

TO

Jim Hoscit

Superior

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DNR-SUPERIOR

JAMIS

Dec (1997) EPA Sed Assess of Hot Spot Assessment
 Areas in the Delta/Superior Harbor 1994

Table 3-6. Description of Field Results for City of Superior WWTP Embayment (STP 1-8, STP 10, STP 12)

Site Number	Water Depth (m)	# Cores per Benthos Rep.	# Cores for		Vibrocore Length (m)	Sections Collected (#)	Depth (cm)	Description
			Toxicity	Chemistry				
STP 1 <i>end of boat slip</i>	7.01	2	22	4	0.82	1 2 3	0-15 15-30 30-45	Floccy orange mat (3 cm) atop loose sandy clay; tox./chem samples had slight oil sheen Loose dark brown clay with detritus Dark brown clay/sand, slight oil sheen
STP 2 <i>wildcat boat slip</i>	4.02	2	NA	7	0.25	1 2	0-15 10-25	Dark brown clay/sand (10 cm) over more gray/black clay/sand Sand with a bit of clay, strong sulfide odor and oil
STP 3	3.60	2 (A) 3 (B&C)	15	6	0.60	1 2 3	0-10 15-30 30-45	Sandy grit atop clay/sand with some detritus, slight oil sheen Fine brown sand with some detritus Fine brown sand (5 cm) over coarse red sand
STP 4	2.44	2	13	6	0.96	1 2 3	0-15 15-30 30-45	Oxidized granular layer (5 cm) over soft, gray-brown clayey sand Soft, uniform brown clay, little detritus Stiffer, uniform brown clay
STP 5	3.17	2	NA	4	NA	1	0-15	Oxidized Fe layer (1 cm) over soft brown clay/silt
STP 6	2.13	2	13	3	0.38	1 2 3	0-15 7-23 23-38	Oxidized Fe layer atop soft silt/clay with detritus Large wood chunks over soft silt/clay Stiffer brown clay
STP 7	2.31	2	12	4	0.23	1 2	0-15 5-23	Thin oxidized Fe layer over red clay (7 cm) over brown clay, slight oil sheen Loose brown clay with wood chunks and oil sheen over sand
STP 8	3.20	2	NA	4	0.30	1 2 3	0-15 0-15(VC) 15-30	Thin oxidized Fe layer over silt/clay over brown clay Loose brown clay with oil sheen Brown soft clay with oil sheen, red sand at bottom 2 cm

NA= Not Applicable

Table 3-6. Continued

Site Number	Water Depth (m)	# Cores per Benthos Rep.	# Cores for		Vibrocore Length (m)	Sections Collected (#)	Depth (cm)	Description
			Toxicity	Chemistry				
STP 10	2.74	3	NA	10	NA	1	0-10	Coarse reddish sand with some clay
STP 12	4.36	3	NA	5	0.91	1	0-10	Soft, loose brown clay with oil sheen and detritus
						2	15-30	Soft brown clay with heavy oil and detritus
						3	30-46	Black/brown silty sand
						4	76-91	Black, fibrous silt over brown clay, oily smell

NA= Not Applicable

Table 3-17. Continued

Site Code	Core Depth (cm)	Mercury Conc. (mg/kg) (dry wt.)
KMB 1	0-8	0.039
KMB 2	0-12	0.062
KMB 3	0-15	0.280
KMB 4	0-15	0.180
KMB 5	0-15	0.220
MLH 1	0-12	0.240
MLH 2	0-20	0.044
MLH 3	0-15	0.710
MLH 4	0-20	0.500
MLH 5	0-17	0.460
MLH 6	0-21	0.030
MLH 7	0-17	0.320
MLH 8	0-15.5	0.230
MLH 9	0-20	0.450
MLH 10	0-20	0.170
MLH 1	25-40	0.038
MLH 2	80-95	0.160
MLH 3	37-52	0.360
MLH 4	30-50	0.015
MLH 5	32-47	0.020
MLH 6	25-40	0.009
MLH 7	72-87	0.011
MLH 8	60-76	<LOD
MLH 9	52-79	0.035
MLH 10	75-95	0.260
MNS 1	0-10	0.490
MNS 2	0-12	0.490
MNS 3	0-15	0.360
MNS 4	0-15	0.330
MNS 4	0-15(VC)	0.260
MNS 5	0-10	0.200
MNS 5	5-20 (VC)	0.090
MNS 1	9-24	0.300
MNS 2	15-30	0.340
MNS 3	15-30	0.380
MNS 4	15-30	0.270
MNS 5	20-35	0.075

Site Code	Core Depth (cm)	Mercury Conc. (mg/kg) (dry wt.)
MNS 1	24-39	0.300
MNS 2	95-125	1.500
MNS 3	30-45	0.580
MNS 4	30-45	0.150
MNS 5	35-50	0.075
MNS 1	39-54	0.380
MNS 2	145-160	1.200
MNS 3	45-60	0.680
STP 1	0-15	0.220
STP 2	0-15	0.890
STP 3	0-10	0.870
STP 4	0-15	0.230
STP 5	0-15	1.000
STP 6	0-15	0.320
STP 7	0-15	0.570
STP 8	0-15	1.300
STP 10	0-10	0.530
STP 12	0-10	0.310
STP 1	15-30	0.470
STP 2	10-25	1.700
STP 3	15-30	0.440
STP 4	15-30	0.160
STP 6	7-23	0.270
STP 7	5-23	0.680
STP 8	15-30	1.200
STP 12	15-30	0.990
STP 1	30-45	0.460
STP 3	30-45	0.220
STP 4	30-45	0.320
STP 6	23-38	0.410
STP 12	30-46	0.820
STP 12	76-91	1.800
SUS 1	0-15	0.280
SUS 2	0-15	0.190
SUS 3	0-15	0.240
SUS 4	0-15	0.320
SUS 5	0-15	0.220

<LOD Mercury level below Limit of Detection

Bold values exceed the OMOEE LEL value of 0.2 mg/kg mercury.

Table 3-20. Continued

Site Code	Core Depth (cm)	PAHs (µg/kg dry wt.)																
		Acene	Aceny	Anth	Bena	Benap	Benb	Beng	Benk	Chry	Diben	Fluo	Flut	Indp	Naph	Phen	Pym	Total
MNS																		
1-C	24-39	790	190	2,000	6,800	4,600	8,100	790	2,100	7,900	530	960	17,000	2,400	420	10,000	13,000	78,000
2-C	95-125	1,300	350	2,600	10,000	7,200	11,000	1,800	2,300	10,000	740	1,800	23,000	3,500	690	16,000	20,000	110,000
3-C	30-45	980	240	2,000	8,300	5,400	9,500	780	2,800	8,500	640	1,400	20,000	3,100	520	13,000	14,000	91,000
4-C	15-30	7,600	570	13,000	22,000	17,000	21,000	4,700	8,800	22,000	1,600	9,300	65,000	7,700	5,400	75,000	44,000	320,000
5-C	20-35	55	49	120	450	380	520	96	190	490	46	54	1,200	210	23	640	1,200	5,700
STP																		
12-D	0-10	74	<26	110	460	430	540	170	230	530	80	110	860	250	90	650	700	5,300
12-C	15-30	220	120	220	650	480	710	94	280	700	99	410	1,200	260	110	2,600	1,100	9,200
12-D	30-46	59	39	140	510	530	670	210	210	630	96	120	880	270	150	500	800	5,800
12-D	76-91	83	82	360	1,300	1,300	1,900	360	450	1,300	220	230	2,600	670	240	1,200	2,200	14,000
SUS																		
1-D	0-15	82	40	170	610	610	890	410	300	740	120	110	1,300	370	120	780	1,100	7,800
2-C	0-15	110	45	240	830	870	1,200	540	390	950	160	160	2,100	480	170	1,000	1,700	11,000
3-C	0-15	1,700	87	2,800	3,600	3,300	4,100	1,200	1,600	3,400	540	2,600	9,100	1,500	530	10,000	7,200	53,000
4-C	0-15	230	100	430	1,400	1,600	2,100	1,000	800	1,700	270	320	3,500	850	240	2,200	3,000	20,000
5-C	0-15	110	31	260	740	780	980	460	310	790	140	140	1,700	420	110	1,000	1,400	9,400
6-C	0-15	190	<53	720	1,800	2,100	2,200	960	750	1,900	290	190	4,500	860	63	2,500	4,900	24,000
7-D	0-5	56	21	150	440	430	560	260	190	480	79	91	870	220	89	620	750	5,300
Lowest Effect Level		NA	NA	220	320	370	NA	170	240	340	60	190	750	200	NA	560	490	4,000

Bold values exceed OMOEE LEL values.

NA = Not applicable.

C = Results merged from two separate sample runs.

D = Analysis at a secondary dilution factor.

Full name of PAH codes at end of Table.

Superior
WWTP
SITE

Table 3-21. Continued

Superior
WWTP
SITE

Site Code	Core Depth (cm)	Normalized PAHs (µg/kg oc dry wt.)																
		Acene	Aceny	Anth	Bena	Benap	Benb	Beng	Benk	Chry	Diben	Fluo	Flut	Indp	Naph	Phen	Pym	Total
STP																		
12-D	0-15	1,800	320	2,700	11,000	10,000	13,000	4,100	5,600	13,000	2,000	2,700	21,000	6,100	2,200	16,000	17,000	130,000
12-C	15-30	4,700	2,600	4,700	14,000	10,000	15,000	2,000	6,000	15,000	2,100	8,700	26,000	5,500	2,300	55,000	23,000	200,000
12-D	30-46	1,600	1,000	3,800	14,000	14,000	18,000	5,700	5,700	17,000	2,600	3,200	24,000	7,300	4,000	14,000	22,000	160,000
12-D	76-91	1,300	1,300	5,600	20,000	20,000	30,000	5,600	7,000	20,000	3,400	3,600	41,000	10,000	3,800	19,000	34,000	220,000
SUS																		
1-D	0-15	1,700	850	3,600	13,000	13,000	19,000	8,700	6,400	16,000	2,600	2,300	28,000	7,900	2,600	16,000	23,000	160,000
2-C	0-15	3,100	1,300	6,800	24,000	25,000	34,000	15,000	11,000	27,000	4,600	4,600	60,000	14,000	4,800	28,000	48,000	310,000
3-C	0-15	35,000	1,800	57,000	73,000	67,000	84,000	24,000	33,000	69,000	11,000	53,000	180,000	31,000	11,000	200,000	150,000	1,100,000
4-C	0-15	5,300	2,300	10,000	32,000	37,000	49,000	23,000	19,000	40,000	6,300	7,400	81,000	20,000	5,600	51,000	70,000	460,000
5-C	0-15	4,800	1,300	11,000	32,000	34,000	43,000	20,000	13,000	34,000	6,100	6,100	74,000	18,000	4,800	43,000	61,000	410,000
6-C	0-15	10,000	1,400	38,000	95,000	110,000	120,000	50,000	39,000	100,000	15,000	10,000	240,000	45,000	3,300	130,000	260,000	1,300,000
7-D	0-5	2,100	780	5,600	16,000	16,000	21,000	9,600	7,000	18,000	2,900	3,400	32,000	8,100	3,300	23,000	28,000	200,000
1-C	30-45	2,400	870	3,300	6,700	6,400	9,300	3,200	2,700	9,300	870	3,500	17,000	2,900	1,900	17,000	14,000	100,000
2-C	30-45	2,000	320	2,800	8,900	10,000	13,000	3,700	4,400	12,000	1,200	2,400	20,000	3,800	2,300	15,000	20,000	120,000
3-C	30-45	2,200	1,800	5,600	14,000	15,000	21,000	6,700	6,900	17,000	2,000	3,600	33,000	6,700	2,800	25,000	27,000	190,000
4-C	30-45	4,600	4,900	10,000	32,000	35,000	42,000	16,000	14,000	32,000	4,200	5,800	70,000	15,000	4,400	37,000	63,000	400,000
5-D	24-38	3,500	1,100	7,800	22,000	24,000	35,000	12,000	12,000	26,000	3,100	6,100	54,000	12,000	5,800	44,000	46,000	310,000
6-D	30-45	12,000	3,000	21,000	50,000	43,000	64,000	27,000	27,000	54,000	3,000	18,000	130,000	22,000	29,000	140,000	110,000	750,000
7-D	30-45	4,400	2,100	7,100	17,000	18,000	23,000	8,600	8,600	17,000	2,200	4,900	41,000	7,900	4,300	31,000	37,000	240,000
OMOEE SEL		NA	NA	370,000	1,480,000	1,440,000	NA	320,000	1,340,000	460,000	130,000	160,000	1,020,000	320,000	NA	950,000	850,000	10,000,000

NA = Not applicable

C = Results merged from two separate sample runs.

D = Analysis at a secondary dilution factor.

Full name of PAH codes at end of Table.

Table 3-22. Total PCB Results for Selected Sites

Site Code	Core Depth (cm)	Replicate Type	Total PCBs (ng/g) (dry wt.)	Mean PCB Conc. (ng/g) (dry wt.)	Standard Deviation	% Organic Carbon	Total PCBs (ng/g OC) (dry wt.)
KMB 1	0-8		16.2			2.2	738
KMB 2	0-12		19.9			1.7	1170
KMB 3	0-15		64.9			3.1	2090
KMB 4	0-15		44.7			2.2	2030
KMB 5	0-15		60.1	63.5	4.80	2.8	2270
KMB 5	0-15	AR	66.9			2.8	2390
MNS 1	0-10		259			4	6480
MNS 2	0-12		313			4.8	6520
MNS 3	0-15		270			3.2	8440
MNS 4	0-15		405			3.5	11600
MNS 4	0-15(VC)		148			2.6	5690
MNS 5	0-10		90.5			2.4	3770
MNS 5	0-10	AR	99.4	95.0	6.29	2.4	3960
MNS 5	5-20 (VC)		55.4			1.6	3460
MNS 1	9-24		119			3.4	3500
MNS 2	15-30		195			3.8	5130
MNS 3	15-30		581			4.6	12600
MNS 4	15-30		64.4			1.9	3390
MNS 4	15-30	AR	115	89.7	35.8	1.9	4720
MNS 5	20-35		58.1			0.67	8670
MNS 1	24-39		259			4.2	6170
MNS 2	95-125		75.0			6.7	1120
MNS 3	30-45		250			4	6250
MNS 4	30-45		87.6			2.2	3980
MNS 5	35-50		107			2.9	3690
MNS 1	39-54		496			4.0	12400
MNS 2	145-160		50.9			4.6	1110
MNS 3	45-60		113			4.1	5140
STP 1	0-15		78.6			3.0	2620
STP 2	0-15		74.5			3.4	2190
STP 3	0-10		109			3.4	3210
STP 4	0-15		58.9			3.6	1640
STP 5	0-15		155			4.1	3780

Bold values exceed the OMOEE LEL value of 70 ng/g PCBs

AR = Analytical Replicate

Table 3-22. Continued

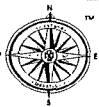
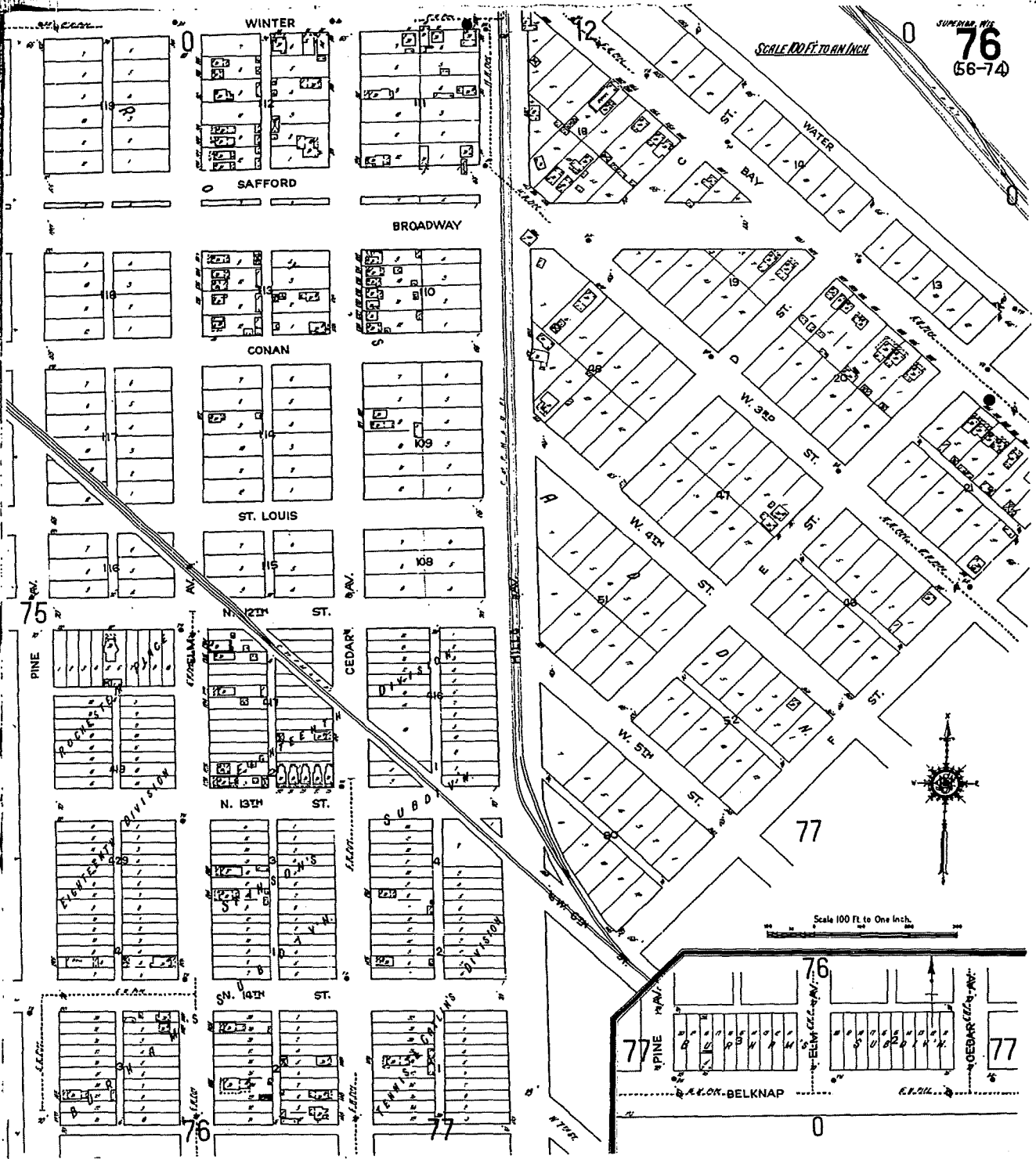
Site Code	Core Depth (cm)	Replicate Type	Total PCBs (ng/g) (dry wt.)	Mean PCB Conc. (ng/g) (dry wt.)	Standard Deviation	% Organic Carbon	Total PCBs (ng/g OC) (dry wt.)
STP 6	0-15		69.6			3.4	2050
STP 6	0-15	AR	64.7	67.2	3.46	3.4	1980
STP 7	0-15		109			3.2	3410
STP 8	0-15		140			5	2800
STP 10	0-10		121			3.4	3560
STP 12	0-10		116			4.1	2830
STP 1	15-30		139			4	3480
STP 2	10-25		213			4.5	4730
STP 3	15-30		35.6			3.9	913
STP 4	15-30		48.1			3.4	1420
STP 6	7-23		62.6			3.2	1960
STP 7	5-23		99.7			3.2	3120
STP 7	5-23	AR	101	100.4	0.919	3.2	3140
STP 8	15-30		88.1			5	1760
STP 8	15-30	AR	86.3	87.2	1.27	5	1740
STP 12	15-30		549			4.7	11700
STP 1	30-45		145			2.3	6300
STP 3	30-45		21.1			1.8	1170
STP 4	30-45		69.2			4.6	1500
STP 6	23-38		81.5			3.6	2260
STP 12	30-46		353			3.7	9540
STP 12	76-91		30.4			6.4	475
SUS 1	0-15		220			4.7	4681
SUS 1	0-15	AR	190	205	21.2	4.7	4040
SUS 2	0-15		121			3.5	3460
SUS 3	0-15		326			4.9	6650
SUS 4	0-15		132			4.3	3070
SUS 5	0-15		134			2.3	5830
SUS 6	0-15		95.0			1.9	5000
SUS 7	0-5		102			2.7	3780

Bold values exceed the OMOEE LEL value of 70 ng/g PCBs

AR = Analytical Replicate

SUPERIOR, WIS.
76
(56-74)

SCALE 100 FT. TO AN INCH

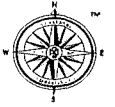
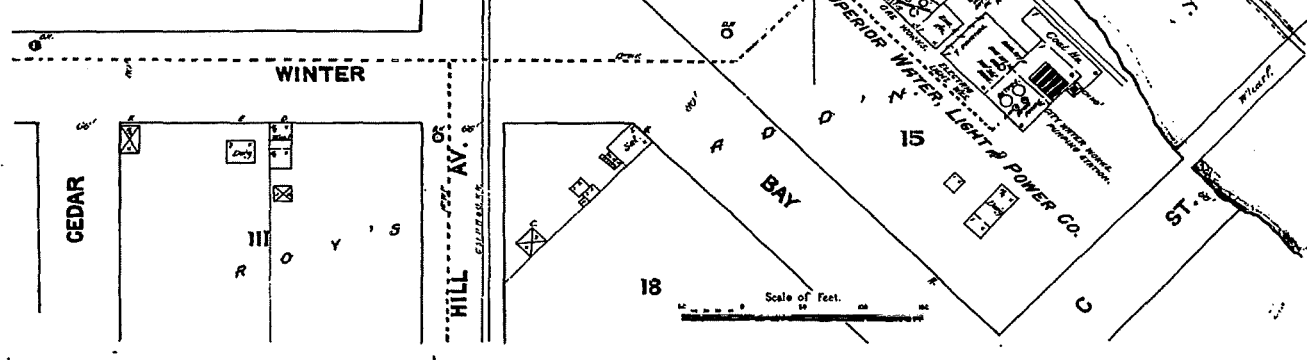
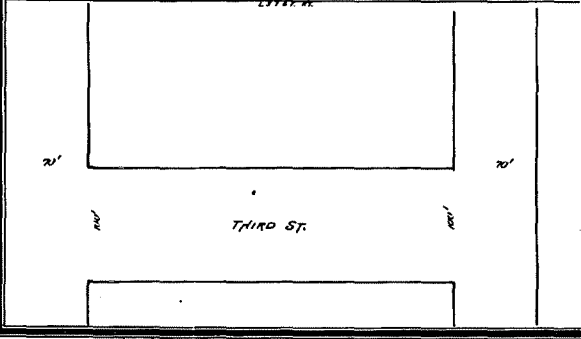
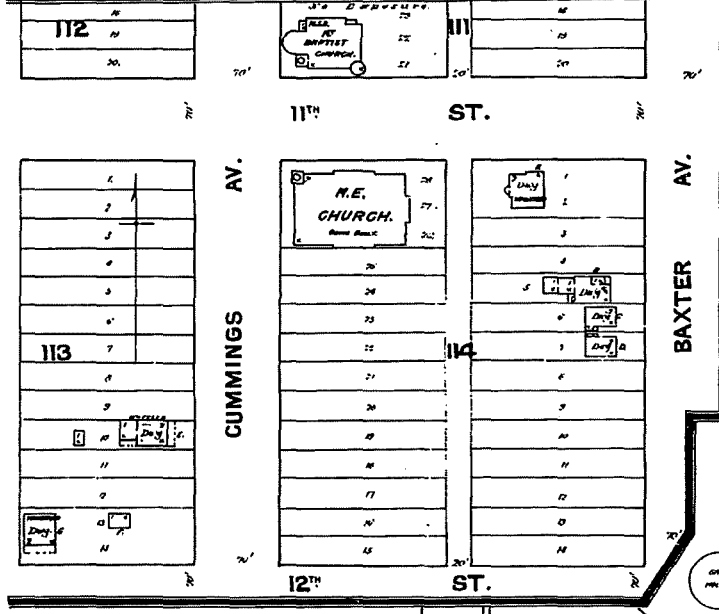
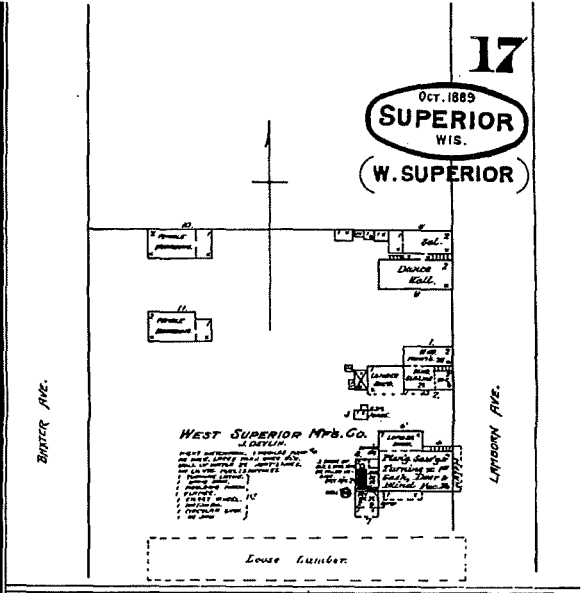
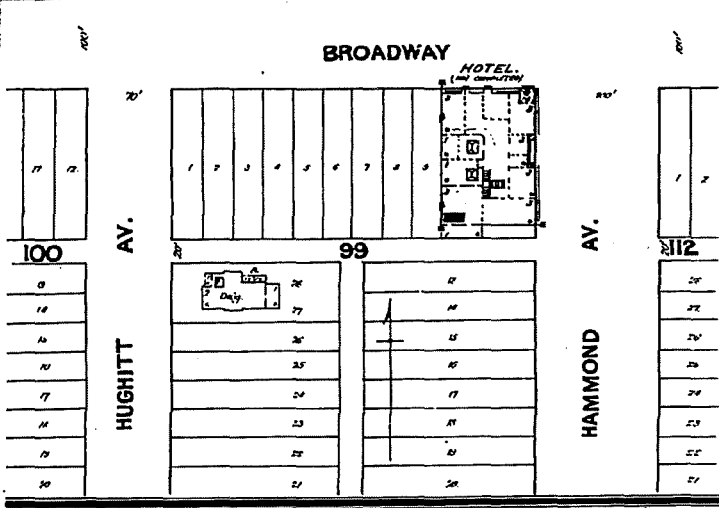


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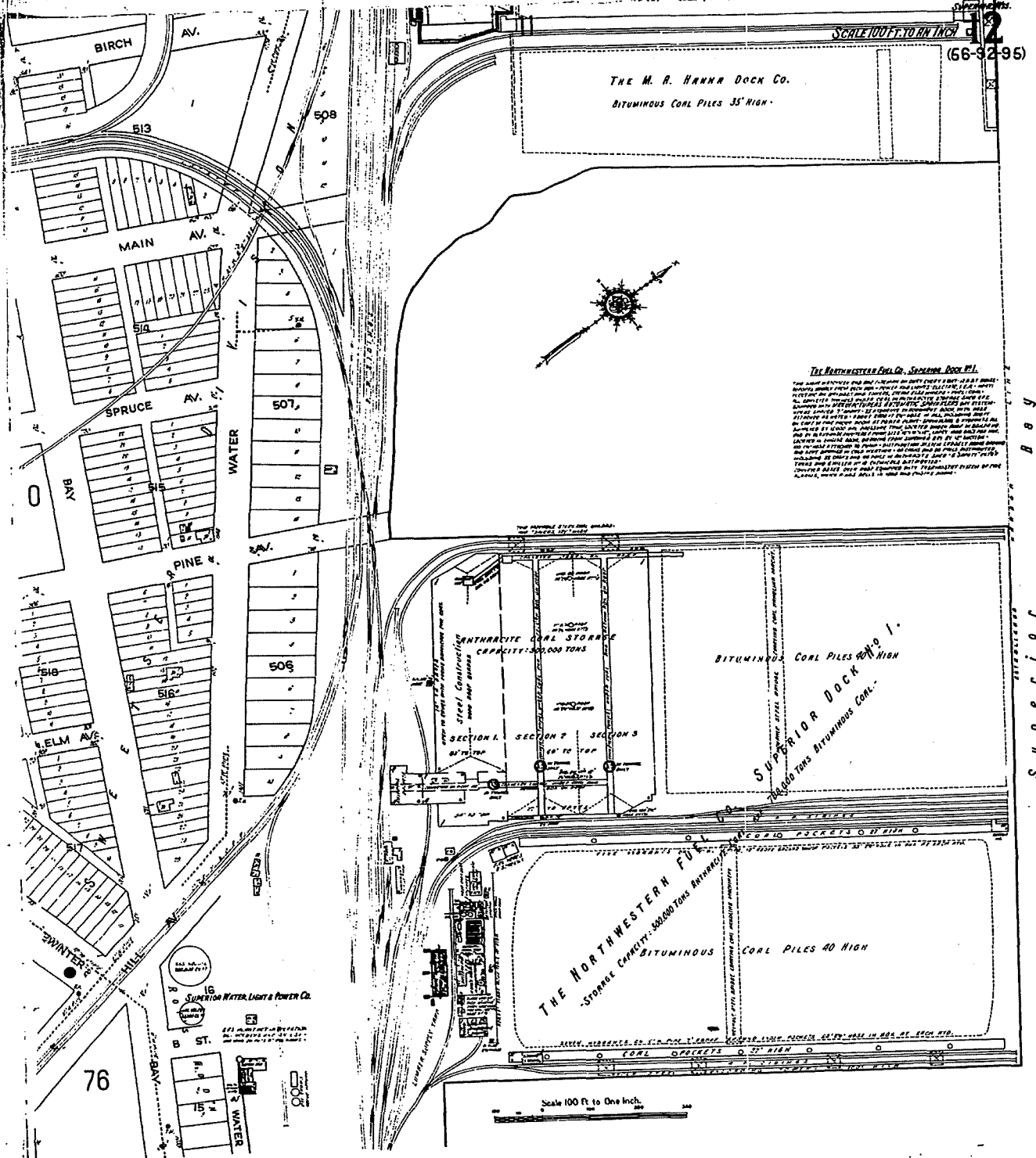


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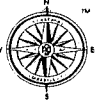
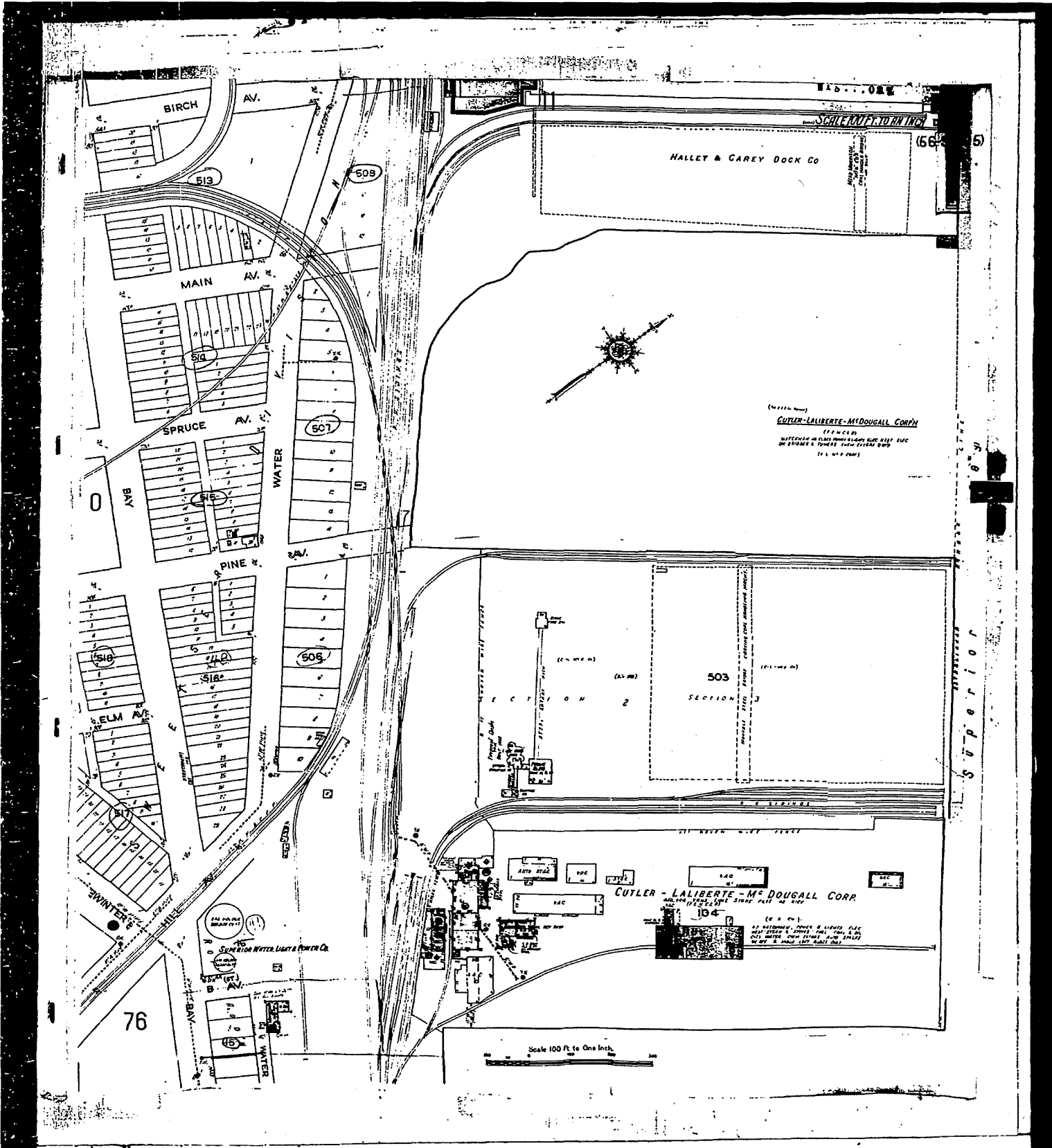


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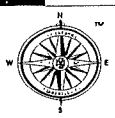
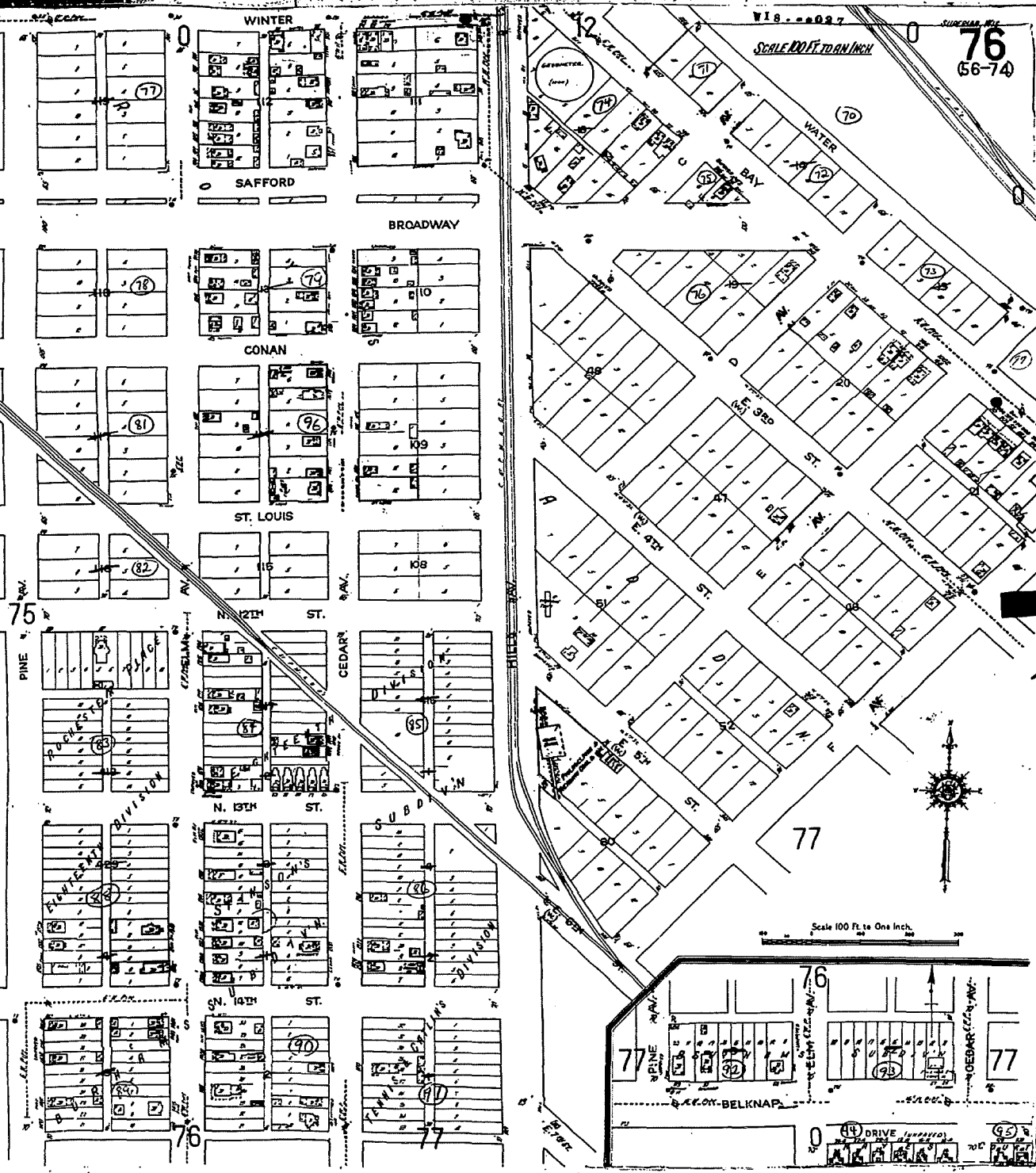


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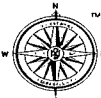
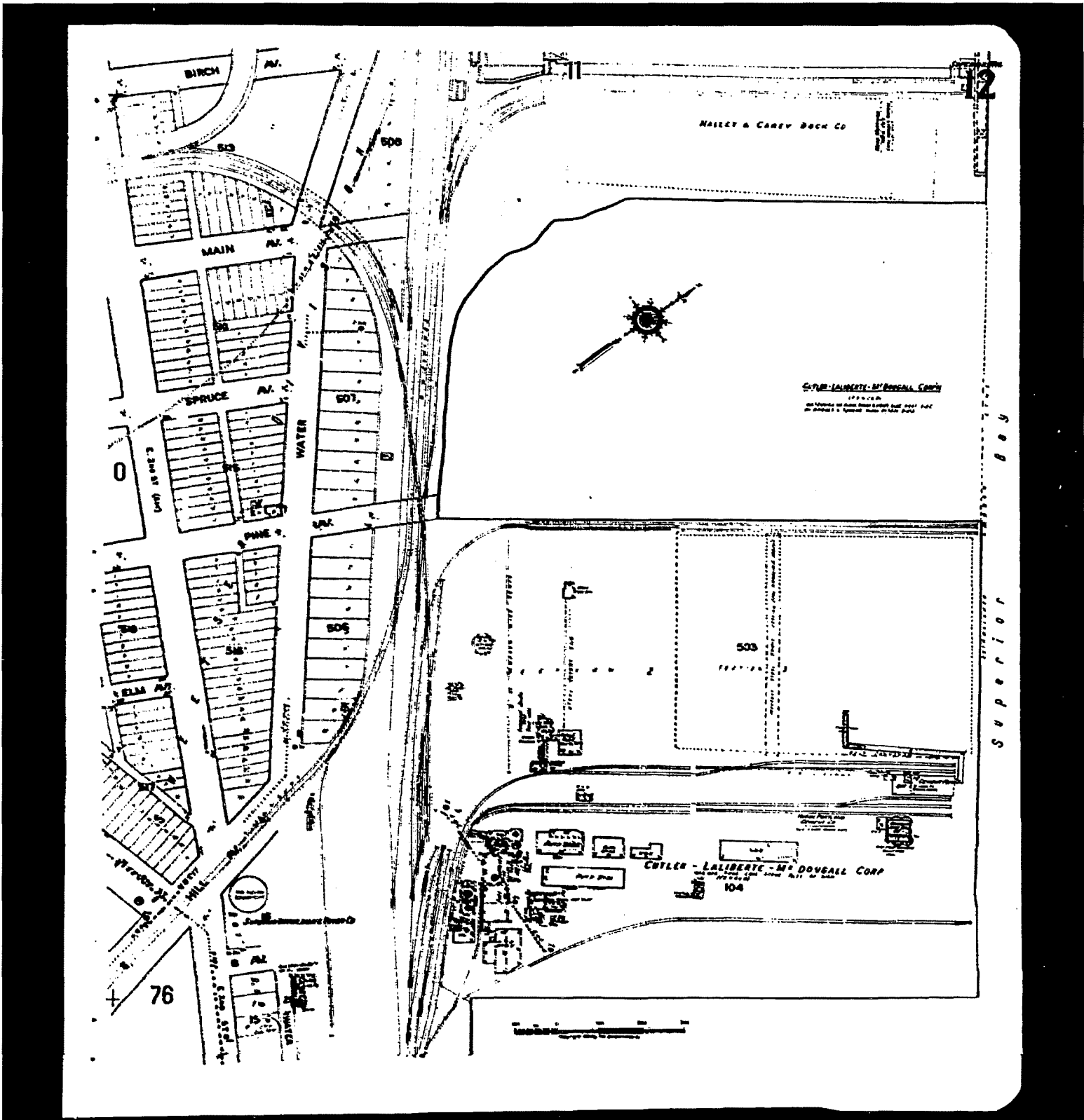


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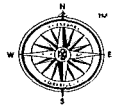
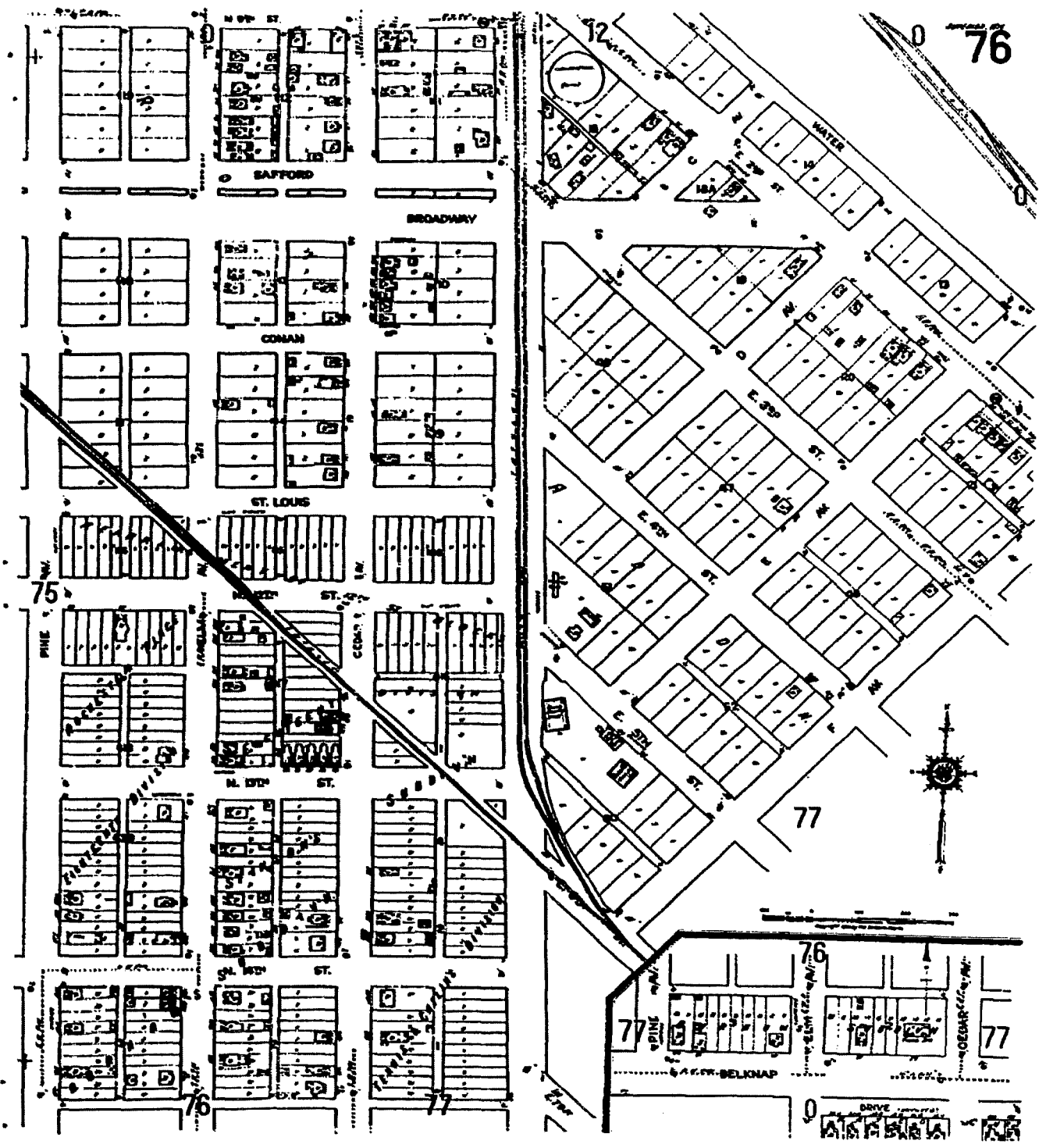


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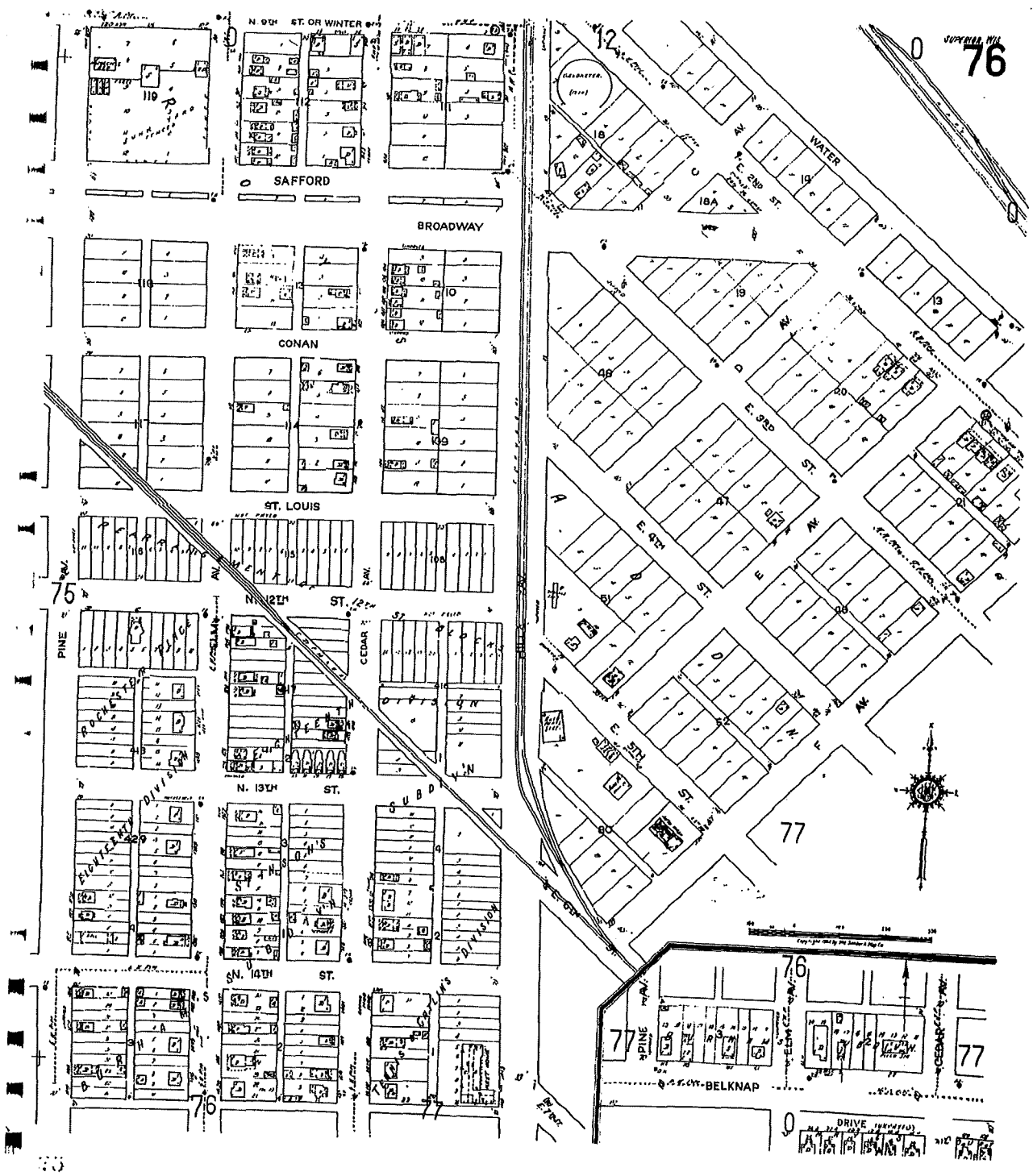


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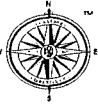
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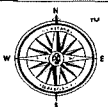
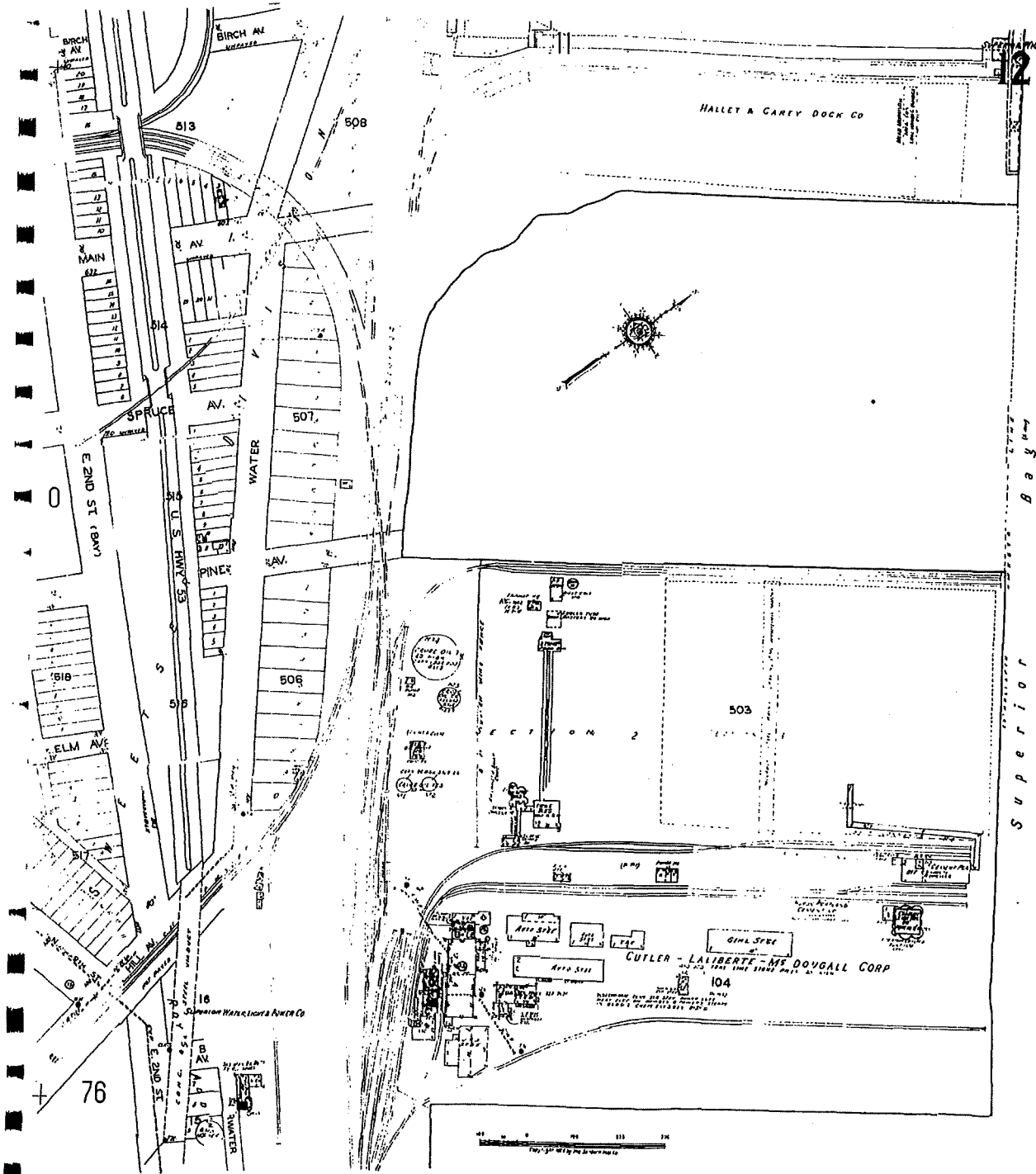


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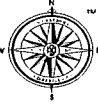
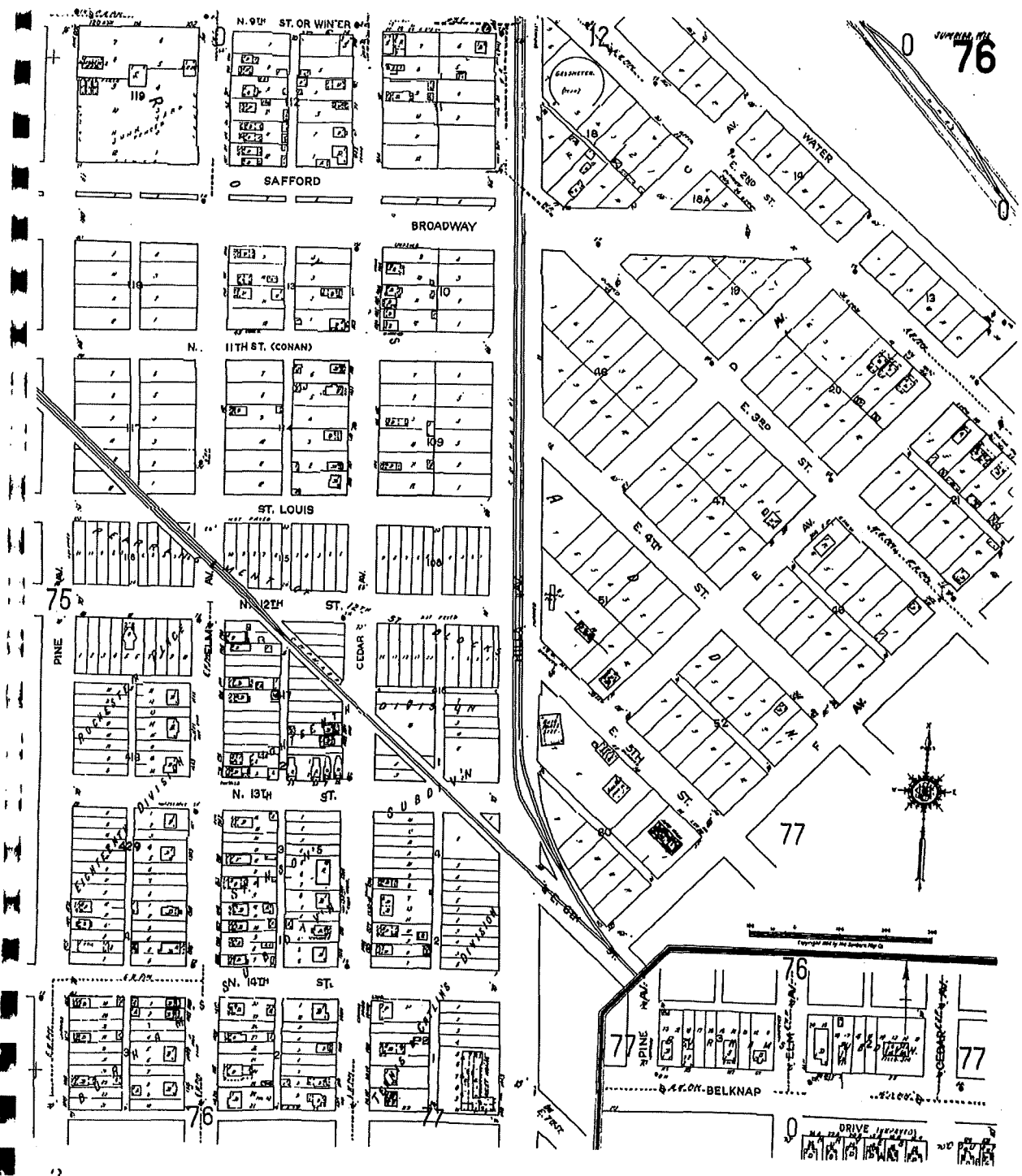


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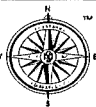
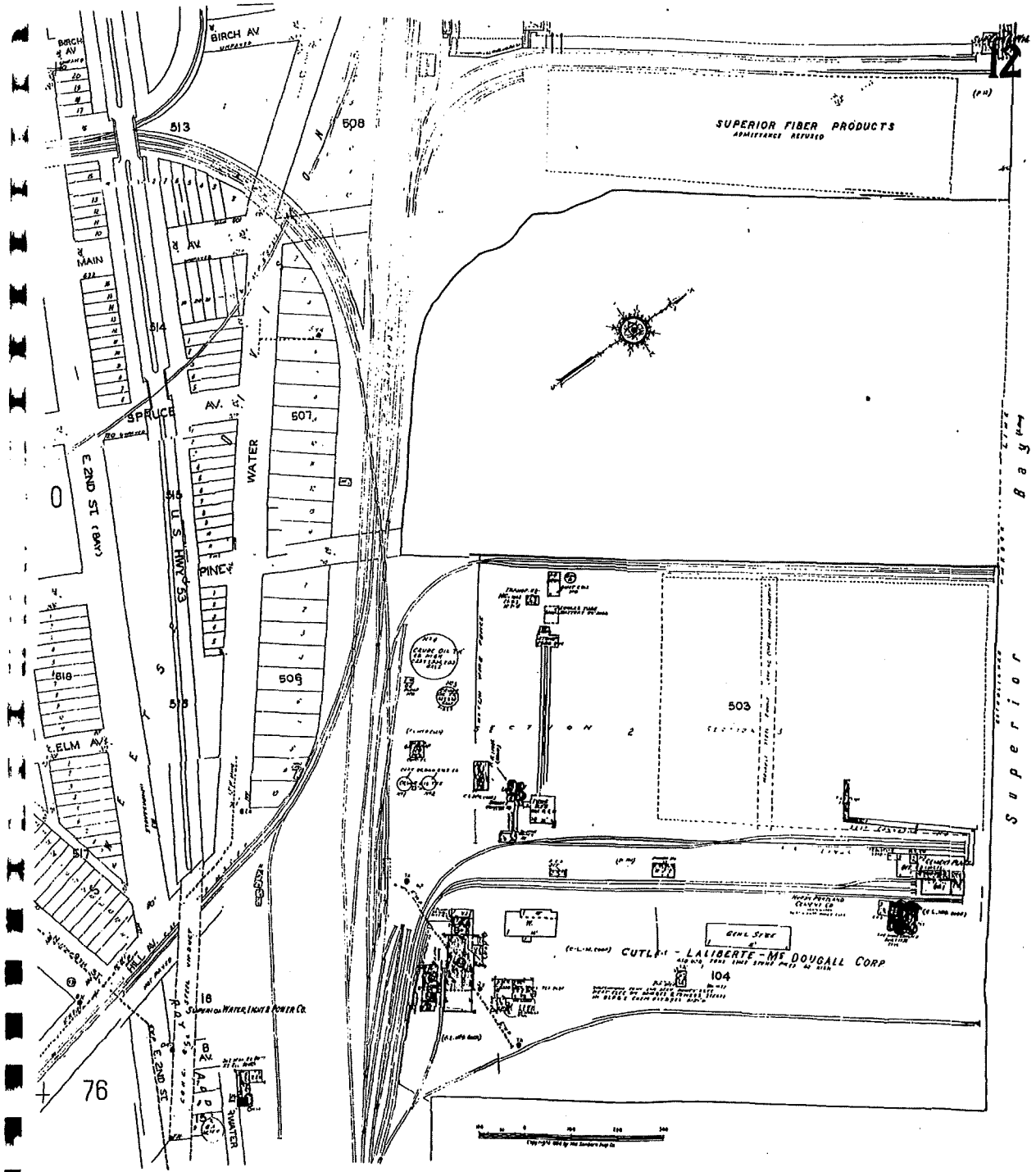


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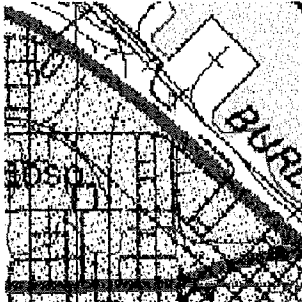
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USGS Topo Map
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