

# **The Selected Remedy is the Most Environmentally Protective Solution for the Diamond Alkali Superfund Site<sup>†</sup>**

*N. Scott Jones*\*

## **I. INTRODUCTION AND OVERVIEW**

The Diamond Alkali Project Team, comprised of representatives of former owners and operators of the Diamond Alkali Superfund Site (Site) at 80 and 120 Lister Avenue in Newark, New Jersey, has been addressing environmental issues at the Site since the 1983 discovery of dioxin in its soils. This article provides an overview of the history of the Site, discusses the current status of the Site, and examines the selected remedy that is being implemented at the Site.

Knowing the primary players will assist in understanding the issues and activities. These entities are: the United States Environmental Protection Agency – Region II (EPA or Agency), New Jersey Department of Environmental Protection (DEP), Occidental Chemical Corporation (OCC), Chemical Land Holdings, Inc. (CLH), and the Diamond Alkali Project Team (DAPT or Project Team).

Since the discovery of dioxin at the Site, millions of dollars have been spent implementing the selected remedy set forth in various DEP Administrative Consent Orders and a Judicial Consent Decree. Furthermore, in 1997, the EPA conducted additional soil sampling

---

<sup>†</sup> Editor's note: The symposium that gave rise to this article occurred on March 30, 1998. At that time, the United States Environmental Protection Agency (EPA) was still considering how the dioxin contamination at the Diamond Alkali Superfund Site would be remedied. Prior to the publication of this journal, however, the EPA gave final approval to a 1990 consent decree, which permits the on-site burial of dioxin waste at the Diamond Alkali site. See Tom Johnson, *Dioxin Site in Newark to be Sealed Underground*, *Star-Ledger* (Newark), Aug. 5, 1998, at 15.

\* N. Scott Jones serves as a member of the Diamond Alkali Project Team, which is working on environmental issues at the Diamond Alkali Superfund Site in Newark. Mr. Jones has 10-years experience working on diverse environmental projects throughout the United States including five years on the Diamond Alkali site. An expert in litigation communication, Mr. Jones has served as an expert witness and deponent in a number of high-profile litigation and administrative law matters in both federal and state courts and various regulatory agencies.

to confirm the Site conditions upon which the selected remedy is based. The EPA analyzed these samples for dioxin and other chemicals and compared the results to the existing data used to select the remedy. The Project Team's analyses of test results confirm these Site conditions. Consequently, the science and engineering confirm that the selected remedy is the most environmentally sound and protective solution for the Site.

## II. TECHNICAL AND LEGAL HISTORY OF THE SITE

The Site is located in a heavily industrialized area of Newark. Historical sources show that the area has been the location of industrial activity for more than 100 years.<sup>1</sup> Diamond Alkali Company (later named Diamond Shamrock Corporation, and then Diamond Shamrock Chemicals Company [DSCC]) owned the Site and conducted manufacturing there from 1951 to 1969. During this time, various herbicides were manufactured, including 2,4,5-Trichlorophenoxy acetic acid (2,4,5-T). During the Vietnam War, the United States government, pursuant to the Defense Production Act of 1950,<sup>2</sup> compelled the Diamond Alkali Company to manufacture Agent Orange for the military. Since 1969, various other companies, unrelated to DSCC, conducted intermittent operations at the Site. In 1977, all chemical production at the Site ceased.

In the mid-1980s, OCC acquired DSCC. As part of this transaction, CLH took title to the real estate at 80 and 120 Lister Avenue, which it continues to hold today. By contractual agreement, CLH is addressing certain environmental issues related to the Site on behalf of OCC. For the purpose of regulatory and legal matters related to the Site, OCC, by virtue of its role as successor to DSCC, is a Potentially Responsible Party (PRP) for environmental conditions at the Site.

Dioxins are an unwanted byproduct of a host of chemical and industrial processes including coal combustion, medical waste incineration, and chlorinated chemical production.<sup>3</sup> More than seventy-five different types of dioxins exist,<sup>4</sup> including 2,3,7,8-tetrachlorodibenzo-*p*-dioxin, the specific dioxin discovered in soils at

---

<sup>1</sup> See D.W. Crawford et al., *Historical Changes in the Ecological Health of the Newark Bay Estuary, New Jersey*, 29 ECOTOXICOLOGY & ENVTL. SAFETY 276 (1994).

<sup>2</sup> 50 U.S.C.A. app. §§ 2061-2170 (West 1991 & Supp. 1998).

<sup>3</sup> See OFFICE OF RES. & DEV., U.S. EPA, ESTIMATING EXPOSURE TO DIOXIN-LIKE COMPOUNDS (June 1994).

<sup>4</sup> See M.P. ESPOSITO ET AL., U.S. EPA, DIOXINS (Nov. 1980).

the Site in 1983.<sup>5</sup> Upon discovery of dioxin at the Site, a comprehensive site stabilization program was implemented. This program consisted of, among other things, a geotextile barrier to prevent erosion and environmental exposure. Site soils slope to the center of the Site so that runoff does not reach the Passaic River. Additionally, due to dioxin's virtual insolubility in water, groundwater is not a pathway to transport the dioxin to surface waters. The entire Site is fenced and guarded twenty-four hours a day to prevent access to the property. In summary, the Site is environmentally stable and secure.

As part of the remedial process to address environmental issues at the Site, DSCC entered into two Administrative Consent Orders<sup>6</sup> (ACOs) with the DEP. To fulfill these agreements, DSCC removed soil from nearby areas in 1984 and 1985. These soils, among other materials, are secured in containers on the 120 Lister Avenue portion of the Site. In September of 1984, the EPA added the Site to the Superfund's National Priorities List<sup>7</sup> (NPL) under the Comprehensive Environmental Response, Compensation and Liability Act<sup>8</sup> (CERCLA). DSCC performed the Site Investigation/Feasibility Studies (SI/FS) as required under CERCLA for the 80 and 120 Lister Avenue properties and submitted them to the EPA and the DEP in 1985 and 1986.

Based on the Site investigation results, the EPA selected a remedy for the Site and memorialized the remedy in its Record of Decision (ROD) issued in September of 1987.<sup>9</sup> Thereafter, in December of 1989, the EPA, the DEP, and OCC, as successor to DSCC, entered into a consent decree for remedial design and remedial action. This consent decree was lodged with the United States District Court for the District of New Jersey. The decree was the subject of public notice with the opportunity for public comment and was approved and entered by the court on November 19, 1990. The consent decree and its appendices set forth the work required to implement the selected remedy, the procedures for accomplishing the work, the cleanup standards, and the quality assurance/quality control standard.<sup>10</sup> Since the entry of the consent decree, the Project Team has

---

<sup>5</sup> See Diamond Alkali Chem. Co. Record of Decision, EPA-ID NJD 980528996, Sept. 30, 1987, available in LEXIS, Environ Library, RODs File.

<sup>6</sup> See *In re* Diamond Shamrock Chem. Co., Admin. Consent Order I (Mar. 13, 1984); *In re* Diamond Shamrock Chem. Co., Admin. Consent Order II (Dec. 24, 1984).

<sup>7</sup> See 49 Fed. Reg. 37070 (1984).

<sup>8</sup> 42 U.S.C. §§ 9601-9675 (1994).

<sup>9</sup> See Diamond Alkali Chem. Co. Record of Decision, *supra* note 5.

<sup>10</sup> See *United States v. Occidental Chem. Co.* Consent Decree, No. 89-5064-JWB,

completed substantial work at the Site. Furthermore, OCC has timely made all requisite submittals.

### III. WORK IMPLEMENTED – SIGNIFICANT PROGRESS HAS BEEN MADE

Work at the Site to implement the selected remedy began in 1989 with the Design Investigation phase. A Remedial Design Work Plan that detailed the Site investigation activities to provide sufficient data to design the remedy was submitted for the EPA to review and approve.<sup>11</sup> The Agency approved this plan in January of 1994<sup>12</sup> and the investigative work began. Six months later, a Preliminary Design Report was submitted for review and comments.<sup>13</sup> This report summarized preliminary design details to set the direction and objectives for the ensuing design development. In June of 1995, the EPA approved the Design Investigation Report for the Site, which provided the new results of the investigation activities.<sup>14</sup> In July of 1995, the Project Team submitted its Per-Final Design Report to provide nearly all of the design drawings and specifications for review by the EPA.<sup>15</sup>

Explaining in a few paragraphs the substantial work conducted during this time period cannot fully convey the complexity, volume, and significance of the work completed. This work encompassed all of the scientific and engineering elements required to implement the selected remedy. The Project Team completed this while working within the prescribed CERCLA procedures, which require that many cumbersome steps be taken.<sup>16</sup> During this time period, the Project Team made every effort to work cooperatively with the EPA to implement the plan so that it could progress as expeditiously as

---

1990 EPA Consent LEXIS 210 (D.N.J. Nov. 19, 1990).

<sup>11</sup> See WOODWARD-CLYDE CONSULTANTS, REMEDIAL DESIGN WORK PLAN FOR DIAMOND ALKALI SUPERFUND SITE, NEWARK, NEW JERSEY (1993) (unpublished report, on file with U.S. Environmental Protection Agency, Reg. II).

<sup>12</sup> See Letter from Raymond Basso, U.S. Environmental Protection Agency, to Occidental Chemical Corporation and Chemical Land Holdings, Inc., Attention M.M. Skaggs (Jan. 21, 1994) (on file with U.S. Environmental Protection Agency, Reg. II).

<sup>13</sup> See WOODWARD-CLYDE CONSULTANTS, PRELIMINARY (30%) REMEDIAL DESIGN REPORT FOR DIAMOND ALKALI SUPERFUND SITE, NEWARK, NEW JERSEY (June 15, 1994) (on file with U.S. Environmental Protection Agency, Reg. II).

<sup>14</sup> See Letter from Raymond Basso, U.S. Environmental Protection Agency, to Occidental Chemical Corporation and Chemical Land Holdings, Inc., Attention M.M. Skaggs (June 9, 1995) (on file with U.S. Environmental Protection Agency, Reg. II).

<sup>15</sup> See ECKENFELDER, INC., PRE-FINAL (90%) REMEDIAL DESIGN REPORT FOR DIAMOND ALKALI SUPERFUND SITE, NEWARK, NEW JERSEY (July 13, 1995) (on file with U.S. Environmental Protection Agency, Reg. II).

<sup>16</sup> See generally 42 U.S.C. §§ 9601-9675 (1994).

possible within the constraints of CERCLA. In fact, the Project Team performed several components of the required work ahead of schedule. For example, the Project Team disassembled three of the four primary buildings at 80 Lister Avenue during the 1994 Design Investigation in order to facilitate the design investigation work.

The following year, in September of 1995, the Project Team voluntarily undertook an Accelerated Work Plan, approved by the EPA, to accomplish some additional required components of the work in advance of remedy construction. This work included, among other things, dismantling existing storage tanks on the property, removing and recycling non-porous, non-hazardous-waste-listed steel, treating water-soluble liquids on-site, and disposing of approved materials off-site.<sup>17</sup> Indeed, these activities are the most visible results at the Site.

Photo 1 is an aerial photograph of the property taken in 1990.<sup>18</sup> The white boundary line delineates the 80 and 120 Lister Avenue property lines. To the north of the property is the Passaic River, to the west is the Sherwin Williams facility, to the east is the Hilton-Davis facility, and directly south of the Site is Chemical Waste Management's facility. As is apparent from the aerial photo, the Site is located in a heavily industrialized area of the city. The white area on the right-hand portion of the property is the top of the cargo containers, referenced earlier, which occupy the 120 Lister Avenue portion of the property.

In contrast, Photo 2 is an aerial photograph of the property taken in 1997, after completion of the Accelerated Work Plan.<sup>19</sup> The results are visually remarkable. All but one primary building, as well as the tank farms, have been removed. The piles of scrap steel that previously existed have been reduced and consolidated. The Project Team voluntarily accelerated this work to move the project expeditiously toward remedy construction.

In June of 1996, the Project Team submitted its Final Design Report to the EPA, where it is pending approval at the time of this writing. Upon approval, the Project Team is prepared to begin the construction process for the selected remedy. As such, the process for selecting a construction contractor has begun and commencement of construction awaits only the approval of the EPA.

---

<sup>17</sup> See *infra* tbl.1 (listing the results of these remedial actions).

<sup>18</sup> See *infra* Photo 1.

<sup>19</sup> See *infra* Photo 2.

In the interim, in June of 1997, the EPA determined that it needed to conduct additional sampling of site soils to confirm the findings made in the SI/FS, upon which the selected remedy was based. The Agency collected 160 soil samples from thirty-two boring locations at the Site and provided CLH with a portion of each sample. The samples were analyzed for dioxin and other chemicals, and the results were compared to the data upon which the ROD was based. The Project Team's analysis of sampling results confirmed the Site conditions and volumes determined in the original 1985 SI/FS, on which the ROD's selected remedy was based. The results of the sampling effort reinforce the remedy selection in the ROD.

To date, approximately forty-six million dollars have been spent on remedial design and action at the Site in preparation for remedy construction.<sup>20</sup> It is significant to note, as delineated in Table 2, that ninety percent of the expenditures provided by the Project Team have gone to design and remedial work at the Site.<sup>21</sup>

#### IV. IMPLEMENTATION OF SELECTED REMEDY – AN ENVIRONMENTALLY SOUND SOLUTION

The Project Team firmly believes, based on the engineering and scientific analysis conducted at the Site, that the selected remedy set forth in the ROD is the most appropriate and environmentally sound solution for the Site. Upon approval of the Final Design Report by the EPA, actual construction of the selected remedy will begin. The Project Team anticipates that the selected remedy will require twenty million dollars for construction, engineering, and laboratory analysis costs. These costs are in addition to the forty-six million dollars already spent to implement the consent decree.

Upon completion, the selected remedy will consist of various elements.<sup>22</sup> First, an impermeable floodwall will be constructed along the Site adjacent to the Passaic River. Second, a slurry wall will be constructed around the rest of the Site perimeter. These two components will seal the entire perimeter of the Site down to an existing impermeable silt layer that lies beneath the Site. Next, a multiple-layer cap including impervious layers of gravel, soil, and geosynthetics will be constructed to contain the remaining contaminated materials. This cap will seal the top of the contained material and, in

---

<sup>20</sup> See *infra* tbl.2.

<sup>21</sup> See *infra* tbl.2.

<sup>22</sup> See *United States v. Occidental Chem. Co. Consent Decree*, *supra* note 10, at \*22.

combination with the low permeable cutoff walls, complete the total encapsulation of the Site. Additionally, an active groundwater extraction and treatment system will operate at the Site to remove and treat chemicals in the ground-water. Finally, monitoring and maintenance of the Site will continue.

#### V. CONCLUSION

Since the 1983 discovery of dioxin in the soil at the Diamond Alkali Superfund Site and the 1990 approval of the consent decree, significant progress has occurred at the Site. The EPA's 1987 Record of Decision set forth a selected remedy for the Site. All of the engineering and scientific analyses confirm that the selected remedy is the most environmentally protective solution for the Site. Working cooperatively in a voluntary fashion with the EPA, the Diamond Alkali Project Team has successfully accelerated much of the work, despite the cumbersome and time-consuming procedures prescribed by CERCLA. The project team continues to work cooperatively with the EPA and the DEP to implement the consent decree.

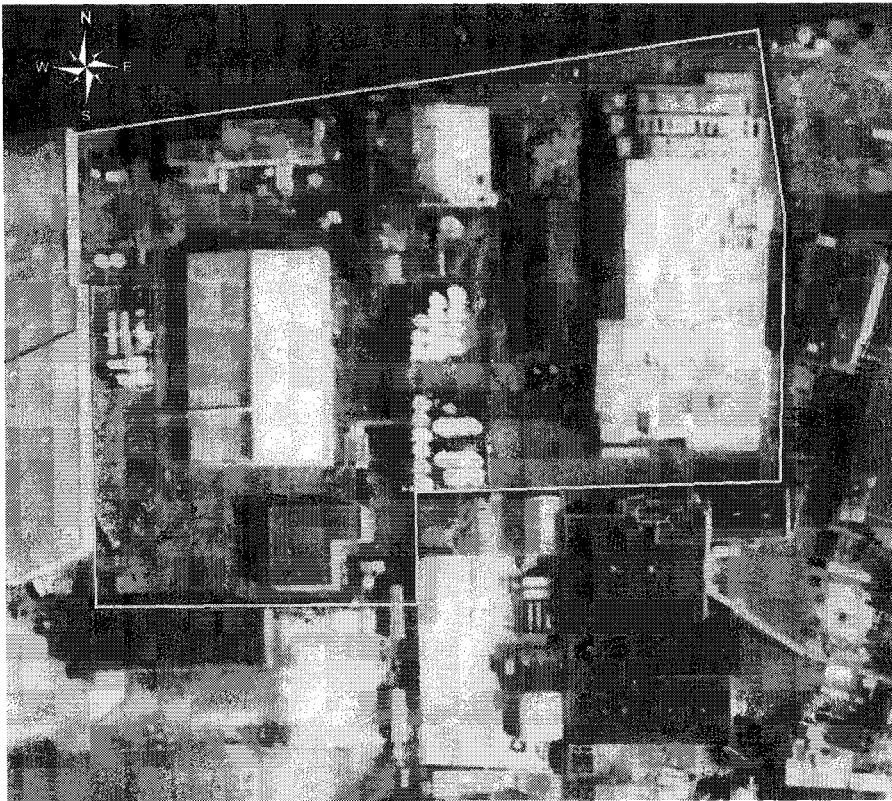


Photo 1: Aerial View of the Diamond Alkali Superfund Site in 1990





Photo 2: Aerial View of the Diamond Alkali Superfund Site in 1997

Table 1. Remedial activities completed at the Diamond Alkali Superfund Site.

- 37 tanks dismantled from three external tank farms.
- Steel piles and 102 smaller tanks consolidated and relocated.
- 564,000 pounds of non-listed, non-porous steel decontaminated and shipped offsite for recycling.
- Over 5,000 gallons of fuel oil taken offsite to approved disposal facility.
- Over 43,000 gallons of site generated water and 37 drums of liquids processed through water treatment plant.
- 49 wells were closed.

Table 2. Summary of money spent to date on remediation activities as of March, 1998.

Site Investigations	\$4 MM
Design	11
<u>Remediation</u>	<u>31</u>
Total	\$46 MM