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Subject: Rebuttal of Thermo Fisher Scientific, Inc. CERCLA §104(e) Response Letter
Standard Chlorine Chemical Co. Inc. Superfund Site
Kearny, New Jersey

Dear Ms. Flanagan and Ms. Hess:

The Group of Cooperating Parties (*i.e.*, Beazer East, Standard Chlorine Chemical Co., Inc. ("Standard Chlorine"), Cooper Industries, and Tierra Solutions, Inc. (for itself and on behalf of Occidental Chemical Corporation)) have reviewed the Thermo Fisher Scientific, Inc. ("Thermo Fisher") response (the "Thermo Fisher Response") to the United States Environmental Protection Agency's ("EPA") CERCLA §104(e) information request relating to the Standard Chlorine Chemical Co. Inc. Superfund site located in Kearny, New Jersey (the "Site"). In its Response, Thermo Fisher admits that its wholly-owned subsidiary,[1] Apogent Transition Corp., is the legal successor to Tanatex Chemical Corporation ("Tanatex"),[2] a dye-carrier and specialty chemical manufacturer that operated at Lot 50 of the Site for approximately ten years (1954-1964)[3] during the period EPA believes hazardous substances were released and disposed of at the Site (1928 to 1980).[4]

The Thermo Fisher Response admits corporate successorship and provides a description of product manufacturing processes. However, beyond advancing the naked argument that Tanatex generated no industrial wastes whatsoever, the Thermo Fisher Response is inexplicably silent on

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[1] *See* Response of Thermo Fisher Scientific, Inc. to United States Environmental Protection Agency's Request for Information Regarding the Standard Chlorine Chemical Company Site, p. 4 (Jan. 31, 2011) ("Thermo Fisher Response") ("Thermo Fisher is an indirect parent corporation of Apogent Technologies Inc., which is the only surviving entity among those identified in this [Section 104(e)] request. Thermo Fisher is also an indirect parent corporation of Apogent Transition Corp.").

[2] In 1970, Tanatex was merged into Sybron Corp. (with Sybron as the surviving corporation), which then, in 1986, merged into Sybron Transition Corp. (with Sybron Transition as the surviving corporation). In 2002, Sybron Transition Corp. changed its name to Apogent Transition Corp. *See* Thermo Fisher Response, p. 5, ¶¶ 3-4.

[3] *See* Continued Response of Thermo Fisher Scientific, Inc. and Apogent Transition Corp. to United States Environmental Protection Agency's Request for Information Regarding the Standard Chlorine Chemical Company Site, pp. 7-8 (Mar. 4, 2011) ("Thermo Fisher Continued Response").

[4] *See* Notice of Potential Liability and Request for Information Pursuant to CERCLA § 101 from United States Environmental Protection Agency, Region 2, to Cooper Industries Ltd., p. 2 (Jul. 29, 2009).

the question of how Tanatex handled, disposed of, or otherwise addressed wastes from ten years of operations at the Site. Indeed, according to Thermo Fisher, not even the paper bags it admits certain raw chemicals were packed in constituted an industrial waste product. Thermo Fisher also claims – equally implausibly – that Tanatex did not release any hazardous substances at the Site during its decade of manufacturing and laboratory research. More tenuous still, Thermo Fisher makes this claim while admitting that Tanatex used, generated, handled and stored several dozen chemicals at the Site, including trichlorobenzene ("TCB"), one of the Constituents of Concern ("COC") at the Site.[5]

Given conventional knowledge regarding housekeeping and chemical management procedures during the period of interest (*i.e.*, 1954-1964 - before the advent of the EPA, let alone CERCLA, RCRA, or other relevant regulatory programs), Thermo Fisher's statements regarding the absence of releases from Tanatex's operations must be viewed with skepticism. Floor drains were in common use during this time period and Tanatex conducted operations via a batch, rather than continuous, process. Such operating procedures would necessarily have entailed frequent vessel cleanings between batch operations (with attendant releases of cleaning fluids) via floor drains or other means. Moreover, the buildings at the Site were plumbed to septic systems that discharged to a drainage swale and the Site was largely unpaved. Hence, any chemicals, spills or operational wastes entering floor drains, sinks, or any other features plumbed to the septic system would have had a direct pathway for release to the environment, either via direct day-lighting into the drainage ditch or via exfiltration from the septic system plumbing.

Notwithstanding Thermo Fisher's admission that Tanatex was a lessee and an operator at the Site during the time periods when EPA contends releases of hazardous substances occurred (and, thus, is an admitted responsible party under CERCLA § 107(a)(2)), Thermo Fisher contends that any TCB present on Lot 50 of the Site is solely attributable to historical releases of dichlorobenzene ("DCB") by Standard Chlorine and not to operations by Tanatex.

The Group finds Thermo Fisher's contention to be:

(1) ***misleading*** in that it (a) misrepresents the nature of Tanatex's operations at the Site, (b) fails to acknowledge the chemical composition of Tanatex's TCB feedstock, (c) ignores the quantity of chemicals (including TCB) used by Tanatex during its Site occupancy, (d) omits conflicting environmental data, and (e) fails to take into account basic physical properties and fate/transport considerations;

(2) ***overreaching, speculative*** and ***inaccurate*** in that it relies on untested witness recollection regarding company operations during select timeframes as representative of all operations (despite evidence to the contrary); and

(3) ***an attempt to obfuscate*** – through what is basically an allocation argument – the essential point that, as the successor to Tanatex, Apogent Transition Corp., is a potentially responsible party for the Site.

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[5] *See* Thermo Fisher Continued Response, pp. 16-17 (partial list of chemicals Tanatex used at Site including formaldehyde and TCB).

In light of these factual and technical shortcomings, and other errors and omissions in the Thermo Fisher Response, the Group has prepared this Rebuttal. This Rebuttal will address the following aspects of Thermo Fisher's argument:

- Factual Errors Regarding Standard Chlorine's Operations
- Physical Extent of Tanatex's Site Production Operations
- Composition of Tanatex's Trichlorobenzene Chemical Feedstock
- Quantity of Materials Used During Tanatex's Site Occupancy
- Trichlorobenzene and Dichlorobenzene Distribution on Lot 50
- Physical Properties and Fate & Transport Considerations
- Sufficiency of Thermo Fisher's Proffered Evidence

Factual Errors Regarding Standard Chlorine's Operations

The Group wishes to correct some fundamental factual errors made by Thermo Fisher with respect to: (1) the location and nature of chlorobenzene chemical processing operations conducted by Standard Chlorine at the Site, and (2) the nature of manufacturing operations conducted by Standard Chlorine on Lot 50.

In its March 7, 2011 letter to USEPA, Thermo Fisher mistakenly asserts that "SCCC has acknowledged that it annually processed millions of pounds of mixed isomers of dichlorobenzene (DCB) in Building 2 on Lot 50." The fact is, Standard Chlorine never processed any DCBs or any TCBs in any building on Lot 50. The only chlorobenzene chemical processing conducted by Standard Chlorine at the Site took place on Lot 49 in Building 18, which was leased to Standard Chlorine by Standard Naphthalene Products Co, Inc. ("SNP")[6] and identified in numerous reports as "the dichlorobenzene process building"[7] and/or the "Distillation Building."

Given that Standard Chlorine's chemical processing operations occurred not in Building 2 on Lot 50, but in Building 18 on Lot 49, Thermo Fisher's perceptions about purported inevitable releases at Lot 50 from Standard Chlorine's supposed chemical "processing" operations at that location need not be addressed.

However, it is important to correct Thermo Fisher's misstatement about the products produced from those processing operations. As has been noted in prior Site reports and investigations:

> . . . from 1962 to 1982, Standard Chlorine Chemical Co., Inc. (SCCC) processed bulk dichlorobenzenes to make paradichlorobenzene (1,4-dichlorobenzene) solids and liquid technical orthodichlorobenzene (1,2-dichlorobenzene) at the site.

[6] "Building 18 is the approximately 8-story, transite-sided, former distillation building located east of Building 16 and Building 17. It is the tallest building in the Northeastern Area. Between approximately 1963 and 1981 Building 18 and the equipment within it was leased by Standard Naphthalene to SCCC for use in the distillation separation of dichlorobenzenes and trichlorobenzene. It is the only building at the Site to be used in chlorobenzenes processing. (Northeastern Area Buildings Work Plan for Closure of Building Openings, Key 2009). See also the Sept 1964 SNP Insurance Report prepared by Alexander & Alexander.

[7] Weston May 1990 RI Work Plan, at 1-1

> Paradichlorobenzene was screened and packaged in 1, 50 and 300 pound containers; orthodichlorobenzene was contained in bulk storage prior to sale or further use by SCC or its subsidiaries.[8]

Thus, Standard Chlorine's operations on Lot 50 involved the storage and packaging of pure (*i.e.*, 100%) paradichlorobenzene solids as moth preventative products, *i.e.*, moth balls and crystals; and the storage and sale of bulk liquid orthodichlorobenzene. Building 2 was the building in which the solid phase paradichlorobenzene moth preventative products were packaged and shipped.

The only orthodichlorobenzene use on Lot 50 was that of Standard Chlorine's subsidiary, Cloroben Chemical Corporation, which blended technical orthodichlorobenzene with soap and surfactants to make an emusifiable drain cleaner.[9] This operation involved only the mixing of chemicals. In sum, Thermo Fisher's assertions regarding Standard Chlorine's Lot 50 operations are simply incorrect: Standard Chlorine conducted no processing of chlorobenzenes on Lot 50.

Physical Extent of Tanatex's Site Production Operations

Many of the assertions in the Thermo Fisher Response are based on the recollection of one or more individuals and, while presented as factual statements, are in fact subject to dispute. Thermo Fisher asserts that Tanatex occupied a 6,400 sq. ft. building at the Site commencing in 1954.[10] Thermo Fisher also implies that this was the only building occupied by Tanatex that could have contributed to the TCB and other COCs found at the Site with statements such as the following: "This [sample] location is on the opposite side of Building 2 (and over two hundred feet away) from the building once used by Tanatex in its production operations."[11] These statements are misleading in that they make no mention of the fact that Tanatex also used the entire second floor of Building 1 (approximately 5,400 sq. ft.) for laboratory operations which involved the use of multiple chemical formulations and included an applications laboratory that duplicated dyehouse operations. As previously mentioned, the laboratory was plumbed to the septic system (and, tellingly, the Thermo Fisher Response is silent on what, if anything, Tanatex did to manage chemical waste products from its laboratory operations). It is also important to note that Building 1, which contained the laboratory, is located "on the opposite side of Building 2."

Composition of Tanatex's Trichlorobenzene Chemical Feedstock

Thermo Fisher's Response indicates that, according to a witness's recollection, the TCB feedstock used at the Site was essentially pure and contained very little, if any, DCB isomers.[12]

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[8] ISRA Site Evaluation Submission (SES) for June 1993. Attachment 2, "Description of Past Operations."
[9] Cloroben ISRA SES, June 1993, Attachment 6, "Description of Operations."
[10] *See* Thermo Fisher Continued Response, p. 5.
[11] *See* Thermo Fisher Response, p. 2.
[12] *See* Thermo Fisher Response, p. 2 ("...although very low concentrations of DCB may have been present in the TCB used by Tanatex"); and Thermo Fisher Continued Response, p. 11 ("Mr. Scott recalls that the TCB that Tanatex purchased was "very pure". Based on the forgoing, it appears that dichlorobenzene may have been present, if at all, in very low concentrations in any TCB that Tanatex purchased from Hooker Chemical.").

To further support this assertion, Thermo Fisher relies on an EPA document's reference to a 1980 Dow Chemical information sheet that "states a purity of 100 percent for that company's 1,2,4-trichlorobenzene."

These statements are suspect for at least two reasons. First, the statement that the TCB was essentially pure and contained very little, if any, DCB isomers is based on recollection and is pure conjecture. No empirical evidence is provided to support this statement. Second, it is inappropriate to rely on a 1980 document to draw any conclusions regarding the purity of materials used from 1954 through 1964. In other words, due to changes in material specifications, a material known as "pure" TCB in 1980 is not necessarily the same material that would have been known as "pure" TCB in the 1950s and 1960s. Per Standard Chlorine's knowledge, Tanatex used Technical Grade TCB which, based on a 1968 Hooker Chemical data sheet (Exhibit A), was 97% 1,2,4-TCB.[13] It is likely that the remaining 3% of this chemical feedstock was made up of other chlorinated benzene compounds, including DCB isomers. Regardless, Thermo Fisher acknowledges that at times it used Hooker Chemical-supplied TCB and based on this more contemporaneous data information sheet, it can therefore be confidently concluded that the TCB used by Tanatex was not 100% pure and likely contained impurities of interest for the Site.

Quantities of Materials Used During Tanatex's Site Occupancy

The Thermo Fisher Response goes to great length to derive a reasonable estimate of the quantity of chemicals Tanatex used at the Site.[14] However, in spite of the mathematical gyrations used to develop estimates for the years 1957 through 1963, multiple technical problems exist with respect to Thermo Fisher's analysis. These problems include at least the following:

1) The underlying premise for the analysis is the hypothetical assumption that the arithmetic (non-weighted) average price of Tanatex products, total sales, and the percentage of dye-carrier sales may be used to generate estimates of the quantities (lbs.) of TCB and other chemicals used. However, the underlying numbers input into Thermo Fisher's assumed formula are all based on recollection. No supporting information is provided regarding the price of Tanatex's products over time or the actual percentage of dye-carriers that were produced.

2) No information is presented for 1954-1956, a period when Thermo Fisher's Response admits that the use of TCB was more prevalent. Consequently, chemical usage estimates for a critical period of Tanatex's operations have not even been considered and no justification for the exclusion of these years is provided.

3) The Thermo Fisher Response attempts to force the impression that only small quantities of TCB were ever used at the Site. In fact, even the flawed numerical analysis produced

[13] Data Sheet – Hooker Industrial Chemicals – 1,2,4-Trichlorobenzene (1968). Hooker Specification by IR or GC – 97% min.

[14] *See* Thermo Fisher Continued Response, pp. 18-20 (derivation of Estimated Tanatex Dye Carrier-Related Chemical Usage in Kearny (1957-1963)).

by Thermo Fisher indicates that Tanatex may have used at least 199,000 lbs and as much as 384,000 lbs of TCB at the Site from 1957 through 1963. The total TCB used at the Site by Tanatex from 1957-1963 per the Thermo Fisher calculations is approximately 1.9 million pounds. Using methods similar to those employed by Thermo Fisher (*i.e.,* back-calculation of TCB use based on an assumed 11.8% annual sales growth) it could also be estimated that Tanatex used 575,000 and 643,000 lbs of TCB in 1955 and 1956, respectively, when Tanatex's dye carrier products were based solely on TCB.

These are significant quantities of TCB, and given the quantities, releases were likely. Even a small release would be more than sufficient to result in substantial environmental contamination at the Site. Given a specific gravity of approximately 1.56, one gallon of TCB would weigh approximately 13 lbs (or 0.0006% of the total Thermo Fisher claims was used from 1957 to 1963). A release of one gallon would be sufficient to result in a concentration of 9 ug/L (the New Jersey Class IIA Groundwater Quality Criterion for 1,2,4-TCB) in 656 million liters (~173 million gallons) of water, a volume substantially greater than the volume of impacted groundwater at the Site.[15] As an example, the upper water bearing zone at the Site (i.e, the fill layer) is estimated to hold, at most, approximately 19.5 million gallons of water (assuming a saturated thickness of 8 feet and a porosity of 30%).[16]

Moreover, there is other evidence that directly contradicts Thermo Fisher's assertion that TCB use was gradually being phased out during their Site occupancy. A market study completed by Standard Chlorine in 1970 (Exhibit B), that included information supplied by Tanatex employees, indicated that Tanatex was still using approximately 3,000,000 lbs of TCB per annum a mere six years after Tanatex left the Site. Clearly, even using Thermo Fisher's flawed analytical approach, a back calculation from 1970 usage rates assuming an 11.8% annual sales growth would result in considerably more TCB use by Tanatex at the Site than what the Thermo Fisher Response suggests. Nevertheless, given the large quantities of TCB being handled by Tanatex each year, it would have taken only minor releases or discharges to the drains to account for a significant contribution to Site contamination.

In conclusion, it is apparent from review of Thermo Fisher's Response that a large quantity of TCB was used by Tanatex during its tenure at the Site.

Trichlorobenzene and Dichlorobenzene Distribution on Lot 50

Unable to dispute the fact that the very chemical (TCB) admittedly used, handled and stored at the Site by Tanatex is found in Site soils on the very lot Tanatex occupied, the Thermo Fisher Response attempts to focus attention on DCB use by Standard Chlorine and away from the Tanatex use of TCB. Pointing to the co-location of DCB and TCB at the Site, the Thermo Fisher

[15] Calculated as follows: 13 lbs = (13 lbs)/(2.2 lbs/kg) = 5.9 kg = 5.9×10^9 ug, hence, (5.9×10^9 ug)/(9 ug/L) = 656×10^6 liters of water = (6.56×10^8)/(3.785 L/gal) = 173×10^6 gal.

[16] Calculated as follows: (25 acres)(43,560 ft^2/acre)(8 foot saturated thickness)(0.3)(7.48 gl/ft^3) = 19.5 million gallons.

Response relies heavily on academic literature indicating that DCB mixtures will contain a small percentage of TCBs (typically on the order of 1%), and suggests that these facts therefore explain the presence of TCB on the Tanatex Lot.[17] However, the Thermo Fisher Response mentions only briefly the fact that that very same literature has found that it is just as likely that ***TCB*** formulations (such as those used by Tanatex at the Site) will contain small quantities of DCB isomers.[18] The coexistence of DCB and TCB thus make it at least as probable that Tanatex's operations were the source of those constituents as that Standard Chlorine's operations were the source.

Ignoring the likelihood, consistent with that literature, that TCB use by Tanatex was the probable source of some of the commingled TCB+DCB contamination (or perhaps because of that likelihood), Thermo Fisher tries to bolster its argument by suggesting that the "relative abundance" of TCB at a sample location versus total TCB+DCB at that location is not consistent with a TCB release but rather supports a "TCB as DCB artifact" conclusion. However, to prove its relative abundance hypothesis Thermo Fisher elects to employ a skewed subset of the available Site data. Thermo Fisher's approach ignores what the entirety of the available data actually shows.

For example, Thermo Fisher cites the results for sample location SB-2B, which yielded a TCB/(TCB+DCB) ratio of 2% - a percentage, which, alone and at face value, one could argue is consistent with a "TCB as DCB artifact" claim. However, Thermo Fisher conveniently omits the results for SB-*2A* (the shallower sample from that same boring SB-2, as highlighted in Table 1 below), which clearly shows a TCB fraction ***an order of magnitude above*** the results cited by Thermo Fisher. These data clearly refute Thermo Fisher's theory. Indeed, how can 30% of all the TCB+DCB found in a sample location be TCB if that TCB purportedly – as Thermo Fisher would have EPA believe – came from a Standard Chlorine source that even Thermo Fisher admits started with only approximately 1% TCB? Simply put: Thermo Fisher's theory is suspect at best. The more likely explanation is that some of that TCB came from releases of a source containing much higher concentrations of TCB, such as the raw material Thermo Fisher admits Tanatex used at the Site.

Table 1
Representative Weston RI Boring Sample Results

Parameter	Units	Weston SB-2 Results	
		SB-2A	SB-2B
1,2-Dichlorobenzene	mg/Kg	6.8	9,200
1,3-Dichlorobenzene	mg/Kg	3.5	1,300
1,4-Dichlorobenzene	mg/Kg	3.4	1,300
1,2,4-Trichlorobenzene	mg/Kg	6.0	240
Total (DCB & TCB)	mg/Kg	19.7	12,040
TCB Fraction of Total	%	30%	2.0%

Source: Remedial Investigation (RI) Report – Roy F. Weston, Inc. - May 1993 – Table 5-6.

[17] *See* Letter from J.F. Brown, Esq., counsel for Thermo Fisher, to S. Flanagan, Esq. & A. Hess at EPA, pp. 2-3 (Mar. 7, 2011).

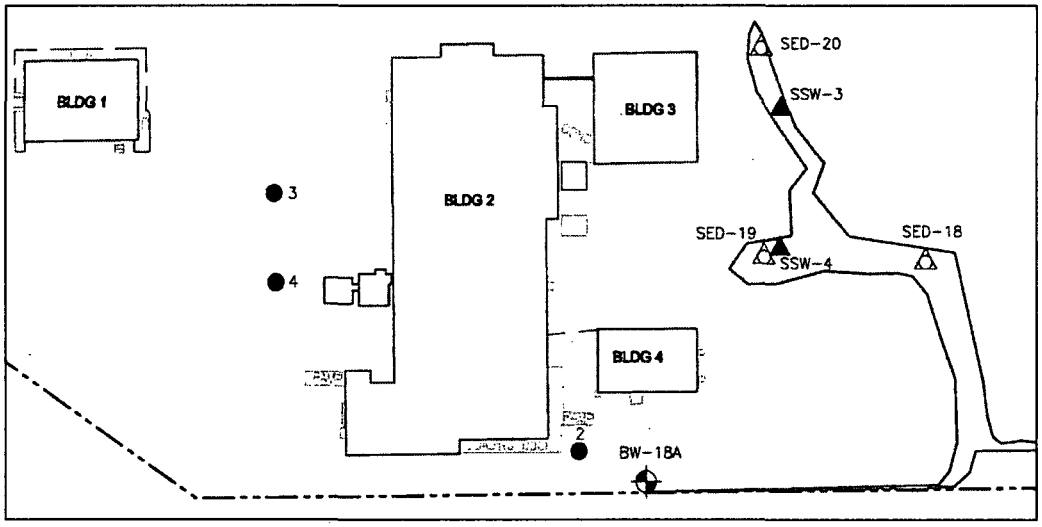
[18] The Health Assessment Document for Chlorinated Benzenes (Jan. 1985) provides a table summarizing the components for 1,2-DCB, which incorporates the Allied Chemical (1973) data referenced in the Thermo Fisher Response. According to page 3-13 of that report, TCB can contain a small quantity of DCBs (<0.5%).

Moreover, the analysis of depth-specific samples (BW-18A in Table 2 and Figure 1 below) obtained during the barrier wall alignment investigation in the same general area as SB-2A yielded similarly high TCB findings in the shallow (fill) and deeper (meadow mat and deep sand) zones:

Table 2
Representative Pre-Design Investigation Boring Sample Results

Parameter	Units	Key BW-18A Results		
		(6.5-7 ft)	(9-10 ft)	(16-17 ft)
1,2-Dichlorobenzene	mg/Kg	2,700	1200	200
1,3-Dichlorobenzene	mg/Kg	2,800	1000	200
1,4-Dichlorobenzene	mg/Kg	1,600	660	110
1,2,4-Trichlorobenzene	mg/Kg	1,300	55	90
Total (DCB & TCB)	mg/Kg	8,400	2,915	600
TCB Fraction of Total	%	15%	1.8%	15%

Figure 1
Lot 50 Sample Locations



In addition, sediment samples obtained from the Lot 50 drainage ditch and near Building 3 (which housed the Tanatex operations) during the Weston RI and during the 2002 USEPA surface water and sediment investigation also clearly indicate that TCB concentrations (as a percentage of total TCB+DCBs) are ***much greater*** than those believed to be purely attributable to artifacts in the Standard Chlorine DCB feedstock or products (as shown in Table 3 below). Moreover, the septic systems from the various buildings (including the one servicing Tanatex's laboratory and manufacturing operations) discharged to this ditch!

Table 3
Representative Weston and USEPA Sediment Sample Results

Parameter	Units	Weston Results		USEPA Results		
		SW-3	SW-4	SED-18	SED-19	SED-20
1,2-Dichlorobenzene	mg/Kg	723	1,070	0.87	5,300	4.6
1,3-Dichlorobenzene	mg/Kg	593	1,010	0.83	3,900	9.3
1,4-Dichlorobenzene	mg/Kg	637	1,170	1.40	6,000	21
1,2,4-Trichlorobenzene	mg/Kg	190	257	0.51	2,900	1.7
Total (DCB & TCB)	mg/Kg	2143	3,507	3.61	18,100	36.6
TCB Fraction of Total	%	8.9%	7.3%	14%	16%	4.6%

Sources: RI Report (as above) and Superfund Contract Support Team Sampling Report – USEPA – October 2002 – Table 2.

If the theory put forth by Thermo Fisher were correct, percentages of TCB (as a fraction of the total TCB+DCB quantity) in the range of 1 to 3% would be expected in Site samples. However, this is not what the data show. Thus, while the selective sample points put forth by Thermo Fisher may show a pattern in certain locations (*e.g.*, the area west of Building 2) indicative of a low percentage of TCB more akin to a Standard Chlorine-associated TCB/DCB release, there are many more sample results – as shown previously – that do not comport at all with Thermo Fisher's "TCB as DCB artifact" theory, and in fact support the theory that releases from Tanatex's TCB sources led to the higher percentages of TCB as a fraction of TCB+DCB contamination. (EPA should also note that both the Weston RI and USEPA data analyzed here were available to Thermo Fisher for consideration during preparation of its Response, yet somehow these data – which directly undermine Thermo Fisher's theory of the contamination source – were omitted from Thermo Fisher's analysis.)

Physical Properties and Fate & Transport Considerations

In addition to its bias in data selection, another shortcoming of the Thermo Fisher Response is its reliance on environmental data itself as a direct indicator of the original raw product or finished product formulations. For example, Thermo Fisher relies heavily on groundwater data to support its relative abundance argument. However, relative concentrations of the constituents in environmental media, particularly in groundwater, are essentially meaningless given the great disparity in the physical properties of the TCB and DCB chemicals.

Table 4
Physical Properties of Constituents of Interest

Parameter	Solubility (mg/L)	Vapor Pressure (mm Hg)	Partition Coefficient (Kg/L)
1,2-Dichlorobenzene	156	1.47	383
1,3-Dichlorobenzene	125	2.15	375
1,4-Dichlorobenzene	81.3	1.74	375
1,2,4-Trichlorobenzene	49.0	0.46	1,360

As shown in Table 4 above, the DCB isomers are significantly more water-soluble, and consequently less adsorptive, than TCB. One implication of this is that groundwater concentrations in the vicinity of a source of DCB and TCB should be enriched in DCBs relative

to the original source concentrations. By the same token, soils rich in organic carbon should be enriched with TCB as a result of the combined effects of volatility and sorption potential.

The unavoidable implication of these physical properties is that one cannot rely on concentration data to ascertain anything regarding the original source chemical formulations without some consideration of physical property or fate and transport information. Direct evidence of the potential implications of fate and transport considerations is evident in the depth-specific sample information previously provided in Tables 1 and 2. Indeed, even a cursory review of the data in Tables 1 and 2 shows a significant disparity in the relative TCB concentrations between the shallow samples and the deep samples at locations S-2 and BW-18A. This disparity is very likely a direct result of the vertical migration of the more water-soluble (and less adsorptive) components (*i.e.*, the DCBs).

Note, however, that the results for BW-18A are inconsistent with this conceptual model to some extent. Specifically, in the absence of any other influencing factors, one would expect the meadow mat (*i.e.*, the 9-10 foot sample in Table 2) to contain a higher percentage of TCB relative to the deeper sand sample (*i.e.*, the 16-17 foot sample in Table 2). The fact that it does not may be indicative of another factor: biological degradation in the organic rich meadow mat zone. The implication of potential biological degradation, at least via anaerobic pathways,[19] is that formation of DCBs could occur in such an organically rich zone as a result of the presence of historical Tanatex releases of TCB. This is a potentially significant fate mechanism that was not even considered by Thermo Fisher. The degradation of TCB under various environmental conditions via less substituted daughter products such as DCB isomers and chlorobenzene is well documented in the literature. In spite of the substantial evidence of the possibility of such degradation, Thermo Fisher chose to completely ignore this potential fate mechanism.

Regardless, it is evident that Thermo Fisher made no effort to take into account (*e.g.*, by considering the adsorptive and other properties of TCB v. DCB) the multiple complexities surrounding the use of environmental data in conceptual models. In addition, Thermo Fisher's biased approach to data selection (*i.e.*, analyzing only the data supporting its argument) makes its theories and arguments regarding the source of Site TCB indefensible. While some TCB contamination may likely be associated with the feedstock and products used/produced by Standard Chlorine, it is readily apparent from a review of all the data that Tanatex likely contributed to the presence of TCBs, and possibly DCB isomers as well, at the Site. Consequently, Thermo Fisher's wholly-owned subsidiary Apogent Transition Corp., the successor to Tanatex, cannot be excluded from Site liability or status as a potentially responsible party under CERCLA.

Sufficiency of Thermo Fisher's Proffered Evidence

Finally, as a general critique, the Group would like to stress that much of the Thermo Fisher Response relies not on any hard evidence, but instead on the recollection of two former Tanatex employees. Given that these former employees were requested to recount details and events that

[19] Evidence of the anaerobic degradation of 1,2,4-TCB to chlorobenzene via 1,4-DCB is available in the literature. For example, see http://umbbd.msi.umn.edu/tbz/tbz_map.html.

occurred more than 50 years ago, their statements should be treated with some degree of skepticism in the absence of any documentary evidence substantiating those statements – especially where, as here, the employees assert that a manufacturing operation never had any releases or generated any industrial wastes, yet that operation admittedly used millions of pounds of the very chemicals of concern now located in Site soils and groundwater.

Based on the above, the Group believes that Apogent Transition Corp. is clearly responsible as the successor to a company that – by their own admission – used millions of pounds of a key constituent of concern at the Site (*i.e.*, TCB) over a period of ten years in the 1950s & 1960s. The Group therefore strongly urges EPA to issue a General Notice Letter to Apogent Transition Corp. as soon as possible. Thank you for your consideration of this information.

Please feel free to contact counsel for any of the Group's members if you have any questions or need additional information.

Sincerely,

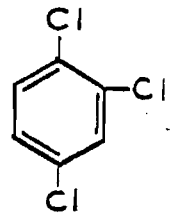
The Group of Cooperating Parties for the SCCC Superfund Site

Exhibit A

1968 1,2,4-Trichlorobenzene Data Sheet
Hooker Industrial Chemicals Division

hooker

Industrial chemicals DIVISION



HOOKER SPECIFICATIONS

Assay 1, 2, 4-Trichlorobenzene by IR or GC	97% min
Description	Clear, colorless liquid
Freezing Point	15°C min
Distillation Range	4°C max, including 213.6°C
Specific Gravity, 15.5°C/15.5°C	1.456 - 1.470
Moisture Content	150 ppm max
Refractive Index, n25/D	1.5685 - 1.5700
Last Crystal Point	16.0°C min

DESCRIPTION

Hooker 1, 2, 4-Trichlorobenzene is a clear, almost colorless mobile liquid having a characteristic chlorobenzene odor.

Formula	$C_6H_3Cl_3$
Molecular Weight	181.5

TYPICAL PROPERTIES

Freezing Point	16°C
Last Crystal Point	16.5°C
Distillation Range	1.5°C
Decomposition Temperature	Above boiling point
Color (APHA)	20
Flash Point (Cleveland open cup)	280°F
Fire Point (Cleveland open cup)	None up to boiling point
Specific Gravity, 15.5°C/15.5°C	1.462
Density Correction Factor per 1°C	0.00124
1, 2, 3-Trichlorobenzene	2.3%

FOR MORE INFORMATION WRITE INDUSTRIAL CHEMICALS DIVISION, HOOKER CHEMICAL CORPORATION, NIAGARA FALLS, N. Y. 14302

The information presented herein, while not guaranteed, is to the best of our knowledge true and accurate. No warranty or guarantee express or implied is made regarding the performance or stability of any product, since the manner of use and conditions of storage and handling are beyond our control. No suggestion for product use, nor anything contained herein, shall be construed as a recommendation for its use in infringement of any existing patent.

Refractive Index, n25/D	1.570
Pounds per Gallon at 15.5°C	12.2
Specific Heat at 25°C*	0.20
Latent Heat of Vaporization *	54 cal/gm (98 BTU/lb)
Boiling Temp at 50 lb gage	280°C
Surface Tension at 25°C	39 dynes/cm
Coefficient of Cubical Expansion at 30°C	0.00086

Viscosity	Centistokes	Centipoises
at 100°F	1.100	1.579
at 210°F	0.549	0.746

Vapor Pressure (1) at 100°C	23 mm

Solubility at 25°C	gms/100 gms
Water in Trichlor	0.22
Trichlor in Water	0.0025
Acetone	Completely miscible
Benzol	" "
Butanol	" "
Carbon Tetrachloride	" "
Diethyl Ether	" "
Ethylene Dichloride	" "
Linseed Oil	" "
Methanol	" "
Petroleum Ether	" "
Solvesso No. 2	" "

* Literature data

USES

1. Chemical synthesis: used in the manufacture of dye intermediates and other organic chemicals.

2. Intermediate in the manufacture of insecticides.

3. Solvent for fats, oils, waxes, resins, and as a crystallization solvent. Used in dye carrier and dye stripping formulations.

4. Soil poison in termite eradication.

5. Heat transfer medium; its physical properties indicate that it is particularly adaptable to condensing vapor systems for a range of from 210°C to about 300°C. It does not leak through ordinarily tight pipe joints. Tests indicate that at 200°C its corrosion of iron amounts to less than 0.125 mm/yr. It is also recommended as a dielectric fluid for transformers.

PRECAUTIONARY INFORMATION

The following precautions for handling trichlorobenzene are quoted from our package labels. This caution label has been prepared in accordance with a pattern established by the Manufacturing Chemists' Association.

"CAUTION! VAPOR HARMFUL
Use with adequate ventilation.
Avoid prolonged breathing of vapor.
Avoil prolonged or repeated contact
with skin."

Exhibit B

1970 TCB Market Survey
Tanatex Chemical Corp.

Tanatex Chemical Corp.
Page & Schuyler Aves.
Lundhurst, N.J. 07071
Phone: 201-438-5900
Contact: Miss Robino - Mr. Scott's Sec.
Jacob Hauser - works for Dr. Winstein, V.P.

1,2,4-T C B

Mr. Hauser admits to Tanatex enjoying 60% of the T C B dye carrier market. He further indicated that they buy about 3,000,000 pounds per year (Du Pont estimates the dye carrier market at about 6,000,000 pounds. Using Hauser's 60% would give 3,600,000. Mr. Pengue of VTM estimates the T C B market at 5,000,000, and that Tanatex buys "several million pounds a year". Again, using Hausers 60% would give 3,000,000 pounds).

PRICE

In a meeting on June 19th Hauser indicated a price of 12.75 ¢ per pound with the statement that they have at least three suppliers.

During the week of June 22 Tanatex obtained a price from Dow of 12.25 ¢ per pound. This has not been confirmed as yet.

REMARKS

Dow is a large supplier of chemicals to Tanatex, on June 19th Tanatex had six 10,000 gallon Dow tank cars on their rail siding.

Tanatex is manufacturing Biphenyl.

While examining this plant, from the outside, it was noticed that Tanatex apparently uses large quantities of ortho cresol, there were about 75 drum of material marked "recovered ortho cresol".

TANATEX

VELSICOL