86Y-92 Investigator: Calvin E. Briggs

CASE INVESTIGATION REPORT

I. INTRODUCTION

On May 14, 1992, Dennis DeYoung, a farmer in the Quincy area, filed an official complaint regarding farm property in Block 73, Units 115 and 271. In 1990, Cenex Full Circle, Inc., applied material from a pesticide-fertilizer waste collection pond onto his farm in Block 73, Unit 271. Since then there are areas in the field which contain no plant growth, other areas where plants are chlorotic to necrotic and deformed. Washington State Department of Agriculture (WSDA) case investigation 157Y-91 details the waste collection pond application to Block 73, Unit 271. Dennis DeYoung stated he has had crop failures in the past and after seeing the symptomology on plants after the pesticide-fertilizer waste pond was applied to his field, he believes Cenex Full Circle, Inc., has over the years, since the pond was constructed in 1986, been applying material from the pond onto other land that he was farming. The pond was buried after the contents were applied to Dennis DeYoung's property in 1990. The Washington State Department of Ecology is in the process of determining if the pond site fits into a hazardous waste clean-up category. EPA also became involved in 1993. The purpose of this investigation is to determine if Cenex Full Circle, Inc., of Quincy, Washington, may have applied illegal pesticides to farm land.

II. PEOPLE INVOLVED

1. Dennis DeYoung - Complainant
   1376 Rd. 12 NW
   Quincy, WA 98848
   (509) 787-3928 or 787-1366

2. Cenex Full Circle, Inc. - Alleged Infractor
   201 A Street SE, P.O. Box 608
   Quincy, WA 98848
   (509) 787-3511

III. LOCATIONS

1. Block 73, Unit 271 (Section 10, Township 20N, Range 24E) - southeast corner of 11 NW and U NW.

2. Block 73, Unit 115 (Section 34, Township 21N, Range 24E) north of 12 NW and 1.2 miles west of Adams Road.

IV. PESTICIDE RESIDUE SAMPLING AND ANALYSIS BY WSDA

Various samples were obtained and tested for various pesticides. It is not known what pesticides ended up in the waste pond, the amount of pesticides, or the concentration of the pesticides. There is always degradation going on; the rate of degradation and the degradation products, or metabolites, depend on many factors. The samples consist of soil, plant tissue, and sludge residue from tanks on the Cenex property in Quincy.

Sample No.	Sample Description	Pesticides Found and PPM	Sample pH	Sample Date
6001	Blk 73, Unit 271 Soil	Treflan 0.17 Ethalfluralin 0.17 Chlorpyrifos 0.14	---	5/14/92
7000	Blk 73, Unit 115 Soil	Treflan 0.11	---	5/14/92
6007	Cenex Discarded Tank	ND	3.0	5/21/92
6009	Cenex Discarded Tank	ND	5.0	5/21/92
6023	Blk. 73, Unit 271 W. orchard apple leaves	Dichlobenil 0.001	---	5/21/92
6024	Blk 73, Unit 271 White residue on soil W. apple orchard	ND	---	5/21/92
6025	Blk. 73, Unit 271 Soil east apple orchard	ND	---	5/21/92
6014	Cenex Discarded Tank	ND	4.0	5/22/92
6022	Blk. 73, Unit 271 Soil 2'-2.5' deep sampled	ND	---	5/22/92
6021	Blk. 73, Unit 271 Soil E. Apple orchard	ND	---	6/9/92
5844	Blk. 73, Unit 271 Soil 100 ac circle	---	5.5	7/2/92
5845	Blk. 73, Unit 271 Soil east orchard	---	7.8	7/2/92
5846	Blk. 73, Unit 271 Soil 100 ac circle	---	8.3	7/2/92
6006	Cenex tank Telone (Standard pH 3.5)	---	2.3	5/21/92
6008	Cenex tank Vapam	---	9.25	5/21/92
6010	Cenex tank Vapam	---	9.2	5/22/92
6011	Cenex tank Vapam	---	9.1	5/22/92
6012	Cenex tank Vapam	---	8.6	5/22/92
6013	Cenex tank Vapam	---	9.6	5/22/92
6015	Cenex tank Sulphur	---	4.5	5/22/92

V. PESTICIDES TESTED FOR IN SAMPLES IN SECTION IV

Sample Number	Pesticides Analyzed For and Minimum Detection Level PPM
6001	Captan 0.07, Atrazine 0.06, Metribuzin 0.2, Cyanazine 0.21, Lindane 0.05, Dacthal 0.06, and Propachlor 0.009.
7000	Captan 0.07, Atrazine 0.06, Metribuzin 0.2, Ethalfluralin 0.01, Cyanazine 0.21, Lindane 0.05, Dacthal 0.06, Chlorpyrifos 0.01, Propachlor 0.009.
6007	Atrazine 0.9, Treflan 1.1, Phorate 0.3, Chlorpyrifos 1.2, Malathion 1.3, Endosulfan 0.9, Parathion 0.8, Trifluralin 0.4, Telone 0.4, Metalochlor 0.5.
6009	Atrazine 0.9, Phorate 0.3, Malathion 1.3, Parathion 0.8, Telone 0.4, Treflan 1.1, Chlorpyrifos 1.2, Endosulfan 0.9, Trifluralin 0.4, Metalochlor 0.5.
6023	Diruon 0.31, Clopyralid 0.004.
6024	Dichlobenil 0.083, Norflurazon 0.11, Diuron 0.09, Clopyralid 0.004.
6014	Atrazine 0.9, Malathion 1.3, Phorate 0.3, Metalochlor 0.5, Chlordane 0.9, Treflan 1.1, Endosulfan 0.9, DDT 0.1, Chlorpyrifos 1.2.
6025	Dichlobenil 0.083, Norflurazon 0.11, Diuron 0.09, Clopyralid 0.004.
6022	Captan 0.07, Atrazine 0.06, Metribuzin 0.20, Treflan 0.0003, Ethalfluralin 0.0003, Cyanazine 0.21, Lindane 0.05, Dacthal 0.06, Chlorpyrifos 0.001, Propachlor 0.009.
6021	Clopyralid 0.004
5844	Not analyzed.
5845	Not analyzed.
5846	Not analyzed.
6006	Not analyzed.
6008	Not analyzed.
6010	Not analyzed.
6011	Not analyzed.
6012	Not analyzed.
6013	Not analyzed.
6015	Not analyzed.

VI. RESIDUE ANALYSIS OF WASTE POND PRIOR TO EMPTYING THE POND AND DISPOSING OF ITS CONTENTS ON DENNIS DEYOUNG 100-ACRE CIRCLE IN BLOCK 73, UNIT 271

The analysis was performed by Harris Environmental Technologies, Inc., 627 Rose Street, P.O. Box 83408, Lincoln, NE 68501, (402) 475-5968, Raymond Szytenchelm, technical coordinator. The report was mailed to Ron Kopezynski of Full Circle, Quincy, on January 11, 1990.

Chemical	Detection Limit PPM	Results (Dry Basis) PPM
Alachlor	5	ND
Atrazine	100	106,667
Chlorpyrifos	5	ND
Cyanazine	50	1,705
Diallate	30	4,905
Metolochlor	8	ND
Metribuzin	30	14,182
Pentachloronitrobenzene	5	ND
Phorate	30	ND
Propochlor	5	ND
Terbufos	5	ND
Trifluralin	5	57,897
Dimethoate	30	ND
Disulfoton	30	ND
Fonofos	5	ND
Methyl Parathion	5	ND

Chemical	Pounds per 1,000 Gallons
Nitrogen	798.6
Phosphorus	454
Potassium	347.9

Chemical	Percent Present
Boron	0.05
Calcium	0.20
Cobalt	0.29
Copper	0.0002 (2 mg/kg)
Iron	0.16
Manganese	0.0049 (49 mg/kg)
Magnesium	0.14
Sodium	0.13
Zinc	0.16

VII. MVTL LABORATORIES, INC. ANALYSIS OF SOIL FROM DENNIS DEYOUNG'S 100 ACRE CIRCLE BLOCK 73, UNIT 271

The samples were taken by David Yonge, PhD, SW 215 Skyline Drive, Pullman, WA 99163 in 1992 and analyzed 4/17/92.

Chemical	MDL	Sample 36 Results mg/Kg	Sample 76 Results mg/Kg	Sample 96 Results mg/Kg
Atrazine	0.05	BDL	0.06	BDL
Chlorpyrifos	0.05	0.16	0.09	0.11
Diallate	0.05	BDL	BDL	BDL
Ethalfluralin	0.05	0.15	0.05	0.10
Methyl Parathion	0.05	BDL	BDL	BDL
Metribuzin	0.05	BDL	BDL	BDL
Propachlor	0.05	0.05	BDL	0.06
Simazine	0.05	BDL	BDL	BDL
Tri-allate	0.05	BDL	BDL	BDL
Alachlor	0.05	BDL	BDL	BDL
Cyanazine	0.05	BDL	BDL	BDL
Di-Methoate	0.05	BDL	BDL	BDL
Metolachlor	0.05	BDL	BDL	BDL
Pendimethalin	0.05	BDL	BDL	BDL
Propazine	0.05	BDL	BDL	BDL
Terbufos	0.05	BDL	BDL	BDL
Trifluralin	0.05	0.15	0.12	0.12
Phorate	0.05	BDL	BDL	BDL
Fonofas	0.05	BDL	BDL	BDL
Prometon	0.05	BDL	BDL	BDL
Linuron	0.05	BDL	BDL	BDL
Butylate	0.03	BDL	BDL	BDL
EPTC	0.03	BDL	BDL	BDL

BDL - Below detection limits.

VIII. EPA ANALYSIS OF CENEX WASTE POND AND AROUND THE PERIMETER OF THE WASTE POND

In 1993, EPA came to the Cenex waste pond site with a backhoe and obtained samples under the superfund program. The complete results of analysis of these samples must be obtained from John Sainsbury, EPA, Seattle, Phone (206) 553-0125, Fax (206)553-0175.

The following table reports the preliminary analysis results submitted to WSDA by John Sainsbury. Only those compounds which were positively found in the sample will be reported. There are five replications for each sample. EPA has not submitted a diagram of their sampling procedures.

Compound	Sample No.	Ug/Kg
Disulfoton (Disyston)	176	6,790
Disulfoton (Disyston)	177	146,000
Disulfoton (Disyston)	178	4,670
Disulfoton (Disyston)	179	3,370
Disulfoton (Disyston)	180	0.0
Diuron	176	295
Diuron	177	0.0
Diuron	178	764
Diuron	179	753
Diuron	180	565
Eptam (EPTC)	176	45,700
Eptam (EPTC)	177	3,470
Eptam (EPTC)	178	406,000
Eptam (EPTC)	179	98,400
Eptam (EPTC)	180	565
Cycloate	176	790
Cycloate	177	0.0
Cycloate	178	0.0
Cycloate	179	0.0
Cycloate	180	0.0
Trifluralin (Treflan)	176	158,000

Trifluralin (Treflan)	177	57,700
Trifluralin (Treflan	178	295,000
Trifluralin (Treflan)	179	349,000
Trifluralin (Treflan)	180	980
Atrazine	176	5,250
Atrazine	177	694
Atrazine	178	21,300
Atrazine	179	38,600
Atrazine	180	0.0
Vernolate (Surpass)	176	42,200
Vernolate (Surpass)	177	2,890
Vernolate (Surpass)	178	112,000
Vernolate (Surpass)	179	78,300
Vernolate (Surpass)	180	347
Triallate (Fargo)	176	2,670
Triallate (Fargo)	177	1,570
Triallate (Fargo)	178	7,080
Triallate (Fargo)	179	8,650
Triallate (Fargo)	180	0.0
Chlorpyrifos	176	19,600
Chlorpyrifos	177	1,310
Chlorpyrifos	178	19,200
Chlorpyrifos	179	4,750
Chlorpyrifos	180	0.0
Tolban (Profluralin)	176	3,510
Tolban (Profluralin)	177	19,700
Tolban (Profluralin)	178	192,000
Tolban (Profluralin)	179	92,000
Tolban (Profluralin)	180	0.0
Pendimethalin (Prowl)	176	14,000

Pendimethalin (Prowl)	177	8,680
Pendimethalin (Prowl)	178	20,500
Pendimethalin (Prowl)	179	24,800
Pentimethalin (Prowl)	180	0.0
Hexazinone (Velpar)	176	1,160
Hexazinone (Velpar)	177	1,020
Hexazinone (Velpar)	178	1,770
Hexazinone (Velpar)	179	2,140
Hexazinone (Velpar)	180	5,330
Ethalfluralin (Sonalan)	176	373,000
Ethalfluralin (Sonalan)	177	120,000
Ethalfluralin (Sonalan)	178	1,530,000
Ethalfluralin (Sonalan)	179	917,000
Ethalfluralin (Sonalan)	180	0.0

A computer check of the above pesticides showed that Eptam, Cycloate, Triallate (Fargo), Tolban (Profluralin), Hexazinone (Velpar), and Ethalfluralin (Sonalan) are not EPA registered to use on corn nor do they have a residue tolerance established by EPA on corn.

IX. ANALYSIS OF SOIL FROM DENNIS DEYOUNG-100 ACRE CIRCLE BY CASCADE ANALYTICAL, INC.

The samples were submitted by Full Circle, P.O. Box 608, Quincy, WA 98848.

1. Sample received by Cascade Analytical on March 2, 1990 analyzed for Atrazine - none was detected. This was sampled prior to Cenex Full Circle applying contents of waste pond onto Dennis DeYoung's 100-acre circle.

2. Sample received by Cascade Analytical, Inc., on November 5, 1990. This is after waste pond deposited on Dennis DeYoung's 100-acre circle.

Chemical	Results	MDL
Simazine	ND	0.02
Atrazine	0.120 ppm	0.02
Sonalan	0.065 ppm	0.01
Treflan	0.091 ppm	0.01
Mocap	ND	0.05

X. FERTILITY ANALYSIS OF DENNIS DEYOUNG 100-ACRE CIRCLE PRIOR TO AND AFTER DUMPING WASTE POND CONTENTS BY CENEX

Test	Measurement	3/2/90 Results	3/22/90 Results
Nitrate Nitrogen	ppm lbs/ac	9 36	24 96
Ammonium Nitrogen	lbs/ac	21	180
Phosphorous	ppm	13	27
Potassium	ppm	290	360
Sulfur	ppm	7	31
Boron	ppm	0.3	0.8
Zinc	ppm	1.4	2.6
Calcium	meg/100g	9.1	8.9
Magnesium	meg/100g	1.7	1.6
Sodium	meg/100g	0.2	0.2
Effervescence	--	Low	Low
pH	--	7.9	7.9
Organic matter	%	1.4	1.3
Soluble Salts	m.mhos/Cm	0.8	1.3
Estimated nitrogen released from organic matter	measure-ment not given	57	55
Sum of tested nitrogen	lbs/ac	114	331
Total Bases (Ca + mg + K + Na)	meg/100g	11.7	11.6

XI. FERTILITY ANALYSIS OF DENNIS DEYOUNG 100-ACRE CIRCLE BY CASCADE ANALYTICAL, INC., ON SOIL SAMPLE RECEIVED 7/20/92

Test	Results	Units	Relative Levels	Optimum Range
Kjeldahl Total Nitrogen	812	mg/l	--	--
Boron	0.93	ppm	optimum	0.5-1.0
Soil soluble salts	1.1	mmho/cm	above optimum	< 1.0
Potassium Soil Bicarb	348	ppm	above optimum	120-200
Calcium	6.99	meg/100g	optimum	3-20
Magnesium	2.19	meg/100g	optimum	0.75-4
Sulfate-S	46	ppm	Excess	6-20
Cation Exchange Capacity	10.3	meg/100g	--	--
Sodium Exchangeable	0.24	meg/100g	--	--
pH	5.6	--	Defi-cient	6-7
Lime requirement	3.1	Tons/ac	Above optimum	0
Nitrate Nitrogen	52.6	ppm	Excess	5-15
Organic matter	1.2	%	Optimum	0.8-2
Zinc	2.8	ppm	Optimum	1-10
Iron	46.4	ppm	Excess	5-30
Copper	2.3	ppm	Above optimum	0.2-2
Manganese	23.7	ppm	Excess	2-10
Phosphorus Bicarbonate	50.0	ppm	Excess	8-20

XII. CENEX FULL CIRCLE WASTE POND

Knutson Construction (Chris W. Knutson), P.O. Box 596, Quincy, WA 98848, Phone (509) 787-4907, on February 10, 1986, gave a job estimate to Cenex Full Circle, Quincy, to construct a holding pond. The dimensions of the pond were 54 feet x 36 feet with 5 feet high wall. Apparently there was a ramp constructed into the

pond. There is no mention of the ramp dimensions. Chris Knutson estimated the ramp would have been 16 feet long at the base and 12 feet wide and 5 feet high. This would give the pond a total holding capacity of approximately 69,300 gallons.

This pond was constructed in 1986 by Knutson Construction. Chris W. Knutson stated that the pond was filled to within six inches of the top the same year that Knutson constructed it. He stated he observed an aeration system constructed in the pond that sprayed the pond contents into the air to aid evaporation.

XIII. INVESTIGATOR OBSERVATIONS OF DENNIS DEYOUNG 100-ACRE CIRCLE WHERE CENEX SPREAD CONTENTS OF WASTE POND IN 1990. (BLK. 73, UNIT 271)

May 14, 1992, was the first time I observed this circle. On this date I took soil samples and one foliage sample. On May 22, 1992, I returned to the circle and took pictures and a soil sample from 2 feet to 2-1/2 feet deep in the northwest corner of the circle which was devoid of plant growth.

This field was not being farmed at this time. The only plant growth was numerous species of weeds. On May 22, 1992, there were numerous areas in the field devoid of plant growth. The largest area in any one spot devoid of plant growth was approximately 70 feet long. It ranged in width from 6 to 12 feet. The moisture in the soil was more than adequate for seed germination and plant growth. Some weeds were growing apparently normal, while others were chlorotic to necrotic and were misshapen and stunted. Some of the weeds which appeared abnormal were China lettuce, kochia, Russian thistle, lambsquarter, and buckwheat. In some spots the plant growth was wilting due to dry soil.

The China lettuce weeds had completely dead lower leaves. The upper leaves were turning a reddish color with necrotic areas on the leaf. The Kochia weeds varied from area to area in the field, but they were generally stunted with chlorotic and necrotic leaves. The Russian thistle weeds generally were stunted and misshapen and ranged from chlorotic plants to completely dead black foliage. The lambsquarter weeds were generally misshapen and chlorotic. The buckwheat weeds had brown dead lower leaves, while the upper leaves were reddish in color.

The Russian thistle and kochia weeds growing in the field road on the east side of the circle were normal-appearing plants. The roots of plants in the circle were examined. The roots were stubby and lacked normal root hair formation. These symptoms are typical of the dinitroaniline herbicides. Trifluralin and Ethalfluralin belong to the dinitroaniline class of herbicides.

XIV. TESTIMONY

John Grotle

He stated he worked for Cenex in Quincy for four years part time. One of his duties during this time was mixing and loading of equipment used to spread fertilizers and pesticides. Mr. Grotle stated the machines were washed off and the rinsate went into the pond. He also stated that any left-over chemical from the spray jobs was dumped into the pond. John Grotle stated that there were 30 gallons of left-over spray from when Cenex bought the business from Western Farmers that he personally dumped into the pond. He stated the labels were missing so he didn't know what products were in the containers.

XV. SUMMARY

1. On May 14, 1992, Dennis DeYoung filed an official complaint with the WSDA that Cenex Full Circle of Quincy allegedly applied illegal waste pesticides to land he farmed since 1986.

2. In 1986 Cenex Full Circle had a concrete pond constructed in Quincy on Burlington Northern Railroad property. This pond was built to catch rinsate from pesticide and fertilizer equipment after applications.

3. In 1990 Cenex Full Circle emptied the contents of the pond onto a 100-acre circle in Block 73, Unit 271 belonging to Dennis DeYoung.

4. Cenex Full Circle did not keep application records as required by law (WAC 16-228-190) of this application. They reported to Steve George they applied 300 gallons per acre of the pond contents to the 100-acre circle. This would be a total of 30,000 gallons.

5. The pond was constructed by Knutson Construction of Quincy. It had the dimension of 54' x 36' x 5' with a ramp going down into the pond. The size of the ramp was estimated to be 5 feet high x 12 feet wide x 16 feet long. This would give a total pond capacity of approximately 69,300 gallons.

6. Cenex Full Circle submitted a sample from the pond to Harris Environmental Technologies, Inc., in Lincoln, Nebraska. Ron Kopezynski of Cenex Full Circle in Quincy received the results of analysis on January 11, 1990, prior to the contents being applied to Dennis DeYoung's circle.

7. Harris Labs found the pesticides Atrazine, Cyanazine, Diallate, Metribuzin, and Trifluralin in the sample; they

also found the fertilizer elements nitrogen, phosphorus, potassium, boron, calcium, cobalt, copper, iron, manganese, magnesium, sodium, and zinc in the sample.

8. MVTL Laboratories, Inc., analyzed soil from Dennis DeYoung's 100-acre circle, which was submitted by David Yonge, PhD, in 1992. They found the pesticides Atrazine, Chlorpyrifos, Ethalfluralin, Propachlor, and Trifluralin in the soil sample.

9. WSDA Chemical lab analyzed soil samples obtained from the 100-acre circle in 1992 by Calvin E. Briggs. The lab found Trifluralin, Ethalfluralin, and Chlorpyrifos in the sample.

10. EPA chemical lab analyzed soil samples obtained by EPA from the waste pond area in Quincy in 1993. They found the pesticides Disulfoton, Diuron, Eptam, Cycloate, Trifluralin, Atrazine, Vernolate, Triallate, Chlorpyrifos, Tolban, Pendimethalin, Hexazinone, and Ethalfluralin in the soil samples.

    Eptam, Cycloate, Triallate, Tolban, Hexazinone, and Ethalfluralin are not EPA registered to use on corn and a residue tolerance on corn has not been established by EPA.

11. Cenex Full Circle in 1990 had soil analyzed form Dennis DeYoung's 100-acre circle after the pond contents were applied to the field. Cascade analytical, Inc., did the analysis. They found Atrazine, Ethalfluralin, and Trifluraline in the sample.

12. John Grotle testified that besides rinsate from the exterior of the chemical spreaders, that left-over chemicals in the spreader rigs were also dumped into the pond, and he personally dumped 30 gallons of old chemical left over from Western Farmers into the pond.

13. The nitrate and ammonium nitrogen in the 100-acre circle increased considerably after the waste pond was applied, the phosphorous, potassium, sulfur, boron, and zinc also increased in amount after the application.

14. The soluble salts increased after the waste pond application.

15. In 1992 the pH of the circle was measured at 5.6. In 1990 the pH of the circle was measured at 7.9.

16. In 1992, when I began my investigation, there were numerous bare areas in the circle devoid of plant growth.

17. Several species of weeds had symptoms typical of the dinitroaniline class of herbicides. Trifluralin and Ethalfluralin belong to this class and were chemically detected in soil samples obtained from the circle.

18. Trifluralin was found in a sample obtained from the Cenex waste pond prior to pond contents being applied to the circle. Ethalfluralin was not analyzed for in the sample.

XVI. CONCLUSION

The contents of the Cenex waste pond applied to Dennis DeYoung's 100-acre circle had deleterious effects on plant growth. According to Steve George's report, the corn grown in 1990 was abnormal and low-yielding. The sudan grass grown in 1991 was also abnormal. In 1992 there was not a crop grown, but various volunteer weeds in the field exhibited typical dinitroanniline herbicide symptoms. There were many areas in the circle in 1992 devoid of plant growth.

The EPA analysis of the contents of the waste pond in 1993 uncovered numerous pesticides that were not registered on corn and there was not a residue tolerance established for them on corn. This information will be forwarded to EPA as additional evidence for possible regulatory action on case 157Y-91.

There was not any conclusive evidence found that Cenex routinely applied contents of the pond to farmland in the Quincy area.

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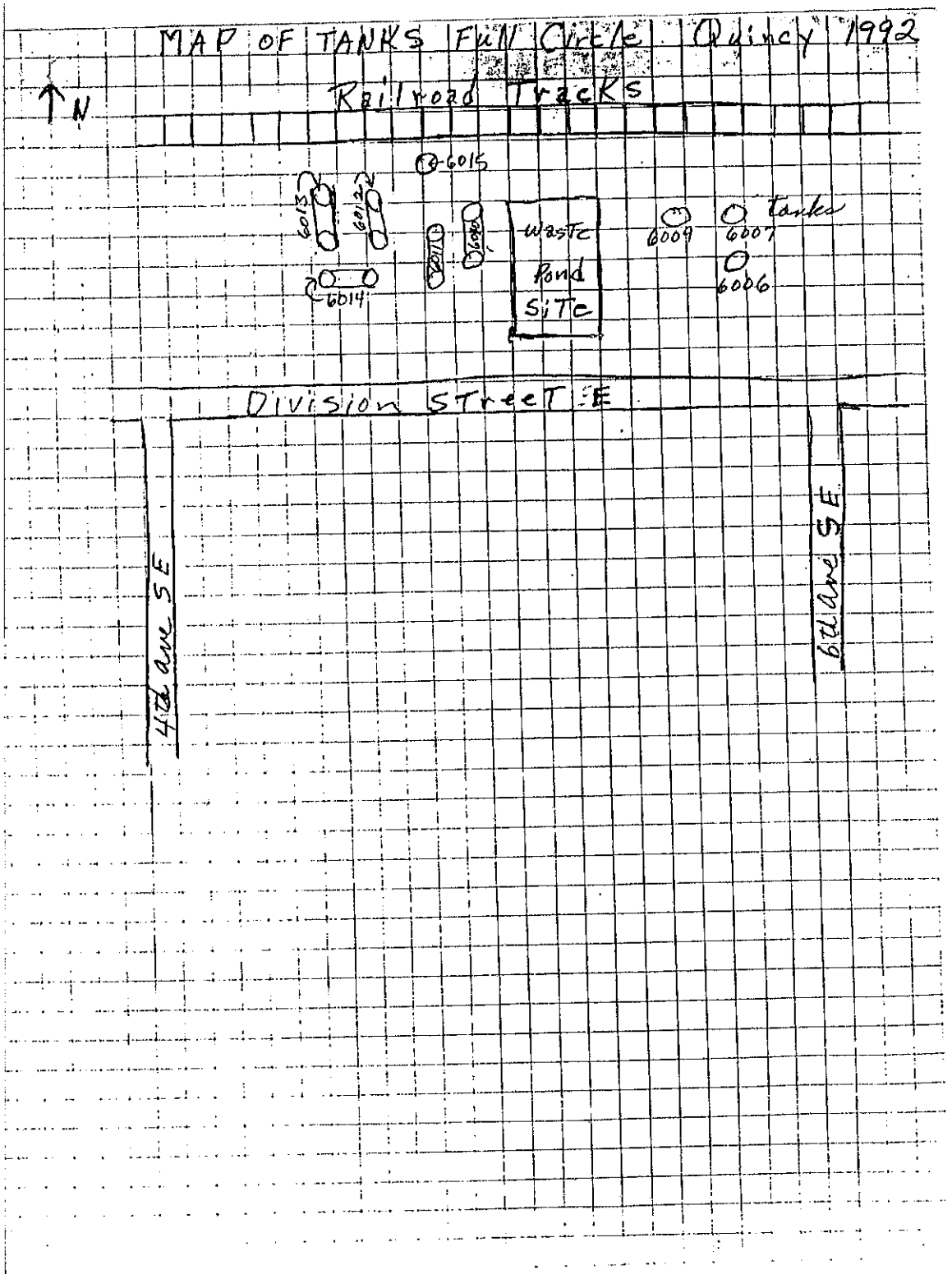
MAP OF TANKS Full Circle Quincy 1992
N
Railroad Tracks
6015
6013
6012
6008
6010
6014
Waste Pond Site
6009
6007
Tanks
6006
Division Street E
41st ave SE
61st ave SE