CON 12-15
Doc #31339

PRELIMINARY ASSESSMENT
ORKIN, CEDAR RAPIDS
LINN COUNTY, IOWA

JUNE 25, 1993

Prepared By

Lambert A. Nnadi
Iowa Department of Natural Resources

Date: JUNE 25, 1993

Prepared by: Lambert A. Nnadi
Iowa Department of Natural Resources

Site: Orkin, Cedar Rapids
3336 Center Point Road
Linn County, Iowa

EPA ID No.:

TDD No.:

1. INTRODUCTION

Under authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the Superfund Amendments and Reauthorization Act of 1986 (SARA), the Iowa Department of Natural Resources in cooperation with the U.S. Environmental Protection Agency (EPA), Waste Management Division, Region 7, conducted a Preliminary Assessment (PA) at the Orkin site in Linn County, Iowa. The purpose of this investigation was to collect information concerning conditions at the Orkin facility sufficient to assess the threat posed to human health and the environment and to determine the need for additional CERCLA/SARA or other appropriate action. The scope of the investigation included review of available file information, a comprehensive target survey, and an off-site/on-site reconnaissance (May 19, 1993).

2. SITE DESCRIPTION, OPERATIONAL HISTORY, AND WASTE CHARACTERISTICS

2.1 Location

Orkin Exterminating Company, Inc., Cedar Rapids, is located at 3336 Center Point Road, Center Point Road, Cedar Rapids, Linn County, Iowa. The geographic coordinates are 42^{o} 00' 43"N latitude and 91^{o} 39' 48" W longitude (Reference 29). To reach the site, travel north on I-380 in Cedar Rapids. Take the 32nd Street exit to Center Point Road. Proceed north on Center Point Road. The site is situated approximately 100 yards north of the intersection of 32nd Street and Center Point Road and 50 yards east of Center Point Road (Reference 23) (Figure 2).

Linn County has a subhumid climate. Summers are sunny and warm with relatively high humidity. Most of the precipitation occurs during the spring and summer months. There is a large annual range in mean temperatures. The average annual precipitation is 33 inches, but a low of 18 inches and a high of 50 inches have been recorded Approximately 2.1 inches of the precipitation is derived from snowfall (Reference 21, Reference 12). The

average annual monthly temperature is lowest in January (19 ^{o}F) and highest in July (76 ^{o}F).

2.2 Site Description

The areal dimensions of the Orkin property are approximately 114 feet by 68 feet or 7752 square feet. The facility is located at the top of a hill that slopes mostly to the west with some slope components to the south and east. There is only one building, with floor dimensions of 60 ft x 30 ft. To the south of the building is an asphalt- surface area used for preparing spray solutions. West of the building is a parking lot which also has asphalt surface. The southwest corner and south of the facility are fenced (Figure 3). The fenced area has a two gates: a west gate is 6 feet wide and a north gate measures 2 1/2 feet (Reference 24).

2.3 Operational History and Waste Characteristics

Orkin Exterminating Company, Inc. is a multi-national company that provides both household and farm pest control services, including the extermination of termites. The Cedar Rapids facility started operation in March 1979. The land originally belonged to Dale Everts who sold it to Jim Sarmek, 523 Gwendolyn Drive, N.E., Cedar Rapids (Reference 23).

In the past the company purchased bulk chemicals and mixed them on-site prior to application. Now most of the chemicals used at the facility are in small vials or packages that do not require weighing. The contents of the vials of packages are simply placed in a sprayer and the solution made up to the correct concentration for application (Reference 23).

Prior to its ban, chlordane was the major chemical used for treating termites. It has been replaced by dragnet, dursban, and tempo. Unlike chlordane, these recent chemicals are systemic pyrethroids (Reference 23).

The site was identified on July 12, 1991, when the file was transferred from Iowa Department of Agriculture and Land Stewardship (IDALS) to the Iowa Department of Natural Resources. On October 16, 1989, IDALS received a complaint from Marsha Homsey of 3311 Carlisle Street, Cedar Rapids. The complainant's residence is directly east and adjacent to the Orkin facility. According to the complaint, there had been illegal dumping of pesticides around the Orkin facility. She stated that Orkin employees had been observed on several occasions rinsing and dumping the rinsates from sprayers and other equipment on the Orkin property. Martha Homsey also alleged there was noxious odor which she attributed to the chemical dumping that had been observed (Reference 5, Reference 9).

IDALS investigated the complaint on October 27 and 31, 1989. During the investigation, empty pesticide packets were observed on the grounds behind the Orkin facility. Soil samples were collected from several points around the facility. Mr. Mike O'Toole the

manager, admitted there was a problem in the past with regard to leaving their dumpster lid open and pesticide packets blowing out. He further stated that he had instituted corrective measures to prevent any future dumping and ensure no empty pesticide packets blew out of the dumpster. The sampling points and the pesticide levels detected are shown in Table 1 (Reference 10).

The well on the north side of the Homsey residence at 3311 Carlisle Street was sampled on October 17, 1991 by IDALS. The water sample was analyzed for chlordane and none was detected (Reference 30).

The IDNR conducted a reconnaissance survey of the Orkin facility on April 19, 1993. During an interview with Michael O'Toole, the manager, the department was informed that in the past there was a trench about two feet deep just behind the building. Rinsates were dumped in the trench. However, the practice had been discontinued. No trench was observed during our visit.

On May 4, 1993, IDNR sampled the soils around the Orkin facility. The well east of the facility was also sampled. The locations of the soil samples are shown in Table 1 and Figure 3. The residence at 3311 Carlisle had a new owner at the time of this investigation (Reference 24).

The waste dumping is alleged to have occurred primarily on the east and south sides of the property. The dump area is approximately 5272 square feet (586 sq. yds). The waste of concern is chlordane, an insecticide that was used in controlling termites. The chemical is a carcinogen (Reference 19). Based on the sampling results obtained by the IDALS and IDNR, the soil contamination appears to be confined to the south and east sides of the building.
(Table 1, Table 3).

3. GROUNDWATER PATHWAY

3.1 Hydrogeologic Setting

The soils in the vicinity of the site belong to the Kenyon-Clyde-Floyd association which are nearly level to strongly sloping, dark colored, moderately well drained to poorly drained soils formed in loamy materials. The soil is within the Clyde series which are typically level to gently sloping and are in drainage ways and lower concave areas. Soils are poorly drained and have a thick, dark colored silty clay loam surface layer over gray stratified subsoil that is mottled yellowish brown in the lower part (Reference 28).

The bedrock in the area is overlain by variable thickness of unconsolidated sedimentary rocks which consist of glacial drift, loess, and alluvium (Reference 21, Reference 22).

The uppermost bedrock belong to the Wapsipinicon Formation of Devonian System. The Wapsipinicon Formation consists, in descending order, of finely crystalline limestone, brown dolomite with gypsum, gray, sandy shale and argillaceous limestone and pale orange limestone (Reference 22). Below the Devonian is the Silurian System consisting of dolomite containing chert with occasional shale layers (Reference 21).

In Linn County alluvial aquifers occur in flood plains. The width of the alluvium in the Cedar River ranges from over two miles to just over a few feet where the river flows on bedrock. Within the Cedar Rapids well fields, the alluvial thickness ranges from 5 to 95 feet (Reference 21).

All the Cedar Rapids municipal wells are situated in the Cedar River alluvium. Alluvial sands and gravel immediately overlie and are in hydraulic connection with underlying buried channel aquifers (Reference 27).

Among the bedrock aquifers that occur in Iowa, the Silurian-Devonian aquifer is the most widely used aquifer in Linn County for domestic, municipal, and light industrial at most rural communities, and for industrial-commercial supplies at many industries and business in the Cedar Rapids area (Reference 21).

The Devonian-Silurian aquifer is generally considered a single hydrologic unit (Reference 20, Reference 21). However a recent study indicates that there is little if any short-term leakage downward through the Devonian confining bed in east central Iowa (Reference 27).

The flow pattern of the alluvial aquifers is generally in a southwesterly direction toward the Cedar River. The groundwater flow pattern in the Cedar Rapids area is affected by the Cedar River, which is a regional discharge point for the bedrock aquifer, and also by two cones of depression created by a concentration of wells in the industrial section of town and the city wells located along the Cedar River, west and southwest of the Orkin site (Reference 16). The groundwater flow at the site has not been investigated. However, based on the topography, it is presumed to be west/southwest toward the McClouds Run creek which empties into Cedar Lake.

3.2 Groundwater Targets

The city of Cedar Rapids has 46 shallow wells. Well depths range from 51 to 72 feet. These wells are located in three well fields: the East Well Field, 19 wells; the West Well Field, 11 wells; and the Seminole Well Field, 16 wells. Portions of all these well fields are within 50 feet of the Cedar River at the high water stage (Reference 13, Reference 15) (Figure 5). The East Well Field is located between 1 to 2 miles, the West Well Field between 2 to 3, and the Seminole Well Field between 3 to 4 miles from the site (Figure 4).

The Cedar Rapids water supply is a blended system. The water from all the wells is mixed while being treated. The output of each individual well is not monitored (Reference 16).

The city of Marion has five wells. Three of these wells are situated in the 3 to 4 mile radius of the site. The municipality of Hiawatha has five wells all which are located in the 2 to 3 mile radius of the site.

There is a private well adjacent and east of the site. The well is 165 feet east of the Orkin building and is used for watering vegetable gardens at the backyard of 3311 Carlisle Street. Some vegetables were observed in the backyard during the soil sampling trip (Reference 24).

The population served by the wells within the 4-mile radius of the site is as follows:

Well Distance from Site (miles)	# of Wells	Population Served
0 - 0.25	0	0
0.25 - 0.5	0	0
0.5 - 1.0	0	0
1.0 - 2.0	19	36,250
2.0 - 3.0	16	41,236
3.0 - 4.0	19	56,653

To arrive at the secondary target population served, the population of Cedar Rapids, Marion, and Hiawatha were taken to be 108,751, 20,403, and 4,986 (Reference 4). The number of wells in the 1 to 2 mile radius of the site is the number for the East Well Field for the city of Cedar Rapids. The population in this category is 1/3 of the population of the city of Cedar Rapids (i.e. 108,751/3 = 36,250). The number of wells for the 2 to 3 mile radius comprises sixteen wells in Cedar Rapids West Well Field plus five Hiawatha wells; the population for the 2 to 3 mile radius is 36,250 plus the population of Hiawatha (4,986). The number of wells in the 3 to 4 mile radius is the 16 wells for the Cedar Rapids Seminole Well Field plus the three Marion wells. The population in this category is 36,250 plus the population of Marion (20,403).

3.3 Groundwater Pathway Conclusions

Analysis of the private well situated 165 feet east of the site showed no pesticide contamination and indicated no off-site release of pesticides to groundwater (Table 3). Information on the adsorption coefficients of the pesticides of concern at the site indicates

that they are tightly bound to soil particles and are not expected to leach significantly except in extremely sandy soils (Reference 7). The soils encountered are unlikely to permit much leaching of any of the chemicals to groundwater. The nearest drinking water wells are city wells which are situated at least one mile from the site. Therefore, there are no primary groundwater primary targets. Secondary targets are the city wells which serve the City of Cedar Rapids with a population of 108,751 (Reference 4).

4. SURFACE WATER PATHWAY

4.1 Hydrologic Setting

Overland drainage from the site flows mostly west into city storm sewers which discharge into McClouds Run. A component of the drainage flows east to the backyard of the residences east of the site. Runoff from these residences flow into the city storm sewer which appear to discharge into McClouds Run. McClouds Run is a creek that flows southerly into Cedar Lake. McClouds Run is approximately 200 yards west and Cedar Lake is situated 1.2 miles south of the site. The Cedar River flows southwesterly 1.5 miles south of the site (Reference 29) (Figure 7).

Cedar Lake is privately-owned by the Iowa Electric Company. The lake receives substantial amounts of urban and suburban runoff. It has been used as a discharge point for industries located near the lake. The lake is being developed into a recreational area for the city of Cedar Rapids. The lake supports a diverse and productive fishery (Reference 16). It measures approximately 150 acres.

The Orkin site is classified as Zone C, an area of minimal flood. This classification effectively places the site in the 500-year flood zone. However, McClouds Run and Cedar Lake basins which receive the runoff from the site are in Zone B. Zone B sites are areas between the Special Flood Hazard Area and the boundary of the 500-year flood zone, including areas of the 500-year flood plain that are protected from the 100-year flood by dike, levee, or other water control measures (Reference 1).

When the Cedar River floods, Cedar Lake is affected. The lake is in the floodplain of the river and is less than 400 feet from the banks of the river.

The average stream flow of the Cedar River at Cedar Rapids is 3278 cubic feet per second (Reference 20).

4.1. Surface Water Targets

The city of Cedar Rapids has surface water intake on the Cedar River. But the intake is situated upstream of the PPE and therefore will not be affected the site. Moreover, the surface water intake is a standby supply that is rarely used (Reference 14).

Potential surface water targets include McClouds Run and the Cedar River. Runoff from

the site enters McClouds Run which flows southerly into Cedar Lake.

Chlordane contamination in fish of Cedar Lake was discovered in 1985 during a survey of chlordane contamination in surface water in the Cedar Rapids area. The level of chlordane in one composite sample of fillets from five channel catfish from the Cedar Lake was 0.410 parts per million (ppm). A composite of carpsuckers contained 0.870 ppm of chlordane. Both of these levels were above Federal Department of Agriculture action level of 0.300 ppm. In 1988 a composite sample of the fillets from five channel catfish contained 1.90 ppm of chlordane. Samples of fish from the lake in 1990 contained 2.0 ppm of chlordane (Reference 17, Reference 18). The 1992 chlordane level in catfish from the lake was 1.3 ppm (Reference 31).

Due to the high levels of chlordane detected in 1985 in several fish species, a fish consumption advisory was issued in 1986 by the owner of the lake in cooperation with the Linn County Department of Health and the IDNR. The advisory, which is still in effect, warns people against eating any fish from the lake (Reference 17).

Several fish species in the Cedar River are classified as endangered or threatened. The weed shiner is endangered while the grass pickerel, blacknose shiner, western sand darter and orangethroat darter are threatened. The Cedar River provides significant fisheries resources that include a sport fishery for channel and flathead catfish, drum, and carp (Reference 2).

State parks are situated within the 15-mile downstream distance from the site. Palisades Kepler State Park is 400 acres and Palisades Access, 89 acres (Reference 2, Reference 29) (Figure 6).

4.3 Surface Water Conclusions

Fish in the Cedar Lake has been reported to be contaminated with chlordane. This organochlorine insecticide was banned for agricultural use in the late 1970s. Chlordane was used in Iowa mainly to control termites in residential areas. The use of chlordane in Iowa was completely banned in 1989. The levels of chlordane in the Cedar Lake and Cedar River water are unknown. However, it is known that this chemical is bioaccumulated by both marine and fresh water species (Reference 17, Reference 19). The Orkin site is a potential threat to the Cedar Lake and the Cedar River because of the proximity of the Cedar River to Cedar Lake. Contamination of the lake could result in cross contamination of the river during floods.

The state parks downstream from the site are unlikely to be affected by the contaminant because of the distance involved. The nearest state park to the PPE is approximately 14.5 miles. The stream flow of the Cedar River at Cedar Rapids is quite rapid. Thus most contaminants at the PPE would be diluted by the time they reach the park locations (Reference 20).

5. SOIL EXPOSURE AND AIR PATHWAYS

5.1 Physical Conditions

The site contains a single building. It is bounded on the east by residential buildings on Carlisle Street and on the remaining sides by commercial buildings, including some empty lots. The south side of the Orkin building is used for chemical mixing and is fenced off. The rest of the site has no fence. The west side is a parking lot. Both the parking lot and the mixing area have asphalt surface. Surface drainage from the mixing area flows west to east (Figure 3).

5.2 Soil and Air Targets

There are no residents at the site. The nearest residence is about 160 feet east of the site. Two other residences are within 200 feet of the site. All the residential buildings are east of the site and they are within a heavily-populated area of Cedar Rapids. The nearest daycare center is the Kandy Kane Kampus Child Care and is situated about 0.25 mile north of the site on Center Point Road (Reference 24).

The total population within a four-mile radius of the site is estimated as 113,000. This population includes about 90% of the population of Cedar Rapids, 50% of the population of city of Marion, and all of city of Hiawatha. Estimates of the population within 0 to 0.25 mile are 1,000; 5,000 within 0.25 to 0.5 mile; 12,000 within 0.5 to 1 mile; 20,000 within 1 to 2 miles; 35,500 within 2 to 3 miles; and 39,500 within 3 to 4 miles radius of the site (Reference 29).

5.3 Soil Exposure and Air Pathway Conclusions

The soil pathway poses a threat to humans and the environment. The soil samples collected from the east and southeast side of the site contain high levels of chlordane. Odors were detected only when holes were being dug for some soil samples. Therefore the air pathway does not appear to pose a threat to humans and the environment if the soil is not disturbed.

6. SUMMARY AND CONCLUSIONS

The Orkin Exterminating Company is situated at 3336 Center Point Road N.E., Cedar Rapids, Iowa. The company has been operating at this site since 1979. The site was discovered after a resident living east and adjacent to the site complained to the Iowa Department of Agriculture and Land Stewardship (IDALS) about chemical misuse and dumping by the employees at the Orkin site. The IDALS later notified the IDNR of the complaints which centered on the dumping of rinsates from sprayers and pesticide packaging behind the Orkin building and the threat of contaminating a private well and the backyard of the residence east of the site. Soil samples taken by both the IDALS and IDNR have confirmed the presence of high chlordane levels on the east and south side of the site. No pesticides analyzed for were detected in the private well.

The presence of high chlordane levels in soil and the poor chemical handling practices may have contributed significantly to the chlordane problem that was detected in fish in the Cedar Lake since 1985. The chlordane level in 1992 fish samples (1.3 ppm) from Cedar Lake is still significantly higher than the FDA action level (0.300 ppm). The 1992 level is lower than the levels detected in 1988 and 1990 when the chlordane fish content was 1.9 and 2.0 ppm. Over a period of several years, runoff carrying chlordane from the Orkin site could have ended up in the Cedar Lake via McClouds Run.

A Site Inspection is recommended for the site.

REFERENCES

1.Federal Emergency Management Agency. 1991. Flood Insurance Study. City of Cedar Rapids, Iowa.

2.Fleckenstein, J. 1993. Sensitive Environments Near the Orkin Terminating Company, Inc. CERCLA Site in Cedar Rapids.

3.Goudy, W. and Burke, S.C. 1991. Iowa's Incorporated Places: Initial Census Counts on Population, Race, Hispanic Origin, and Housing Units.

4.Henning, B. 1990 Census of Urban and Rural Counts in Iowa.

5.Homsey, M. 1989. Statement on Orkin Prepared by Marsha Homsey and Provided to IDALS Investigator by Walter Homsey, Regarding Chemical Handling Practices at the Orkin Site.

6.Homsey, W. 1989. Affidavit Regarding Pesticide Handling Practices at the Orkin Site.

7.Howard, P. H. 1991. Handbook of Environmental Fate and Exposure Data for Organic Compounds. Vol. III: Pesticides. Lewis Publishers, Inc., Chelsea, Michigan.

8.Iowa Department of Agriculture & Land Stewardship. 1989. Report of Investigation: Use/Misuse of Pesticide at the Orkin Site, Cedar Rapids.

9.Iowa Department of Agriculture & Land Stewardship. 1991. Inter Office Memorandum from (IDALS) to IDNR Regarding Soil Contamination at Orkin in Cedar Rapids.

10Iowa Department of Agriculture and Land Stewardship. 1989. Report of Information on a Pesticide Accident, Incident, or Loss.

11.Iowa Department of Agriculture & Land Stewardship. 1989. Notice of Inspection. 3311 Carlisle Street, N.E., Cedar Rapids.

12.Iowa Department of Economic Development. 1991. Statistical Profile of Iowa.

13.Iowa Department of Natural Resources. 1991. Water Compliance Inspection: City of Cedar Rapids. IDNR Files. CON 11-1. Water Supply Files.

14.Iowa Department of Natural Resources. 1992a. Regional Guidance Documentation for Water Supplies.

15.Iowa Department of Natural Resources. 1993. Municipal Water Supply Information System.

16.Iowa Department of Natural Resources. Undated. Site Information Package. Electro-Coatings, Inc. IDNR Files. CON 12-15. Electro-coatings, Cedar Rapids.

17.Iowa Department of Natural Resources. 1992b. Water Quality in Iowa During 1990 & 1991.

18.Iowa Department of Natural Resources. 1992c. Report of the Analyses of Fishes Collected During 1990 from the Regional Ambient Tissue Monitoring Sites in Iowa.

19.Iowa Department of Natural Resources. 1991. Appendix: "Annual Report of the Registry of Hazardous Waste or Hazardous Substance Disposal Sites."

20.Iowa Geological Survey. 1978. Water Resources of East Central Iowa. Iowa Geological Survey Water Atlas No. 6.

21Iowa Geological Survey. 1970. Geology and Groundwater Resources of Linn County, Iowa. Water Supply Bulletin #10.

22.Iowa Geological Survey. 1969. Geologic Map of Iowa.

23.Nnadi, L. A. 1993a. Reconnaissance Survey of the Orkin Site, Cedar Rapids, Iowa.

24.Nnadi, L. A. 1993b. Soil Sampling for Pesticides at the Orkin Site.

25.Nnadi, L. A. 1993c. Chlordane Levels in Cedar Lake Fish Samples in 1992. Personal Communication with John Olson, IDNR, Des Moines, Iowa.

26.Orkin Exterminating Company, Inc. 1993. Current List of Chemical Handled at the Orkin Site.

27.United States Geological Survey-Iowa Geological Survey. Hydrology of Carbonate Aquifers in Southwestern Linn County and Adjacent Parts of Benton, Iowa, and Johnson County.

28.United States Department of Agriculture-Soil Conservation Service. 1975. Soil Survey of Linn County, Iowa.

29.United States Geological Survey. 7.5-Minute Topographic Maps: Cedar Rapids North, Iowa, 1967; Cedar Rapids South, Iowa; 1967; Marion, Iowa 1967; Bertram, Iowa 1968.

30. Iowa Department of Agriculture & Land Stewardship. 1991. Report of Analysis. Private Well at the Marsha Homsey Home at 3311 Carlisle Street.