not been achieved, and therefore Loitherstein should not have filed an RAO Opinion for the site.

In April 2000, DEP sent a notice of noncompliance to Loitherstein and the site owner (the trust) regarding the RAO Opinion, which stated, among other things, that Loitherstein had failed to render an opinion in accordance with the Massachusetts Contingency Plan.²⁸⁴ DEP staff met with Loitherstein on March 21, 2000, listened to him explain why he believed the site should not be included within Zone II, and instructed him that an LSP could not reclassify groundwater in a GW-1 area.²⁸⁵ The agency ordered the trust to file either a “tier classification” of the site, pursuant to 310 CMR 40.0500, or submit a “Class C Response Action Outcome” pursuant to 310 CMR 40.1050.²⁸⁶

In October 2000, Weston & Sampson performed environmental consulting work at 73 Jeffrey Avenue for a third party (Security National Servicing Corporation, a real estate investment and loan servicing and acquisition consultant). It installed additional groundwater monitoring wells outside the building—four of them within two feet of the building’s west side, and two of them in the grassy area between the building’s southern side and Jeffrey Avenue (WS-200B, located 10 feet from the

²⁸³/ Id., at 5.

²⁸⁴/ Id., at 4.

²⁸⁵/ Id., at 6.

²⁸⁶/ Laughton explained that a Class C RAO Opinion “is filed when the LSP does not believe that additional remediation is required but contamination is present at the site that reflects that a permanent solution has not yet been achieved,” and that “additional monitoring is required at the site to ensure the protection of public health and safety.” Laughton RT, at 4.

building, and WS-103B, approximately 40 feet from the building).²⁸⁷ On October 30, 2000, Weston & Sampson sampled these new monitoring wells and those already on site (among them the monitoring wells that Loitherstein Environmental installed, including MW-101 and MW-102, near the catch basin).²⁸⁸ All of the monitoring wells sampled showed contaminant levels comparable to those detected previously except for well WS-103B, whose samples showed VOC concentrations “approximately two orders of magnitude above the levels previously seen, and four orders of magnitude above drinking water standards,” and it appeared possible that higher levels might be found deeper in the underlying bedrock.²⁸⁹ Based upon this data and the site’s location in a town-designated potential drinking water source area, Weston & Sampson concluded that:

a Class C RAO Opinion for this Site will not be viable. Obtaining Site closure under the MCP will require significant additional expense for more site characterization, remediation, and the long-term operation and maintenance of the remedial system.

Based on our experience and the reported Site property value of approximately \$ 1,000,000,

²⁸⁷/ Board Exh. B-7: Letter, William J. Cook, Project Manager, and Paul G. Sutton, LSP, Senior Vice President, Weston & Sampson Engineers, Inc. to Victor Parisi, Security National Servicing Corporation, re: Environmental Consulting Services, Evaluating the Validity of Class C RAO Opinion, Former Corion Property, 73 Jeffrey Avenue, Holliston, Massachusetts, dated November 13, 2000 (“the 2000 Weston & Sampson Report”), at 1, para. 1, and at Fig. 1 (entitled “Site Plan and Monitoring Well Locations”).

²⁸⁸/ 2000 Weston & Sampson Report (Board Exh. B-7), at 1, para. 1.

²⁸⁹/ Id., at 1, para. 2. The VOC concentrations reported by Weston & Sampson for monitoring well WS-103B, approximately 40 feet south of the building, were:

Trichloroethylene - 44,900 ug/l
1,1,1-Trichloroethane - 32,000 ug/l
1,1-Dichloroethylene - 3,200 ug/l

These concentrations exceeded MCP Method 1 Standards applicable where groundwater was classified as GW-1 or GW-2, but below standards where groundwater was classified as GW-3. See 310 CMR 40.0974(2), Table 1. Although high, these concentrations were still below the upper concentration limits specified at 310 CMR 40.0996.

our opinion is that the long-term costs to bring the Site into full regulatory compliance would be prohibitive, relative to the current property value.²⁹⁰

Laughton testified that DEP “was provided” with a copy of the 2000 Weston & Sampson Report 15 months later, in February 2002.²⁹¹ In March 2002, DEP removed the Loitherstein Environmental RAO Opinion for the site on account of noncompliance with M.G.L. c. 21E and 310 CMR 40.0000, and because “recent information” showed that “increased levels of Hazardous Materials were present at the site...,” and it issued a notice of noncompliance to the site owner.²⁹² The violation asserted in DEP’s notice of noncompliance was submitting an RAO Opinion “that classified groundwater as categories GW-2 and GW-3 in an area that was clearly GW-1” when groundwater contamination “was below GW-2 and GW-3 standards but above GW-1 standards.”²⁹³ The agency also issued to the site owner a document entitled “Need to Conduct Further Response Actions at the Site,” because it had not filed a tier classification or a Class C RAO Opinion as DEP had directed in April 2000 (see above, at 123), and had therefore “failed to conduct the additional follow-up work necessary to support a conclusion of No Significant Risk to human and/or environmental receptors exists (sic) or has been achieved at the site.”²⁹⁴

In August 2004, the site owner filed a Class C RAO Opinion for a” temporary solution” with

²⁹⁰/ Id., at 1, para. 3. Weston & Sampson recommended, consequently, “that all site investigation work be terminated and that the environmental liability be left with the current property owner.” Id.

²⁹¹/ Laughton PFT, at 8.

²⁹²/ Id., at 9; see also Board Exh. B-8: Notice of Enforcement Conference dated March 15, 2002, at 1.

²⁹³/ Board Exh. B-8: Notice of Enforcement Conference dated March 15, 2002, at 3.

²⁹⁴/ Board Exh. B-9: Need to Conduct Further Response Actions, M.G.L. c. 21E, 310 CMR 40.0000, dated March 15, 2002, at 1, last para.

DEP.²⁹⁵ Loitherstein testified, however, that no further remediation was performed at the site, which he took as confirming his earlier conclusion that contaminant levels had been reduced at 73 Jeffrey Avenue “to the point where no one would be put at risk,” making an RAO Opinion the appropriate filing even though doing so was “not technically correct.”²⁹⁶ Although Board Witness Edward J. Laughton agreed “that conditions at the site did not pose a current risk to human health,” he faulted Loitherstein for filing a Class A RAO Opinion because this “meant that a condition of No Significant Risk existed for both current and future uses, which was clearly not the case.”²⁹⁷

b.

In its amended proposed order, the Board charged that Loitherstein did not:

- (1) identify that groundwater at 73 Jeffrey Avenue in Holliston should have been classified as GW-1;
- (2) determine the direction of groundwater flow; or
- (3) define the nature and extent of releases or characterize adequately the risks that these releases posed.²⁹⁸

The Board alleged that these omissions comprised the following violations of its Rules of Professional Conduct for LSPs:

- (1) failure to act with reasonable care and diligence with regard to the site, in violation of 309 CMR 4.02(1);
- (2) failure to follow applicable requirements and procedures of M.G.L. c. 21E and 310 CMR

²⁹⁵/ Laughton PFT, at 9.

²⁹⁶/ Loitherstein PFT, at 43.

²⁹⁷/ Laughton RT, at 3.

²⁹⁸/Amended Proposed Order, at 16-17; Findings of Noncompliance, items I.ii-iii, II, and III.

40.0000, in violation of 309 CMR 4.03(3)(b); and

(3) failure to collect sufficient data to define the nature and extent of the releases and to adequately characterize the risk that these releases posed, in violation of 309 CMR 4.03(3)(c).

i.

The Board's charge that Loitherstein did not determine the direction of groundwater flow is without merit. Loitherstein Environmental's 238-page 1996 Phase I Report for 73 Jeffrey Avenue reported that groundwater appeared to flow southward based upon depth-to-groundwater measurements and groundwater elevations in monitoring wells, and this data was included in the report (see above, at 93). I note, in addition, that none of the Board's witnesses contested the groundwater flow direction given by the Phase I Report, and there is no evidence in the record that groundwater flows in a different direction at the site.

ii.

I also find meritless the Board's charge that Loitherstein did not "identify that groundwater at 73 Jeffrey Avenue in Holliston should have been classified as GW-1."

The RAO Opinion disclosed the applicability of GW-1 standards sufficiently. It clearly identified the site as being within a Zone II area (see above, at 111). Having done so, it then presented an argument for not applying MCP Method 1 GW-1 cleanup standards and for applying GW-2 and GW-3 standards instead so as to show (in the course of assessing risk at the site) that the concentrations of various VOCs detected in soil and groundwater did not exceed regulatory limits. There was no need to make this argument if GW-1 standards did not otherwise apply. Although the RAO Opinion did not state affirmatively that GW-1 standards applied, it is quite clear from the

Opinion that they did if the arguments for classifying groundwater differently were not accepted.

This cannot be read reasonably as anything but a disclosure that GW-1 standards applied in view of site location within a Zone II area unless groundwater was classified differently as the RAO Opinion suggested they could be. DEP and the Board clearly disagreed with Loitherstein Environmental's arguments for classifying groundwater as GW-2 or GW-3, but none of the Board's witnesses, DEP personnel included, testified that they were misled by the RAO Opinion as to what groundwater classification applied if these arguments were rejected. Loitherstein's LSP and engineer witness, Richard J. Hughto, opined more accurately that there was no attempt in this RAO Opinion "to hide anything or slip something by the DEP" and that there was, instead, an attempt, after identifying the site's presence in an approved Zone II area, "to identify a remedial approach that would lead to a Permanent Solution and did not sacrifice public health."²⁹⁹

iii.

I turn next to the Board's charge that Loitherstein did not "define the nature and extent of releases or characterize adequately the risks that these releases posed."

Board witnesses Michael J. Webster and Debra J. Phillips each opined that the RAO Opinion for 73 Jeffrey Avenue did not meet the standards for an RAO Opinion.³⁰⁰ Webster furnished a more robust explanation, with which Phillips appeared to concur. I focus upon Webster's testimony, consequently.

(1) As he did with respect to the DPS opinions for the Brighton, Natick and Newton sites,

²⁹⁹/ Hughto PFT, at 19.

³⁰⁰/ Phillips PFT, at 5-6.

Webster criticized the 73 Jeffrey Avenue RAO Opinion for its brevity (“only four pages long”).³⁰¹ As is the case for DPS Opinions, there is no page-length requirement for an RAO Opinion. In addition (as was also the case with the three DPS Opinions at issue), the page-length criticism does not take into account the figures, tables, data or other attachments that the filing included, which brings the number of pages comprising the RAO Opinion to 69. The criticism also ignores Loitherstein Environmental’s 238-page 1996 Phase I Report (see above, at 92-97), which presented site information, including groundwater flow direction, depth to bedrock and groundwater, and other information material to risk assessment on which the RAO Opinion built. The Phase I Report was filed with DEP. It was (or should have been) part of the file for this disposal site or for its RTN tracking number, and should have been available, therefore, for review by DEP staff and, as well, by other professionals dealing with this site when they reviewed the RAO Opinion. More to the point, however, neither 310 CMR 40.0000 nor the Board’s regulations required that Loitherstein Environmental’s RAO Opinion include a copy of the Phase I Report or repeat the information that the Phase I Report presented. Nor do they provide that the Phase I Report cannot or should not be considered as part of the RAO Opinion’s informational base when the RAO Opinion’s sufficiency is considered. I note that a Phase I initial site investigation report such as Loitherstein Environmental prepared was required by the regulations, see 310 CMR 40.0481, and therefore cannot be simply overlooked or discounted in evaluating the RAO Opinion. It is part of the LSP’s reporting on response actions and their outcome, including the assessment of remaining risk, and the reporting “package” should be evaluated as a whole. The Board has cited no regulatory provision or written policy contraindicating this approach to RAO Opinion evaluation, and I have found none.

³⁰¹/ Webster PFT, at 23.

(2) Webster also faulted the RAO Opinion for not including “sufficient information to characterize a chlorinated solvent release,” particularly the potential for the heavier phase of chlorinated solvents— dense non-aqueous phase liquid (DNAPL)—to migrate vertically downward until it reached an impervious surface such as bedrock.³⁰² It was his opinion that deeper wells should have been drilled “to evaluate whether the magnitude of the solvent release was sufficient to create DNAPL conditions.”³⁰³ He faulted Loitherstein for not drilling deeper wells at the site and for not developing “a conceptual site model to explain the choice of locations for the monitoring wells on the site or their depth.”³⁰⁴ Webster did not explain what he meant by a “conceptual site model,” but whatever he meant, he cited no regulation requiring that an LSP develop a “conceptual site model” and neither did the Board. Nor is it clear that deeper wells could have been drilled in view of the extent and depth of bedrock that was encountered beneath and around the building at 73 Jeffrey Avenue during the emplacement of groundwater monitoring wells (see above, at 94). Webster did not mention this data in his testimony. Webster also did not address the seismic refraction survey conducted by Weston Geophysical Corporation at Loitherstein Environmental’s request in May 1996, including seismic survey data included in the Phase I report that appeared to show no “pockets in the bedrock where the DNAPL could accumulate” (see above, at 93-94).

(3) Webster also criticized Loitherstein for not determining groundwater flow direction at the site or including “site-specific ground water elevation data,” and opined that “[w]ithout knowing the

³⁰²/ Id.

³⁰³/ Id. Loitherstein Environmental’s 1996 Phase I Report for 73 Jeffrey Avenue (Board Exh. B-3) noted the tendency of the VOCs detected to sink (because their specific gravity exceeds that of water), but it reported lower VOC concentrations, and no DNAPL, in any of the on-site monitoring wells.

³⁰⁴/ Id.

direction ground water was moving at the site, it was not possible to know whether the existing monitoring wells were sufficient to evaluate possible impacts to the potential receptors that could be affected by the contamination” or to “document that the extent of ground water impacts had been determined.”³⁰⁵ This criticism overlooks the 1996 Phase I Report for 73 Jeffrey Avenue, which stated the direction of groundwater flow (southerly) based upon site-specific data—depth to groundwater and groundwater elevation in monitoring wells that the Phase I Report presented (see above, at 94). Neither the witness nor the Board cited a requirement that groundwater flow direction and related data presented in a Phase I Report must be repeated in the RAO Opinion, or that the RAO Opinion must include a copy of the Phase I Report. In addition, neither Webster nor any other Board witness asserted that groundwater flowed in a different direction. In contrast, the 1996 Whitman & Howard Report (Board Exh. B-31) corroborates southerly groundwater flow in the aquifer within which the site is located based upon water table contours and “unhindered flow between surface water and groundwater in most areas” within this aquifer.³⁰⁶

(4) Webster also faulted the number of groundwater wells monitored, and the number of monitoring samples, as insufficient to establish groundwater quality or levels of chlorinated solvent contamination in groundwater.³⁰⁷ Data from “only three wells from one monitoring event” was included in the RAO Opinion, Webster testified, and in addition, the RAO Opinion lacked “historical data from other wells on the site that were not sampled for the RAO” and it was not even clear that

³⁰⁵/ Webster PFT, at 23-24.

³⁰⁶/ See 1996 Whitman & Howard Report (Board Exh. B-31), at 3-7 and at Fig. 3-6 (following p. 3-7); right-hand map entitled “Bogastow Brook Aquifer.”

³⁰⁷/ Webster PFT, at 24.

the existing wells “were placed in the right locations to determine the nature and extent of contamination.”³⁰⁸ Webster did not state how many additional groundwater monitoring wells should have been sampled, or where they should have been installed. In view of data in the record regarding flat site topography, distance to bedrock and groundwater, groundwater flow direction, and the elevated levels of VOCs closest to the catch basin, it is not evident that the choice of monitoring well sites was incorrect. There is also no evidence that groundwater monitoring wells were emplaced contrary to accepted LSP practice. Neither Webster nor any of the Board’s other witnesses testified that there was a standard of practice among LSPs at the time in question as to the number and location of groundwater monitoring wells at a site. Nor did they identify any established standard by which one could determine whether the number or location of Loitherstein Environmental’s groundwater monitoring well numbers, or the frequency of their sampling, could be evaluated.

Webster’s criticisms are not credible. I note that although Weston & Sampson installed additional groundwater monitoring wells outside the building at 73 Jeffrey Avenue in 2000, its sampling of these and existing monitoring wells at the site showed contaminant levels similar to what was detected previously, with the exception of much higher VOC concentrations in a new well (WS-103B) installed 40 feet south of the building near Jeffrey Avenue (see above, at 123-24). Weston & Sampson drew no conclusions about the origin of these concentrations, and Webster testified (in addressing Loitherstein Environmental’s RAO Opinion for another site, 262 Sawyer Lane in Hudson) that “one round of groundwater sampling is not generally sufficient to demonstrate the range of ground water quality conditions that can be present at a release.”³⁰⁹ Nonetheless, Webster found the

³⁰⁸/ Id.

³⁰⁹/ See Webster PFT, at 27.

Weston & Sampson results from the sampling of a single monitoring well (WS-103B, forty feet south of the building, near Jeffrey Avenue) on one day (October 30, 2000) a sufficient basis for concluding that “Mr. Loitherstein’s RAO did not sufficiently characterize the magnitude and extent of contamination at the site.”³¹⁰ This contradicted his own criticism of conclusions drawn from data collected at “only three wells” during “one monitoring event” and without historical data or proof that the number of monitoring wells sampled was sufficient. In addition, there is no evidence in the record that the VOCs detected by Weston & Sampson at monitoring well WS-103B in October 2000, near Jeffrey Avenue, were actually present at the site in 1996 or 1998, when Loitherstein Environmental conducted groundwater monitoring sampling. Nor is there any evidence in the record ruling out an offsite origin for these VOCs. An offsite origin was not beyond possibility; not only was monitoring well WS-103B close to the street, but other environmental consultants had suggested that the property across the street might be the source of contamination at 73 Jeffrey Avenue (IEP in 1986; see above, at 91) or disputed this origin, without resolving the issue (ERM in 1995; see above, at 91).

Webster also faulted, as inadequate, Loitherstein’s identification of the former catch basin as the source of chlorinated solvent contamination at the site, asserting that he failed to present information regarding when and how the structure was used or what types and quantities of solvents were released there.³¹¹ This information was presented, however, in the 1996 Phase I Report. It was not readily available firsthand to Loitherstein Environmental, because its involvement followed the departure of the site’s long-time industrial tenant, Corion Corporation. Loitherstein Environmental obtained what information it could second-hand, from the site owner, and learned that Corion had

³¹⁰/ Id., at 25-26.

³¹¹/ Id., at 24-25.

“used heated acetone, methanol, and 1,1,1-TCA (trichloroethane, one of the VOCs detected in groundwater samples at the site) in shallow trays to clean lenses after grinding” and that, according to the owner, “approximately 80 percent of the heated cleaning solvents were evaporated by this method” and the remainder “may have been discarded to the leaching catch basin in the former loading dock area, which is now under the building.”³¹² The owner estimated Corion’s use of these solvents as amounting to “not more than one 55-gallon drum per year.”³¹³ He also recalled that after January 1984, Corion converted to a closed system in which “all spent solvents were recirculated and collected in drums for collection and off-Site disposal by licensed contractors.”³¹⁴ The Phase I Report also stated that Loitherstein Environmental had reviewed IEP’s 1991 assessment (see above, at 90) which presented additional information on Corion’s use and storage of hazardous materials at the site.³¹⁵ Contrary to Webster’s assertion, the catch basin was discussed in both the Phase I Report and the RAO Opinion, and the Phase I Report presented information regarding the structure’s use and what types and quantities of solvents were released to it.

Both sides devoted substantial effort to defending (in Loitherstein’s case) and attacking (in the Board’s case, including via Webster’s testimony) the RAO Opinion’s arguments for treating 73 Jeffrey Avenue as being outside a Zone II, including testimony and exhibits regarding water particle

³¹²/ Loitherstein Environmental Phase I Report for 73 Jeffrey Avenue (Board Exh. B-33); narrative report, at 4-5.

³¹³/ Id., at 5, top para.

³¹⁴/ Id.,

³¹⁵/ Id., at 3, top para., and at 4, next-to-last para.

flow at the site under the Whitman & Howard model.³¹⁶ Whether the site should be reclassified as outside the Zone II cannot be determined here, and neither could reclassification be sought via an RAO Opinion, if indeed Loitherstein Environmental attempted to do so.

In view of Loitherstein's unsuccessful attempts to reduce VOC concentrations further after sealing the catch basin, and to resolve with DEP what type of filing was appropriate under these circumstances, the RAO Opinion is read reasonably not as an attempt to reclassify groundwater at the site but to quantify risk. The RAO Opinion focused unnecessarily upon whether remediation efforts at the site had achieved a condition of "no significant risk," as defined at 310 CMR 40.0973(7). That is not a predicate for filing an RAO Opinion or even, more specifically, a Class A-2 RAO Opinion; the required predicate is, instead, the achievement of a "permanent solution," as defined at 310 CMR 40.006, which is not the same as achieving a current condition of "no significant risk" (see above, at 106-107), and which may be, instead, a condition expected to occur in the future.

That was the case here. The Loitherstein Environmental RAO Opinion showed that there had been achieved a permanent solution in the predictive sense, consistent with the regulatory definition—that with the control measures implemented, no substance of concern "will present a significant risk of damage to health, safety, public welfare or the environment during any foreseeable time." 310 CMR 40.0006 (emphasis added). This opinion was reasonable in view of what was known about 73 Jeffrey Avenue as of October 1998, when the RAO Opinion was filed. Loitherstein Environmental's attempt to justify the application of GW-2 and GW-3 standards was misplaced, mostly because this approach was not necessary to justify filing a Class A-2 RAO Opinion.

³¹⁶/ See, e.g., (1) for the Board: Webster PFT, at 22, and Cerutti PFT, at 7-13; and (2) for Loitherstein: Schwalbaum PFT, passim. There was extensive cross, re-direct and re-cross of Schwalbaum during the hearing regarding particle flow and tracking and the Whitman & Howard model.

The RAO Opinion showed sufficiently that a “permanent solution” had been reached even though concentrations of some VOCs at several monitoring wells exceeded the standards for GW-1 groundwater when MCP Method 1 was used to assess the remaining risk that these contaminants posed. It noted, among other things, that (1) VOC concentrations in groundwater had been reduced as much as was feasible, (2) the former catch basin that had been identified as the source of VOCs in groundwater had been contained, and (3) the site’s use and location showed minimal potential for human exposure to the VOCs in question. The earlier Phase I Report had also shown a low potential for VOC exposure and had noted the site’s distance from public water supply wells and from upgradient wetlands and potential wildlife habitat. Moreover, although subsequent testing by Weston & Sampson showed highly elevated VOC concentrations in one new monitoring well approximately 40 feet south of the building, there is no evidence that this material had migrated from the catch basin that Loitherstein Environmental contained—particularly since no other monitoring wells at the site showed a change in VOC concentrations—or that it had originated at any other on-site source. It was not the stated objective of the 2000 Weston & Sampson Report to determine the source of this contamination, and it did not purport to do so. Nor is there any evidence in the record showing that the site actually poses a “significant risk of damage to health, safety, public welfare or the environment.”

I find, consequently, that Loitherstein Environmental’s RAO Opinion for 73 Jeffrey Avenue defined adequately “the nature and extent of releases” at the site and characterized adequately the risks that they posed, and that the Board’s charges to the contrary are unproven.

iv.

I conclude that with respect to 73 Jeffrey Avenue in Holliston, Loitherstein:

(1) acted with reasonable care and diligence with regard to the site, as required by 309 CMR 4.02(1);

(2) followed applicable requirements and procedures of M.G.L. c. 21E and 310 CMR 40.0000, as required by 309 CMR 4.03(3)(b); and

(3) collected sufficient data to define the nature and extent of the releases and to adequately characterize the risk that these releases posed, as required by 309 CMR 4.03(3)(c).

2. 19 Hawks Avenue, Hanson

a.

19 Hawks Avenue in Hanson is a 6.8-acre property in this southeastern Massachusetts town, east of Burrage Pond and Great Cedar Swamp. It is bounded on the north by Hawks Avenue (which runs parallel to a rail line), on the east by the intersection of Hawks Avenue and Pleasant Street, on the south by a private way extending southward from Pleasant Street (Arthur Drive), and on the west by properties owned by LiteControl Corporation, including a vacant field immediately west of 19 Hawks Avenue and, immediately to the west of the field, a larger parcel at which LiteControl manufactures lighting systems.³¹⁷ See Appendix, Sketch 5. Groundwater flow direction in this area

³¹⁷/ Board Exh. B-21: “Phase I Environmental Site Assessment of 19 Hawks Avenue, Hanson, Massachusetts, RTN 4-10516,” dated May 25, 1995 (“Loitherstein Environmental RAO Opinion for 19 Hawks Avenue “); narrative report, at 6, part 3.13 (“Abutters”), and Appendix A, Fig. 1 (“Site Locus”), and Fig. 2 (“Monitoring Well Location Plan,” dated May 23, 1995). As noted below, this report was filed as an RAO Opinion.

is southward.³¹⁸ Two town water supply wells are located over a mile from the site to the northwest, at the intersection of Franklin Street and Main Street (Route 27).³¹⁹

Hanson is within a cranberry-growing region. At the time in question (May 1995), Northland Cranberries, Inc. processed cranberries at 19 Hawks Avenue, and there were cranberry bogs within a half-mile radius of 19 Hawks Avenue, both to the east (beyond the Hawks Avenue-Pleasant Street intersection and the railroad line, and adjacent to a reservoir) and to the west, close to Burrage Pond.³²⁰ An L-shaped main building along Hawks Avenue (the site's northern side) housed a maintenance garage, office, pesticide storage room, parts storage rooms, grading room and scale room. Behind this main building (to the south) was a larger warehouse building that included a freezer and refrigerated storage area, a cranberry washing and freezing area, and, on the building's eastern side (proceeding from north to south), a loading dock, a pad-mounted transformer, berry pits, and an outside paved area.³²¹ A truck scale was located approximately 85 feet east of the loading dock.³²²

³¹⁸/ Loitherstein Environmental RAO Opinion for 19 Hawks Avenue (Board Exh. B-21); narrative report, at 6, part 3.14 ("Groundwater Flow").

³¹⁹/ Id., at Appendix C: Site Profile Report, Project No. 93026, United Cape Cod Cranberry Company, Hawks Avenue, Hanson, MA, prepared by K.F. Reddy Environmental Research, Inc. for Loitherstein Environmental Engineering, dated July 13, 1993 ("1993 Reddy Site Profile Report"), at 8, part 3.6. See also Loitherstein PFT, at 24 (giving the distance from the site to the town water supply wells as approximately 1.2 miles to the northwest).

³²⁰/ Id.; narrative report, at 1, Part 1 ("Executive Summary"), and at Appendix A, Fig. 1 ("Site Locus"), which includes a portion of a topographic map showing the 19 Hawks Avenue site and the surrounding area.

³²¹/ Id.; narrative report, at 1, part 1.00 ("Executive Summary"); see also Appendix A, Fig. 2 (monitoring well location map).

³²²/ Id.; Appendix A, Fig. 2 (monitoring well location map).

19 Hawks Avenue came within the Massachusetts Contingency Plan's purview because fuels stored at the site leaked, contaminated surrounding soil, were detected in groundwater, and required remediation and risk assessment. In the early 1990s, an underground 4,000-gallon gasoline storage tank and an underground 500-gallon diesel fuel tank were located in an area roughly 15-30 feet east of the loading dock, as were an above-ground propane tank and two above-ground fuel fill pumps.³²³ A third underground storage tank with a 12,000-gallon capacity, used to store No. 2 fuel oil, occupied a roughly 30-foot footprint beneath the loading dock and the adjacent warehouse.³²⁴

Three groundwater monitoring wells (MW-1, MW-2 and MW-3) were installed in the vicinity of these tanks and the loading dock in February 1990 by Certified Engineering, a firm that performed a site assessment for a potential buyer.³²⁵ Sampling at these monitoring wells indicated that one or more of the underground storage tanks were leaking,³²⁶ a situation that was confirmed by testing performed in March 1990 by another firm (Leak Detection Systems, Inc.).³²⁷ Four additional groundwater monitoring wells (MW-4, MW-5, MW-6 and MW-7) were installed by GeoSearch, Inc. in June 1990, east and south of the underground storage tanks, and another (MW-8) was installed near the northwestern corner of the main building along Hawks Avenue.³²⁸ DMC Environmental, Inc.

³²³/ Id. These two tanks were installed in the mid-1970s. Id., at Appendix C: 1993 Reddy Site Profile Report, at 6, part 3.2.

³²⁴/ Id.; narrative report, at 4, part 3.11 ("Site Grounds").

³²⁵/ Id., at 1, part 1.00 ("Executive Summary"), and at 8, part 4.00 ("Subsurface Exploration and Conditions").

³²⁶/ Id. at 1, part 1.00 ("Executive Summary").

³²⁷/ Id.

³²⁸/ Id., at 8, part 4.00 ("Subsurface Explorations and Conditions").

excavated the underground storage tank area in August 1990 and determined that the leak was from a fitting on a discharge pipe leading from the gasoline storage tank to a fuel supply pump.³²⁹ Under the supervision of Joel Loitherstein, who was then working for DMC Environmental, the fitting was removed and approximately 15 tons of surrounding soil were excavated and transported offsite for recycling.³³⁰

Groundwater monitoring well sampling in June 1992 showed that petroleum hydrocarbon and volatile organic compound concentrations in groundwater were decreasing.³³¹ Nonetheless, on May 24, 1994 the underground gasoline and diesel storage tanks were removed, and the underground No. 2 fuel oil storage tank beneath the loading dock and warehouse, which could not be removed, was cut open, drained of approximately 2,600 gallons of “waste petroleum/combustible liquid,” and filled with a concrete slurry.³³² Approximately 250 cubic yards of contaminated soil in the vicinity of the tank beneath the loading dock and warehouse were removed and transported off-site for recycling.³³³ Loitherstein Environmental reported the discovery of contaminated soil to DEP, which approved an “Immediate Response Action Plan” to excavate and recycle the oil-contaminated soil.³³⁴

³²⁹/ Id.

³³⁰/ Id.

³³¹/ Id., at 1, part 1.00 (“Executive Summary”).

³³²/ Id.; at 1, part 1.00 (“Executive Summary”); at 4, part 3.11 (“Site Grounds”); and at 9, part 4.40 (“Underground Storage Tank Removal and Immediate Response Action Plan”).

³³³/ Id., at 12, part 7.00 (“Summary of Conclusions and Recommendations”).

³³⁴/ Id., at 2, part 1.00 (“Executive Summary”). See also Board Exh. B-22: DEP Notice of Audit Findings/Notice of Noncompliance re: Hanson-BWSC/ASM-4-10516/4-1056, United Cape Cod Cranberry, 19 Hawks Avenue, NON-SE-96-3A-011, dated April 16, 1996 (“DEP Notice of Audit Findings—19 Hawks Avenue”); Attachment A (“Site Memorandum”), at A2.

b.

Sampling of the contaminated soil remaining below the loading dock and the warehouse on May 24, 1994 showed petroleum hydrocarbon concentrations that exceeded the 500 ug/g concentration limit for this substance in category S-1 soils.³³⁵ See 310 CMR 40.0975(6)(a) (Table 2: MCP Method 1: Soil Category S-1 Standards.³³⁶ S-1 soils have the highest potential for child and adult exposure. See 310 CMR 40.0933(2) and 40.0933(5); see also above, at 100-101 (discussion of soil classification under MCP Method 1 risk characterization). Moreover, petroleum hydrocarbon concentrations “did not appear to be decreasing with additional excavation under the loading dock....”³³⁷

Sampling on July 21, 1994 at newly-installed groundwater monitoring well MW-101 (located approximately 15 feet east of the loading dock, where the removed underground gasoline storage tank had been located³³⁸) showed “PHCs (petroleum hydrocarbons), benzene, toluene, and naphthalene...at concentrations which exceeded their respective GW-1 cleanup concentrations.”³³⁹ The exceeded

³³⁵/ Loitherstein Environmental RAO Opinion for 19 Hawks Avenue (Board Exh. B-21); narrative report, at 2, part 1.00 (“Executive Summary”)

³³⁶/ 310 CMR 40.0975(6)(a), Table 2, expresses the soil category S-1 standards in ug/g; Loitherstein Environmental’s RAO Opinion expressed the concentration of petroleum hydrocarbon in soil in mg/kg, which is equivalent. See above, at 114, Table 1, note (2).

³³⁷/ Loitherstein Environmental RAO Opinion for 19 Hawks Avenue (Board Exh. B-21); narrative report, at 10, part 4.40 (“Underground Storage Tank Removal and Immediate Response Action Plan”).

³³⁸/ Id., at 8, part 4.00 (“Subsurface Explorations and Conditions”).

³³⁹/ Id., at 12, part 7.00 (“Summary of Conclusions and Recommendations”). Samples were also taken on July 21, 1994 from groundwater monitoring wells MW-2, MW-3 and MW-7, in the vicinity of the loading dock and east of it. Id., at 9, part 4.20 (“Monitoring Well Installation and Groundwater Sampling”). Sampling results are shown below, at 143, Table 3.

“cleanup concentrations” were maximum concentrations of oil and/or hazardous materials in groundwater within areas associated with public or private water supplies above which these substances are considered to pose a risk to health, safety and the environment. See 310 CMR 40.0932(4)(a)-(f) (applicability of GW-1 classification), and 310 CMR 40.0974(2), Table 1 (MCP Method 1 groundwater standards). The GW-1 standards applied if groundwater in the area of this monitoring well was within the boundary of a DEP-approved Zone II—the area that contributes water to a well. See 310 CMR 40.0006 (Definition of “Zone II”).

Several other monitoring wells were sampled on the same date. No VOCs or petroleum hydrocarbons were detected in monitoring well MW-3, adjacent to the northeastern corner of the loading dock. At monitoring well MW-2, roughly 15 feet diagonally southeast of the loading dock, sampling showed a benzene concentration above the standard for groundwater classified as GW-1 but below that for GW-2 groundwater. No other VOCs, and no petroleum hydrocarbons, were detected in this monitoring well. At monitoring well MW-7, east of the site of the removed underground gasoline and diesel storage tanks and near the truck scales, benzene concentrations in the samples also exceeded the GW-1 standard for this VOC (but not the GW-2 standard), and other detected concentrations of VOCs were below both GW-1 and GW-2 standards. Petroleum hydrocarbons were not detected in monitoring well GW-7.

Table 3 below shows the concentrations of total petroleum hydrocarbons and VOCs that Loitherstein Environmental detected via sampling on July 21, 1994, and compares them with standards for oil and hazardous material in groundwater classified as GW-1 and GW-2 that apply where MCP Method 1 is used to assess risk and, as well, with upper concentration limits for these substances if Method 3 is used.

Table 3

Results for VOCs and Total Petroleum Hydrocarbons in Groundwater Samples at Monitoring Wells at 19 Hawks Avenue, Hanson, MA Compared to Various Groundwater-Related Standards for MCP Method 1 and Upper Concentration Limits for MCP Method 3

<i>VOC (ug/l)</i>	Result from sample at monitoring well #					Groundwater-related std or limit		
	<i>MW-1</i>	<i>MW-2</i>	<i>MW-3</i>	<i>MW-7</i>	<i>MW-101</i>	Method 1	Method 3	<i>any ground water category</i>
Benzene	N/S	74	ND	260	1,700	5	2,000	100,000
Toluene	N/S	ND	ND	ND	1,300	1,000	6,000	NG
Ethylbenzene	N/S	ND	ND	190	190	700	30,000	100,000
Methyl tert-Butyl Ether (MTBE)	N/S	ND	ND	95	ND	700	50,000	100,000
Xylenes	N/S	ND	ND	ND	1,950	10,000	6,000	100,000
Chlorobenzene	N/S	ND	ND	6	ND	100	1,000	10,000
Naphthalene	N/S	ND	ND	ND	230	20	6,000	20,000
1,2,4-Trimethylbenzene	N/S	ND	ND	ND	270	NG	NG	NG
Total Petroleum Hydrocarbon (TPH)	N/S	ND	ND	ND	4,300	1,000	NG	100,000

Notes:

1. Groundwater sample location concentrations are from Loitherstein Environmental RAO Opinion for 19 Hawks Avenue (Board Exh. B-21); Table 4 (upper table entitled "Summary of Analytical Results in Groundwater From 19 Hawks Avenue, Hanson, Massachusetts"). All samples were taken on July 21, 1994. Concentrations are given in both the regulations and RAO Opinion Table 4 as ug/l (micrograms per liter).

2. MCP Method 1 Groundwater Standards (in gray-shading) are from 310 CMR 40.0974(2), Table 1 (1995 rev.). MCP Method 3 Upper Concentration Limits (in right-hand column) are from 310 CMR 40.0996(5), Table 6 (1995 rev.).

3. NS = not sampled;

ND = not detected in the sample;

NG = not given (neither 310 CMR 40.0974(2), Table 1, nor 310 CMR 40.0996(5), Table 6, as applicable, includes a standard or an upper concentration limit for this substance).

c.

Excavating the remaining contaminated soil proved infeasible when it was attempted on August 29, 1994, because this work threatened to undermine the loading dock and the warehouse and cause them to sustain structural damage.³⁴⁰ As a result, there remained a “concentration of PHCs (petroleum hydrocarbons) in surface soils [that] exceed[ed] the S-1 cleanup concentrations in the area within the immediate vicinity of and under the loading dock” where the concrete-filled tank was located.³⁴¹

For this reason, Loitherstein Environmental placed an Activity and Use Limitation (AUL) on the loading dock area.³⁴² An AUL is used to give notice of the existence and location of oil and/or hazardous materials at a property comprising all or part of a disposal site, and to limit site use or activities so as to minimize exposure to these substances. See 310 CMR 40.1012.³⁴³ One of the circumstances mandating the use of an AUL occurs when:

...a Response Action Outcome and the risk characterization pursuant to 310 CMF 40.0900 used to support the RAO Opinion are based upon the restriction or limitation of Site Activities and Uses to achieve or maintain a level of No Significant Risk including:

1. Any disposal site or portion of a disposal site for which a Response Action

³⁴⁰/ Id., at 2, part 1.00 (“Executive Summary”), at 10, part 4.40 (“Underground Storage Tank Removal and Immediate Response Action Plan”), and at 12, part 7.00 (“Summary of Conclusions and Recommendations”).

³⁴¹/ Id.; cover letter dated May 24, 1995, at 2, first full para.

³⁴²/ Id.; see also Appendix F for a copy of the AUL and Loitherstein Environmental’s supporting opinion.

³⁴³/ An Activity and Use Limitation may be in the form of a recorded “grant of environmental restriction” or (as was the case with 19 Hawks Avenue) a recorded notice. 310 CMR 40.0006 (definition of “activity and use limitation”). The regulations prescribe a form for a notice of activity and use limitation at 310 CMR 40.1099, Form 1075. The form includes a supporting opinion by a licensed site professional.

Outcome is based upon MCP Method 1 or 2 Soil Standards and the Exposure Point Concentrations of oil and/or hazardous material exceed the S-1 standards but meet applicable S-2 or S-3 standards...

310 CMR 40.1012(1).

Loitherstein Environmental's AUL, dated May 1, 1995:

- (1) described a release of fuel oil in the vicinity of and under the loading dock;
- (2) identified activities at the loading dock or in its vicinity that “may result in a significant risk of harm to health, safety, public welfare or the environment” as child care, recreation, crop growing and residential use;
- (3) identified permitted activities at the loading dock or in its vicinity that would allow a condition of no significant risk to exist for any foreseeable time as (a) industrial and commercial uses and activities that were necessary or incidental to them, (b) any other non-residential, non-recreational or non-agricultural uses allowed under the local zoning bylaw, and (c) any activities that, in the LSP's opinion, would present no greater risk of harm to health, safety, public welfare or the environment than would the specified, allowed uses; and
- (4) stated that maintaining a condition of no significant risk required the use and maintenance of “impervious material placed over the area where underground storage tanks were removed...”³⁴⁴

Loitherstein Environmental's accompanying LSP opinion (dated April 18, 1995) stated that “once the AUL is in place a level of control will have been achieved for this area such that ‘no substance of concern will present a significant risk of damage to health, safety, public welfare, or the environment during any foreseeable period of time,’ in accordance with 310 CMR 40.0006.” The opinion also stated that:

Therefore, even though there are no further abatement or remediation measures to implement, it is our opinion that a response action outcome has been achieved for the Site and remediation is not necessary. It is also our opinion that the apparent source(s) of the PHCs (petroleum hydrocarbons)—on-Site oil tanks—have been removed and a Category A-3

³⁴⁴/ Loitherstein Environmental RAO Opinion for 19 Hawks Avenue (Board Exh. B-21), at Appendix F; Notice of Activity and Use Limitation, at 1-2.

Response Action Outcome applies to this parcel.³⁴⁵

Loitherstein Environmental also prepared a “Phase I Environmental Site Assessment” for 19 Hawks Avenue, dated May 21, 1995, expressing the same opinion. The Phase I Assessment was filed with DEP as a Class A-3 RAO Opinion on June 28, 1995.

A Class A-3 RAO Opinion may be filed where:

(a) a Permanent Solution³⁴⁶ has been achieved, (b) the level of oil and hazardous material in the environment has not been reduced to background; and (c) one or more Activity and Use Limitations have been implemented pursuant to 310 CMR 40.1012 to maintain a level of No Significant Risk.

310 CMR 40.1036(3). Loitherstein Environmental determined that the prerequisites for filing a Class A-3 RAO Opinion had been met because:

- (1) the apparent source of soil contamination by petroleum hydrocarbons—the on-site fuel tanks—had been removed or rendered inoperative;
- (2) the concentration of petroleum hydrocarbons in the remaining contaminated soil beneath the loading dock and adjacent portion of the warehouse exceeded standards for S-1 soils;
- (3) there were no further abatement or remediation measures to implement, because excavating the remaining contaminated soils would undermine and cause structural damage to the loading dock and warehouse; and
- (4) placing the activity and use limitation on the loading dock area achieved a level of control such that no substance of concern would present a significant risk of damage to health, safety, public welfare or the environment during any foreseeable period of time.³⁴⁷

³⁴⁵/ Id.; LSP opinion accompanying Notice of Activity and Use Limitation, dated April 18, 1995, at 2.

³⁴⁶/ A “permanent solution” occurs when measures are implemented that “will...ensure attainment” of a level of control of the oil or hazardous substances in question such that none of them “will present” a “significant risk of damage to health, safety, public welfare, or the environment during any foreseeable period of time.” See 310 CMR 40.0006, discussed above at 105-06.

³⁴⁷/ Loitherstein Environmental RAO Opinion for 19 Hawks Avenue (Board Exh. B-21); cover letter, at 2; narrative report, at 13, part 7.00 (“Summary of Conclusions and Recommendations”).

In its “summary of conclusions and recommendations,” the RAO Opinion repeated that concentrations of petroleum hydrocarbons, benzene, toluene and naphthalene detected in monitoring well MW-101 in July 1994 exceeded their respective GW-1 standards.³⁴⁸ However, Loitherstein Environmental opined that groundwater remediation to reduce concentrations of petroleum hydrocarbons and VOCs to “background” was “neither practical nor cost effective.”³⁴⁹ It gave several reasons for this opinion. One was that the source of petroleum hydrocarbons in groundwater, as detected in monitoring well MW-101, “appeared to be from historical leakage from one or more of the fuel tanks that had been removed or rendered inoperative.”³⁵⁰ In addition, the historic use of the site vicinity was “as an industrial area,” and “there are not any private or public drinking water supplies within one mile of the Site.”³⁵¹

Loitherstein Environmental gave another reason for opining that groundwater remediation was neither practical nor necessary—one that ultimately generated the Board’s charges regarding the RAO Opinion for 19 Hawks Avenue. Starting with the word “furthermore,” the RAO Opinion stated that the site “appear[ed] to be mapped in [a] DEP Zone II, Priority Productive Aquifer” because it was “located within one hundred feet of a medium yield non-productive aquifer mapped to the south, and within two hundred feet of a low yield aquifer to the north,” but the area in the vicinity of the loading dock appeared to be “in the non-productive aquifer.”³⁵² It therefore opined that groundwater in the

³⁴⁸/ Id.; narrative report, at 12, part 7.00 (“Summary of Conclusions and Recommendations”).

³⁴⁹/ Id., at 13.

³⁵⁰/ Id.; cover letter, at 1.

³⁵¹/ Id.; narrative report, at 13, part 7.00 (“Summary of Conclusions and Recommendations”).

³⁵²/ Id., at 2, part 1.00 (“Executive Summary”), next-to-last para.

vicinity of the loading dock was classified as GW-2.³⁵³ Although the concentrations of petroleum hydrocarbons, benzene, toluene and naphthalene detected in monitoring well MW-101 exceeded GW-1 standards, they were below GW-2 standards (see above, at 143, Table 3).³⁵⁴

d.

On April 16, 1996, DEP issued a notice of audit findings and notice of noncompliance to Northland Cranberries, Inc. regarding 19 Hawks Avenue and the Class A-3 RAO Opinion that Loitherstein Environmental had filed. DEP questioned the “opinion that a Class A-3 RAO Opinion has been achieved because:

(1) “groundwater was incorrectly classified as GW-2 rather than GW-1;” and

(2) it was “not demonstrated that a permanent solution has been achieved since volatile organic compound (VOC) and Total Petroleum Hydrocarbon (TPH) levels in groundwater (up to approximately 1,700 ug/L benzene and 4,300 ug/L TPH) at the site exceed GW-1 Method I Risk Characterization Standards.” As “the GW-1 Standards for benzene and TPH are 5 ug/L and 1,000 ug/L, respectively,” it was “not demonstrated that a level of no significant risk has been achieved at the site as required for a Class A RAO.”³⁵⁵

The notice directed that the site owner (a) “[s]ubmit the necessary documentation which demonstrates that GW-1 Standards have been met to support the existing RAO opinion...”, or (b) “[s]ubmit a revised RAO opinion” for the site “that complies with the requirements of the MCP...”, or c) “[r]etract the existing RAO Statement,” file a completion report for the immediate response action that DEP approved as to the fuel line leakage that occurred, and was reported, in May 1994

³⁵³/ Id.

³⁵⁴/ Id. Loitherstein Environmental also opined that the concentrations of VOCs and petroleum hydrocarbons in the remainder of the site met GW-1 standards. Id.

³⁵⁵/ DEP Notice of Audit Findings-19 Hawks Avenue” (Board Exh. B-22); Attachment B - Noncompliance Summary, at B1, para. 1.

(see above, at 140), and submit a new LSP opinion by August 2, 1997.³⁵⁶

A handwritten notation on the RAO Opinion states “RETRACTED on 6/14/96,” indicating the alternative that the site owner elected. The record does not show, however, whether a new RAO Opinion was filed for the site or, if it was, whether it shows that any further remedial action was required at the site to achieve a permanent solution.

e.

In its amended proposed order, the Board charged that Loitherstein “did not identify that groundwater at 19 Hawks Avenue in Hanson should have been classified as GW-1.”³⁵⁷ It alleged that this omission comprised the following violations of its Rules of Professional Conduct for LSPs:

(1) failure to act with reasonable care and diligence with regard to the site, in violation of 309 CMR 4.02(1); and

(2) failure to follow applicable requirements and procedures of M.G.L. c. 21E and 310 CMR 40.0000, in violation of 309 CMR 4.03(3)(b).³⁵⁸

The Board’s witnesses contended that Loitherstein not only misclassified groundwater within the area in question as GW-2 but, as well, attempted to “reclassify” GW-1 groundwater within a Zone II as GW-2 groundwater, contrary to the regulations which did not allow him to do this even if he believed that the site was in the vicinity of non-productive or low-yield aquifers.³⁵⁹ This resulted in an underestimate of the risk that contaminants at the site posed to drinking water supplies, even though available information showed that the site was within a Zone II, that groundwater should have

³⁵⁶/ Id., at B2.

³⁵⁷/ Amended Proposed Order, at 16; Findings of Noncompliance, item I.ii.

³⁵⁸/ Id., at 16-17, items I.ii, and II.

³⁵⁹/ See, e.g., Webster PFT, at 19-21; Phillips PFT, at 3.

been classified as GW-1, and that concentrations of volatile organic compounds and petroleum hydrocarbons in groundwater exceeded GW-1 standards.³⁶⁰

i.

I turn first to the Board's charge that Loitherstein "did not identify that groundwater at 19 Hawks Avenue in Hanson should have been classified as GW-1." As worded, the Board's charge is that Loitherstein did not do so at all. That charge cannot be sustained. Loitherstein Environmental's RAO Opinion stated that with the exception of the loading dock area, the site was within a Zone II (which made GW-1 groundwater standards applicable); in addition, although the RAO Opinion compared concentrations of oil and hazardous materials detected in the loading dock area with GW-2 groundwater standards, it also stated that the concentrations of petroleum hydrocarbons and VOCs in monitoring well MW-101 were above GW-1 groundwater standards (see above, at 147).

ii.

I turn next to the alleged "reclassification" of groundwater, which implies an intentional act contrary to unambiguous fact—what the Board and its witnesses characterized as the entire site's clear location within a Zone II according to maps available in 1995. Although Loitherstein admitted, in retrospect (and with the benefit of currently-available maps), that the entire site was within the Zone II boundary, he admitted only an error in this regard and not an intentional effort to modify the Zone II boundary in the vicinity of the loading dock or to reclassify groundwater in that area as GW-2. The Board proved no such intent and the evidence reveals, instead, an erroneous groundwater classification based upon a map interpretation error and, as well, at least some ambiguity as to

³⁶⁰/ Webster PFT, at 20; Phillips PFT, at 3.

whether this part of the site was indeed within the Zone II boundary.

Loitherstein testified that “maps available at the time” (meaning in May 1995, when the RAO Opinion for 19 Hawks Avenue was prepared) “appeared to show that the disposal site, specifically the area of the USTs (underground storage tanks), is not located within the Zone II.”³⁶¹

One of these maps was obtained from the Hanson Water Department.³⁶² No copy of this map appears in the RAO Opinion for 19 Hawks Avenue. During the hearing, the Board introduced a copy of a Hanson Water Department map prepared by Camp, Dresser & McKee during a November 1991 study,³⁶³ which shows the location of a well south of the site, near the southern end of Pleasant Street and the southern end of Great Cedar Swamp (near the northern shore of Monponsett Pond), the well’s Zone I (a circular area immediately adjacent to the well), and the well’s extensive Zone II. The northern boundary of this Zone II appears on this map to run along the northeastern side of the Pleasant Street-Hawks Avenue intersection, across the intersection from 19 Hawks Avenue. On this map, therefore, the site appears to be entirely within the Zone II boundary.

The second map that Loitherstein identified in his testimony was obtained from a commercial database search company (Environmental FirstSearch), a copy of which was included in the RAO Opinion for 19 Hawks Avenue.³⁶⁴ This map identifies its data source as “Massachusetts Geographic Information Systems,” also known as MassGIS. It shows the Zone II in question as a diagonally-

³⁶¹/ Loitherstein PFT, at 25.

³⁶²/ Id.

³⁶³/ Hearing Exh. B-50 (marked for identification only on Oct, 20, 2005).

³⁶⁴/ Loitherstein Environmental RAO Opinion for 19 Hawks Avenue (Board Exh. B-21); Appendix C; copy of Environmental FirstSearch Aquifers Map, 19 Hawks Avenue, Hanson, MA; see also Loitherstein PFT, at 25.

striped area or, more accurately, as several areas of diagonal striping separated by a large area of white indicating, apparently, an area outside the Zone II. This contrasts markedly with the large, continuous Zone II area shown on the Camp, Dresser & McKee map obtained from the Hanson Water Department. The area on the southwestern side of the Hawks Avenue-Pleasant Street intersection, where 19 Hawks Avenue is located, appears to be within one of these diagonally-striped areas. However, the striped area ends a short distance southward along Pleasant Street and then turns to the southwest. It is not clear whether 19 Hawks Avenue is entirely within the diagonally-striped area this map shows or, thus, whether it is within the Zone II that the diagonally-striped area represents. The map does not show property boundaries, and although the original was scaled, I cannot tell (and the record does not clarify) whether photocopying has changed the map's size and rendered the scale inaccurate. The Environmental FirstSearch map does not clearly show the loading dock and the areas east of it (including the location of the removed underground storage tanks) to be within the Zone II, consequently.

Loitherstein ascribed the classification of groundwater in the loading dock area as GW-2 to a measurement error made by an associate (Jeffrey M. Lingham, a geologist who co-signed the RAO Opinion) when he attempted to correlate the scales of these maps with the location of the disposal area (the loading dock and areas of the site east of it) and ended up placing them slightly outside the Zone II boundary, when in fact they are approximately 50 feet inside the Zone II.³⁶⁵ The error was

³⁶⁵/ Loitherstein PFT, at 25-27. See also Hearing Exh. L-27 (marked for identification on December 7, 2005). This exhibit is a marked-up copy of the site plan included in the RAO Opinion as Fig. 2 (a copy of which appears in the Appendix as Sketch 5). Loitherstein drew a green line on this exhibit showing the Zone II boundary that was measured inaccurately. This line runs roughly along the south side of the main building that fronts on Hawks Avenue eastward and, thus, just north of the loading dock and the location of the removed underground storage tanks). Loitherstein also drew a red line on this exhibit showing the "actual Zone II," running roughly eastward from the warehouse south of the

not apparent at the time, and Loitherstein asserted that under the Board's Rules of Professional Conduct, he could rely upon the associate's advice as to what the maps showed regarding the Zone II boundary.³⁶⁶ See 309 CMR 4.02(3).³⁶⁷

The Board countered that Loitherstein did not actually rely upon his associate to determine the Zone II boundary and whether the loading dock area fell within it, and instead made this determination himself, a proposition that was neither borne out by its extensive cross-examination of Loitherstein nor supported by independent proof.³⁶⁸ The Board also argued that if Loitherstein had consulted "the official Zone II map" he would have confirmed that all of 19 Hawks Avenue was within "a large continuous area" that was clearly within not only a Zone II but also both a medium and a highly productive aquifer.³⁶⁹ However, the only MassGIS map that the Board introduced to support this contention was dated November 4, 2005, which post-dated Loitherstein Environmental's RAO Opinion by more than ten years,³⁷⁰ and none of the Board's witnesses testified affirmatively that there existed, in May 1995, a MassGIS map showing that 19 Hawks Avenue was entirely within the Zone II boundary.

loading dock, and through the pad-mounted transformer and the southern end of the truck scales. This line places the loading dock and the location of the removed underground storage tanks within the Zone II.

³⁶⁶/ Loitherstein PFT, at 26-27; Hughto PFT, at 17.

³⁶⁷/ This regulation is quoted above, at 16, n. 9.

³⁶⁸/ Neither side called Lingham as a witness. The Board's post-hearing brief cited testimony by Loitherstein on cross-examination conducted on December 7, 2005 (the sixth day of the hearing) to support its argument. The testimony shows instead, that while Loitherstein discussed the map research with the associate and, as well, the associate's boundary interpretation, he found the associate's position to be supportable and convincing, and therefore relied upon it.

³⁶⁹/ Board's Post-hearing Brief (June 21, 2006), at 19.

³⁷⁰/ Board Exh. B-52 (marked for identification on December 7, 2005).

Following the hearing, the Board filed affidavits by two DEP employees for the purpose of clarifying “whether the MassGIS system was available in 1995 when Mr. Loitherstein filed his opinion and, if so, whether the Zone II and aquifer information for that area of Hanson would have been in the MassGIS system.”³⁷¹

One of the affiants, Robert C. Hames, was employed by DEP in April 1992 as a “senior Geographic Information Systems Analyst,” as he was in 2006, and was responsible for “GIS data development, map production and detailed geographic analysis.”³⁷² Hames stated that MassGIS has existed since 1988 and that in early April 1992, he personally digitized the “Hanson Site 5E-4, Zone II”, so that “[t]herefore, this Zone II would have appeared on any MassGIS maps of that area of Hanson as of early April 1992.”³⁷³ In addition, Hames stated that this MassGIS map would have shown both medium-yield and high-yield potentially productive aquifers because this was included on the United States Geologic Survey’s hydrologic atlas and this was part of the database that MassGIS digitized.³⁷⁴

Although he included a copy of the November 4, 2005 MassGIS Hanson map for the area in question with his affidavit, Hames did not include a copy of a MassGIS map extant in May 1995, when Loitherstein Environmental prepared the RAO Opinion for 10 Hawks Avenue. That, he explained, was because:

Beginning in approximately the mid-1990's, a full series of 189 DEP Priority Resource Maps

³⁷¹/ Board’s Post-hearing Brief (June 21, 2006), at 19.

³⁷²/ Affidavit of Robert C. Hames, sworn-to January 20, 2006 (“Hames Aff.”). A copy of this affidavit was included with the Board’s post-hearing brief.

³⁷³/ Hames Aff., at 1-2, para. 4.

³⁷⁴/ Hames Aff., at 3-4, para. 9.

were printed out approximately biannually and sent to each DEP Regional Office for the purpose of making them available for review by DEP staff and members of the public. The old versions of the various DEP Priority Resource Maps have not been retained by DEP because of lack of storage space and are therefore unavailable.³⁷⁵

The second affiant was Bruce R. Bouck, an Environmental Analyst/Hydrogeologist with DEP's Bureau of Resource Protection's Drinking Water Program, whose primary responsibility and work focus since 1990 has been "to review and research hydrogeologic investigations including water supply development and protection, water management issues, policy/regulation development, and technical assistance to the Department's four regional offices."³⁷⁶ Bouck also kept DEP's "Zone II Log book" showing "when approved Zone II areas were first submitted to the Department's Geographic Information system (GIS)."³⁷⁷ He included, with his affidavit, a copy of the logbook pages showing that the Zone II for "Site 5E-4" in Hanson (the area in question) was submitted to DEP's GIS on April 2, 1992, and was used, in addition, to create an overlay and an 11" x 17" map of the approved Zone II.³⁷⁸ No copy of the overlay or the map accompanied Bouck's affidavit, however.

Although Loitherstein did not object to these post-hearing affidavits, I find it troubling, to say the least, that the Board did not include this testimony as part of its direct case. In view of its assertion that Loitherstein neglected to review the MassGIS map showing clearly that all of 19 Hawks Avenue was clearly within a Zone II, the Board knew or should have known that the truth of this

³⁷⁵/ Hames Aff., at 2, para. 7.

³⁷⁶/ Affidavit of Bruce R. Bouck, sworn-to January 30, 2006 ("Bouck Aff."). A copy of this affidavit was attached to the Board's post-hearing brief.

³⁷⁷/ Bouck Aff., at 2, para. 6.

³⁷⁸/ Id., at 2-3, para. 6.

proposition was in issue and that the best evidence on point was the MassGIS map of the time. Reasoning what a MassGIS map for Hanson must have shown in 1995, as the Board attempted to do with the Hames and Bouck affidavits, is not a reliable substitute for the map itself, and the Board has not shown sufficient cause to rely on such evidence. I am not convinced that it undertook a thorough search for a circa-1995 MassGIS map or that a more thorough search would have been fruitless. Although I have no reason to doubt Hames' explanation that GIS did not retain old versions of the maps for lack of storage space, he did not state whether the underlying digitized data was retained or, if so, whether the circa-1995 map could be reprinted. In addition, the Board did not state what efforts it made to locate a copy of the circa-1995 GIS map—for example, asking its expert witnesses whether any of them happened to have one on file or could locate one. But if indeed the circa-1995 MassGIS map could not be produced because it was not available anywhere, this only begs the question of what the Board reviewed to support its contention that the map clearly showed all of Hawks Avenue to be within a Zone II. If it reviewed a circa-1995 GIS map, or if one of its witnesses did, the question must then be posed: where is that map?

Even if these misgivings and unanswered questions are set aside, the two affidavits do not support the Board's position. Neither affiant stated affirmatively that the circa-1995 MassGIS map showed all of 19 Hawks Avenue within a Zone II. Neither affiant stated, in fact, that he recalled reviewing a MassGIS map in existence as of May 1995 to determine whether the site was within the Zone II boundary. Showing that the MassGIS system was "available in 1995," or that information regarding the Zone II boundary and aquifers in Hanson was "in the MassGIS system" in 1995—the two matters that the Board sought to "clarify" with the two post-hearing affidavits—does not show that Loitherstein would have clearly seen all 19 Hawks Avenue within the Zone II boundary if he had

reviewed a MassGIS map for this area of Hanson. If the map of the day did not in fact show this, or if a MassGIS map for this area of Hanson was not available for review when Loitherstein Environmental prepared the RAO Opinion for 19 Hawks Avenue, it would have hardly mattered that the MassGIS system was “available” and that the information in question was “in the system.”

With the two affidavits added to the evidentiary mix, there still remains, thus, no reliable support for the Board’s contention that the MassGIS map of the day clearly showed all of 19 Hawks Avenue to be within the Zone II boundary. In contrast, there is some reliable evidence in the record that the circa-1995 MassGIS map for Hanson did not show this, or at least not “clearly.” The Environmental FirstSearch Aquifers Map included in Loitherstein Environmental’s RAO Opinion for this site was derived from MassGIS data and does not show clearly that all of 19 Hawks Avenue is within the Zone II boundary (see above, at 151-52).

What all of this leaves is no more than what Loitherstein concedes—a measurement error that led to a mistaken conclusion that the loading dock at 19 Hawks Avenue and areas east of it were outside the Zone II, leading in turn to the mistaken conclusion that GW-2 groundwater standards applied when Method 1 was used to assess the risk remaining from detected contaminants. There was none of the nefarious evasion of GW-1 groundwater standards that the Board and its witnesses attempted to portray.

iii.

The erroneous classification of groundwater in the loading dock area as GW-2 does not establish that filing a Class A-3 RAO Opinion for 19 Hawks Avenue was improper. That would have been the case if the application of GW-2 standards rendered invalid the RAO Opinion’s risk

assessment and its opinion that a permanent solution had been achieved. However, neither the RAO Opinion's risk assessment nor its permanent solution opinion depended upon GW-2 groundwater classification in the vicinity of the loading dock, and, as I discuss further below, applying GW-1 groundwater standards in the loading dock area renders neither the risk assessment nor the permanent solution opinion invalid or even misleading.

The RAO Opinion presented other reasons supporting its opinion that a permanent solution had been reached—removal or deactivation of the tanks that were the source of contaminated soil, inability to further remove contaminated soils because doing so would destabilize and damage the loading dock and warehouse, and the placement of an activity and use limitation on the loading dock area; in addition, with the two underground storage tanks east of the loading docks and surrounding soil removed, there remained no further source contributing contaminants in the vicinity of monitoring well GW-101 (see above, at 146). These reasons would have supported the decision to file a Class A-3 RAO Opinion even if Loitherstein Environmental had not concluded that the loading dock area was outside the Zone II boundary and that GW-2 standards applied there as a consequence. The RAO Opinion listed these reasons first. It then mentioned, starting with the word “furthermore,” the loading dock area's location beyond the Zone II boundary, the resulting applicability of GW-2 standards in this area, and the site's location “within one hundred feet of a medium yield non-productive aquifer mapped to the south, and within two hundred feet of a low yield aquifer to the north” (see above, at 147). These factors were offered, thus, as additional support for the opinion, rather than as primary support for it.

The Board asserts that a Class A-3 RAO Opinion filing was improper because concentrations

of petroleum hydrocarbons and VOCs exceeded applicable GW-1 groundwater standards,³⁷⁹ which tracks DEP's position in the April 1996 notice of audit findings (see above, at 148-149). This argument equates the achievement of a "permanent solution," which 310 CMR 40.1035 makes a prerequisite for filing a Class A RAO Opinion, with the achievement of a "condition of no significant risk." However, as I noted above in the discussion of the RAO Opinion for 73 Jeffrey Avenue in Holliston, "permanent solution" and "condition of no significant risk" are not synonymous. Although achieving a current condition of no significant risk also achieves a permanent solution at a disposal site, a permanent solution may be achieved as well if measures implemented at the site are expected to achieve a condition of no significant risk in the future (see above, at 105-107) and (if a Class A-3 RAO Opinion is filed) that the condition of no significant risk will be maintained after it is achieved (see above, at 107).

It is also not the case, under the regulations, that filing a Class A-3 RAO Opinion is precluded if the concentration of oil or hazardous material in groundwater exceeds GW-1 groundwater standards.

If concentrations of oil or hazardous materials exceed "Upper Concentration Limits" specified at 310 CMR 40.0996—the limits that apply if MCP Method 3 is used to assess risk remaining at a disposal site—a Class A-3 RAO Opinion does not "apply" to a disposal site, and therefore cannot be filed in that circumstance even if response actions at the site have resulted in a permanent solution that will achieve, and maintain, a condition of no significant risk. See 310 CMR 40.2036(4)(a). That is also the case if these concentrations exceed a standard for oil or hazardous materials applied under 310 CMR 40.0993(3) and groundwater is categorized as GW-1, but those standards, too, apply where

³⁷⁹/ See, e.g., Phillips PFT, at 3; Webster PFT, at 20-21.

Method 3 is used to assess risk. See 310 CMR 40.2036(4)(b). In contrast, 310 CMR 40.1036 recites no provision precluding a Class A-3 RAO Opinion filing if Method 1 is used (as it was to assess risk at 19 Hawks Avenue) and the concentration of oil and/or hazardous material in groundwater exceeds standards for GW-1 groundwater recited at 310 CMR 40.0974, Table 1.

Without question, none of the concentrations of petroleum hydrocarbons and VOCs reported in the 19 Hawks Avenue RAO Opinion exceeded “Upper Concentration Limits” for these substances if Method 3 had been used to assess risk (see Table 3 above, at 143). If Method 3 risk analysis had been used, filing an RAO opinion would not have violated 310 CMR 40.1036(4). There was also no violation of this regulation even though Loitherstein Environmental utilized a Method 1-based risk analysis. The RAO opinion reported concentrations of benzene in groundwater samples taken at three monitoring wells east of the loading dock that exceeded Method 1 GW-1 groundwater standards for this hazardous material; it also reported concentrations of toluene and petroleum hydrocarbons in one of these monitoring wells (MW-101, where the underground gasoline storage tank was removed) that exceeded Method 1 GW-1 groundwater standards for these substances. However, 310 CMR 40.1036(4) did not preclude filing a Class A-3 RAO opinion if Method 1 (as opposed to Method 3) GW-1 groundwater standards were exceeded.

Filing a Class A-3 RAO opinion would have been precluded if Loitherstein Environmental had not achieved a permanent solution. Applying the regulatory definition of “permanent solution” recited at 310 CMR 40.0006 (see above at 146, n. 346) to the facts here, no permanent solution would have been achieved, and filing a Class A-3 RAO opinion would have violated the regulations, if:

(1) *the measures implemented at the site* (fuel tank removal and deactivation, contaminated soil removal to the extent feasible, placement of a recorded activity and use limitation on the loading dock area, and maintaining an impervious surface over the area where underground fuel storage tanks were removed),

(2) *did not assure “attainment of a level of control of each substance of concern”* (benzene, toluene and petroleum hydrocarbons) at 19 Hawks Avenue or in the surrounding environment such that none of these substances “will present a significant risk of damage to health, safety, public welfare, or the environment during any foreseeable period of time,

(3) *meaning* (because the Method 1 GW-1 groundwater standards are concentrations above which the substance in question poses risk of harm to health, safety, public welfare or the environment) *that the measures implemented at the site did not assure the reduction of the excessive concentrations of benzene, toluene and petroleum hydrocarbons* detected in the July 21, 1994 groundwater monitoring well samples to their respective GW-1 groundwater standards.

The Board did not prove this. Having incorrectly equated failure to achieve a current condition of no significant risk with failure to achieve a permanent solution, the Board went no further than to show that Method 1 GW-1 groundwater standards applied rather than GW-2 groundwater standards. None of its witnesses addressed the sufficiency of control measures implemented at 19 Hawks Avenue to achieve future reduction of excessive oil and hazardous material concentrations to Method 1 GW-1 standards and, thus, the future achievement of a condition of no significant risk. None of them testified affirmatively that no such condition would be achieved in the future in view of the control measures that Loitherstein Environmental had implemented at the site.

f.

I conclude that with respect to the RAO Opinion that Loitherstein Environmental filed for 19 Hawks Avenue in Hanson:

(1) Loitherstein did not reclassify groundwater at this site and, instead, made a mistake in classifying groundwater in one area of the site as GW-2, but the mistake was the result of reasonable reliance upon the advice of an associate who reviewed maps available at the time,

not all of which unambiguously showed the site as entirely within the Zone II boundary; in addition, the opinion that a permanent solution had been achieved was not based upon the mistaken groundwater classification and instead was based upon, and was justified sufficiently by, other factors including contamination source removal, removal of contaminated soil to the extent feasible, and the implementation of an activity and use limitation in the area where contaminated soils could not be removed further and remained at the site;

(2) Loitherstein acted with reasonable care and diligence with regard to the site, as required by 309 CMR 4.02(1); and

(3) Loitherstein followed applicable requirements and procedures of M.G.L. c. 21E and 310 CMR 40.0000, as required by 309 CMR 4.03(3)(b).

C. RAO opinions that allegedly lacked a determination of groundwater flow direction, did not define the nature and extent of hazardous waste releases at the site, and did not adequately characterize the risks that these releases posed

1. 262 Sawyer Lane, Hudson

a.

The next LSP submission at issue is an RAO opinion that Loitherstein Environmental filed on July 25, 2000 regarding the release of gasoline from underground gasoline storage tanks removed in 1999 at 262 Sawyer Lane in Hudson.³⁸⁰ This site is located along an unpaved way off Main Street (Route 62), near the center of town in an area of mixed industrial, commercial and residential use.³⁸¹

³⁸⁰/ Board Exh. B-23: “Immediate Response Action Completion Report and Response Action Outcome Statement for 262 Sawyer Lane, Hudson, Massachusetts, RTN 2-12775, dated July 25, 2000 (“Loitherstein Environmental RAO Opinion for 262 Sawyer Lane”).

³⁸¹/ Loitherstein Environmental RAO Opinion for 262 Sawyer Lane (Board Exh. B-23); narrative report, at 1.

In 2000, the site included two single-story warehouse buildings and five residential buildings built between 1900 and 1940.³⁸² The focus here is on one portion of the site with a right-angled building north of Sawyer Lane. The western half of this building was closest to the Lane; further into the interior of the site (north of the Lane), the remainder of the building extended eastward at a right angle to the western half.³⁸³ See Appendix, Sketch 6.

Underground storage tanks located along the southern side of each of these two building sections were excavated prior to 2000. The excavated areas are shown with dash markings on a figure marked “site plan” in Loitherstein Environmental’s RAO Opinion for 262 Sawyer Lane.³⁸⁴ A square-shaped site along the southern side of the building’s western half (closer to its western end) is labeled “Approximate Limit of gasoline UST Excavation” on the site plan, which also shows soil sampling sites along its dashed perimeter (S-1 through S-8), a groundwater monitoring well near the center of this excavation site (MW-1), and other groundwater monitoring wells, one of them to the south (labeled MW-4; possibly a typographical error that should read MW-3, as there is another MW-4) and southwest (MW-2). The plan also shows a smaller rectangular area delineated with dash markings at the inner corner formed by the intersection of the building’s two halves, labeled “Approximate Limit of fuel oil UST Excavation.” Two groundwater monitoring wells are shown diagonally southeast of this rectangular area (MW-4, closest to this area, and MW-5, further away from it). The RAO Opinion site plan also shows the location of borings within this rectangular area (B7), to the east of it (B6 and B8) and to the southeast (B5, at groundwater monitoring well MW-4, B9 and B10 at

³⁸²/ Id.

³⁸³/ Id., at Fig. 2 (“Site Plan”).

³⁸⁴/ Id.

groundwater monitoring well MW-5).³⁸⁵

b.

The contaminants of particular interest here are hydrocarbon compounds that comprise petroleum products such as gasoline and fuel oil, both of which were stored in the former underground storage tanks at 262 Sawyer Lane. Petroleum products consist mainly of aliphatic and aromatic hydrocarbons. The molecular structure of these types of hydrocarbons differ distinctly. The carbon atoms of aliphatic hydrocarbons are linked in straight or branched chains and include alkanes such as ethane, propane and butane, alkenes such as ethylene, butylene and hexene, and alkynes such as acetylene, butyne and hexyne. Aromatic hydrocarbons, such as benzene, toluene and naphthalene, consist of one or more six-carbon rings (also known as benzene rings).³⁸⁶ The risks that aliphatic and aromatic hydrocarbons pose to human health and safety and to the environment differ distinctly as well.

Petroleum hydrocarbon-related risks were characterized in the past by identifying and evaluating “specific indicator compounds, like benzene, and/or the quantitation of a ‘Total Petroleum Hydrocarbon’ (TPH) value”; however, by focusing upon “a select few compounds,” this approach did not adequately characterize “the risks posed by all hydrocarbons present” in water and soil at a

³⁸⁵ / Id.

³⁸⁶ / Information on petroleum hydrocarbons and assessing the risk they pose to the environment can be found in DEP Policy #WSC-02-411, “Characterizing Risks Posed by Petroleum Contaminated Sites: Implementation of the MADEP VPH/EPH Approach” (Final Policy, October 31, 2002). Although this Policy postdates the RAO Opinion at issue, it contains relevant background information on petroleum hydrocarbons and their risk assessment, and it helps explain why the focus at the 262 Sawyer Lane site is on the concentrations of particular petroleum hydrocarbons.

contaminated site.³⁸⁷ To evaluate and characterize these risks more accurately at sites contaminated by the release of petroleum fuels such as gasoline, and also to more accurately determine whether a condition of no significant risk has been achieved where petroleum hydrocarbons have been released, DEP developed analytical methods that “differentiate and quantitate collective concentrations of aliphatic and aromatic hydrocarbons in soil and water.”³⁸⁸ Using this “VPH/EPH approach,” the concentrations of two types of aliphatics and aromatics—volatile petroleum hydrocarbons (VPHs) and extractable petroleum hydrocarbons (EPHs)—are determined separately and compared to MCP Method 1 cleanup standards using methodologies developed by DEP.³⁸⁹ The Method 1 Cleanup standards for aliphatic and aromatic hydrocarbons became effective on October 31, 1997. They were added to the tables in the regulations showing standards for oil and/or hazardous materials in soil and groundwater when MCP Method 1 is used to assess risk, see 310 CMR 40.0974(2) and 310 CMR 40.0976(a), (b) and (c), and when Method 3 is used, see 310 CMR 40.0996(7).

The concentrations of extractable petroleum hydrocarbons (EPHs) in soil and groundwater sampled at the site of the former underground storage tanks, particularly shorter carbon-chain aliphatics associated with a gasoline release, feature prominently in the Board’s case against Loitherstein regarding the RAO opinion filed for 262 Sawyer Lane. Concentrations in samples taken from one monitoring well in 1999 exceeded the applicable Method 1 standard for this aliphatic hydrocarbon. The question is whether, as a consequence, the RAO opinion mischaracterized risk and was improperly filed.

³⁸⁷/ DEP Policy #WSC-02-411, at 1 (“Background”).

³⁸⁸/ Id.

³⁸⁹/ Id., at 6-7 (“MADEP Analytical Methodologies”).

c.

On March 31, 1999, Loitherstein Environmental observed, at the site owner's request, the removal of an abandoned 275-gallon fuel oil underground storage tank close to the inner corner of the two building sections.³⁹⁰ Although extractable petroleum hydrocarbons (EPHs) were present in a bottom sample taken from the site of this tank, EPH concentrations were "below applicable RCS-1 Reportable Concentrations."³⁹¹

On April 1, 1999, Loitherstein Environmental and the Hudson Fire Department "observed the removal of three out-of-service gasoline underground storage tanks" (near the southern side of the western building section) that "had been out of service for decades," according to the site owner, and that were observed to be nearly full of water.³⁹² Groundwater in the excavation pit was observed to be two feet below grade, and "a slight petroleum sheen was observed on the groundwater within the excavation prior to backfilling," and accordingly DEP was notified of a gasoline release from the former tanks, a release tracking number (RTN 2-12775) was assigned to 262 Sawyer Lane, and an "assessment only Immediate Response Action (IRA) was approved...."³⁹³

Loitherstein Environmental took soil samples from this excavation area and field-screened them for total organic vapors (TOV) using a photoionization detector, which yielded readings ranging

³⁹⁰/ Loitherstein Environmental RAO Opinion for 262 Sawyer Lane (Board Exh. B-23); narrative report, at 2.

³⁹¹/ Id. Reportable concentrations for oil and hazardous materials in soil and groundwater, which require notification to DEP under M.G.L. c. 21E and 310 CMR 40.0360-0362, appear in tables at 310 CMR 40.1600. They are not the same, thus, as the Method 1 standards for oil and hazardous materials in soil and groundwater or the Method 3 upper limits for oil and hazardous materials.

³⁹²/Loitherstein Environmental RAO Opinion for 262 Sawyer Lane (Board Exh. B-23); narrative report, at 1.

³⁹³/ Id., at 2,

“from non-detectable to approximately 130 parts per million volumetric (ppmv) in localized areas.”³⁹⁴

Before the excavation pit was backfilled on April 1, 1999 (by order of the Hudson Fire Chief, without supervision by Loitherstein Environmental³⁹⁵), Loitherstein Environmental collected samples from the pit’s sidewalls (at soil sampling sites S1, S2, S5 and S8, around the excavation’s perimeter), and at the floor of the tank area.³⁹⁶ These were analyzed by an independent laboratory, according to DEP-approved methodology known as MADEP EPH 98-1, to determine the concentration of VOCs, volatile petroleum hydrocarbons, and extractable petroleum hydrocarbons (EPHs) in the soil samples.³⁹⁷ None of the results exceeded the standards applicable to Method 1 risk analysis of soils classified as S-1 and groundwater classified as GW-2 and GW-3—the undisputed risk methodology and soil and groundwater classifications applied to risk analysis at this site.³⁹⁸ The samples from the floor of the underground gasoline storage tank area (along the southern side of the building’s western

³⁹⁴/ Id.

³⁹⁵/ Id.

³⁹⁶/ Id., and at Table 1: Summary of Analytical Results, 262 Sawyer Lane, Hudson, Massachusetts.”

³⁹⁷/ Id. See also ESS Laboratory analysis results for EPHs included in the RAO Opinion, which state that the methodology used was MADEP EPH 98-1. The RAO Opinion states that the laboratory filtered samples prior to EPH analyses in accordance with DEP’s “VPH/EPH Approach” dated October 1997. Id.; narrative report, at 3.

³⁹⁸/ Loitherstein Environmental RAO Opinion for 262 Sawyer Lane (Board Exh. B-23); narrative report, at 4, where it was explained that for the purpose of a Method 1 risk characterization:

(a) the soil was categorized as S-1 “because 1) it is accessible (0≤3 feet, unpaved); 2) children’s frequency of use is high and intensity of use is low; and 3) adults’ frequency of use is high and intensity of use is low,” and

(b) groundwater was categorized as GW-2 and GW-3 “in accordance with 310 CMR 40.0932, because: 1) groundwater underlying the Site does not meet category GW-1 criteria; 2) average depth to water is less than 15 feet; 3) there is an occupied building located within 30 feet of the Site; and 4) all groundwater in Massachusetts is categorically classified as Category GW-3.”

section) showed the highest concentrations of EPHs, but these were still well below the Method 1 standards that applied where soils were classified as S-1 and groundwater was classified as either GW-2 or GW-3.³⁹⁹ These results for EPHs are compared with the Method 1 standards in Table 4, below (at 169).

The ten soil borings in the vicinity of the removed underground gasoline and fuel storage tanks (B1—B10) were drilled on May 19, 1999 in by ADH Environmental Sampling Services; in addition, soil borings were completed at monitoring wells MW-1—MW-5.⁴⁰⁰ The soil boring logs show that water was encountered at four feet; they also record strong odors in the uppermost layer of borings taken within the sites of the removed gasoline and fuel oil underground storage tanks, and strong odors in borings taken just to the south and east of the former underground fuel storage tanks.⁴⁰¹ Slight odors were detected in the upper several feet of borings taken southwest, south and southeast of the gasoline underground storage tank site, and slight odors or no odors were detected in borings taken to the east and southeast of the former underground fuel oil storage tanks.⁴⁰²

Loitherstein Environmental also took soil samples for analysis from within the area of the former underground fuel oil storage tank.⁴⁰³ None of the concentrations for VOCs and extractable petroleum hydrocarbons detected in these samples exceeded the Method 1 standards for S-1 soils and

³⁹⁹/ Id., at 2, and at Table 1: Summary of Analytical Results, 262 Sawyer Lane, Hudson, Massachusetts.”

⁴⁰⁰/ Id., at 3.

⁴⁰¹/ Id.; Appendix B (Soil Logs and photoionization detector (PID) results).

⁴⁰²/ Id.

⁴⁰³/ Id., at 4.

GW-2 and GW-3 groundwater.⁴⁰⁴ Along with the EPH results from the April 1, 1999 sampling, the EPH concentrations detected in the May 19, 1999 soil samples are compared with the Method 1 standards in Table 4, below.

Table 4

Concentrations of Extractable Petroleum Hydrocarbons Detected in Soil Samples from the Floor of Underground Gasoline Storage Tank Excavation Pit Areas at 262 Sawyer Lane, Hudson, MA on April 1, 1999 and May 19, 1999, Compared With MCP Method 1 Standards

<i>Extractable Petroleum Hydrocarbon</i>	<i>Concentration (ug/g) at the site of the removed:</i>		<i>Method 1 Standard, S-1 soil, GW-2 or GW-3 groundwater (ug/g)</i>
	<i>Gasoline UST 04/01/99</i>	<i>Fuel Oil UST 05/19/99</i>	
aliphatic C ₉ - C ₁₈	237	<31	1,000
aliphatic C ₁₉ - C ₃₆	213	50	2,500
aliphatic C ₁₁ - C ₂₂	113	678	800

Notes:

(1) Concentrations of samples are from Loitherstein Environmental RAO Opinion for 262 Sawyer Lane (Board Exh. B-23), Table 1: Summary of Soil Analytical Results, 262 Sawyer Lane, Hudson, Massachusetts.

(2) Concentrations are expressed in micrograms per gram (ug/g), the units used by the regulations. The RAO Opinion gave concentrations in mg/kg, which are equivalent.

Loitherstein Environmental sampled groundwater monitoring wells at the site on May 20, 1999 and on March 9 and 10, 2000. Samples from two of these monitoring wells—MW-4 and MW-5—were analyzed on both occasions for concentrations of volatile petroleum hydrocarbons (VPHs),

⁴⁰⁴ Id., and at Table 1: Summary of Analytical Results, 262 Sawyer Lane, Hudson, Massachusetts.”

VOCs and extractable petroleum hydrocarbons (EPHs). The May 20, 1999 sampling from groundwater monitoring well MW-4 (southeast of the former underground fuel oil storage tank) showed concentrations of one of these EPHs—aliphatic C₉ - C₁₈—to be well above the Method 1 standard for this substance in groundwater classified as “GW-2.” The concentration in the sample was 6,110 ug/g (micrograms per gram), compared with the standard of 1,000 ug/g. However, the concentration of aliphatic C₉ - C₁₈ in samples taken from groundwater monitoring well MW-4 on March 10, 2000 was less than 600 ug/g, which was below the 1,000 ug/g standard.

Concentrations of another aliphatic hydrocarbon, C₁₉ - C₃₆, and an aromatic hydrocarbon, aromatic C₁₁ - C₂₂, were also elevated in samples taken from monitoring well MW-4 on May 20, 1999, although they did not exceed the applicable Method 1 standards. Concentrations of these hydrocarbons, too, were much lower in samples taken from this monitoring well on March 10, 2000.

Samples taken from groundwater monitoring wells GW-4 and GW-5 on March 9 and 10, 2000 also showed no concentrations of volatile petroleum hydrocarbons or VOCs above the Method 1 standards for GW-2 or GW-3 groundwater.

Table 5 below shows concentrations of extractable petroleum hydrocarbons (the compounds of interest here) detected in groundwater sampling at monitoring wells MW-4 and MW-5 in May 1999 and in March 2000, and compares them with the Method 1 standards for groundwater classified as “GW-2” and as “GW-3.”

[continued]

Table 5

Concentrations of Extractable Petroleum Hydrocarbons Detected in Groundwater Monitoring Well Samples at 262 Sawyer Lane, Hudson, MA on May 20, 1999 and on March 9 and 10, 2000, Compared with MCP Method 1 Standards

<i>Sample location Date</i>	Concentration Detected in Sample From				Method 1 Standard	
	<i>MW-4 05/20/99 (ug/l)</i>	<i>MW-4 03/10/00 (ug/l)</i>	<i>MW-5 05/20/99 (ug/l)</i>	<i>MW-5 03/09/00 (ug/g)</i>	<i>GW-2 ground water standard (ug/l)</i>	<i>GW-3 ground water standard (ug/l)</i>
Extractable Petroleum Hydrocarbon						
aliphatic C ₉ - C ₁₈	6,110 (T) 6,110 (L)	<600 (T) ND (L)	<650 (T) ND (L)	<600 (T) ND (L)	1,000	20,000
aliphatic C ₁₉ - C ₃₆	1,980 (T) 1,980 (L)	<600 (T) ND (L)	<650 (T) ND (L)	<600 (T) ND (L)	NA	20,000
aromatic C ₁₁ - C ₂₂	6,640 (T) 6,640 (L)	500 (T) 500 (L)	520 (T) 520 (L)	<800 (T) ND (L)	50,000	30,000

Notes:

(1) The sources of the sample concentrations are shown above with the suffix:

(T) for values obtained from the Loitherstein Environmental RAO Opinion for 262 Sawyer Lane, Table 2 (“Summary of Groundwater Analytical Results, 262 Sawyer Lane, Hudson, Massachusetts”); and

(L) for values obtained from the groundwater monitoring well sample analysis results from ESS Laboratory that are included in the RAO Opinion.

The laboratory-reported concentration “ND” (not detected) was shown by RAO Opinion Table 2 in several instances as “less than” (<) a particular value, e.g., “<600.” The value it is “less than” appears to be the Massachusetts reportable concentration for the substance in question, which is shown in the laboratory reports in mg/l, multiplied by 1,000 to obtain the value in ug/l. It is not clear why the Table presented some of the concentrations reported by the laboratory as “less than” the reportable concentration and in others as the numerical value that the laboratory reported, but in any event the “less than” values are not inconsistent with the laboratory values.

[Table 5 notes continued on next page]

(2) GW-1 and GW-2 Standards (also known as “cleanup standards”) are from 310 CMR 40.0974(2), Table 1. The notation “NA” (not applicable) refers to standards given at 310 CMR 40.0974(2), Table 1, and shows that there is no standard given by Table 1 for concentrations of this substance when groundwater is classified as indicated.

(3) Concentrations are expressed in ug/l, the units used by the regulations. Table 2 of the RAO Opinion also expressed concentrations in ug/l (micrograms per gram). The laboratory reports included in the RAO Opinion gave concentrations in mg/l, which Loitherstein Environmental multiplied by 1000 to convert to ug/l. For the sake of consistency, the laboratory values shown in the table above with the suffix (L) have been converted to ug/g. For example, the concentration of aromatic C₁₁ - C₂₂ detected in samples taken on May 26, 1999 at groundwater monitoring well MW-5, reported in the ESS Laboratory analysis as 0.52 mg/l, is shown in the table above as 520 ug/l.

d.

Loitherstein Environmental filed a Class B-1 RAO Opinion for 262 Sawyer Lane on July 5, 2000. It described the site location, the gasoline spill from the former underground storage tanks and the tanks’ removal, the immediate response action-related testing of soil and groundwater that followed, and the laboratory results of soil and groundwater sample testing in 1999 and 2000. According to the RAO Opinion:

(1) The sources of the gasoline release at the site—the former underground storage tanks near the building—“were removed in 1999” and “[a]ssessment activities during 1999 indicate that uncontrolled sources for the release have been eliminated,” demonstrating that “all uncontrolled sources” of this contamination had been eliminated or controlled;⁴⁰⁵

(2) Immediate response action (IRA) activities at the site had been “completed in accordance with 310 CMR 40.0410” and “IRA conditions do not exist at the Site”;⁴⁰⁶

⁴⁰⁵/ Loitherstein Environmental RAO Opinion for 262 Sawyer Lane (Board Exh. B-23); narrative report, at 4.

⁴⁰⁶/ Id.

(3) Because extractable petroleum hydrocarbons (EPHs), volatile petroleum hydrocarbons (VPHs), volatile organic compounds (VOCs) and “target analytes” were detected in the soil but their concentrations were below the Method 1 standards for these substances in S-1 soil and GW-2 and GW-3 groundwater,⁴⁰⁷ an Activity and Use Limitation was “not required to maintain a condition of no significant risk for the soil conditions”;⁴⁰⁸

(4) Because EPHs, VPHs, VOCs and “target polynuclear aromatic hydrocarbons” (PAHs) were detected in groundwater but their concentrations were below the Method 1 standards for these substances in GW-2 and GW-3 groundwater,⁴⁰⁹ “[t]herefore, in accordance with 310 CMR 40.0973 a condition of No Significant Risk of harm to health, public welfare, or the environment has been achieved at the Site,” and “[f]urther, a Condition of No Significant Risk of harm to safety exists at the site as there are no conditions related to the release which pose a threat of physical or bodily injury in accordance with 310 CMR 40.0960”;⁴¹⁰

(5) Because a condition of no significant risk had been achieved for the release at the site, and “concentrations of petroleum hydrocarbons and VOCs had been reduced to below their applicable Method 1 cleanup standards, and in view of the site’s “urban industrial setting” and “the lack of potential environmental receptors,” “any incremental benefit of further reducing the concentrations” of petroleum hydrocarbons and VOCs “in soil and groundwater would be significantly outweighed

⁴⁰⁷/ See Table 4, above

⁴⁰⁸/ Loitherstein Environmental RAO Opinion for 262 Sawyer Lane (Board Exh. B-23); narrative report, at 4.

⁴⁰⁹/ See Table 5, above, at 171.

⁴¹⁰/ Loitherstein Environmental RAO Opinion for 262 Sawyer Lane (Board Exh. B-23); narrative report, at 4.

by the associated costs;”⁴¹¹ and

(6) A Permanent Solution had been achieved for the release in question, the requirements for a Class B-1 RAO opinion had been met, and further response actions were “not warranted.”⁴¹²

e.

On February 14, 2001, DEP issued a Notice of Audit Findings and Notice of Noncompliance to the site owner that faulted Loitherstein Environmental’s RAO Opinion for these reasons:

(1) The RAO Opinion reported a condition of no significant risk with respect to groundwater contamination “despite the fact that a sample analyzed from monitoring well MW-4 (5/20/99)

⁴¹¹ Id., at 4-5.

⁴¹² Id., at 5.

A Class B-1 RAO Opinion may be filed for a disposal site “where remedial actions have not been conducted because a level of No Significant Risk exists and no Activity and Use Limitation is necessary to ensure the existence or maintenance of a level of No Significant Risk.” 310 CMR 40.1046(1). The regulations provide that a Class B-1 RAO Opinion “shall not apply to” (meaning that it cannot be filed for):

any disposal site where:

(a) groundwater or soil concentrations of oil and/or hazardous material exceed Upper Concentration Limits specified in 310 CMR 40.0996, except in those cases where the concentrations are shown to be consistent with background; or

(b) groundwater concentrations exceed an applicable or suitably analogous standard listed in 310 CMR 40.0993(3) where the groundwater is categorized as GW-1 pursuant to 310 CMR 40.0932.

310 CMR 40.1046(4).

Both “Upper Concentration Limits specified at 310 CMR 40.0996,” and standards listed in or analogous to those listed at 310 CMR 40.0993(3), apply to groundwater at a disposal site where risk is assessed pursuant to MCP Method 3. In contrast, 310 CMR 40.1046 does not preclude the use of a Class B-1 RAO Opinion if groundwater or soil concentrations of oil and/or hazardous material exceed standards for GW-1 groundwater specified at 310 CMR 40.0974(2) or for soil as specified at 310 CMR 40.0975(6), which apply when MCP Method 1 is used to assess risk at a disposal site.

contained a concentration of C9-C18 aliphatic hydrocarbons (6,100 ppb⁴¹³) in excess of the MEC Method 1 GW-2 standard (1,000 ppb) and only one confirmatory analysis was performed and found below the Method 1 GW-2 standard”; and

(2) The RAO Opinion’s risk characterization “is generally unsupported by sufficient information with respect to physical site characteristics, extent of release and characterization of oil and hazardous materials at the site. The risk characterization fails to identify human (water supplies, downgradient residential structures and occupied buildings, on-site personnel) and environmental receptors (wetlands, waterways, etc.) to contamination at the site, current and reasonably foreseeable site uses and does not identify exposure points to oil and hazardous materials at the site. In addition, there is little or no information provided with respect to migration pathways and receptors including no groundwater flow direction, groundwater velocity or contaminant migration rates to receptors. For the same reasons of technical inadequacy, the provided feasibility evaluation for achieving background is unsupported.”⁴¹⁴

DEP ordered the owner to (1) file a release notification regarding the release of petroleum hydrocarbons at the site based upon soil and groundwater samples obtained on May 20, 1999 showing concentrations of petroleum hydrocarbons in excess of reportable concentrations in soil and groundwater, and (2) retract the RAO Opinion and file a Tier Classification Submittal or a Response Action Outcome Statement “based upon an adequate characterization” of the gasoline and fuel oil releases at the site.⁴¹⁵

f.

In its amended proposed order, the Board charged that Loitherstein did not:

(1) determine the direction of groundwater flow at 262 Sawyer Lane in Hudson; or

⁴¹³/ Parts per billion (ppb) are the equivalent of micrograms per liter (ug/l), the units used in the RAO Opinion tables and in the regulations.

⁴¹⁴/ DEP Notice of Audit Findings/Notice of Noncompliance/Interim Deadline, re Hudson Property, 262 Sawyer Lane, RTN: 2-12775 issued to G. Bonazzoli & Sons, Inc. Dated February 14, 2001; Attachment A (Audit Memorandum), at 2.

⁴¹⁵/ Id.; attached Notice of Noncompliance Summary, at 1 and 4.

(2) define the nature and extent of releases or characterize adequately the risks that these releases posed.⁴¹⁶

The Board alleged that these omissions comprised the following violations of its Rules of Professional Conduct for LSPs:

(1) failure to act with reasonable care and diligence with regard to the site, in violation of 309 CMR 4.02(1);

(2) failure to follow applicable requirements and procedures of M.G.L. c. 21E and 310 CMR 40.0000, in violation of 309 CMR 4.03(3)(b); and

(3) failure to collect sufficient data to define the nature and extent of the releases and to adequately characterize the risk that these releases posed, in violation of 309 CMR 4.03(3)(c).⁴¹⁷

The Board's testimony did not support the charges. Its witnesses opined that Loitherstein Environmental's RAO Opinion for 262 Sawyer Lane was deficient on several grounds, but many of these alleged deficiencies were contradicted by testing results or were otherwise without substance, and others were without consequence to the RAO Opinion's characterization of risk from the gasoline release at the site. I review these alleged deficiencies below.

(1) Page length. Board witnesses and licensed site professionals Debra Phillips and Michael J. Webster faulted the RAO Opinion for being only four pages long.⁴¹⁸ As was true of the Loitherstein Environmental DPS Opinions at issue here, this criticism was not supported by citation to any page-length requirement, and the asserted page count ignored attachments and laboratory reports.

(2) Failure to test for ethylene dibromide. According to Webster and Phillips, although the

⁴¹⁶/Amended Proposed Order, at 16-17; Findings of Noncompliance, items I.ii-iii.

⁴¹⁷/ Id.; items I.ii-iii, II, and III.

⁴¹⁸/ Phillips PFT, at 11; Webster PFT, at 26.

RAO Opinion addressed a gasoline release, “Loitherstein failed to test samples for lead or ethylene dibromide (EDB), common additives that are characteristic of gasoline releases.”⁴¹⁹ Phillips criticized Loitherstein’s “failure to test soil and groundwater samples for certain contaminants tetraethyl lead and/or EDB that would normally be included within sampling parameters for a gasoline release” and that, in 2000, should have been included in all RAO Opinion filings.⁴²⁰

Ethylene dibromide was used as an additive in leaded gasoline. Other names for this substance include 1,2-Dibromoethane. The RAO Opinion includes laboratory reports from ESS Laboratory that show testing for 1,2-Dibromoethane in samples taken on May 20, 1999 from groundwater monitoring wells MW-1 (at the center of the site where the former underground gasoline storage tank was removed), MW-4 (near the site where the former fuel oil underground storage tanks was removed) and MW-5 (southeast of MW-4). The reported concentrations for this substance in each of these samples was “ND” (none detected).

The ESS Laboratory reports included with the RAO Opinion also show that two solid samples were submitted by Loitherstein Environmental to this laboratory on May 21, 1999. Both were from soil boring S-2, located at the northeastern corner of the underground gasoline storage tank excavation site along the southern side of the western portion of the building. The laboratory analysis sheets show testing of one of these samples (B-5/S-2) for 1,2-Dibromoethane, with the reported result “ND,” meaning that no concentration of this substance was detected in the soil sample.⁴²¹

⁴¹⁹/ Webster PFT, at 26.

⁴²⁰/ Phillips PFT, at 11

⁴²¹/ Loitherstein Environmental RAO Opinion for 262 Sawyer Lane (Board Exh. B-23); narrative report, at 3 (Part C: Investigatory and Monitoring Data), at Fig. 2 (“Site Plan,” showing location of soil boring S-2); and at Appendix A: ESS Laboratory “Project Narrative, Page One of Two,” regarding “[t]wo

The laboratory reports show no testing for 1,2-Dibromoethane in March 2000. The reason for this is not clear, but more to the point, the Board's testimony does not establish that there was any need to test for 1,2-Dibromoethane (ethylene dibromide) in 2000 in order to assess risk from the gasoline spill, particularly since the previous year's tests had not detected it in any of the submitted samples. None of the Board's witnesses explained, for example, whether testing for this gasoline additive was a more reliable method of establishing the presence or absence of gasoline contamination in soil or groundwater or, if gasoline was present, whether its concentration exceeded Method 1 standards for the applicable category of soil or groundwater.

The Board's testimony suggests that the omission of testing for ethylene dibromide reflected substandard work on Loitherstein's part.⁴²² As far as testing in May 1999 is concerned, this suggestion is meritless because there was, in fact, testing for this substance under its alternate name 1,2-Dibromoethane.

It is more likely that there was no testing for 1,2-Dibromoethane in March 2000 because a different methodology was used at that time to detect and assess the risk from petroleum hydrocarbon contamination—one approved, and preferred, by DEP. The laboratory reports included in Loitherstein Environmental's RAO Opinion for 262 Sawyer Lane show that soil and groundwater samples were analyzed for volatile petroleum hydrocarbons and extractable petroleum hydrocarbons using DEP methods MADEP VPH 98-1 and MADEP EPH 98-01, respectively—part of the agency's "VPH/EPH Approach" to characterizing risks posed by petroleum-contaminated sites (see discussion above, at 164-65). DEP has promulgated forms on which a laboratory reports the result of its analysis

solid samples...received on May 21, 1999..."

⁴²²/ See, e.g., Phillips PFT, at 11.

using the “VPH/EPH” approach, entitled, respectively, “Required VPH Data Report Content” (for reporting the results of volatile petroleum hydrocarbon (VPH) analytical results) and “Required EPH Data Report Content” (for reporting the results of extractable petroleum hydrocarbon (EPH) analytical results).⁴²³ Each of these forms lists “target analytes” whose concentrations are to be reported. Neither 1,2-Dibromoethane nor ethylene dibromide is listed on these forms. The VPH form lists, on the other hand, aliphatic hydrocarbons including those in the lighter range that are found in gasoline-contaminated soils and groundwater (e.g., “unadjusted C5-C8 aliphatics”), as well as heavier aliphatic hydrocarbons (e.g., C₉-C₁₂ aliphatics and C₉-C₁₀ aromatics). The ESS Laboratory’s reports of volatile petroleum hydrocarbon analysis for groundwater monitoring well MW-4 samples submitted on March 10, 2000 show results for the aliphatic and aromatic hydrocarbons listed on DEP’s “Required VPH Data Report Content” form, as well as results for the other substances listed on this DEP form. Similarly, the ESS Laboratory’s reports of extractable petroleum hydrocarbon analysis for groundwater monitoring well MW-5 samples submitted on March 9, 2000 shows results for the analytes listed on DEP’s “Required EPH Data Report Content” form, including aliphatic and aromatic hydrocarbons that are associated with gasoline contamination.

Thus, while the laboratory reports for the 2000 samples do not report concentrations for 1,2-Dibromoethane (or ethylene dibromide), they report the analytes that must be reported on the DEP-prescribed forms for reporting soil and groundwater sample analyses using the “VPH/EPH approach,” which do not include 1,2-Dibromoethane (or ethylene dibromide). It appears, thus, that Loitherstein Environmental ordered from the independent laboratory, and the laboratory performed, the analyses

⁴²³/ DEP Policy #WSC-02-411, “Characterizing Risks Posed by Petroleum Contaminated Sites: Implementation of the MADEP VPH/EPH Approach” (Final Policy, October 31, 2002): Appendix 3 - Required VPH Data Report Content, and Required EPH Data Report Content.

for gasoline and fuel oil-related analytes required by DEP when the “VPH/EPH approach” is used, as it was here, to characterize risk from gasoline contamination in soil and groundwater.

None of the Board’s witnesses discussed the use of DEP’s “VPH/EPH approach” to characterize the risks posed by petroleum-contaminated soil and groundwater at the site. In addition, none of them explained why separate testing for 1,2-Dibromoethane was necessary to determine the nature, extent and risk posed by gasoline contamination at 262 Sawyers Lane, if indeed that was the case. In view of these omissions, and also because the Board’s witnesses did not recognize that Loitherstein Environmental had samples tested for 1,2-Dibromoethane in 1999, the testimony of the Board’s witnesses regarding Loitherstein’s alleged failure to test for ethylene dibromide furnishes no credible or reliable support for the Board’s charges regarding this RAO opinion.

(3) Failure to test for leaded gasoline additives. The Board’s witnesses also faulted Loitherstein for failure to test samples for lead or tetraethyl lead.⁴²⁴ Phillips stated that testing soil and groundwater samples “for certain contaminants tetraethyl lead and/or EDB (ethylene dibromide)...would normally be included within sampling parameters for a gasoline release.”⁴²⁵ Her testimony includes no references showing what “normal” gasoline release sampling parameters were, or by whom these parameters were established; nor did Phillips address whether testing for tetraethyl lead (or, for that matter, ethylene dibromide) was standard practice among LSPs in 1999 or 2000, particularly if DEP’s “VPH/EPH approach” was used to characterize risk from gasoline contamination and samples were analyzed for the substances listed on the forms for reporting

⁴²⁴/ Webster PFT, at 26 (failure to test for lead); Phillips PFT, at 11 (failure to test for tetraethyl lead).

⁴²⁵/ Phillips PFT, at 11.

laboratory analysis using the MADEP VPH 98-1 and MADEP EPH 98-01 methods (see above, at 178-79).

Even if that was the standard practice, however, Phillips described the testing in question as a choice—“tetraethyl lead and/or EDB”—that would be made, presumably, by the LSP or, if not, by the testing laboratory, in determining what to report. If this testing were necessary, allowing a choice of what to test for would make sense. Leaded gasoline additive⁴²⁶ was a fluid containing tetraethyl lead, 1,2-Dibromoethane and 1,2-Dichloroethane, all of which would be present in soil or groundwater if leaded gasoline had been released. As leaded gasoline would have contained all of these compounds, the presence of any of them in soil or groundwater would be a potential indicator that leaded gasoline had been released.

The ESS Laboratory analysis data sheets included in Loitherstein Environmental’s RAO Opinion for 262 Sawyer Lane show that samples from groundwater monitoring wells MW-1, MW-4 and MW-5 collected at the site on May 20, 1999 were analyzed for 1,2-Dibromoethane and 1,2-Dichloroethane, and that the results for each of these analytes was “ND” (none detected). In 1999, then, Loitherstein Environmental or the independent testing laboratory to which samples were submitted for analysis (or both) indeed tested for two leaded gasoline components whose presence in a sample (individually or together) was indicative of leaded gasoline releases. They made the testing choice, in other words, that Phillips endorsed as good practice.

The laboratory data sheets show no testing for these leaded gasoline additive components in March 2000. However, as was the case with 1,2-Dibromoethane, the absence of such testing does

⁴²⁶ Before lead additives were phased out in the United States, lead was added to gasoline as an anti-knock compound. This allowed for greater engine compression ratios that delivered more power and used fuel more efficiently.

not establish deficient sampling or risk analysis. Even if the underground gasoline storage tanks had been out of service “for decades” as the site owner stated (see above, at 166), making it likely that gasoline detected in soil and groundwater was released at a time when lead was added to motor fuel, lead additive components are not the only indicators of gasoline contamination. Other compounds present in both leaded and unleaded gasoline may also indicate a gasoline release when detected in soil and groundwater. The “VPH/EPH approach” that was used to characterize risk at the site included testing soil and groundwater samples for aliphatic and aromatic hydrocarbons found in gasoline, using DEP-approved methods for analyzing volatile petroleum hydrocarbons and extractable petroleum hydrocarbons (MADEP VPH 98-1 and MADEP EPH 98-1). It is not self-evident that this was insufficient to characterize a gasoline release at the site, or that additional testing for leaded gasoline additives was necessary to determine the existence or extent of a gasoline release. The Board’s witnesses did not address the sufficiency or insufficiency of VPH/EPH approach-related testing to make this determination, however, and none of them explained why additional testing for leaded gasoline additives was necessary.

The testimony of the Board’s witnesses regarding Loitherstein’s alleged failure to test for leaded gasoline additives furnishes no credible or reliable support, therefore, for the Board’s charges regarding this RAO Opinion.

(4) Insufficient extent of testing. Emphasizing that the laboratory analysis of groundwater monitoring well samples taken in May 1999 for extractable petroleum hydrocarbons showed “petroleum hydrocarbons...at concentrations above applicable standards,” Webster faulted Loitherstein for conducting only one followup test in March 2000 “when results were below the standard.” It was his opinion that “[o]ne round of ground water sampling is not generally sufficient

to demonstrate the range of ground water quality conditions that can be present at a release site over the duration of a year (i.e., under all seasonal ground water conditions, such as during conditions of high and low ground water)” since “[d]epending upon source conditions, the level of ground water impacts can fluctuate seasonally as the water table moves up and down and as the direction of ground water changes.”⁴²⁷ Therefore, he testified, “[a]dditional monitoring events should have been completed to evaluate whether the May 1999 or March 2000 results were more representative of typical site conditions (and whether either result was anomalous).”⁴²⁸

Webster’s description of the 1999 testing results as showing petroleum hydrocarbons above applicable standards, or as showing that “results were below the standard,” is not accurate. The concentration of a single class of petroleum hydrocarbons—aliphatic C₉-C₁₈—in a sample from one groundwater monitoring well (MW-4), exceeded GW-2 standards (see above, at 171, Table 5). The concentrations of two other classes of petroleum hydrocarbons detected in the same groundwater monitoring well—aliphatic C₁₉-C₃₆ and aromatic C₁₁-C₂₂—were higher than concentrations found in three other groundwater monitoring wells, but they did not exceed GW-2 or GW-3 standards.

It is also inaccurate to view the groundwater sampling test results from May 1999 and March 2000 as strongly dissimilar, so much so that the need for more followup testing was obvious. In fact, the concentrations of most of the substances analyzed in groundwater monitoring well samples on both occasions, including VOCs, volatile petroleum hydrocarbons, and extractable petroleum hydrocarbons except for aliphatic C₉-C₁₈, were substantially below the applicable Method 1 standards for GW-2 and GW-3 groundwater.

⁴²⁷/ Webster PFT, at 27.

⁴²⁸/ Id. (parentheses in original).

It is fair to characterize the May 1999 and March 2000 laboratory testing results as similar overall, if not consistent, with the exception of the single concentration of aliphatic hydrocarbon from one groundwater monitoring well sample in May 1999. It is therefore more accurate to characterize these as two sets of results showing “typical site conditions” rather than as contrasting results, one of them more representative of typical site conditions and one of them anomalous.

It is not at all clear, consequently, that more than one followup round of groundwater monitoring well testing was needed. If more groundwater monitoring well testing was needed to show “typical” conditions, the Board needed to prove that with more than the personal preference of its witnesses for more testing or with generalizations about the utility of one round of followup testing. There is no evidence, however, that the March 2000 testing results were anomalous in any respect.

(5) Failure to determine groundwater flow direction. The RAO Opinion did not state the direction of groundwater flow. Phillips asserted (as did Webster) that “failure to calculate groundwater flow direction” was a “fundamental error” among several that showed the RAO Opinion to be without sufficient support.⁴²⁹ In addition, Webster opined that:

The source of contamination at the site was adjacent to a building. Mr. Loitherstein did not test soil or ground water underneath the building, and without knowing the direction of ground water flow at the property, it was not possible to evaluate whether contamination may have migrated under the building and associated impacts.⁴³⁰

Loitherstein testified that the RAO Opinion did not state the direction of groundwater because “the gasoline release was clearly downgradient based on topography” (meaning downgradient of the

⁴²⁹/ Phillips PFT, at 10-11; Webster PFT, at 26.

⁴³⁰/ Webster PFT, at 26.

building); moreover, because “[t]he building is on the side of a hill,” he “believed the groundwater flow direction was obvious, which is why we did not do a survey” and why Loitherstein Environmental “did not test beneath the building...”⁴³¹

There is no evidence that the RAO Opinion was prepared without knowledge of groundwater flow direction. Although the RAO Opinion did not give the direction of groundwater at the site, Loitherstein Environmental determined what it was. None of the Board’s witnesses stated what the direction of groundwater at the site is, and Loitherstein’s testimony regarding groundwater flow direction and the location of the gasoline release site downgradient of the building is not contradicted. The Board did not prove its charge that Loitherstein did not determine the direction of groundwater flow at 262 Sawyer Lane, consequently. In addition, it did not show that the migration of contaminants from the former underground storage tanks to a location under the building was even possible, or, therefore, that failure to state groundwater direction or test soil or groundwater beneath the building were omissions that made the RAO Opinion’s risk characterization inaccurate or misleading.

g.

As of July 25, 2000, then, the prerequisites for filing a Class B-3 RAO Opinion for 262 Sawyer Lane were as Loitherstein Environmental described them (see above, at 172-74). I conclude that Loitherstein:

(1) Determined the direction of groundwater flow at 262 Sawyer Lane in Hudson, even though the direction was not stated in the RAO Opinion;

⁴³¹/ Loitherstein PFT, at 30. The locus map included in the RAO opinion (Fig. 1) appears to be a portion of a topographic map with elevation contours, although it is difficult to discern the contours individually from the copy in the record.

- (2) Defined the nature and extent of the gasoline release at the site and characterized adequately the risks that this release posed;
- (3) Acted with reasonable care and diligence with regard to the site, as required by 309 CMR 4.02(1);
- (4) Followed applicable requirements and procedures of M.G.L. c. 21E and 310 CMR 40.0000, as required by 309 CMR 4.03(3)(b); and
- (5) Collected sufficient data to define the nature and extent of the release at the site and to adequately characterize the risk that this release posed, as required by 309 CMR 4.03(3)(c).

2. 83-89 East Cottage Street and
5-9 Humphreys Street, Dorchester

a.

The final site to be considered here is a 71,800-square-foot parcel in Dorchester (Boston) owned by Ming Realty Trust (“the Ming property”), in a mixed-use urban area of single and multi-family residences and commercial and industrial operations located northwest of Uphams Corner and west of the Southeast Expressway (I-93).⁴³² This site is bounded on the north by East Cottage Street and on the east by Humphreys Street and comprises several smaller parcels; hence its address, 83-89 East Cottage Street and 5-9 Humphreys Street.

In 2001, most of the site was occupied (as it had been for many years) by adjacent one and

⁴³²/ See locus maps at (1) Board Exh. B-12: Loitherstein Environmental Engineering, “Response Action Outcome Statement for 83-99 (sic) East Cottage Street and 5-9 Humphreys Street, Dorchester, Massachusetts, RTN 3-0000592,” dated October 11, 2001 (“Loitherstein Environmental RAO Opinion for 83-89 East Cottage Street/5-9 Humphreys Street”), at Figure 1 (“Site Locus”); and (2) Board Exh. B-15: “Site Evaluation and Environmental Assessment Report, Property Located at 83-89 E. Cottage Street, Dorchester, Massachusetts (Project #05-8403) Owned by Ming Realty Trust, May 7, 1985,” prepared by Hidell-Eyster and Associates, Inc. (“1985 Hidell-Eyster Report”), at Exhibit A (unnamed map).

two-story brick and concrete block buildings, the largest of which occupied the center of the site.⁴³³ A paved outside parking area along the northern half of this building's outer (eastern) wall occupied the site's northeastern corner at the intersection of East Cottage and Humphreys Streets; two smaller buildings adjoined the southern half of the larger building's outer wall and occupied the southeastern corner.⁴³⁴ See Appendix, Sketches 7A, 7B and 7C.

The site was used historically for repairing truck equipment and then, until the early 1980s, by a school bus operator for parking, storage, maintenance and business operations.⁴³⁵ In 1984, after Ming Realty Trust had acquired the property, the buildings were converted to a dry storage facility for packaged food products. By 2001, a noodle factory was also operating at the site, and a loading dock had been built in the paved parking area, along the outer walls of the large building and the smaller building adjacent to its mid-section.⁴³⁶

The abutting 32,571-square-foot property to the south is 11-13 Humphreys Street, also known as the Daloz property. This property was owned historically by L.H. Daloz, Inc., which operated a drycleaning business there between 1901 and 1965; so, too, did the next owner (Simon M. Roberts)

⁴³³/ Id.; see also the exhibits attached to the 1985 Hidell-Eyster Report (Board Exh. B-15), particularly Exhibits C ("Sketch Plan C") and D ("Sketch Plan A").

⁴³⁴/ 1985 Hidell-Eyster Report (Board Exh. B-15), at Exhibit D ("Sketch Plan A").

⁴³⁵/ Id., at 3.

⁴³⁶/ Loitherstein Environmental RAO Opinion for 83-89 East Cottage Street/5-9 Humphreys Street (Board Exh. B-12); narrative report, at 1, part 1.0 ("Background"); see also Loitherstein Exh. L-4: Environmental Compliance Services, Inc. d/b/a ECSMarin, "IRA Status Report, Former Daloz Cleaners, 11-13 Humphreys Street, Dorchester, MA, RTN #3-14544," dated March 2004 ("2004 ECSMarin Report"), at Fig. 4 ("Disposal Site Plan, former Daloz Cleaners"), showing the large building on the adjacent site to the north (the Ming property) as "Noodle Factory Warehouse."

until 1996, when the property was acquired by Humphreys Street Studios, LLC.⁴³⁷ Two L-shaped buildings occupied most of the Daloz property (its western third was a vacant lot). One of the Daloz buildings (the Mill Building) was used for clothes storage, ironing and pressing; the other (the Masonry Building) was used for drycleaning leather. See Appendix, Sketches 7B and 7C. A driveway leading from Humphreys Street ran alongside the Daloz property's common boundary with the Ming property to an interior courtyard area between the two Daloz buildings, where underground gasoline and fuel oil storage tanks were located.⁴³⁸

In 2001, Loitherstein Environmental assessed the risk remaining at the Ming property from historical gasoline, diesel fuel and motor oil releases on that site. By that time, however, more recent releases of fuel oil and of mineral spirits used in drycleaning had formed plumes extending from the Daloz property to the soil and groundwater beneath the Ming buildings. See Appendix, Sketch 7B. I turn first to the history of these releases and how they were addressed at both properties.

b.

In June 1984, Ming Realty Trust retained Hidell-Eyster and Associates, Inc. to perform a site assessment and determine the extent of oil and hazardous materials contamination at the Ming property.⁴³⁹ Hidell-Eyster's May 7, 1985 report discussed its investigatory work, findings and conclusions, and is included in the record as Board Exhibit B-15.

⁴³⁷/ Loitherstein Environmental RAO Opinion for 83-89 East Cottage Street/5-9 Humphreys Street (Board Exh. B-12); cover letter dated October 11, 2001, at 1-2; see also Fig. 2 ("Site Plan with Disposal Site and AUL Boundaries"); 2004 ECSMarin Report (Loitherstein Exh. L-4); narrative report, at 1, part 1.1 ("Site Description").

⁴³⁸/ Id.

⁴³⁹/ 1985 Hidell-Eyster Report (Board Exh. B-15), at 2.

The firm's initial investigation during the summer of 1984 included an examination of the physical plant, utilities, heating systems, and electrical systems "to determine the existence of any transformers and to ascertain the possibility of PCBs," as well as a search for filler pipes, accessways and fuel or oil pumps that would indicate the location of underground tanks, and "a detailed study relating to the past history of the site and the neighborhood."⁴⁴⁰

Hidell-Eyster then proceeded with testing to determine the extent and source of contamination. There were no aboveground storage tanks on the site, but there appeared to be at least seven underground storage tanks beneath the buildings and the paved parking area, one of which (a 2,500-gallon-capacity tank) had already been removed.⁴⁴¹ Starting in August 1984, Hidell-Eyster had soil borings drilled in an outside parking area at the site's northwestern corner, and inside the buildings as well, to provide liquid and soil samples for analysis.⁴⁴² Soil sample testing "indicated the presence of petroleum products in the ground and groundwater."⁴⁴³ Chemical analysis of sediment and water samples "indicate[d] that an area of contamination exist[ed] in a northeasterly direction across the site from the center of the main building"⁴⁴⁴ and "under the northeast section of the parcel in the paved parking area"⁴⁴⁵ and consisted of "petroleum based products."⁴⁴⁶ This petroleum contamination was

⁴⁴⁰/ Id., at 4.

⁴⁴¹/ Id., at 3.

⁴⁴²/ Id., at 5.

⁴⁴³/ Id., at 6.

⁴⁴⁴/ Id.

⁴⁴⁵/ Id., at 8, and at Exh. C (Sketch Plan C").

⁴⁴⁶/ Id., at 8.

found in on-site underground tanks, in the floor drain system running under the floor in the contaminated section of the building, and close to Humphreys Street in the parking area.⁴⁴⁷ It formed what appeared to be “two cone shaped areas fanning in depth and width...generally in the same direction as groundwater flow,” which was “from the inside of the building out to the intersection of East Cottage and Humphreys Streets.”⁴⁴⁸

Petroleum hydrocarbons were found in all of the tanks,⁴⁴⁹ which were suspected to be gasoline, diesel fuel, crankcase oil and fuel oil.⁴⁵⁰ No PCBs, phenols or naphthalene were found in any of the underground tanks.⁴⁵¹ Water was found “in some of the tanks, indicating possible leaking.”⁴⁵² To confirm the existence, size and location of these underground tanks and to quantify groundwater elevation, Hidell-Eyster had 15 test pits dug with a backhoe.⁴⁵³ The excavations showed that the borings had been drilled into tanks, floor drains and gas traps; in addition, six tanks were located in the parking area on April 17, 1985 where the presence of only four tanks had been suspected.⁴⁵⁴ These tanks each contained several inches of liquid that included gasoline or diesel fuel in the larger

⁴⁴⁷/ Id., at 8-10. A map labeled “Exhibit B” toward the end of the 1985 Hidell-Eyster Report (Board Exh. B-15) shows the location of gas traps at the Ming property.

⁴⁴⁸/ Id., at 12. The 1985 Hidell-Eyster Report gave this direction as “from southeast to northwest,” id., but apparently meant to state it as “from southwest to northeast” because the Report also described groundwater flow as being “from the inside of the building out to the intersection of East Cottage and Humphreys Streets,” and that intersection is indisputably northeast of the building.

⁴⁴⁹/ 1985 Hidell-Eyster Report (Board Exh. B-15), at 9.

⁴⁵⁰/ Id., at 10.

⁴⁵¹/ Id.

⁴⁵²/ Id.

⁴⁵³/ Id., at 11.

⁴⁵⁴/ Id.

tanks—an 8,000-gallon-capacity tank, a 10,000-gallon-capacity tank, and two 1,000-gallon-capacity tanks—and clean motor oil in two other underground storage tanks with capacities of 1,000 and 1,500 gallons, respectively.⁴⁵⁵ The report made no mention of any other contaminants, including those associated with solvents or paint.

Hidell-Eyster concluded, in its 1985 report, that the sources of the petroleum product contamination at the Ming property were located at that site. One such source was an underground concrete storage tank, located in the larger building’s southeastern corner, that was functioning as a gas trap; another was piping leading to the tank from floor drains in the building.⁴⁵⁶ Liquid in the concrete tank was analyzed and determined to be “heavy petroleum product (possibly crankcase oil) mixed with water,” and an area immediately outside the tank was “heavily contaminated with a similar oil.”⁴⁵⁷ As liquid in the tank was “some three feet higher than the liquid in the ground immediately adjacent” and had stayed at that level for over a week, the concrete tank did not appear to be leaking below that level.⁴⁵⁸ “It [was] much more likely,” Hidell-Eyster concluded, “that the piping from the floor drains to the tank [was] leaking or that the tank ha[d] a leak above the 3' mark and [was] the source of the oil found in the ground.”⁴⁵⁹ Leaking tanks under the parking lot were “[a]nother possible source of contamination,” in the form of gasoline or diesel fuels that escaped from the tanks, volatilized, and “rose into the areas under the floor of the building,” although that could

⁴⁵⁵/ Id., at 11, 13.

⁴⁵⁶/ Id., at 12-13, and at Exh. E (“Sketch Plan A”).

⁴⁵⁷/ Id., at 12-13.

⁴⁵⁸/ Id., at 13.

⁴⁵⁹/ Id.

not be verified unless the tanks were removed and transported offsite.⁴⁶⁰

To mitigate and clean up the petroleum product contamination at the Ming property, Hidell-Eyster recommended, among other things, flushing, cleaning and then abandoning or removing the floor drain system and gas traps, as well as excavating and removing the underground storage tanks and surrounding soils, and installing and operating injection wells to help flush out sediments with fresh water and purge petroleum products from them.⁴⁶¹ The firm also recommended installing a loading dock at the main building as the cleanup proceeded, preferably (in terms of cost) when the underground tanks were removed.⁴⁶²

c.

In 1985, Hidell-Eyster removed the underground storage tanks and fuel pumps inside the larger Ming building and in the paved parking area; in addition, it cleaned and closed “multiple gas traps” including the underground concrete storage tank in the larger building’s southeastern corner that was functioning as a gas trap (see above, at 191).⁴⁶³ DEP issued a “notice of responsibility” on February 11, 1986 “for a release of oil and hazardous material impacting soil and groundwater” at the site, in which the agency recommended the installation of permanent groundwater monitoring wells, the sealing of the floor drain system and piping, and the submission of “detailed plans for a

⁴⁶⁰/ Id.

⁴⁶¹/ Id., at 14-15.

⁴⁶²/ Id., at 16.

⁴⁶³/ Board Exh. B-13: DEP Notice of Audit Findings/Notice of Noncompliance re Dorchester, 83-89 East Cottage Street, RTN 3-00592, Response Action Outcome Activity and Use Limitation NON-NE-03-3A017 (undated) (“DEP Notice”); Audit Memorandum, at 11; see also Loitherstein Environmental RAO Opinion for 83-89 East Cottage Street/5-9 Humphreys Street (Board Exh. B-12); narrative report, at 1-2, Part 1.1 (“Description of Release and Site Conditions”).

product/groundwater recovery and treatment system...”⁴⁶⁴ DEP also issued a release tracking number for this on-site release, RTN 3-0000592,⁴⁶⁵ the number that appears on the Loitherstein Environmental RAO Opinion at issue here.

Ming Realty Trust retained another firm subsequently, C.E.E.S., Inc. (CEES), which backfilled the test pits in the building and installed two observation wells (Boring No. 1 and Boring No. 2) on April 25, 1986.⁴⁶⁶ It is not clear where these were located. CEES’s letter report to DEP on June 10, 1986 (Board Exh. B-14: “the 1986 CEES Report”) gave no location for Boring No. 2, and stated that Boring No. 1 was “placed in front of the garage doors about two feet from the building in the center of the drive.”⁴⁶⁷ The report referred to an attached plan on which the location of the borings was shown, but the copy in the record includes no plan. DEP described the borings as having been installed “east of the building,”⁴⁶⁸ and that is where I have looked on other sketches in the record. One of the sketches included in the 1985 Hidell-Eyster Report (“Sketch Plan A”) shows a building at the site’s southeastern corner with what appears to be a single entranceway fronting directly on Humphreys Street. The single entranceway is not consistent with a location in front of “garage doors.” However, the same sketch shows a better candidate as the site of Boring No. 1—a smaller

⁴⁶⁴/ DEP Notice; Audit Memorandum, at 11.

⁴⁶⁵/ Loitherstein Environmental RAO Opinion for 83-89 East Cottage Street/5-9 Humphreys Street (Board Exh. B-12); narrative report, at 2, Part 1.1 (“Description of Release and Site Conditions”).

⁴⁶⁶/ Board Exh. B-14: Letter, Vincent J. Kalishes, III (C.E.E.S., Inc.) to Rodene Derice, Department of Environmental Quality Engineering, Northeast Region, re: 83-89 East Cottage Street, Dorchester, Massachusetts (Project #E12386), dated June 10, 1986 (“1986 CEES Letter”), at 1.

⁴⁶⁷/ Id.

⁴⁶⁸/ DEP Notice (Board Exh. B-13); Audit Memorandum, at 11.

building along this first building's northern side (south of the underground storage tanks in the parking area) that does not extend to Humphreys Street and instead fronts on part of the parking area, perhaps the "drive" that the 1986 CEES report described. The sketch shows what appear to be two entranceways on this smaller building's front end, which is consistent with the 1986 CEES Report's description of the boring's emplacement in front of the "garage doors."

The 1986 CEES Report stated that samples from Boring No. 1 taken on April 25, 1986 "revealed no readings," while samples taken from Boring No. 2 "showed a reading of approximately 20 p.p.m. from the groundwater and no other sample from this boring exhibited any other reading."⁴⁶⁹ The report did not state what substance exhibited the 20 ppm concentration. The wells were sampled again on May 1, 1986, at which time no petroleum product was observed in samples from either well collected with a bailer (which is used to take surface samples); however, while sampling using a different technique detected none of the "compounds tested" in Boring No. 1, samples from Boring No. 2 "evidenced levels of certain contaminants related to petroleum products, solvents and painting operations."⁴⁷⁰

It was CEES's "belief that the presence of these substances relate to the buried tanks now removed from the site and the painting and cleaning of automotive parts done inside the building which were introduced into the groundwater by the floor drain system."⁴⁷¹ The report does not state the basis for this belief; nor does it furnish any details of the automotive parts painting and cleaning

⁴⁶⁹/ 1986 CEES Letter (Board Exh. B-14), at 1.

⁴⁷⁰/ Id., at 2. The report refers to an attached sampling protocol, but no such protocol appears in the 1986 CEES letter included in the record.

⁴⁷¹/ Id.

that it mentions, including when it occurred. The omission is notable because Hidell-Eyster's earlier investigation included "a detailed study relating to the past history of the site and the neighborhood" but its report said nothing about automotive parts painting and cleaning, and its sampling detected no contaminants other than petroleum products related to releases of gasoline, diesel, fuel oil and motor oil.

Between 1986 and 1988, CEES steam-cleaned the floor drain system and the underground concrete tank in the larger building's southeastern corner that was functioning as a gas trap and then sealed these structures with concrete.⁴⁷² During the same time period, a loading dock was built in the paved parking area at the Ming property's northeastern corner, as Hidell-Eyster had recommended (see above, at 192). The loading dock was in the shape of an "L," with one section adjacent to the larger building's outer (eastern) wall and another section adjacent to the northern wall of the small building with the two driveway entrances, where the former underground storage tanks were removed.

CEES installed groundwater monitoring wells in the area of the loading dock (MW-2a, MW-3 and MW-4) because Borings 1 and 2 (see above, at 193-94) had been, respectively, "compromised" and "destroyed."⁴⁷³ It also installed two vapor monitoring wells in the center of the large building that were monitored with a photoionization detector three times between 1987 and 1988. Total organic vapors (TOV) were detected to be "above background" in the northernmost vapor monitoring well, but there were no TOV readings above background in the southernmost monitoring well.⁴⁷⁴

⁴⁷²/ Loitherstein Environmental RAO Opinion for 83-89 East Cottage Street/5-9 Humphreys Street (Board Exh. B-12); narrative report, at 2, Part 1.1 ("Description of Release and Site Conditions").

⁴⁷³/ DEP Notice (Board Exh. B-13); Audit Memorandum, at 11.

⁴⁷⁴/ Loitherstein Environmental RAO Opinion for 83-89 East Cottage Street/5-9 Humphreys Street (Board Exh. B-12); narrative report, at 2, Part 1.1 ("Description of Release and Site Conditions").

These readings suggest that the petroleum mass emitting these detected vapors was moving away from in-building sources such as the former concrete tank in the direction of groundwater flow, to the northeast (see above, at 190, n. 448). That is what one might expect if contamination sources in the building had been removed or cleaned and filled (as they were in 1986-88) and no vapor-releasing residues were left behind.

c.

The record regarding contamination at the Ming property is practically silent for the years 1989-1995. The historical record resumes with significant developments at the adjacent, upgradient Daloz property beginning in November 1996. Both buildings at the Daloz property were heated at that time with oil stored in onsite tanks⁴⁷⁵ —the buildings at the Ming property were heated, in contrast, with gas and required no onsite storage of heating oil.⁴⁷⁶ During that month, a 3,000-gallon abandoned No. 6 fuel oil underground storage tank and a 5,000-gallon underground storage tank used to store No. 4 and No. 6 fuel oil, both dating from the 1960s and located in the interior courtyard at the end of the Daloz property's driveway (see property description above, at 187-88), were excavated, removed, and replaced with two 275-gallon aboveground No. 2 fuel oil storage tanks.⁴⁷⁷ Both of the removed tanks were pitted and had holes in them, and the surrounding soil was noted to be petroleum-

⁴⁷⁵/ Id.

⁴⁷⁶/ Loitherstein Environmental RAO Opinion for 83-89 East Cottage Street/5-9 Humphreys Street (Board Exh. B-12); narrative report, at 1, Part 1.0 (“Background”).

⁴⁷⁷/ 2004 ECSMarin Report (Loitherstein Exh. L-4); narrative report, at 1, part 1.1 (“Site Description”).

contaminated.⁴⁷⁸ Groundwater monitoring wells were installed and on November 22, 1996, approximately six inches of light non-aqueous phase liquid (LNAPL) was discovered in one of them.⁴⁷⁹ This release was reported to DEP three days later, and DEP issued a release tracking number for a fuel oil release at the Daloz property (RTN 3-14544).

The owner of the Daloz property retained a licensed site professional (Patrick Vargo, LSP, and his firm, Vargo Associates Environmental Consultants) in October 1997. Because part of the Daloz property was designated as a Tier II disposal site related to a release of No. 6 fuel oil, DEP required an immediate response action (IRA) plan, and in February 1998, Vargo submitted a modified IRA plan calling for the installation of a 12-inch recovery well and a system to recover petroleum products.⁴⁸⁰ IRA status reports showed, as of mid-March 1999, approximately 437 gallons of oil and petroleum-impacted water had been manually bailed and removed from the Tier II site on the Daloz property, and 11.69 tons of petroleum-impacted soil was removed when the recovery well was installed; by mid-September 1999, approximately 800 gallons of “remediation waste” had been removed.⁴⁸¹

For reasons that the record does not make clear, Vargo did not complete a response action at the Tier II site on the Daloz property. The Daloz property was transferred from Simon Roberts to Humphrey Street Studios, LLC on May 3, 2001, and in August 2001, the response action was resumed

⁴⁷⁸ / Id.

⁴⁷⁹ / 2004 ECSMarin Report (Loitherstein Exh. L-4); narrative report, at 1-2, part 1.2 (“Site History”).

⁴⁸⁰ / Id., at 2.

⁴⁸¹ / Id.

by new consultants (Kim Henry, LSP and AMEC Earth and Environmental, Inc.).⁴⁸² They determined that the release site on the Daloz property extended northward onto the abutting Ming property; in addition, they discovered “a different type of LNAPL (lighter in color and viscosity reported as mineral spirits)...with a measured thickness greater than ½-inch”.⁴⁸³ Laboratory testing showed that this LNAPL was “comprised of mineral spirits and petroleum products in the lubricating oil (n-C16 to n-C36) range.”⁴⁸⁴ On October 18, 2001, AMEC reported this release to DEP, which assigned a new release tracking number to it in December 2001 (RTN 3-21167), and prepared an immediate response action plan that included bailing LNAPL from a groundwater monitoring well in the courtyard located close to the Ming property boundary, and conducting a soil gas survey and groundwater monitoring program.⁴⁸⁵

Bailing at the Daloz courtyard monitoring well on October 24, 26 and 29, 2001 showed the depth to LNAPL as, respectively, 13.26, 13.28 and 13.29 feet below the surface, very close to the reported depth to water on those dates (13.31-13.35 feet).⁴⁸⁶ AMEC also sampled groundwater monitoring wells in the area of the former gasoline underground storage tank on the Daloz property and, as well (with Ming Realty Trust’s permission), in monitoring wells installed previously at the

⁴⁸²/ Id., at 3.

⁴⁸³/ Id. (parentheses in original). See also AMEC’s “Immediate Response Action Completion Report, Former Daloz Cleaners, 11-13 Humphreys Street, Dorchester, Massachusetts, MADEP Release Tracking Number 3-21167,” dated October 22, 2002 (“2002 AMEC Report,” also included in Loitherstein Exh. L-4), at 2, part 2.2 (“Description of Release”).

⁴⁸⁴/ 2002 AMEC Report (Loitherstein Exh. L-4), at 2, part 2.2 (“Description of Release”).

⁴⁸⁵/ Id.

⁴⁸⁶/ Id., at 4, part 4.1 (“LNAPL Bailing Results”).

Ming property.⁴⁸⁷ Concentrations of volatile petroleum hydrocarbons (VPHs), extractable petroleum hydrocarbons (EPHs) and volatile organic compounds (VOCs) in the groundwater samples were all below the regulatory limits for these substances in GW-3 groundwater, and EPH and VOC concentrations were below the regulatory limits for these substances in GW-2 groundwater as well; however, VPH concentrations were high in samples taken from monitoring wells in the courtyard area on the Daloz property, which “seem[ed] reasonable due to the detection of mineral spirits...”⁴⁸⁸ AMEC’s sampling results also showed that the fuel oil and mineral spirits product plumes were “commingled in some areas,”⁴⁸⁹ and it appeared that the mineral spirits were “cutting or thinning the #6 fuel oil product (based upon visual observation).”⁴⁹⁰

AMEC’s October 22, 2002 Immediate Response Action Completion Report includes a sketch showing overlapping underground plumes, one of fuel oil and the other of mineral spirits, extending in a northeasterly direction from the Daloz courtyard area, buildings and driveway onto the Ming property.⁴⁹¹ See Appendix, Sketch 7B. The plumes are shown as having reached the southeastern corner of the larger Ming building (including the areas of monitoring wells MW-101, where the concrete tank was located, and MW- 207, close to its southern wall adjacent to the Daloz driveway)

⁴⁸⁷/ Id., at 4, part 4.2 (“Groundwater Monitoring Results”).

⁴⁸⁸/ Id., at 5, part 4.2 (“Groundwater Monitoring Results”).

⁴⁸⁹/ Id.

⁴⁹⁰/ Id., at 6 (parentheses in original).

⁴⁹¹/ Id., at Fig. 4 (“Disposal Site Plan, Former Daloz Cleaners, 11-13 Humphreys Street, Dorchester, Massachusetts”).

and most of the smaller building in the Ming property's southeastern corner.⁴⁹² The direction of plume movement was consistent with the northeasterly direction of shallow groundwater flow (see Appendix, Sketch 7C) which AMEC determined to be flowing across the Daloz site "at an average hydraulic gradient of 0.007 feet per foot."⁴⁹³ LNAPL found in all of the groundwater monitoring wells in samples taken on October 12, 2001 and on February 26, 2002 on both the Ming and Daloz properties was "black and thick, and appeared to be fuel oil," except in samples taken from monitoring wells TW-3 in the Daloz courtyard (where the former underground gasoline storage tank was removed) and MW-101 in the larger building at the Ming property, in the vicinity of the former underground concrete storage tank.⁴⁹⁴

The 2002 AMEC Report described what was observed in monitoring well MW-101 as "thin, diesel-like product" and on February 26, 2002 as "thin" with a "diesel odor."⁴⁹⁵ The sketch of the contaminant plumes extending from the Daloz property onto the Ming property places monitoring well MW-101 within the mineral spirits plume but outside of the fuel oil plume (see Appendix, Sketch 7B). It is possible that the mineral spirits plume was dissolving residual contamination in soils beneath the larger building on the Ming Realty Trust property, just as it was "cutting" fuel oil at the Daloz site (see above, at 199). The thinning effect of mineral spirits may also explain why samples from monitoring well TW-3, in the interior courtyard of the Daloz property, showed "lighter product"

⁴⁹²/ Id., at 5, and at Fig. 4 (showing overlapping plumes extending from the Daloz property onto the Ming property).

⁴⁹³/ Id., at 5, and at Fig. 5 ("Groundwater Contour Map, Former Daloz Cleaners, 11-13 Humphreys Street, Dorchester, Massachusetts").

⁴⁹⁴/ Id., at 5.

⁴⁹⁵/ Id., at Table 1: Well Gauging Data and Piezometric Head Elevation Data, Former Daloz Cleaners, Dorchester, MA" (following p. 8).

with a “petroleum odor,” although the 2002 AMEC Report did not state whether that was indeed the case.

More to the point here, however, the observations in monitoring well MW-101 do not rule out ongoing fuel contamination of groundwater beneath the buildings on the Ming Realty Trust property as a result of the fuel oil release at the Daloz property. Sampling elsewhere along the southern side of the buildings on the Ming Realty Trust property, close to the boundary with the Daloz property, suggested strongly that this migrating fuel contamination had indeed occurred. Samples from groundwater monitoring wells MW-207, in the southeastern corner of the larger building, on both October 12, 2001 and February 26, 2002 showed “thick, dark colored product” and “very thick, black product,” similar to what AMEC found in samples taken in the Daloz courtyard where an underground gasoline storage tank had been removed (see above, at 200); the same material was found in samples taken on February 26, 2002 from monitoring well MW-210, in the southernmost smaller building in the southeaster corner of the Ming property, and from groundwater monitoring wells in the Daloz driveway and interior courtyard and within one of the Daloz buildings.⁴⁹⁶

That the fuel oil had migrated onto the Ming Realty Trust property should not have come as a surprise. Although the sources of petroleum contamination on the Daloz property—the former underground storage tanks—had been removed, the leakage from the tanks had been extensive, as suggested by the holes and pitting on the tanks, the petroleum contamination of the surrounding soils, and the quantities of soil and volumes of contaminated water that were removed in 1998 and 1999 (see above, at 196-97). In addition, the petroleum recovery system installed by Vargo (see above, at 197) had not prevented the migration of the leaked fuel oil downgradient to soil and groundwater at

⁴⁹⁶/ Id.

the Ming property. This situation had persisted for four years, and it was not until February 2002 that AMEC found out why this was the case—the recovery system had been disabled.⁴⁹⁷

AMEC's immediate response action for the mineral spirits release at the Daloz property (RTN 3-21167) continued over the next eight months. In its October 22, 2002 Immediate Response Action Outcome Report, AMEC stated that site conditions at the Daloz property had been “stabilized,” meaning that “the nature and extent of the mineral spirits release are defined and there are no known or suspected continuing sources,” and that there existed “[n]o imminent hazards to health, safety, public welfare, and the environment...”⁴⁹⁸ However, because the mineral spirits release had commingled with a portion of the fuel oil release, AMEC “recommended that additional comprehensive response actions for the mineral oil (sic) release be conducted under the fuel oil RTN” (RTN 3-14544), as doing so would be “prudent” in view of the commingling and because “[l]inking the mineral spirits RTN with the fuel oil RTN would circumvent duplicate Phase I-Phase IV reporting.”⁴⁹⁹

Immediate Response Actions (IRAs) were still required at the Daloz property because more than half an inch of LNAPL (mineral spirits and fuel oil) remained below the ground surface.⁵⁰⁰ The new owner of the Daloz property (Humphreys Street Studios, LLC) retained a different consultant, Environmental Compliance Services d/b/a/ ECSMarin, to prepare A Tier II Extension submittal, an

⁴⁹⁷/ 2004 ECSMarin Report (Loitherstein Exh. L-4); narrative report, at 4, part 2.1 (“Status of Assessment and/or Remedial Actions”). AMEC dismantled the disabled recovery system and covered it with gravel.

⁴⁹⁸/ 2002 AMEC Report (Loitherstein Exh. L-4), at 7, part 5.0 (“Findings and Conclusions”).

⁴⁹⁹/ Id., at 8, part 5.0 (“Findings and Conclusions”).

⁵⁰⁰/ 2004 ECSMarin Report (Loitherstein Exh. L-4); narrative report, at 7, part 3.4 (“Reasons IRAs are Required”).

IRA status report, and an IRA plan modification.⁵⁰¹ ECSMarin also recommended modifying the IRA; because Vargo's system for recovering petroleum products from the soil had failed, the best approach, in ECSMarin's opinion, was to assess and monitor the LNAPL plume to determine whether it had stabilized and diminished, and to report periodically on the thickness of the plume and on the amount of dissolved petroleum hydrocarbons in the site's groundwater.⁵⁰²

d.

I return now to the Ming property. In 1988, CEES had installed additional monitoring wells in the loading dock area (see above, at 195). The record includes no results of sampling from these wells or from other monitoring wells within the buildings (if there was any such sampling) between 1988 and August, 1997, when Ming requested that Loitherstein Environmental sample the existing monitoring wells and also review the prior reports that Hidell-Eyster and CEES had prepared.

Sampling by Loitherstein Environmental revealed approximately one inch of LNAPL in monitoring well MW-101,⁵⁰³ located in the southeastern corner of the larger building near the underground concrete storage tank that CEES had steam-cleaned and sealed with concrete by 1988 (see above, at 195). Loitherstein Environmental also "noted an LNAPL seep through a basement wall downgradient of this area."⁵⁰⁴ This LNAPL seep is shown as being in a basement area of the building

⁵⁰¹/ Id., at 3, part 1.2 ("Site History").

⁵⁰²/ Id., at 7, parts 3.5 ("Objective, Specific Plan and Proposed Schedule for the IRA") and 3.7 ("Proposed Environmental Monitoring Plan").

⁵⁰³/ DEP Notice; Audit Memorandum, at 12; Loitherstein Environmental RAO Opinion for 83-89 East Cottage Street/5-9 Humphreys Street (Board Exh. B-12); narrative report, at 2, part 1.1 ("Description of Release and Site Conditions").

⁵⁰⁴/ Loitherstein Environmental RAO Opinion for 83-89 East Cottage Street/5-9 Humphreys Street (Board Exh. B-12); narrative report, at 2, part 1.1 ("Description of Release and Site Conditions").

in the southeastern corner of the Ming property, along a wall common to this building and the larger building and northeast of groundwater monitoring well MW-101.⁵⁰⁵ DEP was notified of this release and assigned a release tracking number to it (RTN 3-0015411).⁵⁰⁶

A passive soil gas survey in 1997 showed a “distribution of diesel-range hydrocarbons” that “appear[ed] to be from a source located near the southeast corner of the building, but the exact source was not fully defined”; it also showed that “chlorinated hydrocarbons, trichloroethene (TCE) and tetrachloroethene (PCE), plus benzene, exhibited a different pattern, appearing to be located south of the building altogether, although the source at that time was not fully defined.”⁵⁰⁷

Samples were taken for laboratory analysis on August 8, 1997 from groundwater monitoring wells inside the larger building, near the loading dock and in the paved area near Humphreys and East Cottage Street (MW-101 through MW-106).⁵⁰⁸ Although total petroleum hydrocarbon (TPH) concentrations were detected in all of them, they were significantly higher in samples taken from wells that were closer to the upgradient Daloz property. Of these monitoring wells, the one closest to the Daloz property was MW-101, in the southeastern corner of the larger building on the Ming property. This was in the area of the underground concrete storage tank that CEES had steam-cleaned and sealed with concrete by 1988, but it was also within the mineral spirits plume extending from the

⁵⁰⁵/ Id., at Fig. 2: “Site Plan With Disposal Site and AUL Boundaries.”

⁵⁰⁶/ Id.; DEP Notice; Audit Memorandum, at 12.

⁵⁰⁷/ Loitherstein Environmental RAO Opinion for 83-89 East Cottage Street/5-9 Humphreys Street (Board Exh. B-12); narrative report, at 2, part 1.1 (“Description of Release and Site Conditions”).

⁵⁰⁸/ Id., at 5, part 2.0 (“Description of Response Actions”), and at Table 2: “Summary of Groundwater Analytical Results-1997, East Cottage Street, Dorchester, Massachusetts.” The location of monitoring wells MW-101—MW-106 is shown at Fig. 2 (“Site Plan With Disposal Site and AUL Boundaries,” a copy of which appears in the Appendix to this decision, at Sketch 7A.

Daloz property. The concentration of total petroleum hydrocarbons in samples from monitoring well MW-101 was 430,000 ug/L.⁵⁰⁹ In contrast, the TPH concentration was 20,000 ug/L in samples taken from the monitoring well that was farthest downgradient from the Daloz property, near the larger building's northern wall (MW-102).⁵¹⁰ This monitoring well was beyond the fuel oil and mineral spirits plumes from the Daloz property as the 2002 AMEC Report showed them.⁵¹¹ The TPH concentrations were lower in samples from four groundwater monitoring wells in the Ming property's paved northeastern corner—1,400 ug/L in MW-103, 2,100 ug/L at MW-104, and 260 ug/L at MW-105—and in samples from monitoring well MW-106, just south of the loading dock outside of the small building with two garage doors (1,700 ug/L).⁵¹² These monitoring wells, too, were beyond the fuel oil and mineral spirits plumes extending from the Daloz property onto the Ming property.⁵¹³

Based upon these results, the 1985 Hidell-Eyster Report and the 1986 CEES Report, and the prior removal of the gasoline and diesel underground storage tanks at the Ming property, Loitherstein Environmental concluded that the LNAPL release associated with RTN 3-0015411 was “attributable

⁵⁰⁹/ Id., at Table 2: “Summary of Groundwater Analytical Results-1997, East Cottage Street, Dorchester, Massachusetts.”

⁵¹⁰/ Id.

⁵¹¹/ 2002 AMEC Report (Loitherstein Exh. L-4), at Fig. 4: “Disposal Site Plan, Former Daloz Cleaners, 11-13 Humphries Street, Dorchester, Massachusetts.”

⁵¹²/ Loitherstein Environmental RAO Opinion for 83-89 East Cottage Street/5-9 Humphreys Street (Board Exh. B-12); narrative report, at 5, part 1.2 (“Definition of Site and disposal site”), and at Table 2: “Summary of Groundwater Analytical Results-1997, East Cottage Street, Dorchester, Massachusetts.” The Method 1 cleanup standards for TPH are 1,000 ug/L for groundwater classified as GW-2, and 20,000 ug/L for groundwater classified as GW-3.

⁵¹³/ See 2002 AMEC Report (Loitherstein Exh. L-4), at Fig. 4: “Disposal Site Plan, Former Daloz Cleaners, 11-13 Humphries Street, Dorchester, Massachusetts.”

to the property immediately upgradient to the Site,” meaning the Daloz property.⁵¹⁴ The firm presented its findings and conclusions, together with a copy of the 1985 Hidell-Eyster Report and the 1986 CEES Report, in a Phase I Report and Tier II Classification that it filed with DEP in August 1998.⁵¹⁵

Additional soil borings performed by Loitherstein Environmental in August 1999 showed “significant heavy oil contamination along the south wall of the Site building” that “did not correlate with the previous conditions reported at the Site.”⁵¹⁶ Previous reported conditions at the site included CEES’s total organic vapor readings, obtained in 1987-88, after that firm had steam-cleaned the floor drain system and the underground concrete storage tank in the southeastern corner of the building and filled them with concrete (see above, at 195). None of those TOV readings was above background in the southernmost vapor monitoring well installed in the large building.

That prompted Loitherstein Environmental to investigate an off-site source for the contamination, which it found in short order—the release of No. 6 fuel oil at the Daloz property to which RTN 3-14544 was assigned in late 1996.⁵¹⁷ In September 1999, Loitherstein Environmental drilled through the floor slab within the Ming property buildings close to the Daloz boundary, near monitoring wells MW-207 (along the larger building’s southern wall) and MW-210 (along the adjacent smaller building’s southern wall), and found “NAPL, visually and analytically characteristic

⁵¹⁴/ Loitherstein Environmental RAO Opinion for 83-89 East Cottage Street/5-9 Humphreys Street (Board Exh. B-12); narrative report, at 2, part 1.1 (“Description of Release and Site Conditions”).

⁵¹⁵/ Id. Neither the Board nor Loitherstein filed a copy of the 1998 Phase I Report.

⁵¹⁶/ Id., at 3, part 1.1 (“Description of Release and Site Conditions”).

⁵¹⁷/ Id.

of No. 6 heating oil.”⁵¹⁸ The AMEC Report would show later that No. 6 heating oil released at the Daloz property had migrated onto the Ming property (see above, at 198-202). In addition, “data from these locations indicate[d] the presence of chlorinated volatile organic compounds (VOCs) and gasoline-related VOCs” that were consistent with the 1997 soil gas survey results and that supported “an off-Site, upgradient, source for some, if not all, of the contaminants documented” at the Ming property.⁵¹⁹

Soil and groundwater sampling and analysis at the Ming property continued through 2001. These yielded several findings worth noting here:

(1) Elevated vinyl chloride concentrations were found near the Daloz boundary. Groundwater monitoring well samples taken on September 30, 1999 showed vinyl chloride concentrations of 75 ug/l (above the Method 1 cleanup standard of 2 ug/l for GW-2 groundwater) at groundwater monitoring well 210, located along the southern wall of the small building in the Ming property’s southeast corner, adjacent to the driveway on the Daloz property and across from the Mill Building that had been used by Daloz for clothes storage, ironing and pressing⁵²⁰ (see above, at 188). Vinyl chloride is a byproduct of perchloroethylene, a commonly-used drycleaning solvent. In all of the other groundwater monitoring wells sampled (including MW-207, close to the southern wall of the larger building on the Ming property and in the area of the former concrete tank), vinyl chloride concentrations were less than 2.0 ug/l except at well MW-101 (inside the larger building on the Ming

⁵¹⁸/ Id., at 4, part 1.1 (“Description of Release and Site Conditions”), and 6, part 2.1 (“Investigatory and Monitoring Data”); see also Fig. 2 (“Site Plan With Disposal Site and AUL Boundaries,” which shows the location of the monitoring wells.

⁵¹⁹/ Id., at 4, part 1.1 (“Description of Release and Site Conditions”)

⁵²⁰/ Id., at Table 4 (“Summary of Groundwater Analytical Results-1999, East Cottage Street, Dorchester, Massachusetts”).

property and north of MW-207), where it was 2.0 ug/l.⁵²¹

(2) Petroleum hydrocarbon contamination remained in the loading dock area. Laboratory analysis of samples taken in 2001 from groundwater monitoring wells in the area of the loading dock and adjacent paved area in the northeastern corner of the Ming property showed concentrations of total petroleum hydrocarbons (TPH) above the Method 1 cleanup standard of 1,000 ug/l for GW-2 groundwater, thus:

(a) In samples taken in February and October, 2001 from MW-104 (in the paved area along Humphreys Street), the concentration of TPH described as “weathered fuel” was 1,600 ug/l;

(b) In samples taken in February and October, 2001 from MW-208 (inside the larger building, along its outside (eastern) wall, adjacent to the loading dock), the concentration of TPH described as “gasoline and kerosine (sic) ranges” was 2,900 ug/l;

(c) In samples taken in April 2001 from MW-401 (at the inside corner of the two sections of loading dock and the paved parking area, the concentration of TPH described as “fuel oil and lubricating oil ranges” was 18,900 ug/l.⁵²²

Soil sampling also showed that petroleum hydrocarbon contamination remained in the loading dock area. Loitherstein Environmental collected soil samples on May 17, 2000 from three additional hand-augered borings “in the vicinity of the loading dock,” and on March 30, 2001 from a soil boring “in the vicinity of a former UST (underground storage tank) location adjacent to the loading dock, which was completed as groundwater monitoring well 401” (just outside the intersection of the two loading dock sections that formed an “L”).⁵²³ All of these samples were sent to an independent

⁵²¹/ Id.

⁵²²/ Id.; narrative report, at 6-7, part 2.1 (“Investigatory and Monitoring Data”), and at Table 6: “Summary of Groundwater Analytical Results-2001, East Cottage Street, Dorchester, Massachusetts.”

⁵²³/ Id.; narrative report, at 6-7, part 2.1 (“Investigatory and Monitoring Data”). The soil boring locations are not shown on the RAO Opinion’s sole plan showing monitoring wells, soil borings, and other features of the Ming and Daloz properties (Fig. 2). Without question, however, the three new soil borings were hand-augered rather than power-drilled through concrete. This rules out their location in

laboratory for analysis to determine the concentrations of extractable petroleum hydrocarbons (EPHs), volatile petroleum hydrocarbons (VPHs) and VOCs. The results showed that:

(a) None of the VPH or VOC concentrations exceeded Method 1 standards for GW-2 and GW-3 groundwater, and most were very low (expressed as a “less than” figure), but several indicators of gasoline contamination—ethylbenzene, naphthalene and xylene—were noticeably present in one of the hand-augered borings within the loading dock area (B-301); and

(b) In hand-augered boring B-302 within the loading dock area, concentrations of several of the extractable petroleum hydrocarbons (EPHs) analyzed exceeded the Method 1 standard for GW-2 and GW-3 groundwater—Benzo(a)anthracene, Benzo(a)pyrene and Benzo(b)fluoranthene, each of which is an indicator of diesel, fuel oil and/or used motor oil contamination. In samples from borings B-303 and B-401, concentrations of these EPHs did not exceed the Method 1 standards for them in GW-2 and GW-3 groundwater, but with one exception—benzo(a)pyrene at boring B-302 on May 17, 2000—they were nonetheless noticeably present.⁵²⁴

These soil results are summarized below in Table 6.

[continued]

the footprint of the loading dock or in the adjacent buildings, whose surfaces were too solid to be hand-augered. A more likely location for the hand-augered soil borings was the softer pavement adjacent to the loading dock, in the Ming property’s northeast corner.

⁵²⁴/ Id., at Table 6: “Summary of Groundwater Analytical Results-2001, East Cottage Street, Dorchester, Massachusetts.”

Table 6

Selected petroleum hydrocarbon contaminant concentrations in soil samples taken in the loading dock area of the Ming property compared with MCP Method 1, GW-2/GW-3 Standards

PARAMETER	BORING # and SAMPLING DATE	CONCENTRATION (ug/g)	STANDARD (ug/g)
VPHs	////////////////////////////////////	////////////////////////////////////	////////////////////////////////////
Aliphatics C ₉ - C ₁₂	B-301 05/17/00	23.8	1,000
Aromatics C ₉ -C ₁₀	B-301 05/17/00	30.8	100
VOCs	////////////////////////////////////	////////////////////////////////////	////////////////////////////////////
Ethylbenzene	B-301 05/17/00	0.308	500
Naphthalene	B-301 05/17/00	0.692	100
Xylene	B-301 05/17/00	0.527	500
EPHs	////////////////////////////////////	////////////////////////////////////	////////////////////////////////////
Benzo(a)anthracene	B-302 05/17/00	1.890	0.700
	B-303 05/17/00	0.666	0.700
	B-401 03/03/01	0.400	0.700
Benzo(a)pyrene	////////////////////////////////////	////////////////////////////////////	////////////////////////////////////
	B-302 05/17/00	0.939	0.700
	B-302 05/17/00	< 0.361	0.700
	B-401 03/30/01	0.529	0.700
Benzo(b)fluoranthene	////////////////////////////////////	////////////////////////////////////	////////////////////////////////////
	B-302 05/17/00	1.390	0.700
	B-303 05/17/00	0.486	0.700
	B-401 03/30/01	0.661	0.700

e.

Before discussing what Loitherstein Environmental filed in October 2001, it is worth recalling that there were, at the time, four active release sites at the Ming and Daloz properties. These are summarized in Table 7 below.

Table 7

Summary of Release Tracking Numbers and Related Releases at Ming and Daloz Properties, 1986-2001

RTN #	Date Issued	Property	Area	Release
3-0000592	02/86	Ming	Northeastern corner of property, including paved parking area, loading docks, site of former underground storage tanks removed by Hidell-Eyster in 1985, and northeastern quarter of the larger building.	Gasoline, diesel fuel, motor oil
3-14544	11/96	Daloz	Buildings, inner courtyard (where former underground fuel and gasoline storage tanks were removed), and driveway on the Daloz property; extending north onto Ming property (southeastern quarter of larger building, and adjacent small building in southeastern corner of the Ming property).	No. 6 fuel oil
3-0015411	08/97	Ming	Monitoring well MW-101, in southeast corner of larger building near underground concrete storage tank/gas trap that CEES steam-cleaned and sealed with concrete by 1988.	LNAPL; total petroleum hydrocarbons; thin, diesel-like product, possibly thinned by mineral spirits
3-21167	12/01	Daloz	Inner courtyard (where former underground fuel and gasoline storage tanks were removed), extending north onto Ming property, within larger building.	LNAPL (mineral spirits; also lubricating oil in the range n-C ₁₆ -n-C ₃₆)

On August 22, 2001, Ming Realty Trust recorded, relative to RTN 3-0000592, a Notice of Activity and Use Limitation (AUL) on 83-89 East Cottage Street/5-9 Humphreys Street with an accompanying Activity and Use Limitation Opinion by Joel S. Loitherstein dated August 20, 2001. The purpose of the AUL was to prevent direct contact at the Ming property with subsurface soil. Accordingly, the activities and uses allowed by the AUL included “[a]ny commercial or industrial activities and uses which do not cause or result in direct contact with, disturbance of, and/or relocation of soils beneath the building slab, loading dock, or paved areas.”⁵²⁵ Activities and uses listed as inconsistent with the AUL included the Ming property’s use for residential or agricultural purposes or its use for a children’s school, permanent removal of the floor slab, loading dock or pavement, and any activities that resulted in the removal of the buildings, loading dock or pavement without prompt repair or replacement consistent with the AUL after the work was completed.⁵²⁶

With the AUL implemented, Loitherstein filed a Class A-3 RAO Opinion for RTN 3-00592 on October 15, 2001. A Class A-3 RAO Opinion may be filed if a permanent solution has been achieved but the level of oil and/or hazardous material has not been reduced to background, and one or more activity and use limitations “have been implemented pursuant to 310 CMR 40.1012 to maintain a level of No Significant Risk.” 310 CMR 40.1036(3); see discussion above, at 107-108.

The RAO Opinion described a release of gasoline and diesel fuel from the former underground storage tanks in the loading dock area, extending horizontally “to the area in the immediate vicinity of the current loading dock at the Site,” and vertically “to a depth of approximately 15 feet below

⁵²⁵/ Loitherstein Environmental RAO Opinion for 83-89 East Cottage Street/5-9 Humphreys Street (Board Exh. B-12); Appendix E (AUL dated August 20, 2001), at 2.

⁵²⁶/ Id.

grade surface.”⁵²⁷ Risk was characterized using Method 1,⁵²⁸ with groundwater classified as GW-2 (based upon a less-than-15-foot depth to groundwater and the close proximity of occupied structures—the food warehouse and noodle factory) and GW-3 (the default groundwater classification for groundwater in Massachusetts) and soils classified as S-3, pursuant to 310 CMR 40.0933, in view of low site use intensity with a potential for high frequency of adult use, and because contaminated soils were located at depths of less than 15 feet under pavement and beneath the building.⁵²⁹ Groundwater analytical data, all from monitoring wells in the vicinity of the loading dock, indicated that “exposure point” concentrations of volatile petroleum hydrocarbons, extractable petroleum hydrocarbons and VOCs were all below applicable Method 1 cleanup standards for S-3 soils and were, as well, below Method 1 cleanup standards for S-1 soils except for benzo(a)anthracene (a diesel fuel indicator), the concentration of which exceeded the applicable standard (see above, at 210, Table 6).⁵³⁰

⁵²⁷/ Id.; narrative report, at 8, part 3.1 (“Site Information Required for Risk Characterization”).

⁵²⁸/ MCP Method 1 was described above, at 97-98 (in the discussion of the RAO Opinion for 73 Jeffrey Avenue in Holliston). To recapitulate: Method 1 is one of three methods that DEP’s regulations prescribe for determining “the need for a remedial action or to demonstrate that a level of no significant risk of harm to health, public welfare and the environment exists or has been achieved.” 310 CMR 40.0941(3). It characterizes risk by comparing concentrations of oils and hazardous waste in soil and groundwater at a disposal site with standards that appear at 310 CMR 40.0970 through 40.0979. See 310 CMR 30.0941(3)(a).

⁵²⁹/ Loitherstein Environmental RAO Opinion for 83-89 East Cottage Street/5-9 Humphreys Street (Board Exh. B-12); narrative report, at 12-13, part 3.4 (“Identification of Site Soil and Groundwater Categories”).

⁵³⁰/ Id., at 12-13. The exposure point concentrations for soil were “calculated as an arithmetic mean of reported concentrations for each compound detected in samples collected from within an Exposure Point, defined by the horizontal and vertical distribution of the contaminated soil in combination with each applicable Soil Category.” Id., at 11, part 3.3.1 (“Identification of Exposure Point Concentrations-Soil”). The exposure point concentrations for groundwater were the concentrations of the substances in question in samples taken from monitoring wells in or near the disposal site boundary defined by Loitherstein Environmental for RTN 3-0000592 (MW-101 through MW-106, MW-208 and

It was Loitherstein Environmental's opinion that with the AUL in place for the area in the vicinity of the loading dock, a condition of no significant risk for human health, safety, public welfare and the environment existed in the disposal area to which RTN 3-0000592 applied.

This risk characterization excluded, from the RTN 3-0000592 disposal area, soil and groundwater analytical data from monitoring wells near the Daloz property—MW-101 (in the southeast corner of the larger building, near where the concrete tank was cleaned and capped in 1985), MW-207 (near the southern wall of the larger building, near the Daloz driveway and courtyard), and MW-210, along the south wall of the smaller building in the southeastern corner of the Ming property, near the Daloz driveway and one of the Daloz drycleaning buildings. As noted above, in September 1999 Loitherstein Environmental found “NAPL, visually and analytically characteristic of No. 6 heating oil,” the material released at the Daloz site in 1996, near groundwater monitoring wells MW-207 and MW-210 (see above, at 206-07). In addition, concentrations of vinyl chloride, a byproduct of the drycleaning solvent perchloroethylene, were found to be well above the Method 1 cleanup standard for GW-2 groundwater in late September 1999 (see above, at 207-08).

In Loitherstein Environmental's opinion, this other contamination at the Ming property, particularly the LNAPL found at monitoring well MW-101 in the area of the concrete tank that Hidell-Eyster cleaned and capped with concrete in 1985, was associated with RTN 3-0014544, the 1996 release of No. 6 fuel oil at the Daloz property.⁵³¹ The firm also opined, therefore, that the release associated with RTN 3-0015411 (see above, at 203-204) was the responsibility of the Daloz

MW-401). Id.

⁵³¹/ Id.; cover letter dated October 11, 2001, at 2.

property owner. It filed an IRA Completion Statement for this release.⁵³²

f.

DEP audited Loitherstein Environmental's Class A-3 RAO Opinion in May 2002. It found inadequate support for the conclusion that LNAPL and vinyl chloride detected in groundwater monitoring wells MW-101 and 207 on the Ming property were migrating solely from an upgradient off-site source, in view of these factors:

- (a) Both monitoring wells were near the former underground concrete tank and the floor drain system that Hidell-Eyster and CEES identified as contamination sources;
- (b) Monitoring wells MW-101 and MW-210 were "located in the immediate vicinity" of former underground storage tanks 8, 9 and 10, and "MW-210 is located within the area formerly occupied by UST 6";
- (c) The 1985 Hidell-Eyster Report identified on-site contamination sources "such as an UST used as a gas trap, and piping connecting floor drains under the building"; and
- (d) CEES reported that "solvents used to paint and clean automotive parts inside the building were discharged into the groundwater by the on-site floor drain system."⁵³³

The Board's testimony against Loitherstein tracked these assertions. The assertions are significantly flawed, however. Among other things, DEP stated inaccurately not only the number of former underground storage tanks but also where they were located, and how proximate the monitoring wells in question were to the former underground storage tank locations. I discuss this further in reviewing the Board's testimony (see below, at 221-26).

DEP also noted, in its audit findings, that the concentration of vinyl chloride in a sample taken in September 1999 from monitoring well MW-210 (along the southern wall of the small building on

⁵³²/ Id.

⁵³³/ DEP Notice (Board Exh. B-13); Attachment A: Noncompliance Summary, at 1.

the Ming property, adjacent to the Daloz driveway) exceeded the Method 1 standard for GW-2 groundwater.⁵³⁴ The vinyl chloride concentration in the sample was 75 ug/l, significantly above the Method 1 standard of 2 ug/l; in another sample taken at the same time at groundwater monitoring well MW-101 (at the location of the concrete tank in the southern portion of the larger Ming building), the vinyl chloride concentration was equal to the Method 1 standard.⁵³⁵

Loitherstein Environmental excluded these vinyl chloride concentrations from its characterization of risk at the Ming property because, in its view, the source of vinyl chloride contamination was upgradient and offsite, on the Daloz property. DEP concluded that vinyl chloride should not have been excluded from risk characterization at the Ming property and that there were potential on-site sources of the vinyl chloride contamination, including the concrete tank and gas traps in the area of monitoring well MW-101.⁵³⁶ Moreover, DEP's audit report continued, since vinyl chloride concentrations had exceeded the applicable Method 1 standards, a condition of no significant risk had not been achieved at the Ming property, the on-site sources of both the vinyl chloride and LNAPL detected in these monitoring wells had not been eliminated or controlled, and a Class A RAO Opinion should not have been filed.⁵³⁷

DEP ordered Ming Realty Trust to “[c]onduct additional groundwater monitoring to adequately define the extent and levels of chlorinated solvents and petroleum, including LNAPL...and demonstrate that contaminant concentrations pose a level of NSR (no significant risk) under a revised

⁵³⁴/ DEP Notice (Board Exh. B-13); Attachment A: Noncompliance Summary, at 5.

⁵³⁵/ Id.

⁵³⁶/ Id., at 4-5.

⁵³⁷/ Id.

Method 1 or Method 3 Risk Characterization” and revise the Class A-3 RAO Opinion.⁵³⁸ It also ordered that the Trust file “a Confirmatory Notice of Activity and Use Limitation” including a sketch plan showing the location and boundary of the building floor slab, loading dock, pavement boundary, disposal site boundary and boundary of the activity and use limitation area.⁵³⁹

g.

In its amended proposed order, the Board charged that Loitherstein:

(1) did not determine the direction of groundwater flow at 83-89 East Cottage Street and 5-9 Humphreys Street in Dorchester;

(2) did not define the nature and extent of releases or characterize adequately the risks that these releases posed; and

(3) opined that vinyl chloride and NAPL detected onsite had migrated entirely from an upgradient property without adequate support.⁵⁴⁰

The Board alleged that these omissions comprised the following violations of its Rules of Professional Conduct for LSPs:

(1) failure to act with reasonable care and diligence with regard to the site, in violation of 309 CMR 4.02(1);

(2) failure to follow applicable requirements and procedures of M.G.L. c. 21E and 310 CMR 40.0000, in violation of 309 CMR 4.03(3)(b); and

(3) failure to collect sufficient data to define the nature and extent of the releases and to adequately characterize the risk that these releases posed, in violation of 309 CMR 4.03(3)(c).⁵⁴¹

⁵³⁸/ Id., at 8.

⁵³⁹/ Id.

⁵⁴⁰/Amended Proposed Order, at 16-17; Findings of Noncompliance, items I.iii-iv.

⁵⁴¹/ Id.; items I.iii-iv, II, and III.

Board witness Michael J. Webster testified that the Ming property was “a complicated site with a complicated site history and multiple on-site and off-site sources,” and that “the possibility existed that contaminant plumes from on-site were commingled with contaminant plumes originating off-site,” although he did not identify the composition, origin or location of any of these contaminant plumes.⁵⁴² In his opinion, “the level of field investigation undertaken by Mr. Loitherstein was not commensurate with the site’s complex history” and lacked “hydrogeologic and hydraulic information, including stratigraphic information, the depth to ground water at the site, and the direction of ground water flow (even though multiple field sampling events were completed at the site),”⁵⁴³ and the RAO Opinion was “silent as to the former source areas and the historical work done in these areas.”⁵⁴⁴ Webster found “prior assessment reports” to be “confusing regarding the locations of former tanks, pumps, and surface structures,”⁵⁴⁵ although he did not explain what in particular he found confusing. He faulted the RAO Opinion for not discussing or clarifying this information, and stated that the RAO Opinion’s site map did “not indicate the locations of some of the former tanks,” although he did not identify which ones were not shown or where they were located.⁵⁴⁶ In view of these asserted omissions, Webster concluded that “Mr. Loitherstein was in not in a position to point blame in the direction of an abutter without first documenting the information in his opinion.”⁵⁴⁷ Nor, in his view,

⁵⁴²/ Webster PFT, at 28.

⁵⁴³/ Id., at 29 (parentheses in original).

⁵⁴⁴/ Id., at 31.

⁵⁴⁵/ Id.

⁵⁴⁶/ Id.

⁵⁴⁷/ Id.

could Loitherstein “parse out” separate hazardous waste and oil disposal areas or state with certainty that LNAPL and vinyl chloride contamination at the Ming property was not attributable to on-site sources.⁵⁴⁸ These omissions, in his view, amounted to a violation of the standard of care required of an LSP, including the exercise of reasonable care and due diligence.⁵⁴⁹

Board witness Debra J. Phillips essentially concurred with Webster’s assertions.⁵⁵⁰ She also faulted Loitherstein for failing to “discuss that previous assessments had indicated the presence of various on-site sources of petroleum contamination and had reported that chlorinated solvents had been discharged into groundwater via floor drains,” although she did not furnish any specifics.⁵⁵¹ Phillips testified that Loitherstein “failed to indicate on the site map in the report the location of potential source areas such as the gas trap and floor drains.”⁵⁵² Her prefiled direct testimony did not mention, however, that a copy of the 1985 Hidell-Eyster Report, including its maps, had accompanied the Loitherstein Environmental RAO Opinion. Phillips also faulted Loitherstein for not filing a downgradient property status (DPS) opinion for the Ming property relative to contamination remaining there from releases “from an upgradient property” (meaning the Daloz property, presumably).⁵⁵³ If DEP had not audited the RAO Opinion, Phillips added, it would not have known that this contamination “remained on site above acceptable levels...” and this might have prompted

⁵⁴⁸/ Id., at 29, 30.

⁵⁴⁹/ Id., at 32.

⁵⁵⁰/ Phillips PFT, at 12.

⁵⁵¹/ Id.

⁵⁵²/ Id.

⁵⁵³/ Id., at 13.

a premature closing out of two disposal sites—RTN 3-0000592 (assigned to the discharge of gasoline, diesel fuel and motor oil the area in the northeastern corner of the Ming property including the loading dock and site of the former underground storage tanks removed by Hidell-Eyster in 1985) and RTN 3-0015411 (assigned to the LNAPL release that was detected in the area of monitoring well MW-101, in the southeaster corner of the larger Ming building near the underground concrete storage tank that CEES had steam-cleaned and sealed with concrete by 1988).⁵⁵⁴

Board witness and DEP environmental analyst and auditor James W. Perry found inadequate support in the RAO Opinion for Loitherstein Environmental’s conclusion that LNAPL and vinyl chloride detected in groundwater monitoring wells MW-101 and 207 on the Ming property were migrating solely from an upgradient off-site source.⁵⁵⁵ The historical record convinced Perry that there were “potential sources” at the Ming property contributing vinyl chloride and LNAPL to groundwater, particularly the concrete tank that had been used as a gas trap and the floor drain.⁵⁵⁶ DEP had reached the same conclusion in its 2002 audit report, and Perry recited the same four supporting grounds that the report gave (see above, at 215).⁵⁵⁷

h.

Each of these grounds is factually flawed. As a result, they support neither Perry’s opinions nor the same opinions that DEP gave in its audit report, and they also furnish no factual support for the opinion testimony offered by Webster and Phillips. Reviewing these proffered grounds and their

⁵⁵⁴/ Id., at 13.

⁵⁵⁵/ Perry PFT, at 5.

⁵⁵⁶/ Id., at 6-7.

⁵⁵⁷/ Id., at 6.

flaws seriatim:

(a) *Monitoring wells MW-101 and MW-207 were located “in the midsection of the building” near the former underground concrete tank used as a gas trap and the floor drain system that Hidell-Eyster and CEES identified as sources of contamination.*⁵⁵⁸ However, neither firm identified vinyl chloride as having been detected in samples taken from either well (see above, at 188-196). Hidell-Eyster identified the liquid in the concrete tank, instead, as “heavy petroleum product (possibly crankcase oil) mixed with water,” and an area immediately outside the tank was “heavily contaminated with a similar oil” (see above, at 191). In addition, the concrete tank and floor drain had long ago been cleaned and sealed, and testing showed that no petroleum residue was left behind. CEES steam-cleaned the concrete tank and the floor drain and sealed them with concrete between 1986 and 1988 (see above, at 195), which eliminated them as sources of petroleum hydrocarbons. After this work was completed, CEES monitored total organic vapor (TOV) in the larger building on the Ming property but obtained no readings above background in the southernmost of its vapor monitoring wells—the one closest to the cleaned and sealed concrete tank—in contrast with higher TOV readings at the opposite (downgradient) end of the larger building, in the northernmost vapor monitoring well. This was consistent with a successful cleanup in the concrete tank area that left no vapor-emitting petroleum residues behind, and with the migration of the contamination plume in the direction of groundwater flow (see above, at 195-96). To sum up, although the concrete tank and the floor drains were on-site contaminant sources of petroleum hydrocarbons prior to 1988, they were never identified as sources of vinyl chloride, and after they were cleaned and sealed in 1988, vapor

⁵⁵⁸/ Perry PFT, at 6; DEP Notice (Board Exh. B-13): Attachment A (“Noncompliance Summary”), at 1.

testing confirmed that they no longer remained even as potential petroleum hydrocarbon sources.

(b) *Monitoring wells MW-101 and MW-210 were “located in the immediate vicinity” of former underground storage tanks 8, 9 and 10, and “MW-210 is located within the area formerly occupied by UST 6.”*⁵⁵⁹ There were no underground storage tanks numbered 8, 9 or 10, however. The 1985 Hidell-Eyster Report listed six underground storage tanks numbered 1-6,⁵⁶⁰ and neither CEES nor Loitherstein Environmental identified any such tanks with a higher number. Hidell-Eyster had suspected initially that each of its 11 numbered borings, drilled in August and September 1984, might have been the location of an underground storage tank, but the test pits dug by April 1985 confirmed such tanks only at borings 1-6.⁵⁶¹ All of these six underground storage tanks, numbered 1-6, were located in the outside paved parking area in the northeastern corner of the Ming property. Tanks 1-4 and 6 were where the L-shaped loading dock would be built later (between 1986 and 1988, along the outer walls of the larger building and the smaller building with two garage doors).⁵⁶² None of the numbered underground storage tanks was located within a building, and none of them were in the immediate vicinity of groundwater monitoring wells MW-101 (located in the southern quarter of the larger building) or MW-210, located along the southern wall of the small building in the Ming site’s southeastern corner, near the Daloz driveway.

(c) *The 1985 Hidell-Eyster Report identified on-site contamination sources “such as an UST*

⁵⁵⁹/ Perry PFT, at 6; DEP Notice (Board Exh. B-13); Attachment A: Noncompliance Summary, at 1.

⁵⁶⁰/ 1985 Hidell-Eyster Report (Board Exh. B-15), at 11, and at site sketch labeled “Exhibit B.”

⁵⁶¹/ Id., at 5-11.

⁵⁶²/ Id., at site sketch labeled “Exhibit B.”

used as a gas trap, and piping connecting floor drains under the building.”⁵⁶³ This is indeed what the report identified, and the report was accurate as of 1985. However, these contamination sources were steam-cleaned and sealed with concrete by 1988 (see above, at 195), and subsequent TOV testing showed no vapors above background levels (see above, at 195-96). There was, thus, no evidence that these structures, or the soil surrounding them, remained as on-site contamination sources. There were, in contrast, more recent upgradient, off-site sources of contamination at the adjacent Daloz property (No. 6 fuel oil and mineral spirits, reported in 1996 and after) that had generated plumes extending downgradient onto the Ming property in the vicinity of groundwater monitoring wells MW-101, MW-207 and MW-210 (see above, at 196-203).

(d) *CEES reported that “solvents used to paint and clean automotive parts inside the building were discharged into the groundwater by the on-site floor drain system.”*⁵⁶⁴ CEES stated this to be its “belief,” but its 1986 Report furnished no supporting information such as when these activities occurred (see above, at 194-95). In addition, the 1985 Hidell-Eyster Report, which reflected “a detailed study relating to the past history of the site and the neighborhood,” said nothing about automotive parts painting and cleaning, and its sampling detected no contaminants other than petroleum products related to releases of gasoline, diesel, fuel oil and motor oil (see above, at 195). But whatever was discharged to the floor drain system in the Ming building, that system was steam-cleaned and filled with concrete by 1988, which eliminated it as an on-site source of contaminants. In addition, groundwater was moving continuously to the northeast, making it unlikely that

⁵⁶³/ Perry PFT, at 6; DEP Notice (Board Exh. B-13); Attachment A: Noncompliance Summary, at 1.

⁵⁶⁴/ Id.

contaminants discharged from the floor drains prior to 1988 were still present in groundwater at the same location nearly a decade later. In contrast, testing by AMEC documented that by October 2001, plumes of fuel oil and mineral spirits from releases at the upgradient Daloz property had reached the areas surrounding monitoring wells MW-101 and MW-210 on the Ming property (see above, at 197-202). Neither Perry nor any of the Board's other witnesses stated why this information was insufficient to show that the vinyl chloride and LNAPL detected at these monitoring wells originated at the Daloz property rather than from the concrete tank and floor drain in the Ming building that were cleaned and sealed ten years earlier. To recapitulate the information that the Board's witnesses appear to have found insufficient:

(1) The concrete tank and floor drain in the southern portion of the larger Ming building (in the vicinity of groundwater monitoring well MW-101) were cleaned out and sealed by 1988, and subsequent testing had detected no vapors indicating a remaining petroleum residue (see above, at 195-96). In addition, groundwater flowed in a northeasterly direction along a measureable hydraulic gradient (see above, at 200), meaning that any contaminants left behind despite the cleaning and capping by 1988 were unlikely to have remained in place. Neither the Board nor its witnesses presented any evidence to the contrary, and nor did they explain why this evidence was not sufficient to rule out the concrete tank and floor drain as on-site sources of LNAPL or mineral spirits detected nearly ten years later.

(2) Neither the 1985 Hidell-Eyster Report nor the 1986 CEES Report identified vinyl chloride in any monitoring well sample obtained at the Ming property. In addition, the Ming property was used afterward as a food warehouse and noodle factory and was heated with gas rather than with fuel oil (see above, at 196). In contrast, the upgradient Daloz property was used by a drycleaning business

through 1996 (see above, at 187-88), and vinyl chloride is a byproduct of the drycleaning solvent perchloroethylene. Groundwater monitoring well testing on September 30, 1999 showed elevated vinyl chloride concentrations near the Daloz boundary (see above, at 207). In addition, the Daloz buildings were heated with oil stored in onsite tanks at least through November 1996 (see above, at 196). These facts were uncontradicted by the Board and its witnesses, who also did not explain why these facts did not suffice to rule out an on-site source of vinyl chloride at the Ming property.

(3) Releases of mineral spirits and fuel oil at the upgradient Daloz site, documented by AMEC and ECCMarin, occurred much closer in time to the detection of LNAPL and mineral spirits at the Ming property than did the gasoline, fuel oil and motor oil releases that Hidell-Eyster and CEES documented at that site during the mid-1980s. The releases at the Daloz property were also substantial and persistent, generating contaminant plumes that extended onto the Ming property in the direction of groundwater flow and required continued remediation after Loitherstein Environmental filed its RAO Opinion for the Ming property (see above, at 196-203). The Board and its witnesses presented no evidence to the contrary and did not explain why these factors did not rule out an onsite source of the LNAPL and vinyl chloride releases.

I conclude that the RAO Opinion's identification of an upgradient, offsite source (at the Daloz property) for vinyl chloride and LNAPL detected in groundwater monitoring wells MW-207 and MW-101 was supported by sufficient data, and that there was, in contrast, no factual support for attributing this contamination to the cleaned and sealed concrete tank and drainage system in the Ming building or to remaining petroleum residues (if there were any) in these structures. Consequently, Loitherstein Environmental (1) correctly excluded this contamination from its consideration of risk remaining from onsite releases, and (2) correctly defined the disposal site on the Ming property as an

area in its northeastern quadrant including the northeastern portion of the larger building, the loading dock, and the paved open area adjacent to the loading dock and to Humphreys and East Cottage Streets.

i.

I turn next to the Board's charge that Loitherstein failed to determine groundwater flow direction at the Ming property.

The RAO Opinion did not describe an independent investigation of groundwater flow direction or depth to groundwater. That does not prove, however, that the firm failed to determine depth to groundwater or the direction in which groundwater flowed. Loitherstein testified that groundwater flow direction was discussed in the Phase I Report that Loitherstein Environmental filed with DEP in August 1998, and that it was therefore "not necessary to replicate all of the thought processes that went into the Phase I in the RAO," including, apparently, the determination of groundwater flow direction.⁵⁶⁵ As the Phase I Report was not filed by the Board or by Loitherstein (see above, at 206, n. 515), I cannot evaluate what that report stated about groundwater flow direction. That said, Loitherstein's testimony that the Phase I report discussed groundwater flow direction was not contradicted directly by any of the Board's witnesses or by any other evidence.

The Phase I Report aside, it is worth remembering that a reliable informational record regarding the Ming and Daloz properties, including groundwater flow information, had been developed by other environmental professionals by the time Loitherstein Environmental was retained

⁵⁶⁵/ Loitherstein PFT, at 32-33; Loitherstein Environmental RAO Opinion for 83-89 East Cottage Street/5-9 Humphreys Street (Board Exh. B-12): narrative report, at 2, part 1.1 ("Description of Release and Site Conditions").

in 1997. Its involvement followed extensive field testing and remediation at the Ming property. It also followed a recent discovery of LNAPL and mineral spirits releases at the adjacent, upgradient Daloz property (see above, at 196-97). Loitherstein Environmental was retained in August, 1997 not to re-do earlier site work and investigation but, instead, to review prior reports, to determine whether contamination originating at the Daloz property had migrated to the Ming property, and to determine what further work or filings were required. Background information, including groundwater flow direction and depth to groundwater, had been developed by Hidell-Eyster in 1985-86 (see above, at 188-91), and at the upgradient, adjacent Daloz property by AMEC through October 2001 (see above, at 197-200). The 1985 Hidell-Eyster Report described the flow of groundwater at the Ming property as being “from the inside of the building out to the intersection of East Cottage and Humphreys Streets”—northeasterly, in other words (see above, at 190). The 1986 CEES Report furnished no different information (see above, at 193-95). Loitherstein Environmental’s RAO Opinion noted its review of both reports, and the firm had filed copies of both reports with DEP when it filed the earlier Phase I Report (see above at 206). AMEC’s subsequent report on the LNAPL and mineral spirits releases at the Daloz property, in 2002, confirmed the northeasterly direction of groundwater flow (see above, at 200).

The Board presented no evidence that the information on groundwater flow direction developed by Hidell-Eyster was unreliable; indeed, the Board relied in part upon the 1985 Hidell-Eyster Report as an exhibit supporting its case. For this reason alone I have no cause to discount the reliability of groundwater flow direction that the report presented, or to fault Loitherstein Environmental for relying upon it. There are other reasons for not doing so; the northeastern direction of groundwater flow was confirmed subsequently at the adjacent, upgradient Daloz site, and this

direction is not disputed by the Board or by any of its witnesses. Nor did DEP dispute it; DEP's 2002 audit report found no fault with the RAO Opinion based upon groundwater flow direction, and did not allege that Loitherstein Environmental had failed to determine groundwater flow direction.

In these circumstances, the fault found by the Board's witnesses with Loitherstein Environmental's RAO Opinion for the Ming property relative to groundwater flow direction amounts to little more than academic quibbling. The testimony by these witnesses regarding the alleged failure to determine groundwater flow direction is also wholly conclusory and misleading; none of the Board's witnesses mentioned the existing groundwater flow information on which Loitherstein Environmental drew, its reliability, its prior disclosure in the Phase I report, and the absence of any dispute regarding it, and none of them stated why Loitherstein Environmental needed to determine groundwater flow direction anew when it prepared the RAO Opinion.

Although the Board did not charge Loitherstein with failing to determine depth to groundwater, its witnesses faulted him for not determining depth to groundwater independently, and as a result this assertion became intertwined with the charge that groundwater flow direction was not determined. The criticism elevates form over substance, and is inaccurate as well. The RAO Opinion stated clearly that risk remaining at the Ming property was assessed using Method 1 and applying GW-2 groundwater standards, based upon an assumed depth of groundwater of less than 15 feet (see above, at 212-13). In doing so, the RAO Opinion stated what the depth to groundwater was. In view of the informational database that prior consultants had amassed, I cannot accept the proposition that Loitherstein Environmental simply pulled this number out of thin air; instead, as was true of groundwater flow direction, the range of depth to groundwater appears to have been an established fact that did not need to be redetermined. AMEC reported depths to groundwater at the adjacent

Daloz property as ranging from 13.31 to 13.35 feet in October 2001 (see above, at 198)—within the same range, in other words, that Loitherstein Environmental’s October 2001 RAO Opinion reported.

More to the point, DEP’s risk assessment methodology required no greater specificity in stating depth to groundwater for purposes of risk assessment at a site such as this one, and none of the Board’s witnesses offered any reason why a more precise determination of depth to groundwater was required at this highly-developed site in an older urban neighborhood. None of the Board’s witnesses asserted that more stringent GW-1 groundwater standards applied at this site. None of them disputed the propriety of using risk assessment methodology that assumed a depth to groundwater of less than 15 feet, and none testified that a different depth to groundwater should have been assumed instead.

j.

The Board’s witnesses also faulted Loitherstein for not filing a downgradient property status (DPS) opinion regarding contamination attributed to releases at the Daloz site.⁵⁶⁶ However, the fuel oil plume extending from the Daloz property had commingled with the petroleum hydrocarbon contamination remaining in the loading dock area, which included fuel oil released from the former underground storage tanks removed during the late 1980s. Loitherstein explained that in view of this commingling, he could not file a DPS Opinion representing that no act on the part of a past Ming property owner contributed to the fuel oil release.⁵⁶⁷ I find this explanation credible because it is consistent with the extent of the Daloz contaminant plumes shown on the Loitherstein Environmental

⁵⁶⁶/ See Perry PFT, at 10; Phillips PFT, at 13-14.

⁵⁶⁷/ Loitherstein PFT, at 38.

and AMEC site maps (see Appendix, Sketches 7A and 7B). It is also consistent with the regulatory requirement that a DPS opinion may be filed if “no act” of a downgradient property owner “has contributed to the release” or has caused the release “to become worse than it otherwise would have been...” 310 CMR 40.0183(2)(c). The Board did not show, thus, that a DPS opinion was necessary or would have been proper. Consequently, the absence of a DPS opinion does not show that excluding the LNAPL and vinyl chloride detected in groundwater monitoring wells MW-207 and MW-101 from the characterization of risk at the Ming property was factually unsupported or done in bad faith.

k.

I conclude that with respect to the Ming property—83-89 East Cottage Street and 5-9 Humphreys Street in Dorchester—Loitherstein:

- (1) determined the direction of groundwater flow at this site;
- (2) defined the nature and extent of oil and hazardous materials releases and petroleum releases detected at the site and characterized adequately the risks that these releases posed;
- (3) opined, with adequate support, that vinyl chloride and LNAPL detected onsite had migrated entirely from the upgradient Daloz property;
- (4) collected sufficient data to define the nature and extent of the releases and to adequately characterize the risk that these releases posed, as required by 309 CMR 4.03(3)(c);
- (5) acted with reasonable care and diligence with regard to the site, as required by 309 CMR 4.02(1); and
- (6) followed applicable requirements and procedures of M.G.L. c. 21E and 310 CMR 40.0000, as required by 309 CMR 4.03(3)(b).⁵⁶⁸

⁵⁶⁸/ In its post-hearing brief (at 47), the Board asserted that Loitherstein’s “work on the RAO opinion for the Dorchester site” also violated 309 CMR 4.03(3)(d), which requires that in rendering a waste site cleanup activity opinion, a licensed site professional “disclose and explain...the material facts,

Disposition

The Board did not prove that Loitherstein violated M.G.L. c. 21E and 310 CMR 40.0000 (the Massachusetts Contingency Plan) or its Rules of Professional Conduct, 309 CMR 4.00, as charged in its Amended Proposed Order Finding Sufficient Grounds for Discipline dated November 13, 2003, with respect to (1) any of the downgradient property status (DPS) opinions that Loitherstein Environmental filed in 1996 regarding releases of oil and/or hazardous materials at 130 Lincoln Street in Brighton, 5 Commonwealth Road in Natick, and 1203 Washington Street in Newton, or (2) any of the response action outcome (RAO) opinions that Loitherstein Environmental filed between 1995 and 2001 for releases of oil and/or hazardous materials at 73 Jeffrey Avenue in Holliston, 19 Hawks Avenue in Hanson, 262 Sawyer Lane in Hudson, and 83-89 East Cottage Street / 5-9 Humphreys Street in Dorchester.

Accordingly, I find that sufficient grounds do not exist for disciplinary action against

data, other information, and qualifications and limitations known by him or her which may tend to support or lead to a waste site cleanup activity opinion contrary to, or significantly different from, the one expressed.” However, the Board’s Amended Proposed Order did not charge Loitherstein with violating 310 CMR 4.03(3)(d). That charge was asserted against Loitherstein only as to the DPS Opinions that his firm filed for the sites at 130 Lincoln Street in Brighton, 5 Commonwealth Road in Natick, and 1203 Washington Street in Newton.

Because a violation of 310 CMR 4.03(3)(d) was not charged as to the RAO Opinion filed for 83-89 East Cottage Street/5-9 Humphreys Street in Dorchester, I make no formal findings and reach no conclusions as to whether the RAO Opinion met the requirements of that regulation. I note, nonetheless, that Loitherstein unquestionably complied with those requirements. Among other things, the RAO Opinion addressed the possibility of an on-site origin for the LNAPL and vinyl chloride detected at the Ming property; it also gave sound and sufficient reasons for concluding that these releases originated entirely offsite, including the prior cleanup and capping of the tank and drainage system in the Ming building and the subsequent testing for petroleum-related vapors that found none, and the documented, more recent releases of these substances at the adjacent, upgradient Daloz property, which had formed plumes extending well into the Ming property.

Loitherstein as to any of these waste site cleanup activity opinions, and I conclude that the Board's Amended Proposed Order should not be made final.

Notice

I issue this recommended decision pursuant to the Regulations of the Massachusetts Board of Registration of Hazardous Waste Site Cleanup Professionals, see 309 CMR 7.08, and the Standard Adjudicatory Rules of Practice and Procedure, 801 CMR 1.00. It contains my recommended findings of fact and conclusions of law concerning the charges set forth in the Board's Amended Proposed Order Finding Sufficient Grounds for Discipline dated November 13, 2003. Pursuant to 309 CMR 7.08(1), this recommended decision is being transmitted to the Board for the issuance of a final decision, and a copy is being furnished to the respondent as well.

Any objections to this recommended decision, and any responses to such objections, must be filed with the Board in accordance with the procedure and time limits set forth in the Board's regulations at 309 CMR 7.10.

Mark L. Silverstein
Administrative Magistrate

Matter of Loitherstein, Docket No.04-206, Recommended Decision

APPENDIX OF SITE SKETCHES

SKETCH 1: 130 Lincoln Street, Brighton, Massachusetts.

From *Loitherstein Environmental DPS Opinion for 130 Lincoln Street* (Board Exh. B-18), Fig. 2 (“Site Plan”).

SKETCH 2: 5 Commonwealth Road, Natick, Massachusetts.

From *Loitherstein Environmental DPS Opinion for 5 Commonwealth Avenue* (Board Exh. B-25), Fig. 2 (“Site Plan”).

SKETCH 3: 1203 Washington Street, Newton, Massachusetts.

From *Loitherstein Environmental DPS Opinion for 1203 Washington Street* (Board Exh. B-26), Fig. 2 (“Site Plan”).

SKETCH 4: 73 Jeffrey Avenue, Holliston, Massachusetts.

From *Loitherstein Environmental RAO Opinion for 5 Commonwealth Avenue* (Board Exh. B-3), Fig. 2 (“Site Plan”).

SKETCH 5: 19 Hawks Avenue, Hanson, Massachusetts.

From *Loitherstein Environmental RAO Opinion for 19 Hawks Avenue* (Board Exh. B-21), Fig. 2 (“Monitoring Well Location Plan”).

SKETCH 6: 262 Sawyer Lane, Hudson, Massachusetts.

From *Loitherstein Environmental RAO Opinion for 262 Sawyer Lane* (Board Exh. B-23), Fig. 2 (“Monitoring Well Location Plan”).

SKETCHES 7A, 7B and 7C: 83-89 East Cottage Street / 5-9 Humphreys Street, Dorchester, Massachusetts.

SKETCH 7A: From *Loitherstein Environmental RAO Opinion for 83-89 East Cottage Street/ 5-9 Humphreys Street* (Board Exh. B-12); Fig. 2 (“Site Plan With Disposal Site And AUL Boundaries”).

SKETCH 7B: From *2002 AMEC Report* (Loitherstein Exh. L-4); Fig. 4 (“Disposal Site Plan, Former Daloz Cleaners, 11-13 Humphreys Street, Dorchester, Massachusetts”).

SKETCH 7C: From *2002 AMEC Report* (Loitherstein Exh. L-4); Fig. 5 (“Groundwater Contour Map, Former Daloz Cleaners, 11-13 Humphreys Street, Dorchester, Massachusetts”).