AMENDED FINAL PLAN OF REMEDIAL ACTION

TONI CLEANERS SITE (DE-1005)

1606 Kirkwood Highway *February 2014*
Wilmington, DE *DNREC Project No. DE-1005*

This Amended Final Plan of Remedial Action (Amended Final Plan) presents clean-up actions required by the Department of Natural Resources and Environmental Control (DNREC) to address environmental contamination at the Toni Cleaners Site.

DNREC issued public notice of the Amended Proposed Plan of Remedial Action (Amended Proposed Plan) for the Toni Cleaners Site on August 3, 2013 and opened a 20-day public comment period. A public hearing was held on the Amended Proposed Plan on November 7, 2013. The Amended Proposed Plan is attached. There were several comments from the public during the hearing. The Secretary, having reviewed the Amended Proposed Plan, the comments thereon, and DNREC's responses to comments, issued Secretary's Order No. 2014-WH-0002 on February 11, 2014, directing that the Amended Proposed Plan be adopted as the Amended Final Plan. Therefore, the Amended Proposed Plan is adopted as the Amended Final Plan.

Approval:
This Amended Final Plan meets the requirements of the Hazardous Substance Cleanup Act.

Timothy T. Ratsep, Program Administrator
Site Investigation and Restoration Section

February 25, 2014
Date

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STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
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OFFICE OF THE
SECRETARY

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Secretary's Order No. 2014-WH-0002

Re: Approval of Amended Final Plan of Remedial Action for Toni Cleaners Site (SIRS DE-1005) at 1606 Kirkwood Highway Wilmington, New Castle County

Date of Issuance: February 11, 2014
Effective Date: February 11, 2014

This Order of the Secretary of the Department of Natural Resources and Environmental Control (Department) considers the attached Report of the presiding hearing officer, which recommends approval of the August 2013 Amended Proposed Plan of Remedial Action (Plan) for Toni Cleaners Site located at 1606 Kirkwood Highway, Wilmington, New Castle County (Site). This Order adopts the Report to the extent it is consistent with this Order.

Background

The Department's Division of Waste and Hazardous Substances, Site Investigation and Restoration Section (SIRS) prepared the Plan pursuant to the *Delaware Hazardous Substance Cleanup Act, 7 Del. C. Chapter 91* (HSCA), the Department's HSCA Regulations. *7 DE Admin. Code 1375,* and the Department's guidance documents for HSCA investigations. SIRS' involvement began in 1993 with the discovery of possible contamination from dry cleaning solvents. In 1994, the Department approved a final Plan for the removal of contaminated soil next to the dry cleaning building, and the addition of treatment chemicals to reduce groundwater contamination. In 2000 270 tons

of contaminated soil was excavated, but this excavation disclosed the presence of contamination under the building's concrete pad. The Department monitored the Site d in 2007 amended the Plan to provide for remedial action to conduct further study of the groundwater and installed vapor mitigation systems on three adjoining properties. The groundwater monitoring showed that there was a high level of contamination underneath the building, which also was the source of a groundwater plume extending off the Site to the southwest.

The Department's experts determined that the building needed to be demolished in order to reasonably gain access to the contaminated soil under the building. The Department's experts also determined from among five remedial action alternatives that the most appropriate remediation was to use an electro-resistance heating (ERH) system. This system entails the installation of electrodes in the building's concrete pad following the demolition of the building. Electricity would be supplied to the electrodes, which would heat the soils and groundwater to allow the volatile organic compounds, PCE and TCE and derivatives chemicals, to vaporize. The ERH system would use wells to recover the vaporized volatile organic compounds.

The Plan was subject of a request for a hearing by the owners of the Site and operators of Toni Cleaners, Mr and Mrs. Chong, who opposed the Plan in their public comments. The Chong's comments were submitted by counsel and an engineer, and raised questions about the selected remedial action, namely, the ERH system. SIRS' experts responded to Chong's comments, and reaffirmed the Plan as the appropriate remedial action to approve. The Report finds that the ERH system represents a reasonably acceptable and sound method of environmental remediation of the Site, and

that the Plan requires the building to be demolished to allow the environmental remediation to occur.

Findings and Reasons

The Department finds that the Plan should be approved as a reasonable environmental remedial action for the Site. The Plan is supported by the record of decision, which includes a vast amount of empirical data from soil, groundwater and air samples. The Plan is also supported by the expert analysis of past remediation efforts at the Site, and by the experts' selection of the current Plan's proposed method of remediation. The current method of remediation is the installation of ERH system, and this selection was made after consideration of alternatives. The selection of the alternatives included demolition of the existing building at the Site, which is required in order to allow access to the contamination in the soil underneath the building.

The Department's approval of the Plan as a final Plan will allow the remedial action to commence, which is in the best interest of the public. The remedial action to be implemented by this Order will result in the removal of contamination at its source, namely, underneath the existing building. The removal will require the demolition of the building, but the source of the contamination needs to be remediated to prevent the spread of contamination. The contamination already has spread to other properties. The remediation will be by ERH, which will heat the subsurface beneath the concrete pad and cause the volatile organic compounds to be released from the soil as vapor, which would be recovered using wells and a vapor recovery system.

The issues raised by the Site's owners in their comments were considered and found not to support any change to the Plan. SIRS' experts carefully reviewed and

responded to each issue in the technical response attached to the Report. The safety of ERH as raised by the owners was shown to be not applicable to the lower temperatures used by ERH as opposed to steam injection methods that the comments appear to have used for the safety issue concerns.

The overall environmental remediation of the Site will benefit from ERH, which provides the safest method to remove the contaminants. SIRS indicated that ERH has been successfully used in similar locations where excavation poses a significant challenge and an increased risk to worker safety. Moreover, the Department will continue to monitor the Site and evaluate further action to remediate as may be necessary, including the areas impacted outside of the Site by the plume.

Conclusions

The Department adopts the following findings and conclusions:

1. The Department has jurisdiction under its statutory authority to make a determination in this proceeding;

2. The Department provided adequate public notice of the proceeding and the public hearing in a manner required by the law and regulations;

3. The Department held a public hearing in a manner required by the law and regulations;

4. The Department considered all timely and relevant public comments in making its determination;

5. The Department shall issue the Final Plan of Remedial Action based upon the Proposed Plan of Remedial Action in order to allow the remedial action to occur at the Site; and

6. The Department shall provide notice of this action in a manner consistent with the law and regulations and shall publish the Order on its web page.

Collin P. O'Mara
Secretary

HEARING OFFICER'S REPORT

TO: The Honorable Collin P. O'Mara
Secretary, Department of Natural Resources and Environmental Control

FROM: Robert P. Haynes, Esquire
Senior Hearing Officer, Office of the Secretary
Department of Natural Resources and Environmental Control

RE: Amended Proposed Plan of Remedial Action for Toni Cleaners, 1606 Kirkwood Highway, Wilmington, New Castle County (SIRS Project DE-1005)

DATE: January 12, 2014

I. BACKGROUND AND PROCEDURAL HISTORY

This Report recommends to the Secretary of the Department of Natural Resources and Environmental Control (Department) that the Proposed Plan for Remedial Action (Plan) (DNREC Ex.16) be approved as a final Plan.

The Plan was developed by the Department's Division of Waste and Hazardous Substances, Site Investigation and Remediation Section (SIRS) pursuant to a voluntary clean up agreement under the Hazardous Substance Cleanup Act (HSCA) *7 Del. C. Chap. 91* and the Department's HSCA regulations. The Plan is for the environmental remediation of New Castle County tax parcel 07-038.20-014, which is located at 1606 Kirkwood Highway, Wilmington, in the unincorporated Elsmere area (Site).

The Site is 0.11 acres and is improved by a 2,448 square foot building. The Site is currently used as a dry cleaning business under the name Toni Cleaners. The building was built in 1942 and has been used as a dry cleaning business since at least 1965. In February 1990, Mr. and Mrs. Chung Run Chong purchased the Site and the Toni Cleaners business. In 1993 the Chongs sought refinancing, and the lender required a Phase I Environmental Assessment, which resulted in disclosure of possible contamination from dry cleaning solvents. A Phase II Environmental Assessment was conducted that disclosed the possible presence of the hazardous substances from dry cleaning solvents in tetrachloroethlene (PCE) and trichloroethylene (TCE),

which were found in the soil and groundwater around the building. The Chongs and SIRS entered into a Voluntary Cleanup Program and a Consent Decree and at that time SIRS did not consider that the Chongs were responsible for the contamination, but nevertheless were a potential responsible party for any liability under HSCA from owning the Site and operating the dry cleaning business.

In February 1994, SIRS completed a Remedial Investigation (RI), which noted high levels of PCE and TCE contamination and recommended further investigation. In 1994, SIRS completed its Feasibility Study (FS) (DNREC Ex. 3), which considered alternatives and after evaluating the alternatives recommended that the contaminated soil next to the building be removed and cleaned by incineration and the ashes returned to the Site. In May 1995, SIRS completed a Phase II RI, which determined that the Site contained significant levels of PCE above the maximum contaminant level established by the United States Environmental Protection Agency and that the source was the dry cleaning operations. SIRS prepared a proposed Plan of Remedial Action based upon its recommended alternative. (DNREC Ex. 4). This proposed plan was approved on August 8, 1996 and a final Plan of Remedial Action was issued (DNREC Ex. 5).

On November 30, 2000, SIRS proposed amending the 1996 Final Plan because of technical advances. This proposed amendment would add a chemical reducing agent to the area of the excavated soil, placing clean fill in the excavated area, and monitoring groundwater for a minimum of two years. DNREC Ex. 6. This amendment was approved January 2001. DNREC Ex. 7.

On September 21, 2001, an interim Response Action report was prepared for SIRS by Tetra Tech that reviewed the removal of approximately 270 tons of PCE contaminated soil next to the east side of the building, the addition of 1,200 pounds of hydrogen release compound and the groundwater monitoring from four wells. DNREC Ex. 8.

In a June, 18, 2004 report (DNREC Ex 9) to SIRS, Tetra Tech reviewed the progress at the Site since 1993. The report also indicated that the groundwater samples revealed a reduction in the PCE level, but that it was still well in excess of the maximum contaminant limit (MCL). The report indicated that the possible source was underneath the building. The report also stated that the Department had spent $400,000 on the Site.

In a May 26, 2009 letter, SIRS wrote to counsel for the Chongs indicating the past actions taken and future steps to be taken . Chong Ex. 2

In an October 2009 report prepared by Tetra Tech for SIRS, the data from extensive testing was reviewed. DNREC Ex. 10.

In October 2010, Tetra Tech provided SIRS with a final Feasibility Study (DNREC Ex. 11) that reviewed the past efforts and studies and provided alternatives to remediate the remaining high level of PCE and its related contaminants in the soil and groundwater. This study showed the migration of contamination to other properties and recommended the removal of contaminants underneath the building. In a June 29, 2011 letter from Tetra Tech's structural engineer, Steve Huff, P.E., provided his opinion that the building is not suitable for a helical pile or similar procedures, and his recommendation was to explore demolishing all or part of the building. DNREC Ex. 12.

In a December 2011, Additional Source Evaluation Report (DNREC Ex. 13), Tetra Tech reviewed alternatives and recommended demolition, excavation and offsite removal at a cost of $750,000 to $950,000.

In a May 2013 Quarterly Long-Term Monitoring Report-April 2013 Sampling Event, Tetra Tech indicated that the plume of groundwater contamination was relatively static and that the PCE was showing some deterioration, but that additional testing was recommended. DNREC Ex. 14.

In a July 2013 final Feasibility Study Report (DNREC Ex. 15) Tetra Tech reviewed five alternatives under a two tiered analysis with the primary tier assuming the demolition of the building. Tetra Tech recommended use of alternative 2 of electro-resistance heating (ERH), which entails inserting coils to heat the soils. The heating process causes the volatile organic compounds to vaporize for their recover and removal from the Site.

On August 1, 2013, SIRS issued the Plan. DNREC Ex. 16. On August 23, 2013, counsel for the Chongs requested a hearing. Chong Ex. 1. A public hearing was held and counsel for the Chongs presented comments through their counsel and an engineer.

Following the hearing, SIRS provided the attached technical response to the public comments. I consider the below record of decision supports a final decision approving the final Plan.

II. SUMMARY OF RECORD OF DECISION[1]

This Report is based upon the record of decision, which includes the public hearing transcript, the written documents submitted as exhibits at the hearing, the written public comments timely received during the public comment period, and the post hearing investigation of the issues raised by the public comments, and SIRS' technical expertise.

The hearing opened with introductory remarks on the hearing's procedures. SIRS representatives present were Timothy Ratsep, Administrator, Paul Will, Program Manager, and Robert Asreen, Project Manager. In addition, Robert Kuelhl, Esquire, from the Department of Justice and Dave Kane and Ralph Boedeker from Tetra Tech, the environmental consultants for the Plan attended the hearing. Mr. Asreen went through a slide presentation on the Site's investigation and the Plan (DNREC Ex. 6) and SIRS provided the following exhibits, most of which were discussed above:

[1] HSCA uses a 'record of decision,' which also used in federal hazard substance regulation. The record of decision is the same as the record developed to support other Department decisions, including those that do not entail public hearings. The record is the information the Department determines is sufficient to support its decision and in the case of public hearings, any public comments in the record that may be contrary to the Department's decision.

1. DNREC-Superfund Branch VCP, Phase II, Remedial Investigation Report of Toni Cleaners, 1994
2. DNREC-Superfund Branch VCP, Remedial Investigation Report of Toni Cleaners, 1994
3. DNREC, Feasibility Study Report for Toni Cleaners Site
4. Proposed Plan of Remedial Action for Toni Cleaners Site, May 1996
5. Final Plan of Remedial Action for Toni Cleaners Site, July 1996
6. Proposed Amendments to Final Plan of Remedial Action for Toni Cleaners Site, 1996
7. Amended Final Plan of Remedial Action for the Toni Cleaners Site, December 2000
8. Interim Response Action Report, Tetra Tech, Inc., September 21, 2001
9. Site Summary of Toni Cleaners, Robert Asreen, DNREC, June 2004
10. Additional Study Summary Report for Toni Cleaners Site, Tetra Tech NUS, Inc., October 2009
11. Final Feasibility Study Report for Toni Cleaners Site, Tetra Tech NUS, Inc., October 2010
12. Letter from Tetra Tech NUS, Inc., regarding Site visit, June 29, 2011
13. Final Additional Source Evaluation Report, Tetra Tech NUS, Inc., December 2011
14. Final Quarterly Long-Term Monitoring Report, Tetra Tech NUS, Inc., July 2013
15. Final Feasibility Study Report for Toni Cleaners Site, Tetra Tech NUS, Inc., July 2013
16. Amended Proposed Plan of Action for Toni Cleaners Site, DNREC, August 2013
17. Notice of public hearing regarding Amended Proposed Plan of Action for Toni Cleaners Site, October 16, 2013
18. Presentation for the Public Hearing for the Amended Proposed Plan of Remedial Action for the Toni Cleaners Site, November 7, 2013
19. RI/FS Consent Decree, between DNREC and Mr. and Mrs. Chong, December 1993
20. Letter to Andrew Taylor, Esq. from Kathleen Stiller, DNREC, May 26, 2009
21. Current Tax Assessment of Site-1606 Kirkwood Highway
22. Data Supporting all reports

The public comments were received from representatives of Toni Cleaners' counsel, Robert Whetzel, Esquire of the law firm of Richard Layton and Finger, and from Kevin Hansen or Landmark Engineering and Science. Mr. Whetzel submitted written comments that were introduced as Chong Ex. 1.

SIRS responded to the public comments in the attached technical response memorandum, which reaffirmed the Plan as the appropriate method for the Site's remediation.

III. DISCUSSION AND REASONS

I find that the Department's Plan is a reasonable and sound method of environmental remediation of the Site. I also find that the record of decision supports approval of the Plan based upon the data from SIRS' comprehensive investigation of the Site.

From the above review of the Site's history it is evident that the environmental clean-up has taken far more time and resources than originally anticipated. Part of this is due to the Department's effort to not disturb the operations of the dry cleaning business. At this time it is apparent that the best method available is for the demolition of the building to the concrete slab and the installation of the ERH system and vapor recovery wells in the slab. This process will remove the contaminants in a manner with the least impact on the surrounding properties. The continued presence of contamination in the groundwater in the plume from the Site has caused the contamination to spread to other properties and the source of the contamination is the high level of contamination in the soil underneath the building. The removal of this source of contamination cannot be reasonable occur while the building remains in place.

The substantial costs of the State of Delaware's clean-up efforts over the past twenty years have not accomplished the desired environmental remediation of the Site to levels that are safe for human health. The risk of human health is established by levels of know cancer causing substances at elevated levels that based upon the Site use and location will likely cause human health problems if not abated through further environmental remediation.

The environmental remediation procedure SIRS recommends is the ERH procedure, which can only reasonably be performed with the demolition of the building. The ECH will remove the source of the remaining PCE underneath of the building. Further study will be required on the groundwater plume of contamination that extends from the Site southwest approximately 500 feet long and 250 to 300 feet wide. The ERH provides the best solution to remedy the contamination at the source in the confined residential and commercial neighborhood that would make excavation extremely difficult and could damage nearby structures. The past efforts to excavate the soil next to the building and to treat the groundwater with chemicals has not been enough as the contamination is far in excess of the allowed levels as shown below:

PCE- 89,000 parts per billion (ppb) versus 1 ppb MCL.
TCE-1,500 ppb versus 0.44 ppb MCL.

Cis-1, 2-DCE 1,000 ppb versus 2.8 ppb MCL.
Vinyl chloride-29 ppb versus 0.15 ppb MCL.

The Chong's comments focused on the selection of the ERH method for the remedial action. The comments questioned the safety of using the ERH, but as noted by SIRS in its response the comments appear to be based upon the use of steam injection method and not the ERH, which uses lower temperature to vaporize the volatile organic compounds in the soil and groundwater beneath the building. The comments also questioned the change to ERH after this method had been previously rejected, but again SIRS explained the reason for the change and I find that ERH is appropriate for the Site and has been successfully used in similar locations where excavation would pose severe problems on the community and the safety of the workers.

The comments also questioned the cost, but this consideration is supported by the almost twenty years of trying to remediate the Site while allowing the building to remain standing and the dry cleaning business in operation. This time the contamination has remained and spread in the groundwater plume off the Site where it now impacts other properties, including properties that have had vapor systems installed. The ERH system will cause the removal of all the contamination from the Site. The Department will continue to monitor the Site and may require remedial action of other locations by following its HSCA procedures.

The above levels exist after twenty years of environmental remediation, including chemical treatment and excavation. The alternatives of further excavation and chemical treatment also would require the building to be demolished to access the source of the contamination underneath the concrete slab. Thus, under the HSCA analysis of alternatives the use of ERH is reasonable and supported in the record.

In sum, based upon my review of the record of decision, I recommend approval of the Plan in final in order that its remedial actions may be implemented.

IV. CONCLUSION

Attached is a draft Order should the Secretary accept this Report.

Robert P. Haynes, Esquire
Senior Hearing Officer

Toni Cleaner Site
Proposed Plan of Remedial Action
Public Hearing

Department Responsiveness Summary
For Public Hearing Comments

1. Robert Whetzel: As I will outline in these comments, the cleanup plan selected by DNREC does not address the real groundwater problems at the site, and in that sense really isn't much of cleanup. It is also not much of a plan since DNREC has not fully evaluated other technical options.

Department Response to Mr. Whetzel: *The Department has evaluated remedial alternatives for both the source of the groundwater contamination which lies in the soil and groundwater beneath the dry cleaner as well the down gradient groundwater plume in accordance with the regulatory requirements under Chapter 91.*

2. Robert Whetzel: I should add, they are not native speakers and this process we are engaged in, indeed, the very language we speak is completely foreign to them. Much of this proceeding has taken place in highly technical language that is difficult even for native English speakers to understand, and very little of this has been made available in the Chong's native language, I note unlike other proceedings relating to dry cleaner regulatory actions involving the dry cleaning Korean community in this state.

Department Response to Mr. Whetzel: *Prior to Mr. Whetzel's representation of the Chong's, the Department provided and paid for translation services by J.C. Kim, a Korean engineer, with Tetra Tech on at least seven occasions to explain the site and the investigation and remediation processes.*

3. Robert Whetzel: As I noted, the Chong's are really innocent victims of the situation. They didn't cause the contamination on the site, and DNREC has acknowledged that fact.

Indeed, in a letter dated May 26th, 2009, DNREC acknowledged that the release of dry cleaning materials at the site occurred prior to the operation of the site by the Chong's, based on the presence of substantial degradation products from the dry cleaning fluid release.

Department Response to Mr. Whetzel: *Under the Delaware Hazardous Substance Cleanup Act, 7 Del. C. Chapter 91 § 9105, the Chong's are liable as owners and operators of the site.*

In addition, the Chong's did not perform "Due Diligence" prior to purchasing the site. The Department has reviewed both the "Environmental Assessment of the Toni Cleaners Property", dated March 19, 1993, and the "Soil Sampling at Toni Cleaners Property," dated April 6, 1993, which were performed by JACA Corp

The Environmental Assessment concluded that "The eastern portion of the property receives discharges from two separate sources. A potential exists that the condensate discharge from the facility's vapor recovery unit may contain low levels of PCE." Also, "Current State Air Quality Regulations require a permit modification if a change of ownership or equipment occurs." To date, the facility only maintains one dry cleaning unit and a change of ownership has occurred. Reportedly, no permit modification was applied for." JACA's recommendations included: collecting soil samples from the area around the discharge point from the vapor recovery unit, and submitting a permit modification to DNREC in accordance with Delaware State Air Quality Regulations.

The Soil Sampling report concluded that: "The TCE and PCE levels measured in the subject soil samlpes indicate a pollutant is being discharged into thenenvironment. The discharge is in violation of Section 3.02 of the Delaware Water Pollution Control Regulations."

In addition, the Chong's have been out of compliance with the provisions of their DNREC Air Quality Permit since the compliance inspection which was performed by DNREC's Division of Air Quality on December 22, 2011. As of October 14, 2013, the Chong's are $1,025.00 in arrears on permit fees which represents over 5 years of unpaid fees.

4. Robert Whetzel: And turning to the plan itself, it really doesn't address all the problems at the site, and there are a number of other technical alternatives that could and should have been considered.

DNREC, we acknowledge, has spent vast sums of money on this site. Unfortunately, to little effect in terms of addressing the remedial action objectives that were identified earlier today. And DNREC hasn't even followed its own procedures or guidance in selecting the remedy that's proposed.

Department Response to Mr. Whetzel: *The Department has evaluated remedial alternatives for both the source of the groundwater contamination which lies in the soil and groundwater beneath the dry cleaner as well the down gradient groundwater plume in accordance with the regulatory requirements under Chapter 91.*

1. Kevin Hansen: As of the last meeting we had, my understanding was that DNREC was proposing an excavation alternative that would involve destruction of the building, and so I was very surprised to see earth resistance, or I guess the trade name being used here is Electro Resistance Heating, plus vapor extraction, proposed as the final approach.

Department Response to Mr. Hansen: *Please note that Electro Resistance Heating (ERH) is not a trade name but rather it is a technology commonly used by many remedial vendors.*

2. Kevin Hansen: So I went back and looked at why and how it was selected. Typically, you only find this in military bases, and I have worked in a lot of military bases where electro-resistance is used. So in 1997 the Final Plan of Remedial Action proposed excavation and off-site disposal.

Department Response to Mr. Hansen: *The Final Plan of Remedial Action (Final Plan) was actually issued by DNREC in July 1996 and recommended the excavation and off-site incineration alternative along with the establishment of a groundwater management zone as the remedy for the Toni Cleaners Site (DNREC Exhibit 5).*

3. Kevin Hansen: The 1999 Interim Response Action also called for excavation, combined with soil vapor extraction. Neither of those proposed any building demolition.

Department Response to Mr. Hansen: *In the correspondence from Tetra Tech to DNREC dated September 20, 1999 regarding the subject titled "Interim Response Action (IRA) Approach," Tetra Tech summarized the IRA approach as consisting of 2 elements: excavation and off-site removal of contaminated soil, and the installation and operation of a soil vapor extraction system for 2-4 months. Excavation and offsite disposal of contaminated soil was included in the December 2000 Amended Final Plan of Remedial Action but soil vapor extraction was not. At the time of the 1996 Final Plan and the 1999 IRA document, the extent of soil contamination and presence of free phase product (dense non-aqueous phase liquid (DNAPL)) under the building was not known. The presence of DNAPL under the building was discovered during the 2001 removal action.*

4. Kevin Hansen: The 2009 FS report ruled out, specifically ruled out electro-resistance heating. One of the issues I want to come back to in the rule-out is the screening level. In other words, it never even made it to the final list, so why it was screened out early to me was an interesting point. And the note in the screening table in 2009 in the draft was that it was a safety risk, in part.

Department Response to Mr. Hansen: *The 2009 Feasibility Study (FS) was a Draft document, which was finalized in October 2010. The 2009 FS screened thermal technologies for their application to treat groundwater contamination at the site. These included: steam injection, conductive thermal heating, and electrical resistivity heating. It was the steam injection and conductive thermal applications that were ruled out in part due to potential safety issues, not ERH. Although thermal technology applications were originally developed for use at large Federal sites, they have been applied at smaller scale for several years. In particular, electrical resistance heating (ERH) has been utilized as a commercially viable technology for some time. It has been used for years at small sites such as dry cleaners, restaurants, shopping malls, etc. The following is a partial list of small scale projects at which Thermal Remediation Systems (TRS) has successfully applied ERH: 1) Richmond, VA - PCE Remediation below an Operating Facility; 2) Arlington, TX - TCE NAPL Remediation in Active Alleyway; 3) Chicago, IL - Guaranteed Performance Based Full Scale Remediation of PCE using ERH under an Operating Shopping Mall; and 4) Owosso MI - PCE Remediation under Active Restaurant.*

Additional details regarding these projects can be found on the TRS website at http://www.thermalrs.com/company.php.

ERH was screened out of consideration in the 2010 FS because is not the most cost effective remedial technology for addressing dissolved phase/groundwater contamination. It was also screened out because the application presents greater logistical challenges in a mixed commercial and residential setting (primarily logistical and installation issues not necessarily safety concerns).

ERH when applied to the presumed source area (footprint under the dry cleaners building) is a logistically simpler, safer, quicker and more cost effective method to achieve source removal. The ERH technology is best applied in scenarios where there are gross levels of contamination in tight soils that cannot be treated as readily with traditional dig/haul, injection or pump/treat technologies.

5. Kevin Hansen: The 2010 final FS report confirmed the draft and again used the same screen-out. It never made the short list of technologies in the 2009 or 2010 reports. So it was never evaluated further than that. And this is, the technology I'm referring to is the Electro-Resistance Heating, ERH trade name acronym. So the 2011 Additional Source Evaluation Report reversed the findings of the 1999 Interim Response Action Report, and proposed excavation with off-site disposal again, this time with destruction of the building.

Department Response to Mr. Hansen: *See previous comment. In addition, the Additional Source Evaluation Report, finalized in December 2011, evaluated both In-Situ and Ex-Situ Remedial Alternatives. During the source evaluation, high concentrations of contaminants were found in the soil and groundwater beneath the building. An engineering determination was made by Tetra Tech that the building was not structurally capable to allow excavation under the building even with support (DNREC Exhibit 12); therefore, removal of the building was recommended for the excavation in this limited review of remedial alternatives.*

6. Kevin Hansen: So up until 2011, the destruction of the building was not proposed. In 2011 that shifted. It was excavation, with destruction of the building. The Chong family opposed that. And so as of

earlier this year I had expected that demolition of the building was going to be combined with excavation of the soil.

Department Response to Mr. Hansen: *An additional source evaluation investigation was conducted in 2011. The investigation focused on subsurface conditions immediately beneath the slab of the dry cleaner building. The results of the investigation showed that the levels of contamination under the building were much higher than previously believed. Results for the monitoring well install inside the building showed the concentration of PCE at levels as high as 100,000 parts per billion (ug/l). These concentrations support the presumption of the continued presence of DNAPL under the building that was first observed during the soil excavation in 2001(DNREC Exhibit 8).*

Based upon the extent and elevated concentrations of soil and groundwater contamination under the building, further evaluation of remedial alternatives was determined to be warranted. Initially, demolition of the building followed by excavation and disposal was considered. However excavation and disposal was eventually ruled out for the following reasons:

- *Major disruption to the neighborhood residents and potential high ambient vapor exposure issues.*
- *Potential businesses interruption from excavation due to the need to close neighborhood roads for the duration of the excavation, transport and disposal.*
- *The potential high ambient vapor issue risks to worker and residents during excavation; especially during removal of the building slab.*
- *Due to the limited footprint of the site and the adjacent residences, contaminated soil would need to be "live loaded" to trucks for offsite disposal due to the lack of a suitable staging area for soil and the related potential exposure of site contaminants to nearby residents.*
- *The excavation work would need to be conducted in Level A or B or personal protective equipment, which would increase the time to complete the work as well as the costs. The most likely scenario for excavation would involve "tenting and ventilating" the work area due to the elevated levels of site contaminants; unparticular PCE and TCE.*
- *A mobile water treatment system (water storage "frac" tank and carbon vessels) would need to be installed at the site to treat contaminated groundwater during the dewatering process. This water would need to be continuously trucked off site for disposal.*
- *Any contamination that may have migrated into the bedrock would not be able to be removed by excavation.*

7. Kevin Hansen: So the jump in of Electro-Resistance Heating in the 2013 final FS and then the proposed PPRA that lists electro-resistance as a methodology, with destruction of the building, was a bit big shift, pretty fast, considering that earlier that specific technology was ruled out more than once. Now, we know that this is a contaminated site. There is no question about that. And I went back and I said, you know, what information was DNREC provided with in order to come up with a decision that Electro-Resistance Heating was the right choice for this site, along with destruction of the building? So I went back and I looked at what the contractor had provided, that was at least provided in the appendix.

Department Response to Mr. Hansen: *The 2010 FS clearly states that only the groundwater plume was being addressed and not the source area. As mentioned in the previous comment, ERH was ruled out as a remedial alternative for the dissolved groundwater plume. The updated 2013 FS deals with both source area contamination (soil, DNAPL and groundwater) and the down gradient groundwater plume. Each of these areas is addressed separately with its own proposed remedial technology. ERH was determined not*

to be a cost effective remedial alternative to address dissolved phase groundwater contamination, and was screened out of future consideration for dissolved phase groundwater contamination at that time.

8. Kevin Hansen: This is a company called Thermal Remediation Systems, TRS, I believe is the name of the vendor. And I started looking through their cost assumptions, and I noted that they had intended to treat 2,625 square feet to a 14 depth of 25 feet for their estimation of 180015 cubic yards of treatment. And I thought that was a pretty small area. And that's not surprising, because typically on military sites Electro-Resistance Heating is used when there is a lot of money available and there is a very serious risk of solvent contamination, but it is very expensive, and typically it is ruled out because of its expense. In other words, it works as a technology, but it is so darn expensive.

Department Response to Mr. Hansen: *The volume of contaminated media estimated for treatment is based on the data collected during the Additional Source Area Investigation. ERH is intended to deal only with the source area contaminants beneath the dry cleaner building and not under the entire neighborhood. The groundwater plume will be addressed with the separate remedial technologies that are discussed at length in the 2013 FS Report.*

9. Kevin Hansen: It also has a significant safety risk, and that is the eruption of steam and hot water. Now, those risks can be controlled in the military base, but they are very difficult to control in a residential/commercial setting. So safety, to me, which was noted twice in earlier FS documents provided to DNREC, was not mentioned that I could find in the 2013 document. So why is safety not an issue now but it was then? I am concerned that boiling water for ten months and pushing that much electrical energy into the earth has to be released somehow. Now, the conduction of heat and the movement of boiling water and steam is something which has to be considered very directly. I didn't see boiling water, steam, eruption of those into the building.

Department Response to Mr. Hansen: *This statement confuses* in situ *thermal remediation by electrical resistivity heating (ERH) with thermal conductive heating and steam injection. A review of the TRS web site at http://www.thermalrs.com/company.php clearly states the following.*

"ERH is an in situ *thermal remediation technology that uses the heat generated by the resistance of the soil matrix to the flow of electrical current to raise subsurface temperatures* up to the boiling point of water (212°F or 100°C). *ERH electrodes do not get any hotter than the rest of the soil - the electrodes direct electrical current into the proper subsurface depth interval that you desire to heat. During ERH volatile compounds transition to the vapor phase and are captured by a vapor recovery system. ERH is equally effective in saturated and unsaturated soils. Subsurface heating may be used for a variety of remedial purposes including contaminant volatilization,* in-situ *steam stripping, enhancing soil vapor extraction efficiency, and increasing biological degradation and chemical dechlorination reaction rates...*

...Conductive heating relies on using electricity applied to heater wells to generate very high temperatures (i.e. >1,000°F) at the heater well. Radiation and thermal conduction heat transfer are effective near the heater. As a result, thermal conduction and convection occur in the bulk of the soil volume. Thermal conduction heating can heat the vadose zone or de-watered zones to temperatures far above the boiling temperature of water; this makes it possible for thermal conduction heating to treat compounds like PCBs or pyrenes, though at high energy costs. Thermal conduction heating has great difficulty in treating the saturated zone. Its inherently uneven heating is not conducive to thermally enhanced bioremediation..."

10. Kevin Hansen: But I will note that the contractor's literature is pretty clear that you can't do this remedy underneath an occupied structure, with safety as a major issue, particularly when you trap it with impervious surface. That heat and pressure has to get out somewhere. So if you have got heat and pressure building up because of the addition of electrical resistance creating heat in the ground, that energy has to be released somehow. So where does that energy come out?

Department Response to Mr. Hansen: *Again, this statement confuses ERH with thermal conductive heating or steam injection, which raises the subsurface temperature up to 1000°F degrees. ERH technology has been successfully applied under actively operating facilities ranging from restaurants to businesses in a shopping mall (as well as major industrial sites). The TRS website as well as other thermal treatment vendors are consistent in making this assertion for this technology and have a completed project backlog to demonstrate this.*

11. Kevin Hansen: Well, it comes out as a distribution of heat into the earth. It comes out as the evacuation of heated gases into the soil vapor extraction system wells. But given the known complexity of utilities, and the known heterogeneity of the subsurface, and the complexities of fill and contaminant transport, I'm very concerned about bypassing of obvious migration routes, and the movement of heat, steam into utility conduits, breaking out into the sewer system, things like this that are I think legitimate concerns that need to be more thoroughly evaluated.

Department Response to Mr. Hansen: *As stated previously, this is not an issue with ERH since it doesn't generate the extreme temperatures that conductive thermal heating or steam injection does. TRS indicated that the only potential issues with utilities from ERH are with those utilities that are encased in PVC. Otherwise, no impact to utilities would be expected. Based upon a 2011 utilities survey conducted by Soft Dig, the present configuration of utilities at the site indicates that most of the utilities (gas main, sewer main) run in front of the dry cleaners store along Route 2 (Kirkwood Highway). A small lateral for water and gas does run from Kirkwood Highway along Forest Avenue along the west side of the building and a small sanitary line runs along the east side of the building. All other utilities (electric, telephone) are above ground. An evaluation of the need for any protective measures for utilities (e.g., sleeving of any piping lines) would be conducted as part of the Remedial Design for the site.*

12. Kevin Hansen: Next, the area and volume of treatment proposed by the contractor appear too small to me. My experience, okay, the theoretical solubility of PCE at standard temperature and pressure in water is about 150 or so parts per million. This area is about ten parts per million, because this is in units, a thousand times that. But in a practical sense, many sites with solvents are at this concentration only with the nearby presence of free phase, because groundwater sampling itself highly dilutes the actual earth concentration.

Department Response to Mr. Hansen: *The groundwater sampling at the site is conductive by passive diffusion sampler methods. Passive diffusion bags are placed in the wells for extended periods of time and do not rely upon pumping/purging which can result in both aeration and dilution of the sample. The results for samples collected by this method are representative of real-time field conditions. Furthermore, in almost 10 years of groundwater sampling, separate phase product has never been detected in the monitoring well network but has been observed in the subsurface during the removal action in 2001 (DNREC Exhibit 8)*

13. Kevin Hansen: What you get in a groundwater sample is, by necessity, much lower than what is actually present if you could get down to the level of pour fluid. So 10,000 to me represents an approximation of the area within which free product can or could be close. The problem is that if I draw a

box of 2650 square feet, if I draw a box on this map, it is a box about this big. It encompasses about a third of the 10,000 contour from the 2011 assessment.

So I was concerned that the contractor had under scoped the remedy and, therefore, the cost used in DNREC's comparison was arbitrarily too low. I went back and I recalculated based on the numbers provided by the contractor, and using the table apparently provided by the contractor with a month-to-month summary of the expected costs per month provided in the appendix of the 2013 approved final FS. I believe it was approved. I get $1.4 million for the first ten months, which was substantially higher than the capital cost shown. And it was in the range of a number that to me made more sense, but it wasn't the number used in the FS for cost comparison, as I understand it.

So I calculated a cost per cubic yard based on that number, and then multiplied it times the area that I calculated within this 10,000 line, saying, well, if we could get earth-resistance heating or Electro-Resistance Heating to work, we would have to treat the entire area of source, and for that, using the 10 percent low to 30 percent high formula typically used in feasibility studies, I get a treatment of cost of 4.4 million to 6.4 billion dollars to implement earth-resistance, electro-resistance heating inside this 10,000 contour. Of course, none of the safety risks go away, but the technology can work if it is implemented properly. I was concerned that the contractor may have provided information which pumped up its own technology, because the guaranteed fixed price remediation thing also leaves lots of assumptions unanswered about how, in fact, they would implement that method.

So if I were to say I could completely wipe out everything inside this, which is, of course, three times larger than what the scope of the FS listed, I would still be left with the entire plume in place. At the low groundwater migration rates we discussed, that would leave the plume untreated for some time to come, absent the implementation of the PPRA's proposed additional groundwater remedy.

Thus, taking my estimate of 4.4 to 6.4 million dollars and raising it still further by the cost of the groundwater remedy as yet unscoped, so to me that drives Electro-Resistance Heating well beyond any of the other listed options in terms of its cost. And I think that's an important step forward.

Department Response to Mr. Hansen: *As observed during the removal action in 2001, DNAPL is most likely still present underneath the footprint of the dry cleaner building. However, given the very tight soils at the site (silts and clay and weathered rock/saprolite), the low transmissivity of the aquifer, and the general stability of the plume as demonstrated over the past 3 years of monitoring, there is no evidence to suggest that DNAPL has migrated from the site beyond the footprint of the dry cleaners building. The tight silt and clay materials would retard movement of DNAPL significantly. This limited mobility due to these tight aquifer materials was best exemplified during a 2007 pilot test for permanganate injection. During this test the permanganate exhibited very limited mobility in the subsurface. The limited decrease in PCE was followed by a rebound or spike in concentrations most likely due to back diffusion from the silt-clay subsurface materials.*

The projected source area is presumed to be underneath the existing structure. For planning purposes, the volume of contaminated soil calculated in the 2013 FS was conservative and used for the cost estimation for ERH treatment on the source property only. The area within the 10,000 ppb PCE isoconcentration line referred to by Mr. Hansen extends beyond the source property and down gradient under Forest Avenue and would be addressed as part of the down gradient groundwater plume.

Further, a pre-design investigation using 3-D Electrical Resistivity Imaging ("GeoTrax" Survey) is planned to confirm the presence and distribution of DNAPL, the subsurface materials (soil versus

saprolite versus bedrock). All of this data will be pulled into a 3-D representation/model that will allow a more precise definition of the source area footprint. This data will be used to develop final cost estimates for remedial design and determine the optimum layout of the ERH well grid.

14. Kevin Hansen: So assuming we go with the listed remedy in the feasibility study, there would be a lot of problems, not only the steam risk, damage to nearby utilities, potential downgrading of receptors unaffected by the remedy, but close, for example, I don't know what this building owner would feel like about the possibility of steam eruptions. Would they have to evacuate or shut down in this adjacent building or in this building down here?

Department Response to Mr. Hansen: *While thermal conductive heating or steam injection has the potential to cause this kind of damage due to extreme temperatures, ERH does not.*

15. Kevin Hansen: I don't know, given that we haven't seen the contractor's proposed plan in detail yet, nor have they provided a final quote, ready to sign a contract price with DNREC. So when I went down and I compared the FS proposed remedy with HSCA and national contingency plan criteria for effectiveness, I cannot say that it would control the source, I cannot say that it would protect the public down gradient, I cannot say that it will incorporate sustainability practices, I cannot say that it would affect contaminant toxicity, mobility or volume outside the treatment area, I cannot say that the life cycle costs have been fully evaluated. And that's just the HSCA criteria.

Department Response to Mr. Hansen: *The fact that ERH will eliminate the source material has not been considered by Mr. Hansen. Eliminating the source material will reduce all future contamination of the aquifer. Once the source is removed then down gradient groundwater remedial alternative(s) will continue to reduce the remaining concentrations to achieve the remedial action goals for the site, and therefore reduce the Vapor Intrusion risks associated with the site groundwater.*

15. Kevin Hansen: And I really, I have to ask the question, if you told people that DNREC was going to spend more than 4.4 to 6.4 million dollars to treat the source, but their homes would remain impacted by vapors emanating from groundwater, would the public accept that as the outcome of having spent that much money?

To me, that's a question which hasn't been answered yet. And I'm concerned about the public's reaction, and, in fact, because it involves demolition of the Chongs' building, I would really like to see something implemented that didn't. My feeling is that given the high cost of Electro-Resistance Heating, several of the other remedies proposed by DNREC could substitute effectiveness for much lower cost and ought to be reconsidered in the PPRA.

So in summary, Electro-Resistance Heating is the most expensive remedy of those evaluated when the correct numbers are used for source area. Electro-Resistance Heating provides no more certainty and no more protectiveness than other remedies at the cost threshold used in the FS.

Additional expensive actions would be required for groundwater in addition to the Electro-Resistance Heating, but these were not apparently included in the combined total for the evaluation of that alternative.

And, of course, these all demand the destruction of the Chong's' livelihood, I believe unnecessarily. So since human health does not appear to be shifted toward protectiveness downgradient as a result of this action, it appears to me that this is something which ought to be relooked at.

Toni Cleaner Site
Proposed Plan of Remedial Action
Public Hearing

Department Response to Mr. Hansen: *It is likely that in any response from the general public they would be most concerned about protection of their health and well-being by remediating the contamination. Any remedy that requires leaving the existing dry cleaners building (and source beneath) in place will take considerably longer to achieve an acceptable cleanup/risk level, have a higher lifecycle cost (when you factor in 15 to 20 years of groundwater and vapor mitigation systems monitoring and the long-term cost of money), will likely leave unacceptable levels of contaminants beneath the building, and extend the duration of time that vapor risk is posed to the neighborhood. At this time, ERH appears to offer an alternative that protects public health by cleaning up the site in an expeditious and cost effective manner, with the least inconvenience to the local residents, businesses and the taxpaying public.*

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AMENDED PROPOSED PLAN OF REMEDIAL ACTION

Toni Cleaners Site
Wilmington, Delaware
DNREC Project N0. DE-1005

August 2013

Delaware Department of Natural Resources and Environmental Control
Division of Waste and Hazardous Substances
Site Investigation & Restoration Section
391 Lukens Drive
New Castle, Delaware 19720

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AMENDED PROPOSED PLAN OF REMEDIAL ACTION

Toni Cleaners Site
Wilmington, Delaware
DNREC Project No. DE-1005

Approval:
This Proposed Plan meets the requirements of the Hazardous Substance Cleanup Act.

Approved by:

Timothy Ratsep, Environmental Program Administrator
Site Investigation & Restoration Section

August 1, 2013
Date

What is the Proposed Plan of Remedial Action?

The Proposed Plan of Remedial Action (Proposed Plan) summarizes the clean-up (remedial) actions that are being proposed to address contamination found at the Site for public comment. A legal notice is published in the newspaper for a 20-day comment period. DNREC considers and addresses all public comments received and publish a Final Plan of Remedial Action (Final Plan) for the Site.

What is the Toni Cleaners Site?

The Toni Cleaners Site consists of one tax parcel (07-038.20-014) covering 0.11 acres at 1606 Kirkwood Highway, Wilmington, New Castle County, Delaware (Figure 1). The Site is located at the southeast corner at the intersection of Forest Avenue and Kirkwood Highway.

The Site itself consists of a source area located at 1606 Kirkwood Highway, and a dissolved groundwater plume that has migrated approximately 450 feet to the southwest from the source area under commercial and residential properties towards Little Mill Creek (Figure 2).

The source area has been an operating dry cleaner since 1965 and consists of a single story 2,448 square foot building, which covers most of the property, a narrow unpaved area along the eastern side of the building, with a sidewalk along the north and west side, and a paved area behind the building for parking. The source area has very high concentrations of chlorinated solvents associated with the dry cleaning industry [tetrachloroethylene (PCE) and degradation products trichloroethylene (TCE), dichloroethylene (DCE) and vinyl chloride (VC)] in both the soil and groundwater beneath and around the building. The Site is zoned commercial.

What happened at the Toni Cleaners Site?

Dry cleaning operations began on the property in 1965 and have continued till the present day.

Environmental investigations have been carried out at Toni Cleaners since 1993. At that time, PCE was detected in soil at concentrations, which exceeded the DNREC Uniform Risk-Based Cleanup Standards (URS), and also in groundwater at concentrations that exceeded the EPA Maximum Contaminant Level (MCL) for that compound of 5 parts per billion (ppb).

The Site was entered into DNREC's Voluntary Cleanup Program (VCP) in 1993 but shortly thereafter, it became a state lead Hazardous Substance Cleanup Act (HSCA) site because of the current and previous owner's apparent inability to pay.

A Final Plan of Remedial Action (Final Plan) was issued by DNREC in July 1996 and was amended in December 2000. Between October 2000 and September 2001, 270 tons of PCE contaminated soil was removed from the Site and 1,200 pounds of hydrogen reducing compound

(HRC) were applied to the groundwater area to reduce the groundwater contamination at the source area.

Since 2005, off-site investigations have been performed at twenty-five (25) properties by DNREC and its contractors to define the extent of contamination. The groundwater contaminant plume extends approximately 450 feet to the southwest of the dry cleaner.

In May 2007, a pilot test involving the injection of 331 pounds of potassium permanganate into the groundwater at the source area was performed to evaluate the effectiveness of permanganate in treating the source of the groundwater contamination on the Site. The results showed that it was somewhat effective at reducing the levels of PCE in the pilot study area.

In addition, soil gas vapor and indoor air sampling has been performed at properties where access was granted to DNREC to evaluate the potential for PCE in the groundwater to volatilize and migrate through soil and into nearby buildings. PCE has been detected in the indoor air samples from four buildings at concentrations which slightly exceed the risk based calculated concentrations. A vapor mitigation system was installed at 1604 Kirkwood Highway and systems are being designed for two other buildings. One property owner has refused access to allow additional sampling and to install a vapor mitigation system.

Sediment and surface water samples have also been collected from both Little Mill Creek and Chestnut Run. PCE has recently been detected in the surface water samples collected at Chestnut Run but it does not appear to be related to the groundwater contamination emitting from Toni Cleaners.

What is the environmental problem at the Toni Cleaners Site?

PCE and its degradation products TCE, DCE, and VC are the potential contaminants of concern (COCs) in the soil and ground water in the source area. These COCs are present in the soil and groundwater in the source area at very high concentrations suggesting the presence of dense non aqueous phase liquid (DNAPL) beneath the building which continue to source the groundwater contaminant plume.

Due to the presence of the groundwater plume under residential properties, there is a continued risk from the intrusion of PCE, TCE, DCE and VC vapor into those building and other properties near the Site if cleanup actions are not taken.

What clean-up actions have been taken at the Toni Cleaners Site?

As mentioned previously, between October 2000 and September 2001, 270 tons of PCE contaminated soil was removed from the source area and 1,200 pounds of HRC were applied to the groundwater at the source area to reduce the source of the groundwater contamination.

In May 2007, a pilot test involving the injection of 331 pounds of potassium permanganate into the groundwater at the source area was performed to evaluate the effectiveness of permanganate in treating the source of the groundwater contamination on the Site. The results showed that it was somewhat effective at reducing the levels of PCE in the pilot study area.

Due to the presence of the groundwater plume under residential and commercial properties, DNREC performs indoor air sampling on a semi-annual basis, at properties where access is granted, and performs groundwater sampling every quarter. DNREC has also conducted soil gas vapor sampling, indoor air sampling and surface water sampling at properties where access has been granted to determine if the COCs in the groundwater have migrated into the buildings. DNREC also performs indoor air sampling on a semi-annual basis and performs groundwater sampling every quarter.

A vapor mitigation system was installed at 1604 Kirkwood Highway and systems are being designed for two other buildings. One property owner has refused access to DNREC to install a vapor mitigation system.

What does the Department want to do at the Toni Cleaners Site?

The Department needs to remove the existing dry cleaning building in order to achieve an effective, timely and cost effective remediation of the source of the soil and groundwater contamination beneath the building footprint.

What additional clean-up actions are needed at the Toni Cleaners Site?

Based on the revised Final Feasibility Study, dated July 2013, prepared by Tetra Tech, DNREC proposes the following remedial actions for the Site, which need to be completed before a Certificate of Completion of Remedy (COCR) can be issued:

1. The demolition of the existing building while leaving the slab in-place, provides the best scenario to achieve an effective, timely and cost effective remediation of the soil and groundwater contamination in the source area.

2. Implementation of Electro-Resistance Heating (ERH) through the building slab to treat the contaminated soil and groundwater in the source area. The presence of the low ceiling on the existing building does not allow access for a drill rig within the building. Since a drill rig is required to install the EHR points, the structure must be removed so that the EHR points can be installed.

3. Treatment of groundwater within the PCE plume downgradient of the source area by methods to be determined by additional evaluations, bench scale and/or pilot scale testing during the remedial design to be protective of human health and the environment.

4. An Environmental Covenant, consistent with Delaware's Uniform Environmental Covenants Act (Title 7, Del. Code Chapter 79, Subtitle II) (UECA), will be recorded in the office of the Recorder of Deeds to include the following:

   [a.] Use Restriction. Use of the Property shall be restricted solely to those non-residential type uses permitted within Commercial, Manufacturing, or Industrial Districts;

   [b.] Interference with Remedy. There shall be no digging, drilling, excavating, grading, constructing, earth moving, or any other land disturbing activities on the Property without the prior written approval of DNREC-SIRS;

[c.] Limitation of Groundwater Withdrawal. No groundwater wells shall be installed, and no groundwater shall be withdrawn from any well, on the Property without the prior written approval of DNREC-SIRS and DNREC Division of Water;

[d.] Compliance with Long Term Stewardship Plan. Perform all work required by the Long Term Stewardship Plan ("LTS Plan"), as issued, approved, modified or amended by DNREC;

[e.] Compliance with Final Plan. Perform all work required by the Final Plan, the Amended Final Plan, etc. ("Final Plan"), as issued, approved, modified or amended by DNREC;

5. Develop a DNREC approved contaminated materials management plan (CMMP) to allow construction workers to safely handle any potential contaminated soil and groundwater at the Site.

6. Develop and implement a DNREC-approved Long-Term Stewardship (LTS) Plan. The LTS Plan will detail: 1) the groundwater monitoring network and schedule to be followed in order to monitor the attenuation of the groundwater COCs, and 2) the inspection schedule to be followed in order to ensure the long-term integrity of the remedy

What are the long term plans for the Toni Cleaners Site after the cleanup?

The Site use will be restricted to non-residential (commercial/industrial) purposes by recording the environmental covenant. The CMMP will be completed and available for the Site.

How can I find additional information or comment on the Proposed Plan?

The complete file on the Site including the Feasibility Study and the various reports are available at the DNREC office, 391 Lukens Drive in New Castle, 19720. Most documents are also found on: http://www.nav.dnrec.delaware.gov/DEN3/

The 20-day public comment period begins on August 03, 2013 and ends at close of business (4:30 pm) on August 23, 2013. Please send written comments to the DNREC office at 391 Lukens Drive, New Castle, DE 19720 to Robert C. Asreen, Jr., Project Officer or Robert Newsome, Public Information Officer.

Figure 1: General Site Location Map
Figure 2: Site Map with Monitor Well Locations
Figure 3: Water Table Contour Map April 2013
Figure 4: PCE Concentrations in Groundwater April 2013

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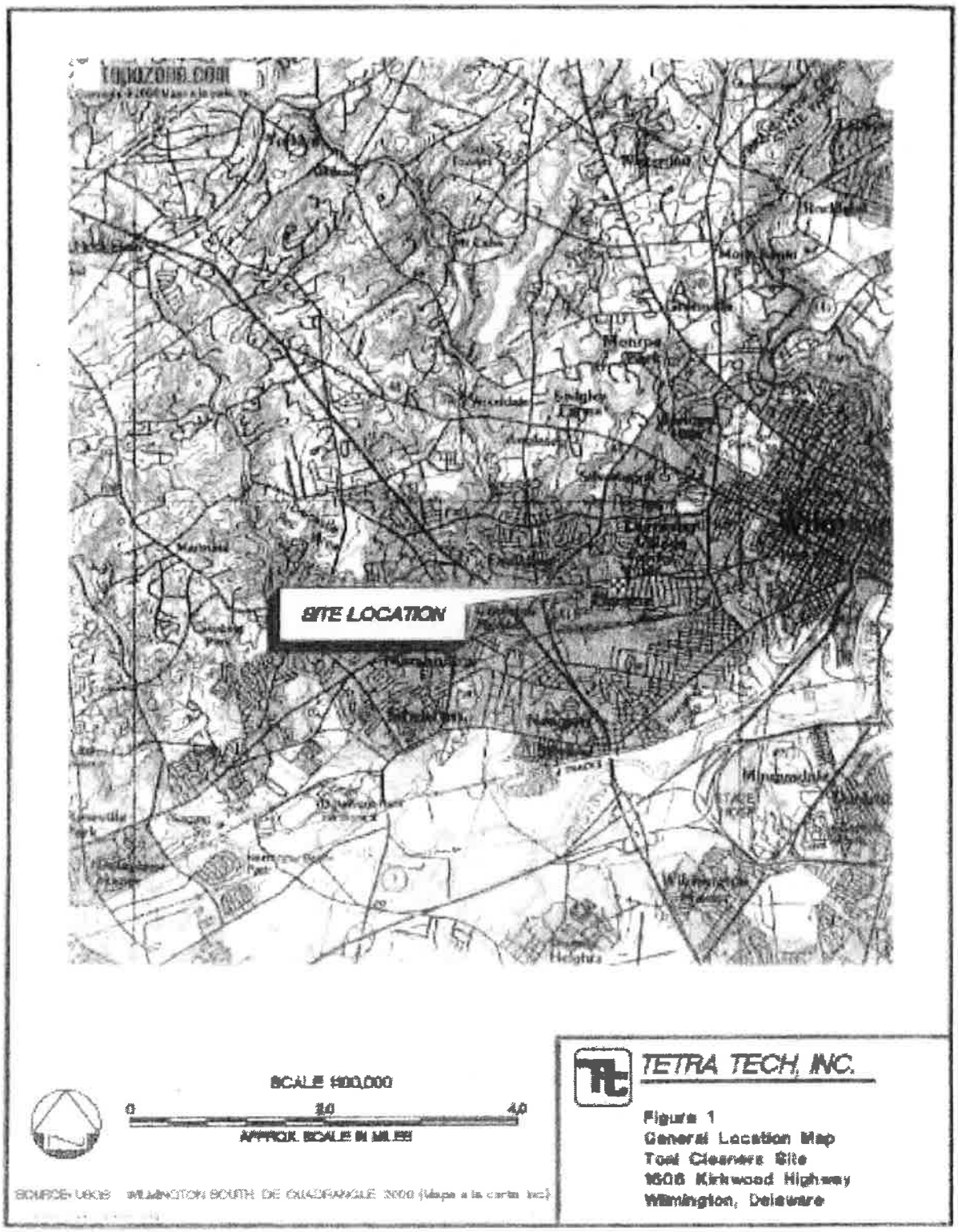

Figure 1: Toni Cleaners General Location Map

Figure 2: Toni Cleaners Site Map with Monitor Well Locations

Figure 3: Toni Cleaners Site Water Table Contour Map April 2013

Figure 4: PCE Concentration Map April 2013

Glossary of Terms Used in this Proposed Plan

Remedial Investigation (RI)	Thorough environmental study of a site which includes 1) sampling of site environmental media and/or wastes on the property and 2) conducting a preliminary risk assessment using the data collected to determine the risk posed to human health and the environment.
Certification of Completion of Remedy (COCR)	A formal determination by the Secretary of DNREC that remedial activities required by the Final Plan of Remedial Action have been completed.
Contaminant of Concern (COC)	Potentially harmful substances at concentrations above acceptable levels.
Contaminated Materials Management Plan	A written plan specifying how potentially contaminated material at a Site will be sampled, evaluated, staged, transported and disposed of properly.
Exposure	Contact with a substance through inhalation, ingestion, or direct contact with the skin. Exposure may be short term (acute) or long term (chronic).
Final Plan of Remedial Action	DNREC's adopted plan for cleaning up a hazardous site.
Groundwater Management Zone	A geographical area where DNREC restricts drilling for ground water because it is contaminated
Hazardous Substance Cleanup Act (HSCA)	Delaware Code Title 7, Chapter 91. The law that enables DNREC to identify parties responsible for hazardous substances releases and requires cleanup with oversight of the Department.
Human Health Risk Assessment (HHRA)	An assessment done to characterize the potential human health risk associated with exposure* to site related chemicals.
Preliminary Risk Assessment	A quantitative evaluation of only the most obvious and likely risks at a site
Risk	Likelihood or probability of injury, disease, or death.
Restricted Use	Commercial or Industrial setting
SIRS	Site Investigation Restoration Section of DNREC, which oversees cleanup of sites that were contaminated as a result of past use, from dry cleaners to chemical companies
Uniform Risk-Based Remediation Standards (URS)	A set of concentration criteria for various contaminants potentially present in site media that are developed for protection of human health and the environment
US EPA	United States Environmental Protection Agency