COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS
BOARD OF REGISTRATION OF
HAZARDOUS WASTE SITE CLEANUP PROFESSIONALS

In the Matter of:	)	
James J. Decoulos,	)	
Respondent	)	Docket No.: LSP-10AP-01

DIRECT TESTIMONY OF RICHARD E. DOHERTY

Prepared Direct Testimony of Richard E. Doherty, PE, LSP

Q: Please state your name and business address.

A: My name is Richard E. Doherty and my business address is 22 Orchard Drive, Acton, Massachusetts, 01720.

Q: How are you employed?

A: I am President of Engineering & Consulting Resources, Inc., an environmental consulting firm that I founded in 2003.

Q: Please summarize your experience in the environmental consulting field.

A: As shown on the attached resume (attached as Exhibit R-7), I have over twenty years professional experience in the assessment and cleanup of sites impacted by chemical releases. I have performed work on hundreds of sites, the majority of which involved petroleum products

such as gasoline or diesel oil. I have extensive knowledge of the Massachusetts Contingency Plan regulations and related policies, and I have been a Licensed Site Professional (LSP) since 1994.

Q: Describe your educational background and other certifications.

A: I received a Bachelor of Science degree in Civil Engineering from the University of Lowell in 1985. I Received a Master of Science degree in Civil and Environmental Engineering from MIT in 1987. I am a registered Professional Engineer in Massachusetts, New Hampshire, and Maine, and a Grade IV Certified Wastewater Treatment Plant Operator in Massachusetts.

Q: Describe your involvement with the License Site Professional Association (LSPA).

A: I have been a member of the LSPA since 1993. I served on the LSP Board of Directors from 2001 to 2003. I have been a member of the Loss Prevention Committee since approximately 1995, and served as Chairman from 2000 to 2001.

Q: What documents have you reviewed in developing your testimony?

A: I reviewed the Complaint filed with the Board by Najib Badaoui, Mr. James Decoulos's responses dated January 20, 2006 and August 31, 2007, and the January 8, 2010 Order to Show Cause. I reviewed documents prepared by the Massachusetts Department of Environmental Protection (MassDEP) and Mr. Decoulos related to the Eagle Gas site in Carver.

I also reviewed the direct testimony of Ms. Baran, Mr, Fitzgerald, Mr. Luhrs, and Mr. Philips in connection with this case.

Q: Are you sponsoring any exhibits in addition to your direct testimony?

A: Yes, I am sponsoring Exhibit R-7.

Q: What is your opinion regarding Mr. Decoulos's conclusion that the petroleum found at the outfall to South Meadow Brook work originated from surface sources such as stormwater runoff from the Eagle Gas property?

A: After reviewing the data and visiting the Eagle Gas site, it is my opinion that Mr. Decoulos reached a valid and reasonable conclusion that was supported by multiple lines of evidence. These lines of evidence, taken together, provided strong support to his conclusion that surface sources such as stormwater runoff, rather than diesel oil leaking from the buried remote fill line, were the cause of the petroleum impacts found at the South Meadow Brook outfall in May 2003. These lines of evidence include the following:

1. The impact to South Meadow Brook manifested itself as a visible petroleum sheen on the water surface. This sheen was first observed by Mr. Decoulos at the point where South Meadow Brook flows under Main Street. The sheen was then traced back to the storm drain outfall. Next, visual observations were made of the upstream catch basins to check for the presence of the sheen. Both MassDEP (Exhibit B-18) and Mr. Decoulos agree

that the sheen was observed in the catch basin that captures surface water from the Eagle Gas property. This catch basin is located in the Main Street right-of-way in front of the private residence at 133 Main Street. As can be seen from Figure 3 of the Phase I Report (Exhibit B-30), and from basic knowledge of stormwater collection systems, stormwater (and petroleum, if present) flows by gravity from this catch basin into the storm drain line. Flow moves in this direction because the catch basin is hydraulically upstream from the storm drain line. Therefore, the only likely conclusion that can be reached is that the petroleum that caused the sheen in the catch basin entered the subsurface via surface flow through the grate of the catch basin. The area drained by this catch basin includes most if not all of the Eagle Gas property.

2. Another investigatory action taken upon the discovery of petroleum at the outfall was the screening of vapors from catch basins and drainage manholes along the storm drain route. Screening was performed using a photoionization detector, which is sensitive to volatile compounds such as those found in gasoline and relatively fresh diesel oil. The results of the vapor screening indicated significant impacts at the catch basin where the sheen was observed (i.e., the catch basin discussed above that drains the Eagle Gas property), and at two drainage manholes downstream from that catch basin. However, significant impacts were <u>not</u> observed in the upstream drainage manhole and catch basin, including the drainage manhole in front of Eagle Gas. This drainage manhole is significant because it lies downstream from the BP-5RR area where separate-phase petroleum was detected. Manhole locations and photoionization detector readings are shown on the Existing Conditions Plan, Appendix B of the Phase I Report dated April 30, 2004, (Exhibit B-30)

and on Exhibit RR-8. These results provide an additional line of evidence indicating that the petroleum observed at the outfall entered the storm drain via the catch basin rather than from the upstream area where separate-phase petroleum was discovered.

3. On June 3, 2003, Mr. Decoulos oversaw the installation of eight soil borings, three of which were completed as monitoring wells. Borings DCW-1, DCW-2 and DCW-3 were installed immediately adjacent to the storm drain for the specific purpose of evaluating whether or not diesel oil from the BP-5RR area had reached permeable bedding soils that surround the storm drain pipe. If separate-phase diesel oil were traveling from the BP-5RR location to the storm drain, it must travel through the bedding material around the storm drain pipe prior to entering the pipe. The soil and groundwater samples taken from DCW-1, DCW-2 and DCW-3 in 2003 did not indicate the presence of separate-phase petroleum (i.e., oil-saturated soils were not observed). The lack of indications of separate-phase petroleum in these wells in June 2003 (one month after the detection of petroleum at the outfall) is another line of evidence indicating that a source other than the diesel oil found at BP-5RR caused the impacts at the outfall.

4. After viewing the petroleum impacts at the South Meadow Brook outfall, it was Mr. Decoulos' opinion, based on visual inspection of the interior of the storm drain pipe and soils and vegetation in the area, that the impacts at the outfall had been occurring for a relatively long period of time. In reports submitted to MassDEP, Mr. Decoulos states that the release to the Brook "appears historic" (Exhibit B-30,pg. 26). In his June 19, 2008 response to the Complaint Review Team, Mr. Decoulos reiterated his opinion that

the contamination was historic, and stated that wetland vegetation near the outfall "appeared stressed for at least ten years." These observations are inconsistent with the theory that a release from the relatively recently-installed remote fill line was the source, and supported his conclusion that an alternative source was responsible.

5. Evidence of storage and general operating practices at the Eagle Gas station, during and prior to Najib Badaoui's ownership, provided an additional line of supporting evidence for the conclusion that surface sources were the likely cause of the outfall impacts. These observations were documented in photographs showing oil-stained areas and the storage of 55-gallon drums and numerous lawnmowers and other equipment on the property (See photographs 4, 5, 6 and 7 of Exhibit RR-2). It is in my opinion reasonable to conclude that surface water runoff from these areas would be impacted by petroleum.

6. Table 3 of the July 3, 2003 IRA Status report (Exhibit B-21) and Exhibit RR-8 shows that substantially elevated concentrations of EPH fractions were detected at the outfall. Significantly lower EPH concentrations were seen in samples from the drainage manhole closest to the diesel release area, and from the downstream wells installed within the storm drain bedding material (also shown on Table 3 of Exhibit B-21). The lack of equal or higher EPH concentrations in these upstream locations is another indication that the outfall impacts did not originate from the diesel remote fill line release.

Q: In your opinion, what data support the MassDEP's contention that diesel oil leaking from the former remote fill line was the cause of the impacts observed at the outfall to South Meadow Brook?

A: Other than the fact that the outfall impacts appeared to be due to diesel oil or home heating fuel, and that the discovery of the defective remote fill line occurred in the same month as the discovery of contamination at the outfall, I see little or no support for MassDEP's contention.

Q: You previously mentioned that initial results from DCW-1 and other wells did not indicate the presence of separate-phase petroleum. Does the fact that separate-phase petroleum was later found at DCW-1 change your opinions?

A: No. In my opinion the appearance of separate-phase petroleum at DCW-1 long after its installation indicates that diesel oil from the remote fill line release was migrating slowly. In other words, it took a significant amount of time for the separate-phase petroleum to travel from the BP-5RR area to the DCW-1 area. Note from Exhibit RR-8 that DCW-1 is closer to the storm drain line than BP-5RR. If diesel oil from the remote fill line had been the actual source of the impacts at the outfall, one would expect that separate-phase petroleum would have been detected at DCW-1 upon its installation in June 2003, which was several weeks after the detection of petroleum at the outfall.

Q: Do you believe that Mr. Decoulos was justified in differing with MassDEP's conclusion that an active product recovery trench was needed at the Eagle Gas site?

A: Yes. The state of knowledge of the mobility and recoverability of separate-phase petroleum was evolving at the time that MassDEP was requiring an active recovery trench at the Eagle Gas site. At that time, MassDEP generally accepted the now-outdated idea that separate-phase petroleum floated on the water table as a distinct layer that could readily travel through the subsurface. However, experience at actual sites was showing that significant volumes of separate-phase petroleum could be held tightly by soils, rendering it both non-mobile and non-recoverable via either active or passive means. This knowledge was becoming more widely available at the time that remedial options were being considered at the Eagle Gas site. For example, in June 2000, the American Petroleum Institute (API) published a bulletin entitled "Non-Aqueous Phase Liquid (NAPL) Mobility Limits in Soil" that defined petroleum concentrations in soil below which separate-phase oil would not migrate. In August 2003, API published its first version of the Interactive LNAPL Guide which provided detailed information on the improved understanding of the mobility and recoverability of separate-phase petroleum. Mr. Decoulos referenced and attached copies of portions the API Interactive LNAPL Guide to his IRA Plan Modification report dated July 8, 2005 (Exhibit B-50), and used the API approach to conclude that active recovery would not be necessary or beneficial. Recently, MassDEP has come to recognize API's work, and as a result is currently re-evaluating its approach and cleanup standards for separate-phase petroleum in an "LNAPL Workgroup."

Q: Do you agree with Mr. Decoulos' proposed measures for removing the separate-phase diesel oil from the ground?

A: Yes. In my opinion, if the initial recovery measures recommended by Mr. Decoulos had been approved by MassDEP in a timely manner, the net benefit to the environment would have been significantly greater than that realized from operation of the recovery system that was eventually implemented. This is based on my knowledge of the mobility of separate-phase petroleum in the subsurface, experience with recovery trenches at sites overseen by myself and others, and on the reported nature of the soils at the site. Mr. Decoulos, in his IRA Plan dated March 17, 2003 (Exhibit B-16), proposed oil recovery from well BP-5RR, and, if oil continued to flow into BP-5RR after his field testing, a recovery well would be installed downgradient of BP-5RR and utilized for active oil recovery. I believe this approach would have recovered a greater volume of separate-phase petroleum than the active recovery trench located in the middle of Main Street, and would have done so at a substantially lower cost.

Q: Do you agree with MassDEP's criteria for rejecting Mr. Decoulos' proposed oil recovery measures, specifically that full delineation of the extent of separate-phase petroleum area was necessary prior to designing and implementing an oil recovery system at the Eagle Gas site?

A: No. While in general it is preferable to have the maximum amount of information possible prior to designing any system, I do not believe that it is essential to fully delineate a separate-phase petroleum plume prior to implementing a successful oil recovery system. In my experience at actual sites, and my review of sites overseen by others, I have consistently found

that the most efficient location for oil recovery is as close to the release point as possible. At the Eagle Gas site, the location of the source was known (i.e., the remote fill line to the diesel tank). Therefore I believe that the most appropriate and efficient location for an oil recovery system was as close as practical to this release point, which is what Mr. Decoulos repeatedly proposed to MassDEP. Expending valuable time and resources on locating the fringes of a separate-phase petroleum plume is less important from a recovery perspective because the relatively small amounts of separate-phase petroleum in these outlying areas are held tightly by soils and are therefore essentially unrecoverable. Delaying the implementation of an oil recovery system in order to obtain better information on the "full extent" is in my opinion counter-productive, because it allows more time for oil to spread and become absorbed onto adjacent soils, reducing the volume of oil that can eventually be recovered.

Q: Do you agree with the allegations that Mr. Decoulos failed to evaluate potential Imminent Hazards, Conditions of Substantial Release Migration, and Critical Exposure Pathways in a timely manner?

A: No. In fact, Mr. Decoulos' discovery of contamination at the South Meadow Brook outfall in May 2003 was part of his Imminent Hazard Evaluation, and that fact is clearly stated in several of his reports (for example, see Section 4.2 of Exhibit B-21). The discovery of contamination at the outfall constituted a potential Condition of Substantial Release Migration and was reported to MassDEP by Mr. Decoulos as required. Mr. Decoulos also obtained samples from three private wells in the area in May and June of 2003 as part of an evaluation of Imminent Hazards and Critical Exposure Pathways. The results showed that an Imminent

Hazard was not present at these locations, although compounds typically associated with gasoline (i.e., a prior release for which Mr. Decoulos was not the LSP) were detected in the private well at 132 Main Street. In March 2004, MassDEP issued a Notice of Noncompliance to the previous owner of Eagle Gas for gasoline-related compounds detected as early as 1997 in the 132 Main Street well and two nearby wells. Although Mr. Decoulos did not submit a formal Imminent Hazard Evaluation document to MassDEP until December 2004 (Exhibit B-42), activities involved in protecting the human and environmental receptors were in fact being performed by Mr. Decoulos throughout his tenure as LSP for the Eagle Gas site.

Q. Based on the above, is it your opinion that Mr. Decoulos acted with reasonable care and diligence in providing Licensed Site Professional services at the Eagle Gas site?

A: Yes. It was Mr. Decoulos' diligence that led him to investigate and discover the contamination at the outfall to South Meadow Brook. He took appropriate actions to respond to that contamination, and developed a reasonable conclusion, supported by multiple lines of evidence, as to its cause. His proposed actions to address the separate-phase diesel oil released from the remote fill line were in my opinion reasonable and well-supported by the facts available at the time.

Q. Does this conclude your testimony?

A: Yes.

I, Richard E. Doherty, under the pains and penalties of perjury, adopt these answers as my direct testimony in this proceeding. I further state that if asked the questions in this testimony, I would provide the same answers.

Dated: September 22, 2010

Respectfully submitted,

Richard Doherty

Digitally signed by Richard Doherty
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Richard E. Doherty

STATEMENT OF SERVICE

I, James J. Decoulos, do hereby certify that I caused a copy of the DIRECT TESTIMONY OF RICHARD E. DOHERTY dated September 22, 2010 to be served on the following parties by electronic mail:

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Signed under the penalties of perjury this 22nd day of September, 2010.

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