"	34F-16 39F-16	do.	Sluice	"	200 mm	2	do.
thru	45-5-36F-16 38F-16	do.	"	"	250 mm	3	do.
None		do.	"	"	100 mm	1	do.
"		Pipe	Dia: 400 mm			1,150 M	Sea water under ground
"		do.	" 300 mm			800 M	do.
"		do.	" 100 mm			100 M	do.
thru	45-5-32-1V 3V	Atomos Valve	Size: 6"			3	for Storage Tank
"	" 18V 20V	do.	do.			3	do.
"	" 27V 29V	do.	do.			3	do.
45-32-108V		do.	do.			1	do.
"	109V	do.	do.			1	do.
"	120V	do.	do.			1	do.
"	121V	do.	do.			1	do.
"	61V	do.	do.			1	do.
"	62V	do.	do.			1	do.
"	85V	do.	do.			1	do.
"	86V	do.	do.			1	do.

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 77 5013

Inventory No.	Name of Machinery	Brief Specification	Quantity	Remarks
45-32-156V	Atomos Valve	Size: 6"	1	for Storage Tank
" 157V	do.	" "	1	do.
" 164V	do.	" "	1	do.
" 165V	do.	" "	11	do.
" 178V	do.	" "	1	do.
" 179V	do.	" "	1	do.
" 184V	do.	" "	1	do.
" 185V	do.	" "	1	do.
" 204V	do.	" "	1	do.
" 205V	do.	" "	1	do.
" 200V	do.	" "	1	do.
" 201V	do.	" "	1	do.
thru 45-32-37	Winches	Manual Operation	4	Attached to Tank
" " 40				
" " 55 56	do.	" "	2	do.
" " 59 60	do.	" "	2	do.
" " 62 63	do.	" "	2	do.
45-32-42	do.	" "	1	do.
" 45	do.	" "	1	do.
" 50	do.	" "	1	do.
thru 45-32-66 71	Lightning Arresters	Height: 16 M	6	

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 77 5013

2017	do.			1	do.
thru 45-32-37	Winches	Manual Operation		4	Attached to Tank
" " 40					
" " 55 56	do.	"	"	2	do.
" " 59 60	do.	"	"	2	do.
" " 62 63	do.	"	"	2	do.
45-32-42	do.	"	"	1	do.
" 45	do.	"	"	1	do.
" 50	do.	"	"	1	do.
thru 45-32-66 71	Lightning Arresters	Height:	16 M	6	
45-32-72 74 75	do.	"	50 M	3	
None	Pipe	Diameter:	27 mm	4,370 M	above ground
"	"	"	42 mm	70 M	do.
"	"	"	60 mm	1,555 M	do.
"	"	"	34 mm	1,995 M	do.
"	"	"	"	400 M	Under ground
"	"	"	48 mm	145 M	do.
"	Valve	Stop	75 mm	1	
thru 45-5-70F-15 71F-15	"	Foot	300 mm	2	

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 77 5013

Inventory No.	Name of Machinery	Brief Specification	Quantity	Remarks
45-5-72F-15	Valve	Sluice 300 mm	1	
" 73F-15 74F-15	do.	" 200 mm	2	
None.	Air Pipe	Dia. 255 mm	2	
45-5-478	Turbine Pump	Bore: 50 mm, Head: 65 m Cap: 150 L/Min 10 stage	1	Ethyl Blend
" 58(2)	do.	Bore: 150 mm, Head: 60 m Cap: 2.2 m^3/min 2 stage	1	do.
" 460	Motor	Induction: 40 HP 3 phase 220 V 4 poles	1	do.
None	(Resistance Bulb)	25 Ohm	12	for Laboratory use
"	do.	50 Ohm	12	
45-5-278	C.F.R. Engine	(Engine) Cylinder Inside Dia 2.85 mm Cylinder Cap. 615 cc Stroke 115 mm (Meter Board) 1-Reducing Valve 1-D.C. Voltmeter 1-Lubricant Oil pressure Gauge 1-Thermometer 1-Ammeter 1-Knock Meter (A.C. Generator) Synchromous Induction, 3 phase 4 HP 1,200 R.P.M. 60 cycle, 220-444V 10-20 AMP (D.C. Generator) Closed 0.22 KW, 110V. D.C.	1 set	with Meter Board A.C. Generator and D.C. Generator make a Complete Set.

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 77 5013

45-5-278	C.F.R. Engine	(Engine) Cylinder Inside Dia 2.85 mm Cylinder Cap. 615 cc Stroke 115 mm (Meter Board) 1-Reducing Valve 1-D.C. Voltmeter 1-Lubricant Oil pressure Gauge 1-Thermometer 1-Ammeter 1-Knock Meter (A.C. Generator) Synchromous Induction, 3 phase 4 HP 1,200 R.P.M. 60 cycle, 220-444V 10-20 AMP (D.C. Generator) Closed 0.22 KW, 110V. D.C. 1,800 R.P.M. V Belt Driven	1 set	with Meter Board A.C. Generator and D.C. Generator make a Complete Set.
45-5-279	do.	do.	1 set	do.
" 280	do.	do.	1 set	do.

Total 598 Items

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 77 5013

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775013

APPLICATION FOR CONVERSION OF DESIGNATED REPARATION PLANT

31, March, 1950.

45-5 Sec. II

TO : Minister of Finance Hayato Ikeda

From : President of Nippo Kagaku Kogyo K.K. Hachiro Kugimiya

Address : 18, 2-chome, Marunouchi, Chiyoda-ku, Tokyo.

I Name of Plant & Code No : Iwakuni E4-Army Fuel Depot (45-5)

II Location of Plant : 550, Shozoku, Iwakuni-shi, Yamaguchi-ken.

III Category : Chemical Plant

IV Production :

Present : None

Planned : Urea 6,000 t/mon

Ethylene Dichloride	30 t/mon
Ethylene glycol	100 t/mon
Glycerin	200 t/mon
Iso-Octyl Alcohol	100 t/mon

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775013

V Necessity of Conversion

The object of our company's plant is to manufacture large quantities of urea iso-octyl alcohol, glycerin, ethylene glycol, ethylene dichloride, etc. from cracked gas, coal and coke. These products at present are scarce and very expensive in our country, and they will play a very important part in agriculture and production of industrial products for export as well as in the manufacturing of plasticizers.

A supply of large quantities of these products at low cost will contribute much to the economic rehabilitation of Japan.

The above plant previously was an oil refinery and is adjacent to another oil refinery soon to be cracking petroleum. So the best conversion of this plant should place emphasis on using the by-product cracked gas.

Urea is to be produced by using the high pressure hydrogenation equipment and hydrogen generators of this former army fuel depot.

The other products are to be synthesized from fractionated unsaturated petroleum gases, chlorine, and caustic soda by using the former butanol dehydro polymerization plant, iso-octane plant, etc.

Cracked gas is to be obtained from the adjacent Koa Oil Company and the pitch coke plant and paraffin cracking plant of this depot.

These synthesies belong to the petro chemical industries which are highly developed in the United States. However, in our country, cracked gas chemical industry is still a new development and our pioneering work will no doubt stimulate other manufacturers.

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775013

In our plan to manufacture large quantities of urea and special petroleum derivatives, there is also a plan to introduce capital and techniques from the United States. This plant is very important in the development of our industrial techniques and in line with our national policy.

The merits of this plan can be seen more clearly from the following details:

A. As a fertilizer, urea will open a new field in Japan. It does not require sulfuric acid as does ammonium sulphate, it does not contain acids and it has more active ingredient. Furthermore, it is a basis for plastics, medical products, and fodder.

At present, due to poor Japanese technique, too low a reaction proportion is achieved with too much corrosion of equipment. Therefore large-scale production of urea at low cost can not now be done in Japan.

So urea has not been available for general use as a fertilizer in Japan. However, using this plant with the introduction of American technique urea can be produced in large scale at low cost. Japan then can be supplied with low cost fertilizer, that is utilization of this equipment will reduce the cost from ¥ 42,000 to ¥ 33,r00/ton or lower. And urea is equal in nitrogen content to two times as much ammonium sulphite for use as fertilizer.

B. Octyl alcohol is required to make plasticizer needed for vinyl plasties and fibers to be used in production for export.

In Japan, at present, octyl alcohol is produced in small quantity by the expensive butanol fermentation and synthesis process.

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775013

Octyl alcohol can be synthesized easily at low cost by using proper technique and this equipment to produce iso-octane from the butene in by-product cracked gases.

The octyl alcohol produced in this process is of better quality than that made by other processes.

Furthermore, by using this equipment and method it is possible to reduce the production cost to about ¥ 316,000 per ton from the present cost of around ¥600,000.

At present, the production costs of glycerin, ethylene glycol and ethylene dichloride are very high due to the fact that they are made feom fats and alcohol. However, with the use of cracked gas as a raw material, production cost will be only about one half of the present cost.

These cost reductions should contribute appreciably to promotion of export industries using these products.

C. It is very difficult to obtain high pressure equipment suitable for urea production. It would cost pver five billion yen to set up new equipment for synthesis of urea including generating and refining gas. Thus, utilization of this plant to make urea would be most useful.

D. There is a petroleum refining plant adjacent to this former fuel depot, with equipment to produde gasoline by cracking perroleum residues.

So this plant is very well situated for obtaining by product gas from such cracking.

E. The above plan for production includes introduction of capital and most recent techniques from the U.S.A.

If this plan is carried out, it will play an important role in the recovery of our industries in accord with our national policy.

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775013

In conclusion, the equipment of the former Iwakuni Fuel Depot can be utilized to its fullest advantage by our company's plan, and the result of our plan will further advanc the field of fertilizer and petroleum chemistry.

The cost of production will be lowered with the improvement in quality and enterprise rationalization can be fulfilled.

In the future, even direct export can be anticipated, thereby playing an important role in the economic recovery of our country.

Thus, we firmly believe that we can make fullest most valuable usage of the plant by this conversion.

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775013

VI Additional Reparation Items needed for the Above Production :

1. Machinery

Water Gas Plant

Producer Gas Plant

Pith Coke Plant

Methane Cracking Plant

Carbon Monoxide Conversion Plant

Carbon Monoxide Removing Plant

Carbon Dioxide Removing Plant

Liquid Air Manufacturing Plant

Nitrogen Gas Separation Plant

Hydrogen Purification Plant

High Pressure Experiment Plant

Butanol Kehydro-polymerization Plant

No. 2. Iso-octane Plant

Synthetic Lub. Oil Plant

Alcohol Plant

Electric Power Plant

Coal Handling Equipment

Electric Power Substation

Water Feeding Pump Plant

Water Electrolysis Plant

Osygen filling Plant

Miscellaneous Equipment

(Miscellaneous Equipment includes the following equipment considered destroyed: No. 1. Iso-octane plant, Catalyst Plant, Paraffin Cracking Plant, Olefin Polymerization Plant, Contact Rerun Plant, etc.)

2. Building
Total area 10.041 (tsubo)

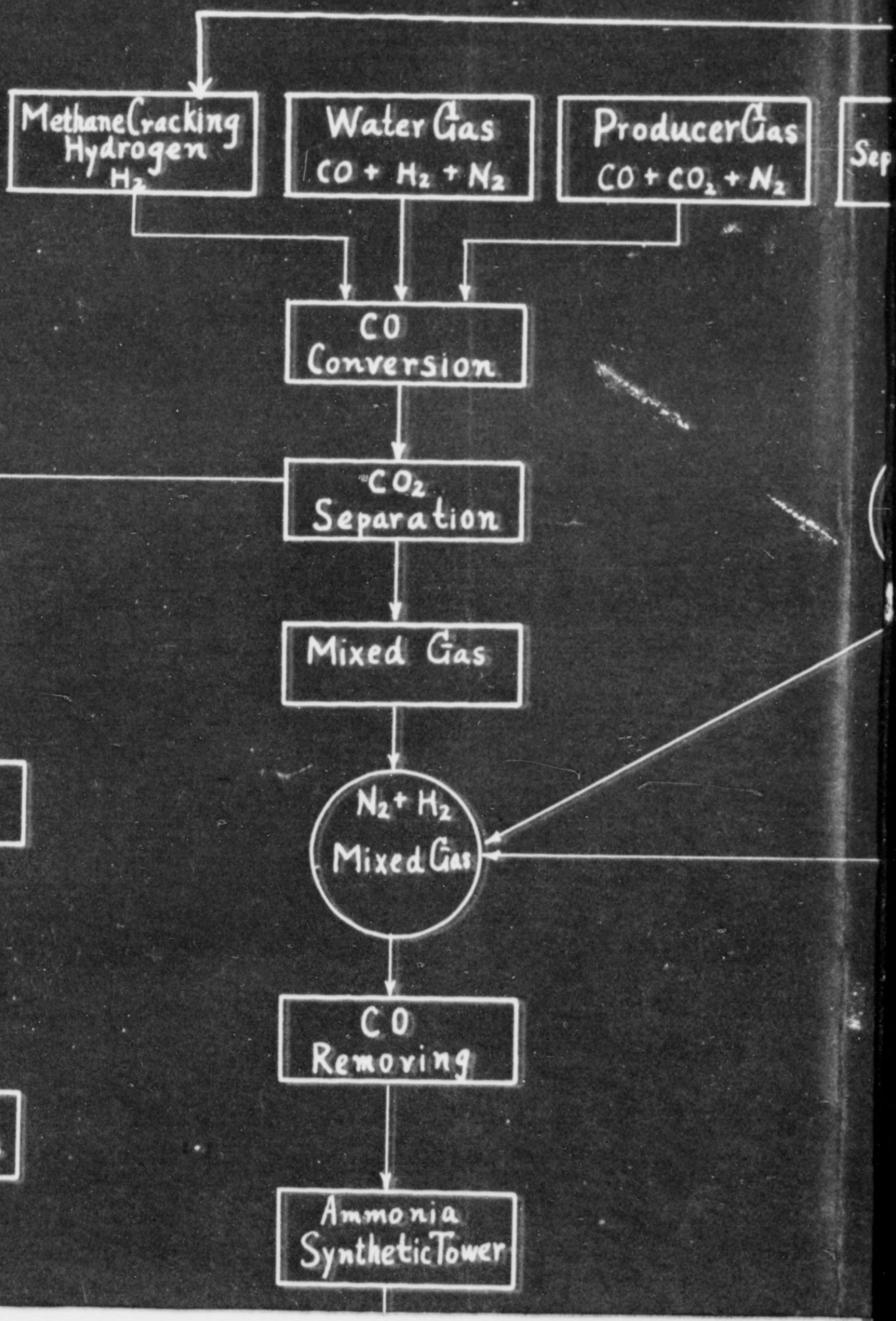
3. Land
Total area 86.200 (tsubo)

President of Nippo Chemical Industry Co.,Lt
H. Kugimiya

Sign K. Kugimiya)

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775013

FLOW SHEET of UF



DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775013

FLOW SHEET of UREA

Gas
+ N_2

Producer Gas
$CO + CO_2 + N_2$

Nitrogen
Separation from-
N_2 -Air

Hydrogen
Electrolyisis of-
H_2 -Water

sion

tion

Gas

H_2
Gas

ng

ia
Tower

N_2
Gas Holder

H_2
Gas Holder

Methane
C_1 Gas

after washing

to Methane
Cracking

catalyst

Isomerization
C=C-C

Butylen
Polimerization

iso-O ne

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775013

DERIVATIVEs of F

Hydrogen Electrolyisis of H_2 Water

H_2 Gas Holder

Methane C_1 Gas

after. washing

to Methane Cracking

catalyst

Isomerization C=C-C

Butylen Polimerization

iso-O[illegible]ne

Stabilizer Gas

Oil Refyning Gas

Gas Holder 600,000 M^3

Compress. Liquify Rectify

Higher Carbon Gas C_4 C_5

Low Carbon C_2 C_3 Gas

Hydrochlorination Reactor

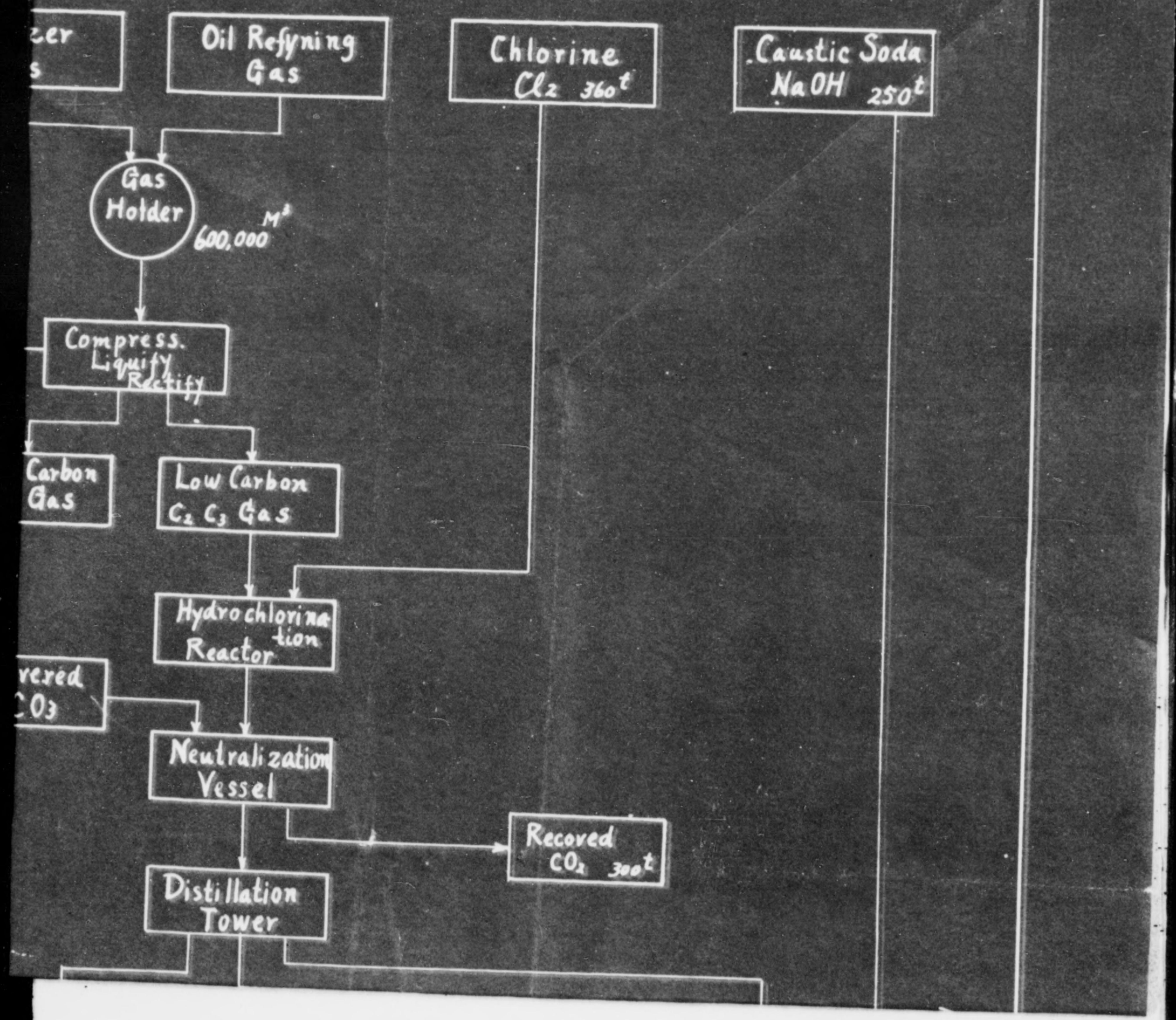
Recovered $CaCO_3$

Neutralization Vessel

Distillation Tower

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775013

RIVATIVEs of PETROLEUM GAS



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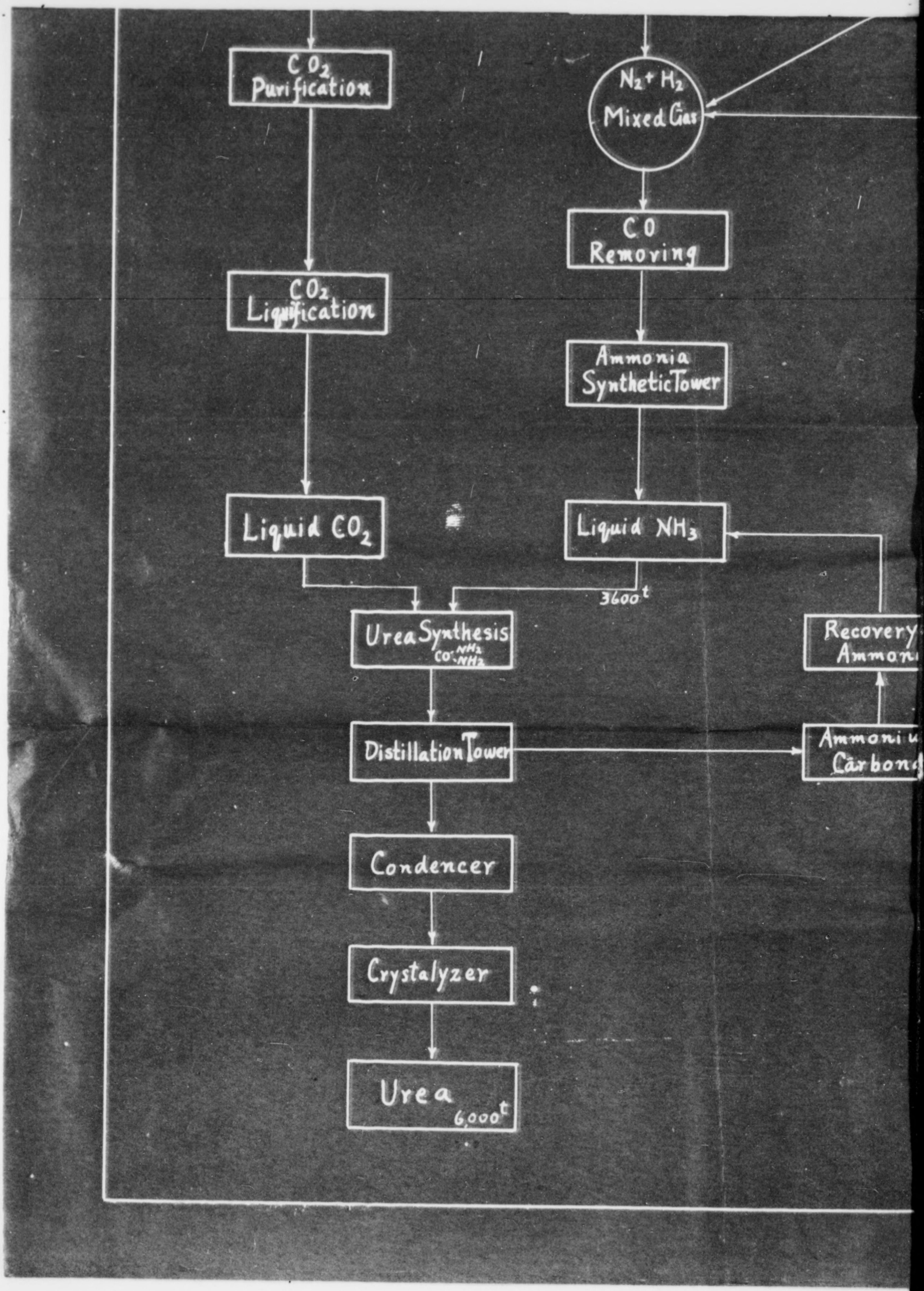

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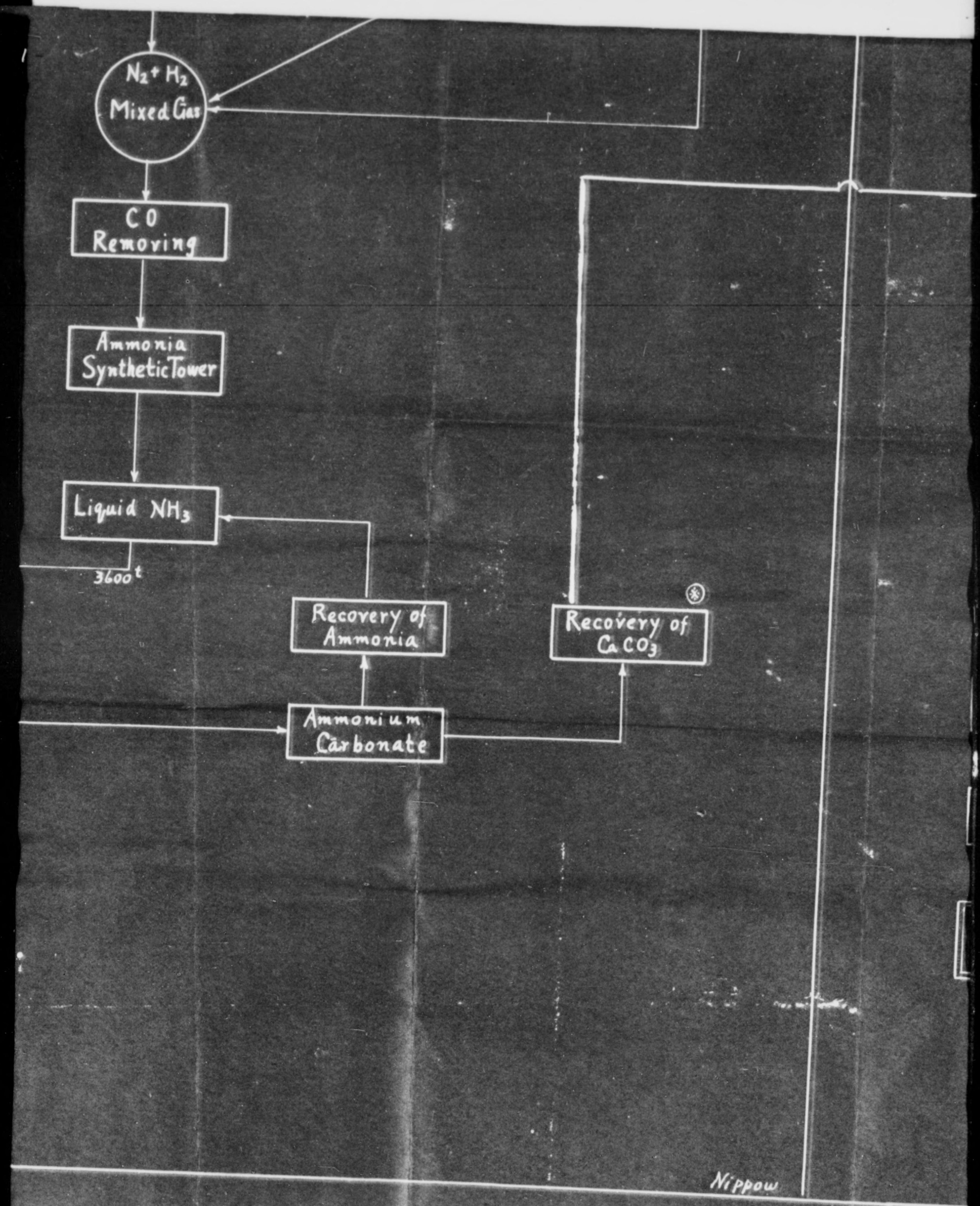

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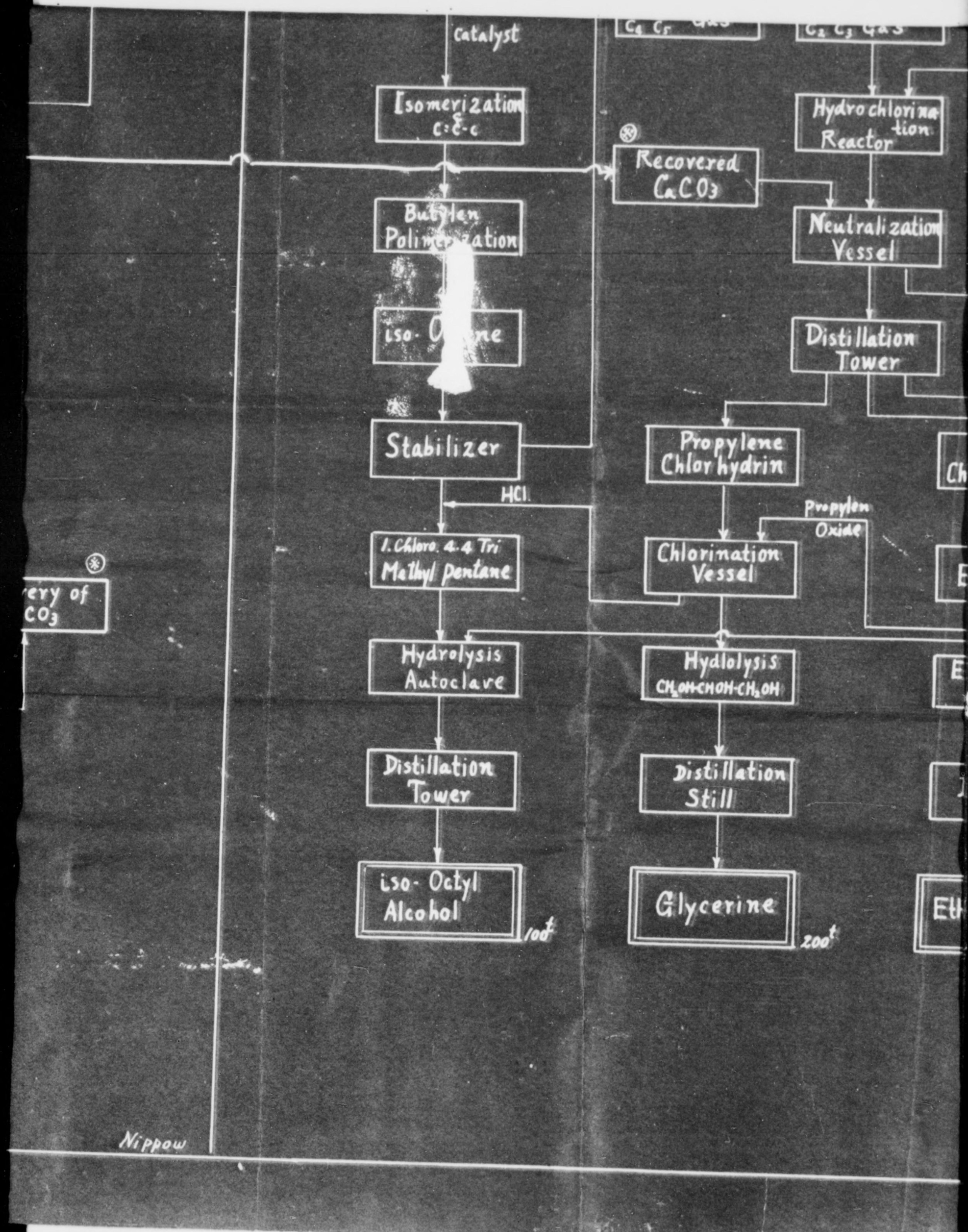

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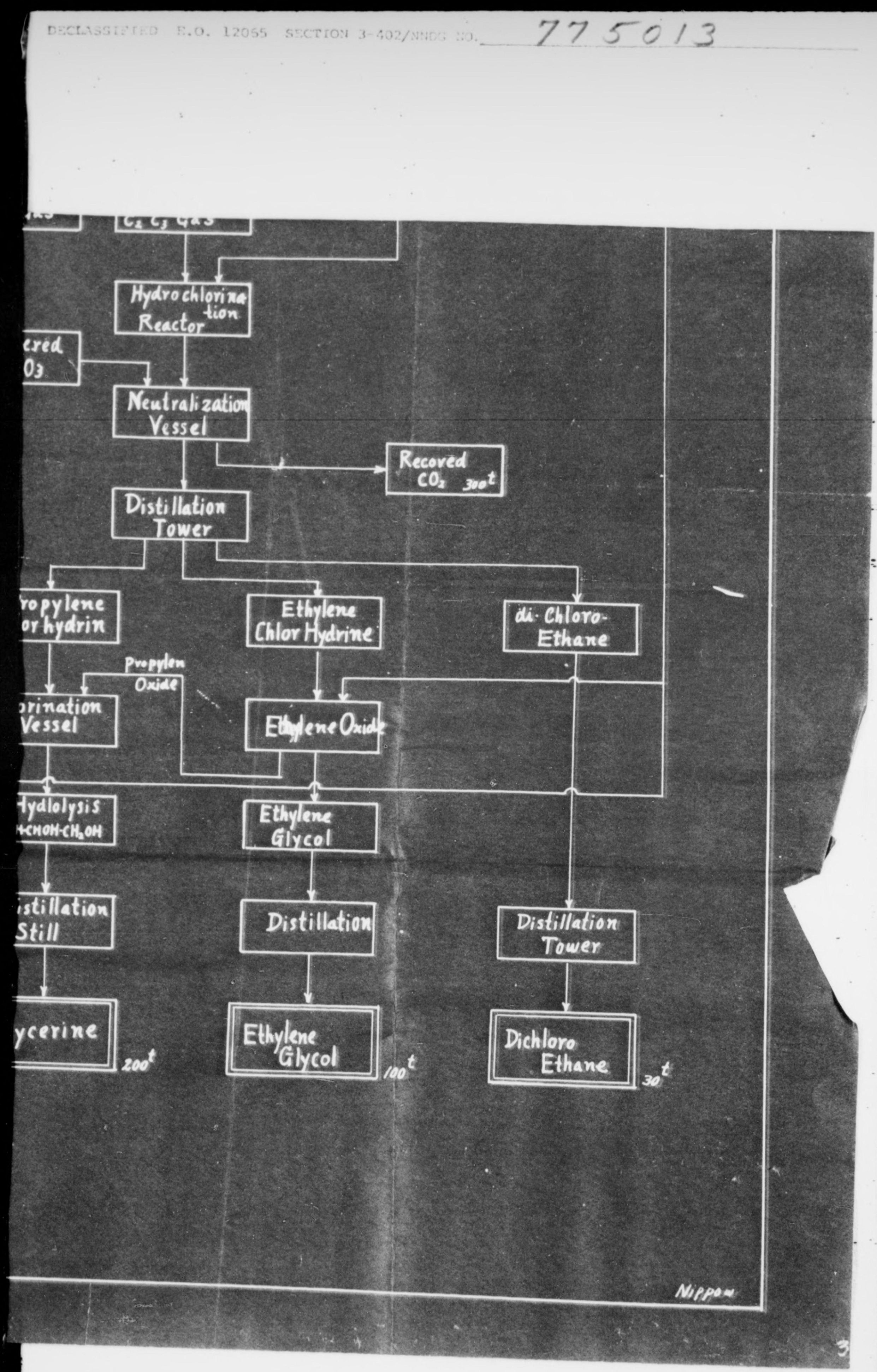

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775013

LIST OF FACILITIES FOR APPLICATION

Code No. 45 - 5

Name of Plant : Iwakuni Ex-Army Fuel Depot

Address of Plant : 550, Shozoku, Iwakuni-shi, Yamaguchi-ken

1. Machinery

Referred to Attached Sheet "List of Machinery for Application"

Grand Total 4,687

2. Building

Area No.	Building No.	Name of Building	Total Area (tsubo)	Construction	Remarks Damage %
I	1	Pump room	48	One wooden one-storied	20
I	2	Pump room	25	One ferro-concrete one-storied house	0
I	3	Electricity receiving room	123	One ferro-concrete two-storied house	5
II	4	Central experiment room	520	One ferro-concrete two-storied house	10
II	5	Workman's resting room	193	One wooden one-storied house	20
II	6	Drug warehouse	61	One ferro-concrete one-storied house	10
II	7	Engine room	120	"	10
II	8	Experiment room annex	9	One wooden one-storied house	30
III	11	Electric power room	1,623	One iron frame, ferro-concrete	20
III	13	Pump room	12	One iron frame concrete	30

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775013

Area No.	Building No.	Name of Building	Total Area (tsubo)	Construction	Remarks Damage %
V	16	Transformer room	140	One ferro-concrete two-storied house	50
V	17	Water electrolysis room	535	One iron frame one-storied house	10
V	18	Filling up room	100	One ferro-concrete one-storied house	20
V	19	Substation	25	One iron frame one-storied house	20
V	20	Water gas furnace room	207	Two iron frame four-storied room	20
V	21	Rain water pump room	23	One ferro-concrete	10
V	22	Metal cracking room	250	One iron frame construction	
V	23	Carbon monoxide degeneration room	231	Two iron frame one-storied house	50
V	24	Pump room	25	One iron frame one-storied house	
IX	50	Pump room	73	One iron frame ferro-concrete one-storied house	5
IX	51	High pressure water adding room	3,397	Four iron frame one & two-storied house	10
IX	52	Copper liquid washing room	30	One wooden one-storied house	10
X	53	Boiler room	140	One iron frame room	10
XVIII	77	Butanole recombining room	350	Two iron frame one-storied house	30
XVIII	78	"	350	"	30
XVIII	79	Rubber oil factory	79	One iron frame one-storied house	
XVIII	80	Rubber warehouse	308	One wooden one-storied house	
XIX	83	Mediation factory	234	One ferro-concrete	
XIX	86	Mediation warehouse	234	One wooden one-storied house	

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775013

Area No.	Building No.	Neme of Building	Total Area (tsubo)	Construction	Remarks Damage %
XXIII	96	Edelius room	450	One iron freme one-storied house	40
XIII	65	Purchasing Association	205	One wooden one-storied house	
XIII	66	Kitchen	290	"	
II	6	Drug warehouse	20	One ferro-concrete one-storied house	
		TOTAL	10,041 (tsubo)	41 frames	

3. Land

Area No.	Area (tsubo)	Remarks
I		
II		
III		
V		
VI		
IX		
X		
XIII		
XVIII		
XVIIII		
XX		
XXI		
XXII		
XXIII		
Total	86,200	

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775013

LIST OF FACILITIES FOR APPLICATION

Code No. 45 - 5

Name of Plant: Iwakuni Ex-Army Fuel Depot

Address of Plant: 550, Shozoku, Iwakuni-shi. Yamaguchi-ken

1. Machinery

Referred to Attached Sheet "List of Machinery for Application"

Grand Total 4,687

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II	4	Central experiment room	520	One ferro-concrete two-storied house	10
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II	6	Drug warehouse	61	One ferro-concrete one-storied house	10
II	7	Engine room	120	"	10
II	8	Experiment room annex	9	One wooden one-storied house	30
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III	13	Pump room	12	One iron frame concrete	30

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775013

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V	19	Substation	25	One iron frame one-storied house	20
V	20	Water gas furnace room	207	Two iron frame four-storied room	20
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DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775013

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XIII	65	Purchasing Association	205	One wooden one-storied house	
XIII	66	Kitchen	290	"	
II	6	Drug warehouse	20	One ferro-concrete one-storied house	
		TOTAL	10,041 (tsubo)	41 frames	

3. Land

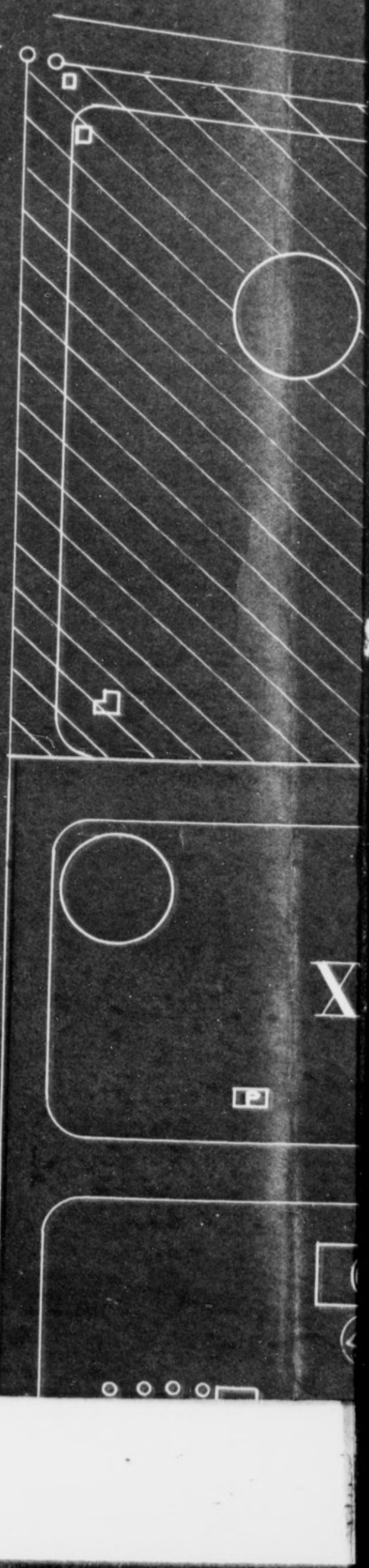
Area No.	Area (tsubo)	Remarks
I		
II		
III		
V		
VI		
IX		
X		
XIII		
XVIII		
XVIIII		
XX		
XXI		
XXII		
XXIII		
Total	86,200	

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775013

PLAN OF FOR

IND

INVEN-TORY NO.	PLANT NO.	NAME OF PLANT
F1	/	LUBURICATING OIL PLANT
F1	5	VACUUM DISTILLATION PLANT
F1	10	ACID WASHING PLANT
6	6	SOLVENT EXTRCTION PLANT(DUO-SOL)
7	7	DEWAXING PLANT (BARI-SOL)
F1	8	CONTACT RERUN PLANT
36	36	SOLVENT EXTRACTION PLANT(EDELEANU)
F1	499	DRUMCLEANING PLANT
F1	146	DRUM FILLING PLANT
F2	/	CRUDE OIL DISTILLATION PLANT
F2	21	NNO TYPE (2 UNITS)
3	3	CONTINUOUS GASOLINE TREATING PLANT
F3	34	HYDRO CRACKING PLANT
F4	25	WATER ELECTROLYSIS PLANT
F4	26	OXYGEN FILLING PLANT
F5	/	HYDROGEN PRODUCTION PLANT
F5	27	WATER GAS PLANT (P.G.C.)
F5	28	METHANE CRACKING PLANT(KOPPERS)
F5	29	CO CONVERTER
F5	31	CO REMOVING PLANT
F5	30	CO_2 REMOVING PLANT
F5	33	HYDROGEN PURIFICATION PLANT
F5	32	NITROGEN GAS SEPARATION PLANT
F5	277	LIQUID AIR SEPARATION PLANT



DECLASSIFIED E.O. 12065 SECTION 3-402/NNDS NO. 775013

AN OF FORMER IWAKUNI ARMY FU

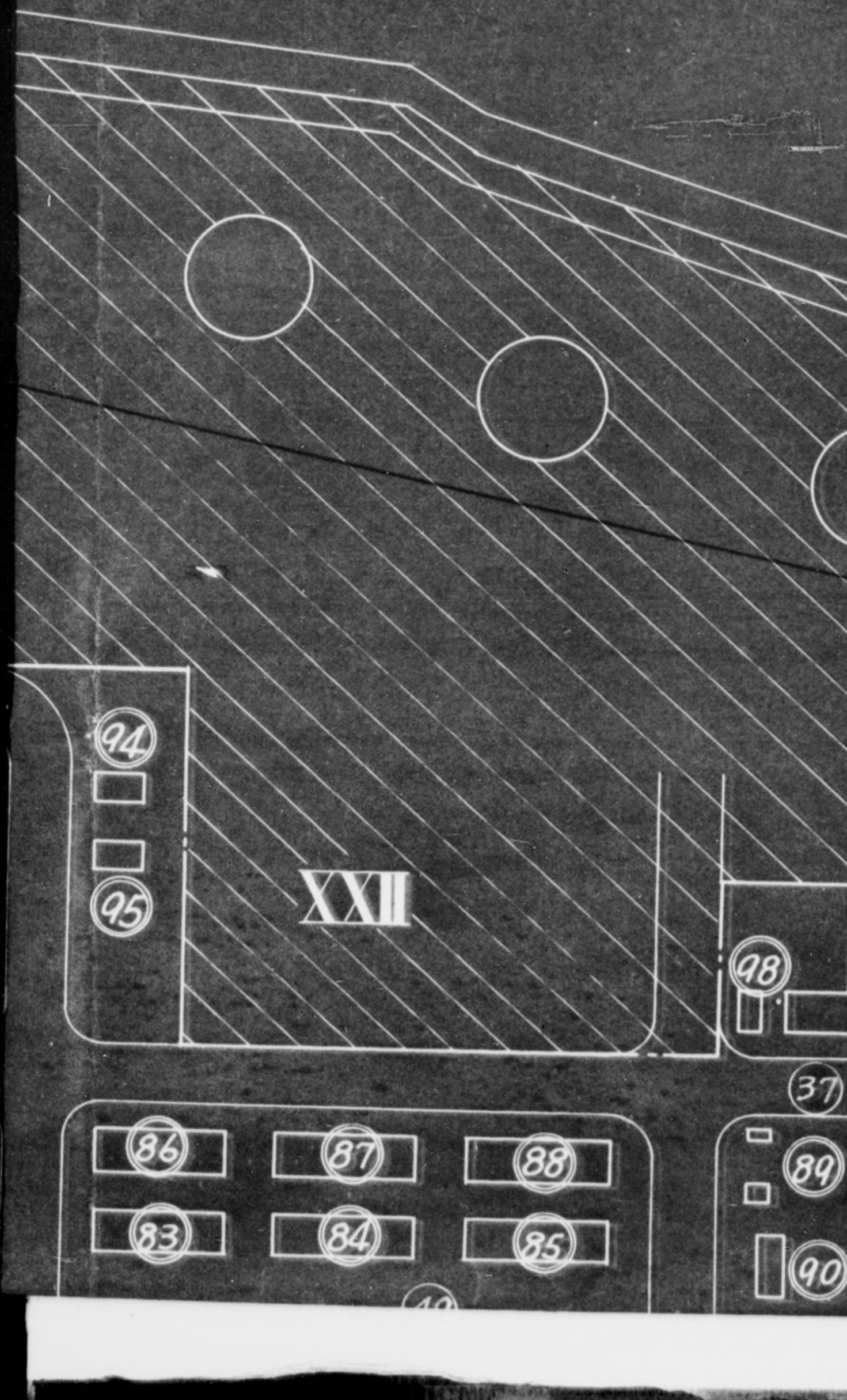
INDICATING INVENTRY NO. OF PLANTS

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDB NO. 775013

...KUNI ARMY FUEL DEPOT

...ENTRY NO. OF PLANS.

SCALE 1/2000



DECLASSIFIED E.O. 12065 SECTION 3-402/NNDB NO. 775013

FUEL DEPOT

...VIS.

SCALE 1/2000

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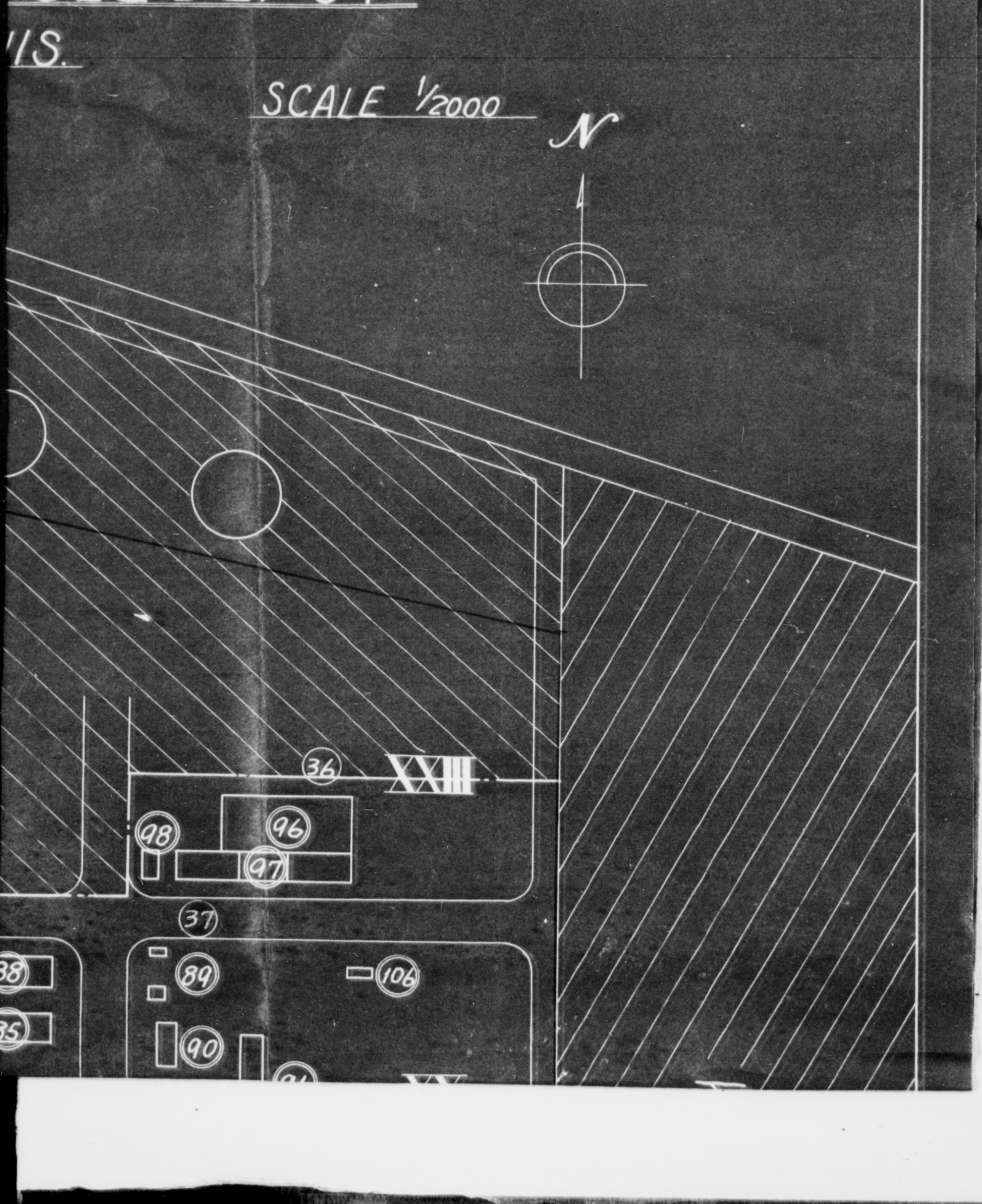
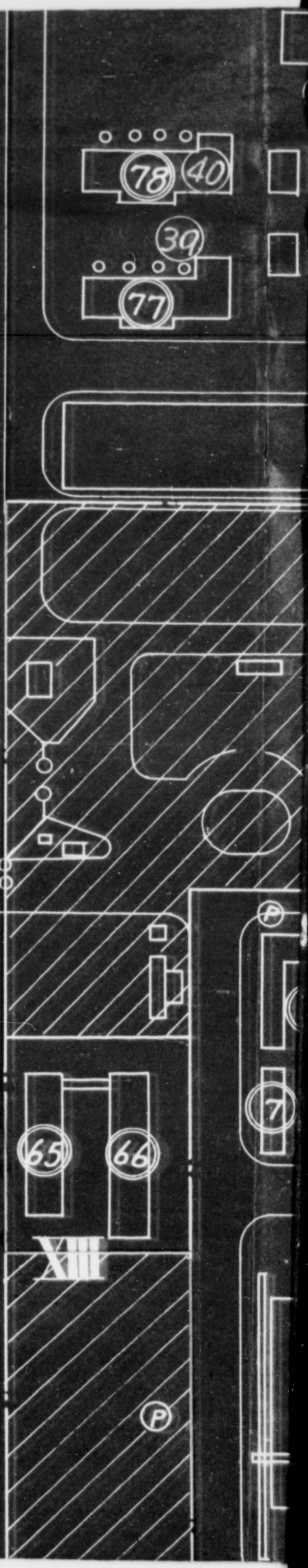


DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775013

F5	33	HYDROGEN PURIFICATION PLANT
F5	32	NITROGEN GAS SEPARATION PLANT
F5	277	LIQUID AIR SEPARATION PLANT
F6	43	ALCOHOL PLANT
F7	499	DRUM MANUFACTURING PLANT
/	/	CRACKING PLANT
22	22	NNC THERMAL TYPE (2 UNITS)
11	11	CATALYTIC CRACKING PLANT (ARMY)
23	23	CATALYTIC CRACKING PLANT (NNK)
12	12	RERUN TOPPING PLANT
F8	4	CLAY TREATING PLANT FOR (RACKED GASOLINE)
F8	48	CLAY DRYING FURNACE
35	35	HIGH PRESSURE HYDROGENATION PLANT
F9	/	ISO OCTANE PLANT
18	18	GAS SEPARATION PLANT
20	20	PROPANE REFINING PLANT
17	17	NO. 1 ISO-OCTANE PLANT
F9	39 40	BUTANOL DEHYDRO POLYMERIZATION PLANT
19	19	SPECIAL EMULSION PLANT
F9	41	NO. 2 ISO-OCTANE PLANT
49	49	CATALYST PLANT
F10	/	SYNTHETIC LUB OIL PLANT
F10	42	PLANT FOR DESTRUCTIVE DISTILLATION OF RUBBER
13	13	PARAFFINE CRACKING
14	14	OLEFFINE POLYMERIZATION PLANT
15	15	CONTACT RERUN PLANT FOR POLY PLANT
16	16	TANK AND PUMP FOR ABOVE PLANT
24	24	PITCH COKE PLANT
F11	38	PRODUCER GAS PLANT
F12	37	HIGH PRESSURE EXPERIMENTAL PLANT
F13	46	STEAM BOILER PLANT
F14	45	HIGH PRESSURE STEAM BOILER PLANT
F15	55	WATER FEEDING PUMP PLANT
F16	50	SEA WATER PUMPING PLANT
F17	52	CRUDE OIL TREATING PLANT
F18	144	WASTE ACID TREATING PLANT



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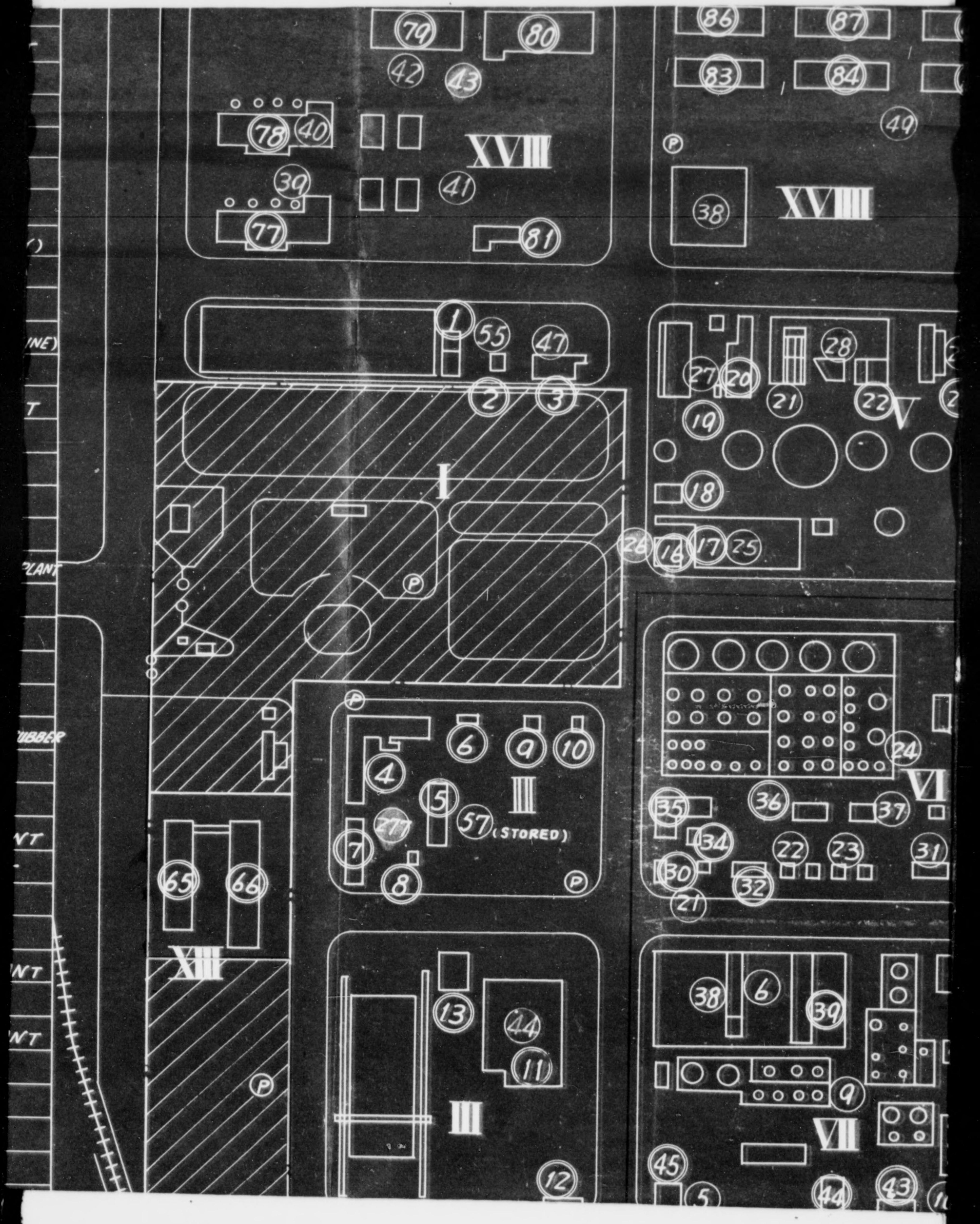

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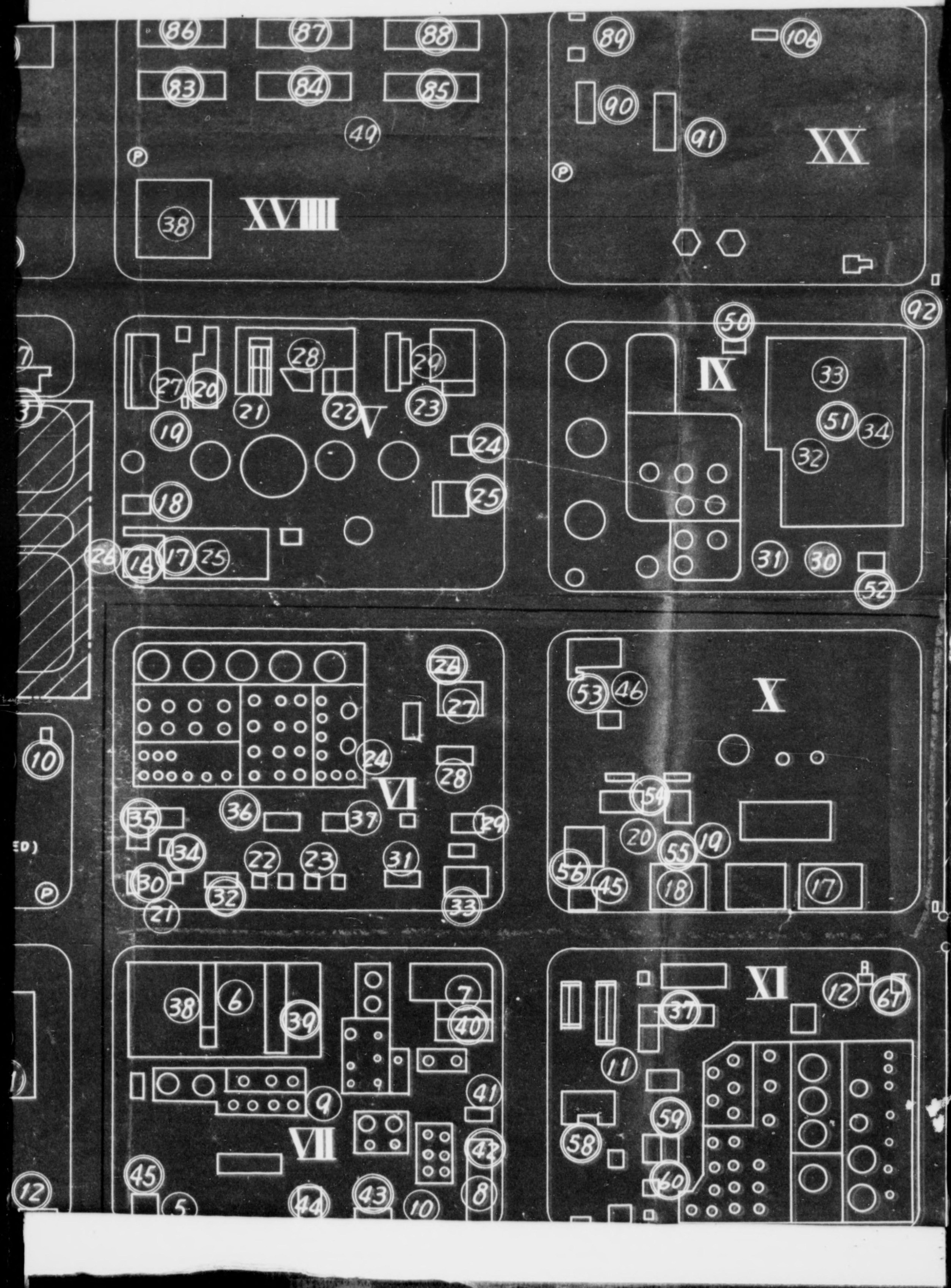

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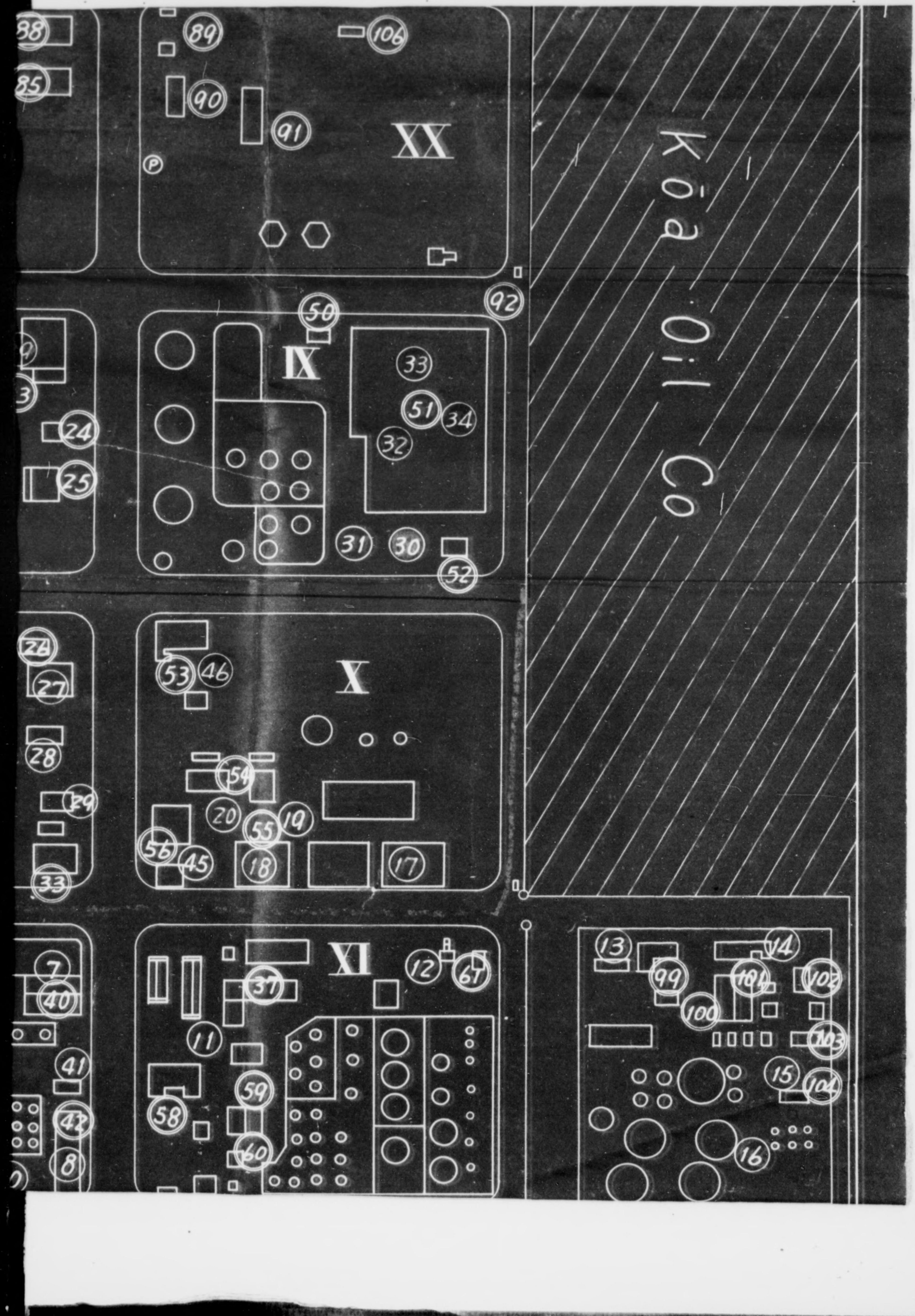


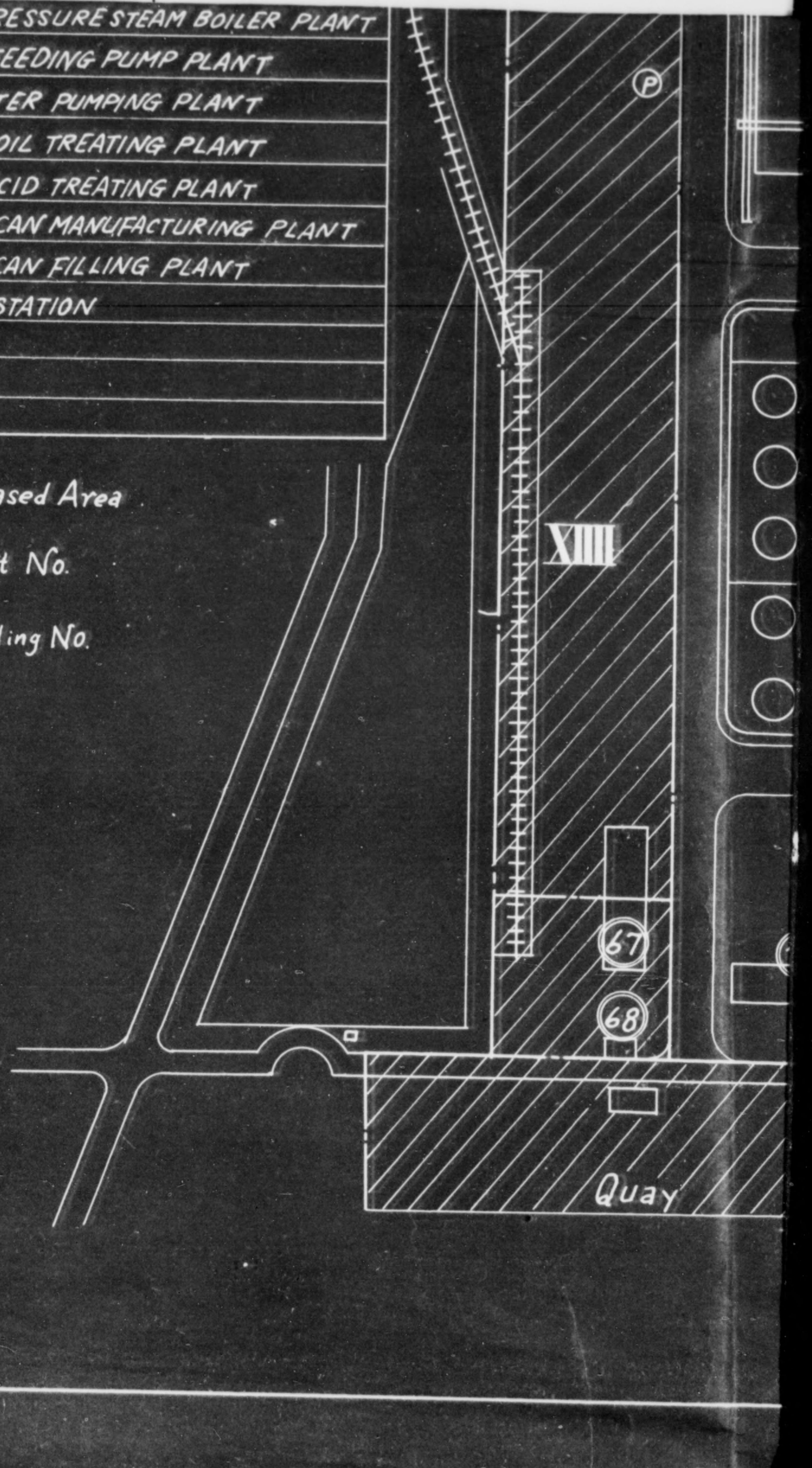
DECLASSIFIED E.O. 12065 SECTION 3-402/NNDB NO. 775013

F14	45	HIGH PRESSURE STEAM BOILER PLANT
F15	55	WATER FEEDING PUMP PLANT
F16	50	SEA WATER PUMPING PLANT
F17	52	CRUDE OIL TREATING PLANT
F18	144	WASTE ACID TREATING PLANT
F19	57	5 GALS. CAN MANUFACTURING PLANT
F20	246	5 GALS. CAN FILLING PLANT
F21	44	POWER STATION

: Released Area

: Plant No.

: Building No.



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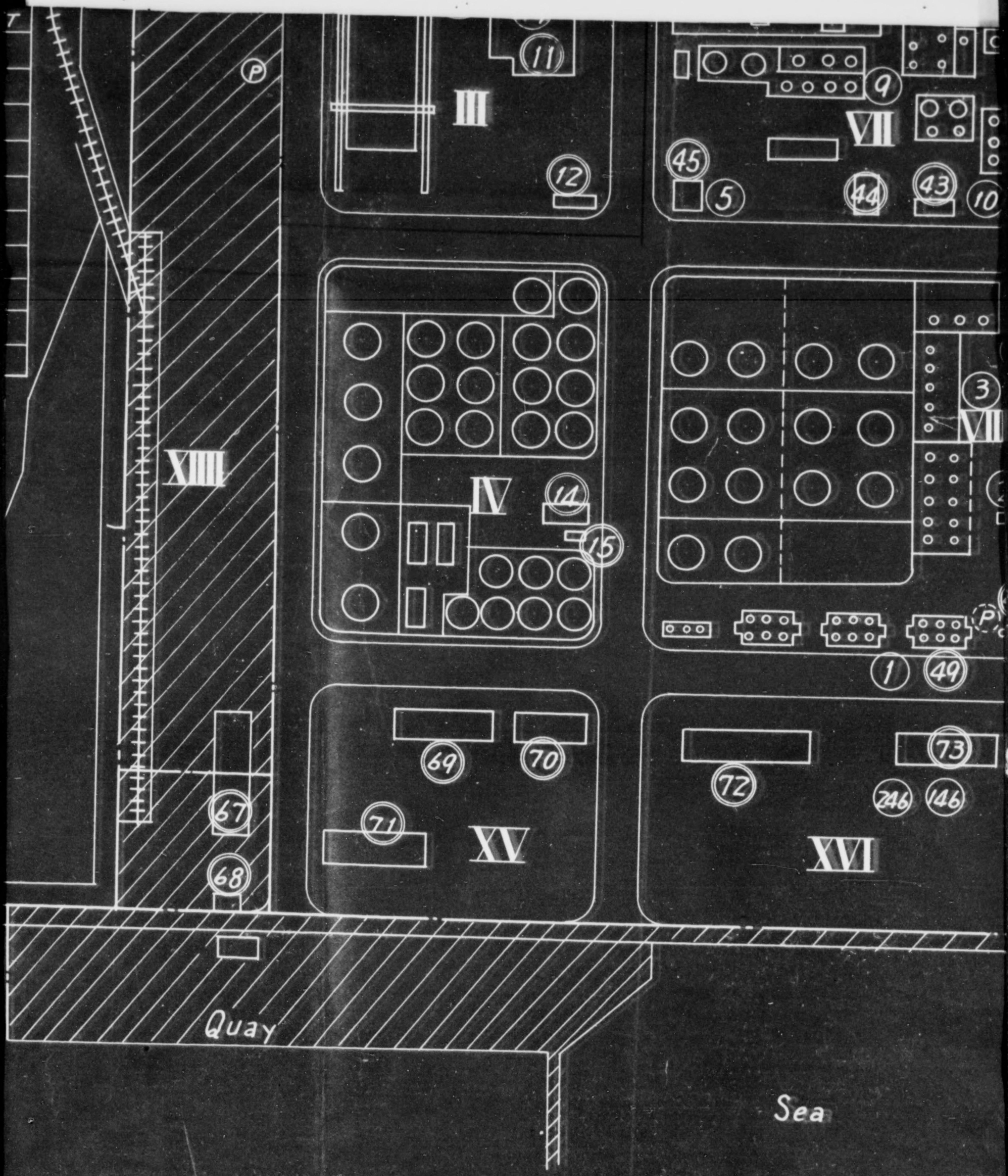

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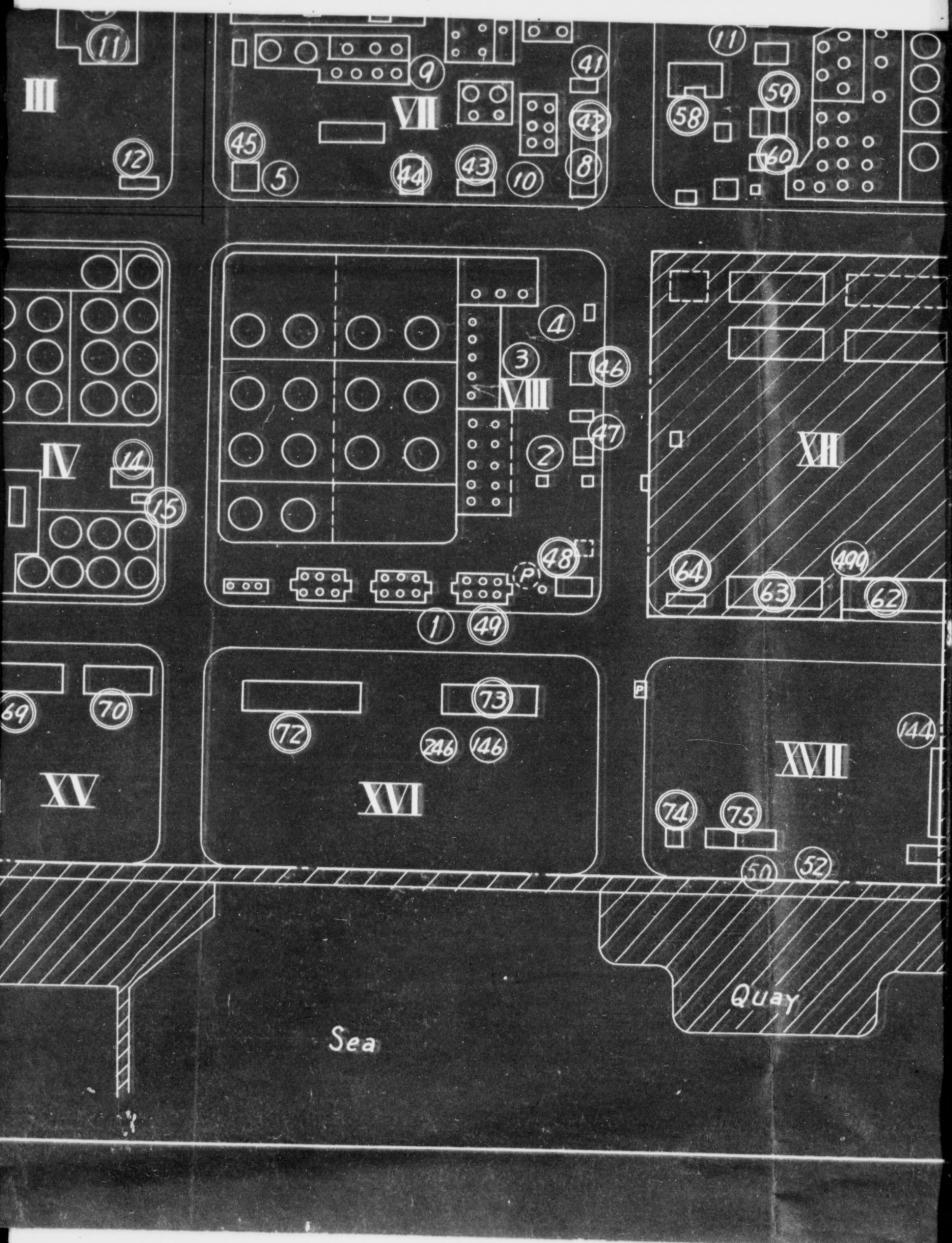

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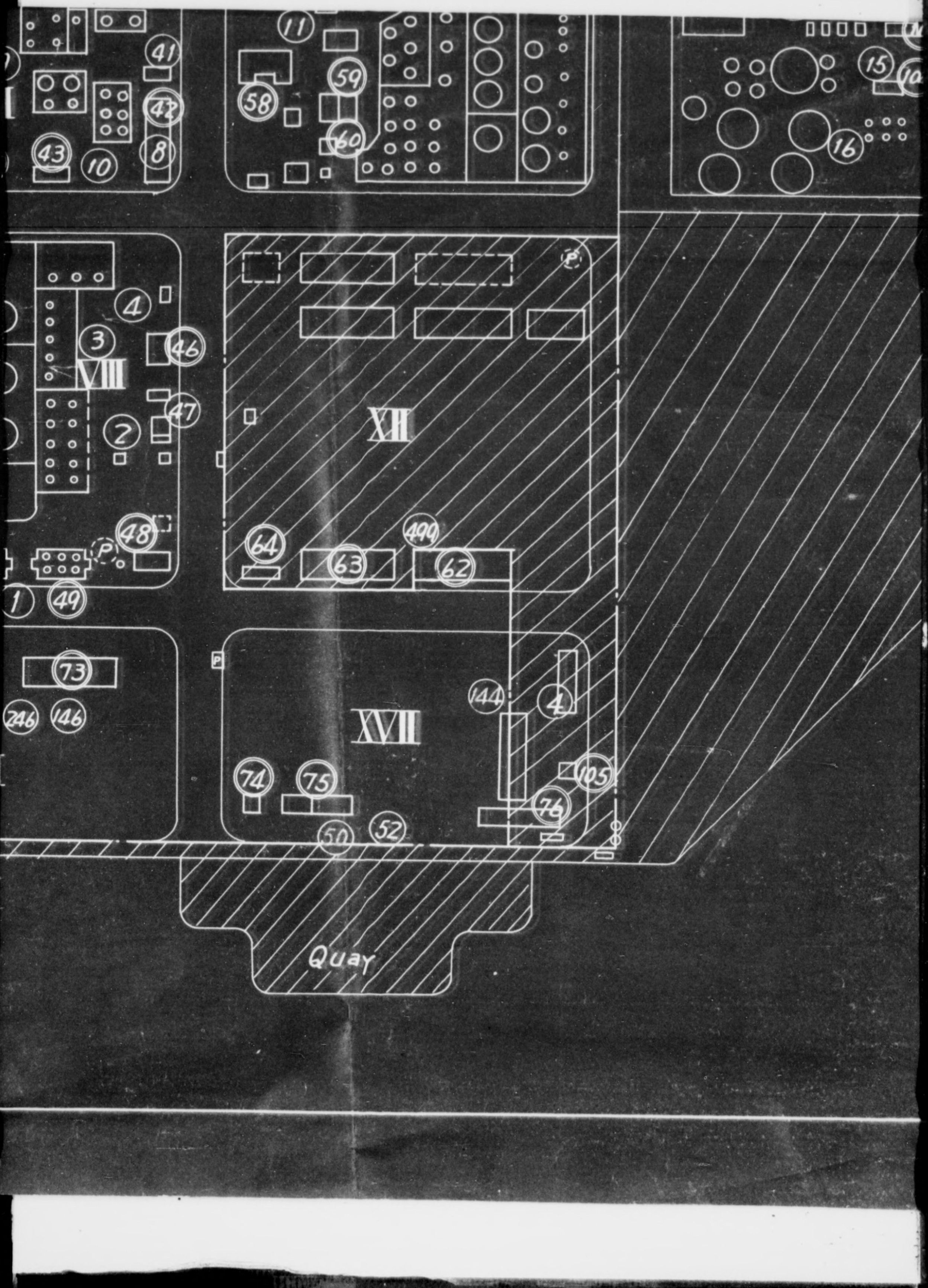

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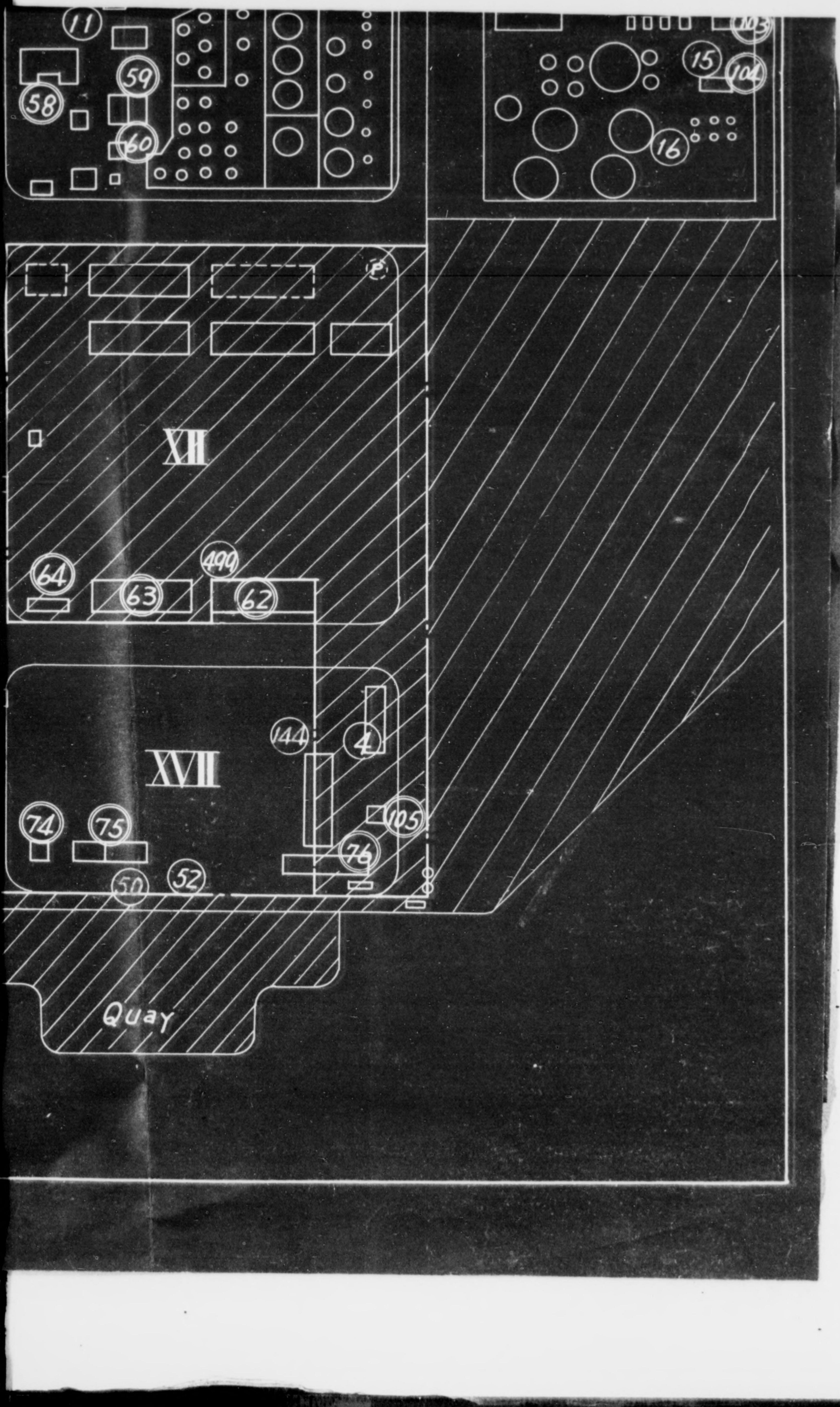


DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775013

TOKUYAMA SODA CO., LTD.,

8355 Tokuyama.

COPY

APPLICATION FOR CONVERSION OF

DESIGNATED REPARATION PLANT

September 15, 1949

To : Mr. Hayato Ikeda, Minister of Finance

From : Yukinobu Kageyama, President of Tokuyama Soda Co., Ltd.

Address : 8355 Tokuyama-shi, Yamaguchi-ken.

1) Name of Plant & Code No. : Iwakuni Ex-Army Fuel Depot, 45-5

2) Location of Plant : Shozoku, Iwakuni-shi, Yamaguchi-ken

3) Category : Chemical Industry

4) Production :

Present : None

Palnned : Ammonia (Ammonium Chloride Fertilizer)

	Production of Ammonia	Production of Ammonium Chloride Fertilizer
1st project :	14,000 tons per year	50,000 tons per year
2nd project :	28,000 tons "	100,000 tons "

5) Necessity for Conversion :

This company is engaged in the manufacture of soda by the Solvay process for thirty years. As a means for rationalization, research on ammonium chloride fertilizer has been carried out continuously for ten years. Resulting in the conformation that, as a fertilizer, ammonium chloride is not in any way inferior to ammonium sulphate, but on the contrary it works more effectively,

Conditions are grave, under the prevailing situation for industries using the Solvay process at present. The complete cut in subsidy, also the leap in the production costs are extremely vital problems, and the only rational counter-measure is the manufacture of a by-product, ammonium chloride fertilizer.

45-5-1 Sec II

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775013

TOKUYAMA SODA CO., LTD.,

8355 Tokuyama.

In this process of soda manufacturing, filtrate of sodium bicarbonate (mother liquor) which contains 19% ammonium chloride and 7% (table) salt. This is evaporated and concentrated to produce the by-product, ammonium chloride, furthermore, in this process, salt content will be recovered. As in the past, ammonia is recovered by distilling the mother liquor but this process necessitates a stupendous amount of lime, coke (or anthracite coal) and steam. In addition, the salt content (approximately 30%) is wasted. To be specific, in manufacturing ammonium chloride, not only the natrium contents of the salt but the chlorine can be utilized completely, and it is possible to economize on lime, coke, steam, electricity and also labor etc., rendering a considerable decrease (by about 25% less) in production cost.

For details, it is requested that reference be made to : plan for synthetic ammonium plant and ammonium chloride fertilizer plant, attached herewith.

When ammonium chloride is manufactured, the expensive sulphuric acid can be dispensed with, which will make possible the supply of moderately priced fertilizer, contributing toward increase of food production.

The most important facility in the production of this ammonium chloride is the synthetic ammmnium plant. Accordingly, in view of operations, to insure the source of the ammonia supply is truly a matter of the utmost importance. Fortunately, there is a hydro-cracking equipment at the Iwakuni Ex-Army Fuel Depot and the manufacture of ammonia may be made possible by converting only a part of the interior structure of the hydro-cracking tower, requiring no other alternations.

To newly manufacture these ammonium synthetic facilities in our country is well-nigh impossible. If newly installed, an expenditure of more than 2,000 million yen and an extended period of three to four years will become necessary. Moreover, the manufacture of such high pressure vessels as the synthetic tower is impossible.

As mentioned in the preceding paragraphs, this plan is :

1. through reduction of import of salt,
2. decrease in the cost of soda production, stabilization of the soda industry, the key industry in the chemical industries,
3. contribution toward increasing of food production by the increased production of moderately priced fertilizer.
4. acquisition of foreign capital with fertilizer exports etc.,

firmly believed to be a great factor conducive to the rehabilitation of the industrial economy of our country.

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775013

TOKUYAMA SODA CO., LTD.,

8355 Tokuyama.

6) Additional itoms of plant dosignato for roparation noodod for tho abovo production plan :

a) Land : Applied aroa 56,873 tsubo (46.5 acros)

Roloasod aroa 34,846 " (28 ")

b) Building : 6,048 tsubo (4.5 acros)

c) Machinory and Equipmont : 1,543 itoms

Attachod List :

List of machinory and oquipmont to bo usod.

For Tokuyama Soda Co., Ltd.

Yukinobu Kagoyama, Prosidont

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775013

ACCOMPANYING LETTER

OF

RECOMMENDATION

December 20, 1949

A plan has been made recently, by this company for installation of a plant, for the manufacture of Ammonia, indispensable as raw material for the manufacture of ammonia chloride fertilizer, at the Ex-Army Fuel Depot, located at Wagi-son, Kuga-gun, Yamaguchi-ken and Shozoku, Iwakuni-shi :

1. To maintain and stabilize the Soda industry.

2. To produce moderately priced nitrogenous fertilizer.

This company desires to promote economic self-sustainance and to contribute to the national policy, we beg the approval and recommendation at your office.

For Tokuyama Soda Co., Ltd.

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775013

This is to certify that the application is revealed to be rational and proper.

Yasukane Murakami, Wagi-son Mastor, Kuga-gun, Yamaguchi-ken

Yakichi Tsuda, Mayor of Iwakuni-shi

Tatsuo Tanaka, Governor of Yamaguchi-ken

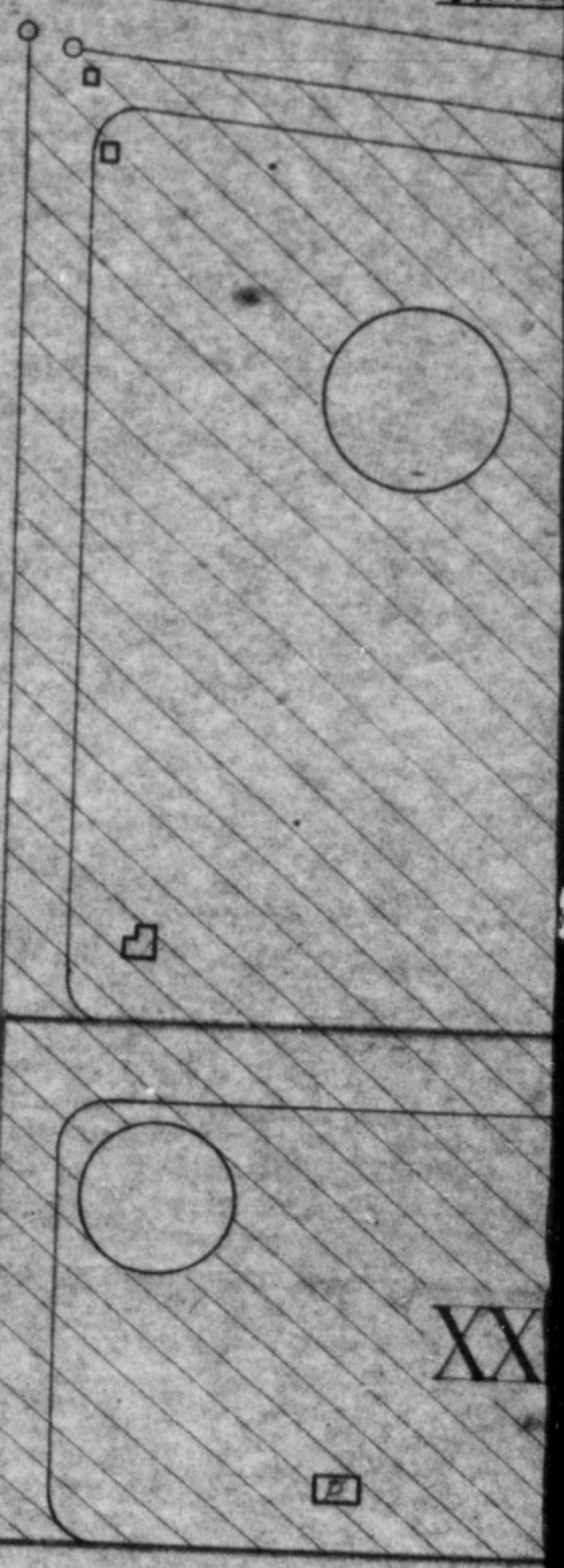
DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775013

PLAN OF FORM

INDI

APPL

INVENTORY NO.	PLANT NO.	NAME OF PLANT
F1	/	LUBURICATING OIL PLANT
F1	5	VACUUM DISTILLATION PLANT
F1	10	ACID WASHING PLANT
6	6	SOLVENT EXTRACTION PLANT (DUO - SOL)
7	7	DEWAXING PLANT (BARI - SOL)
F1	8	CONTACT RERUN PLANT
36	36	SOLVENT EXTRACTION PLANT (EDELEANU)
F1	499	DRUM CLEANING PLANT
F1	146	DRUM FILLING PLANT
F2	/	CRUDE OIL DISTILLATION PLANT
F2	21	NNC TYPE (2 UNITS)
3	3	CONTINUOUS GASOLINE TREATING PLANT
F3	34	HYDRO CRACKING PLANT
F4	25	WATER ELECTROLYSIS PLANT
F4	26	OXYGEN FILLING PLANT
F5	/	HYDROGEN PRODUCTION PLANT
F5	27	WATER GAS PLANT (P.G.C.)
F5	28	METHANE CRACKING PLANT (KOPPERS)
F5	29	CO CONVERTER
F5	31	CO REMOVING PLANT
F5	30	CO_2 REMOVING PLANT
F5	33	HYDROGEN PURIFICATION PLANT
F5	32	NITROGEN GAS SEPARATION PLANT
F5	277	LIQUID AIR SEPARATION PLANT
F6	43	ALCOHOL PLANT
F7	499	DRUM MANUFACTURING PLANT
/	/	CRACKING PLANT
22	22	NNC THERMAL TYPE (2 UNITS)

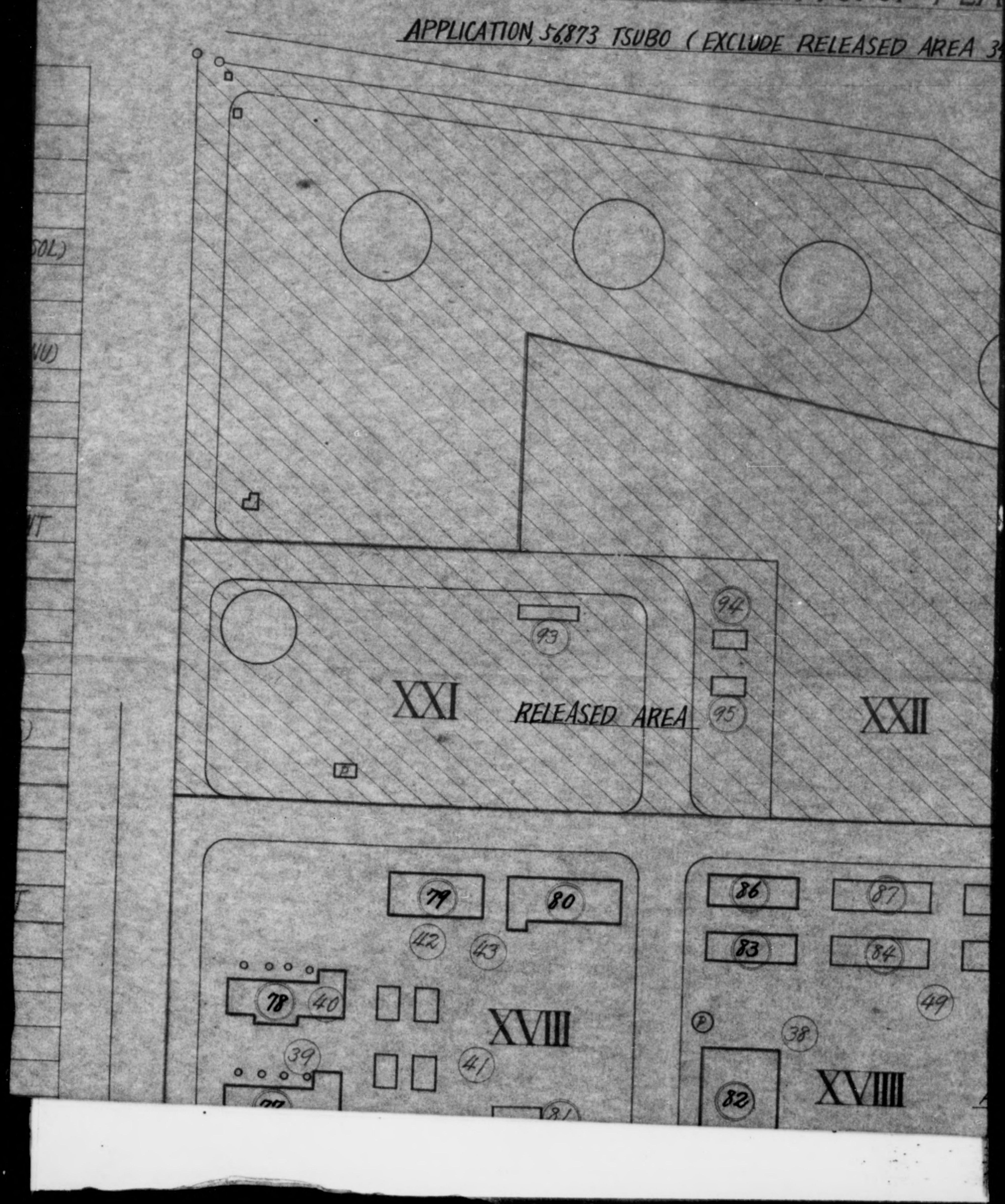


DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775013

PLAN OF FORMER IWAKUNI ARMY

INDICATING INVENTORY NO. OF PLA

APPLICATION, 56,873 TSUBO (EXCLUDE RELEASED AREA 3



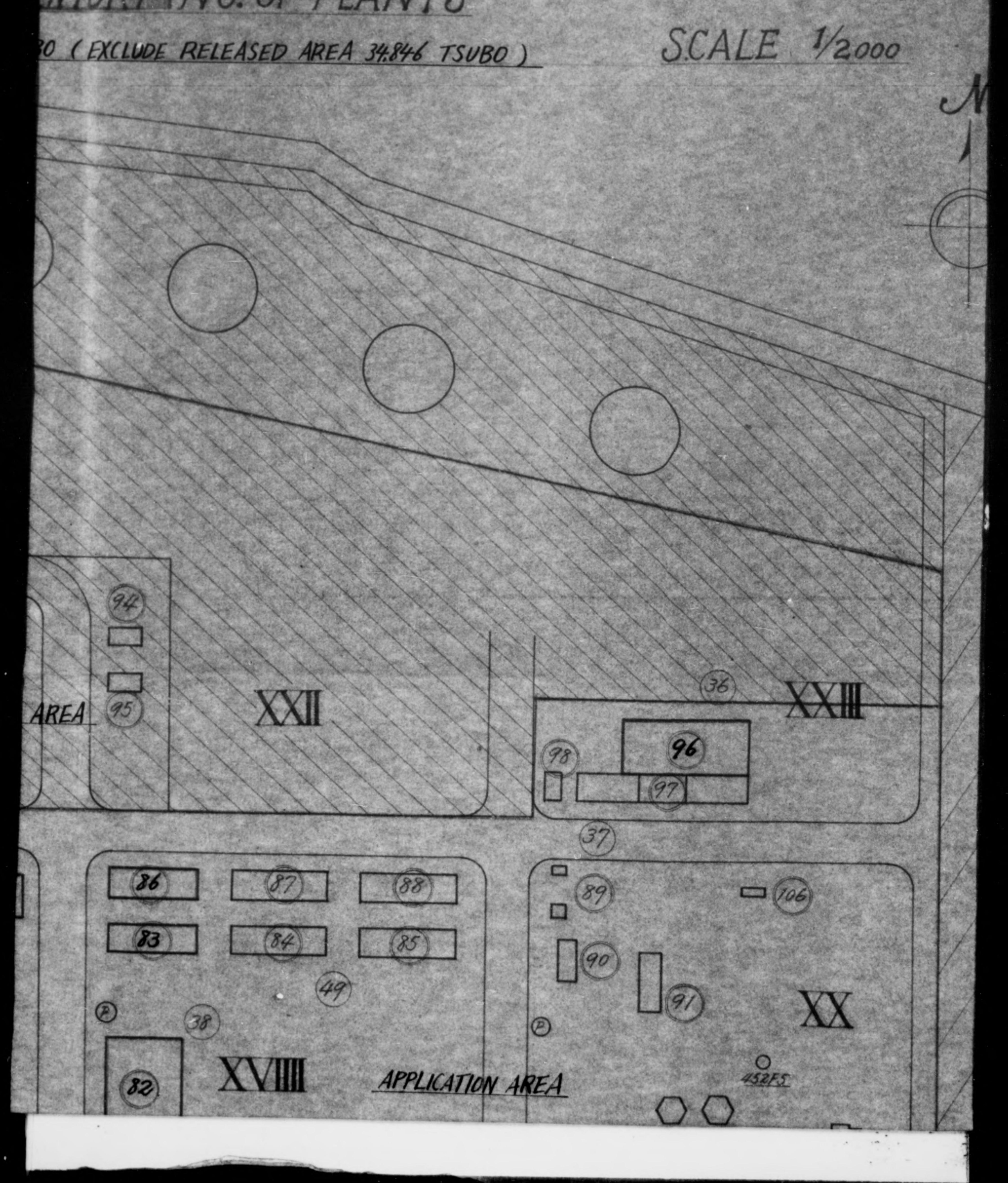
DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775013

AKUNI ARMY FUEL DEPOT

ENTORY NO. OF PLANTS

30 (EXCLUDE RELEASED AREA 34.846 TSUBO)

SCALE 1/2000



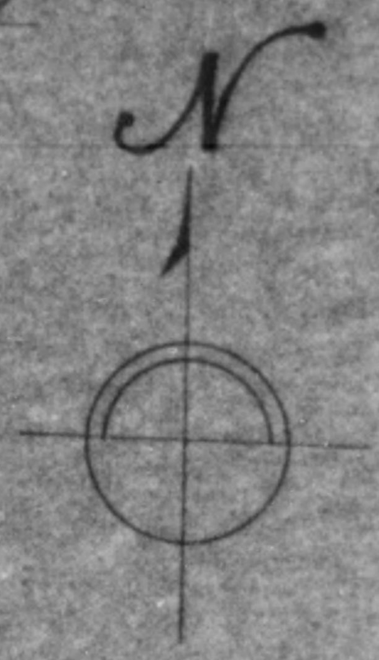
DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775013

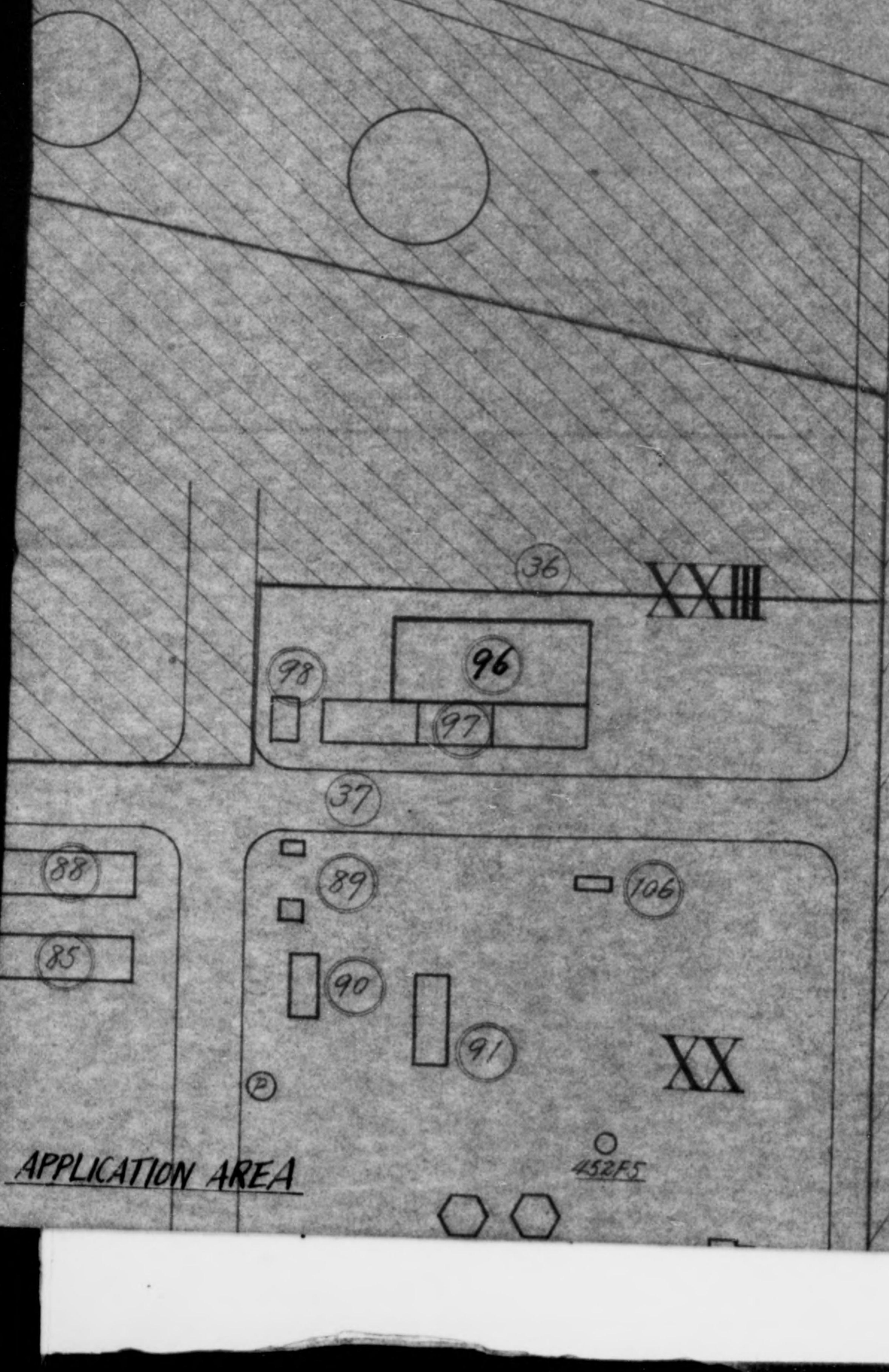
FUEL DEPOT

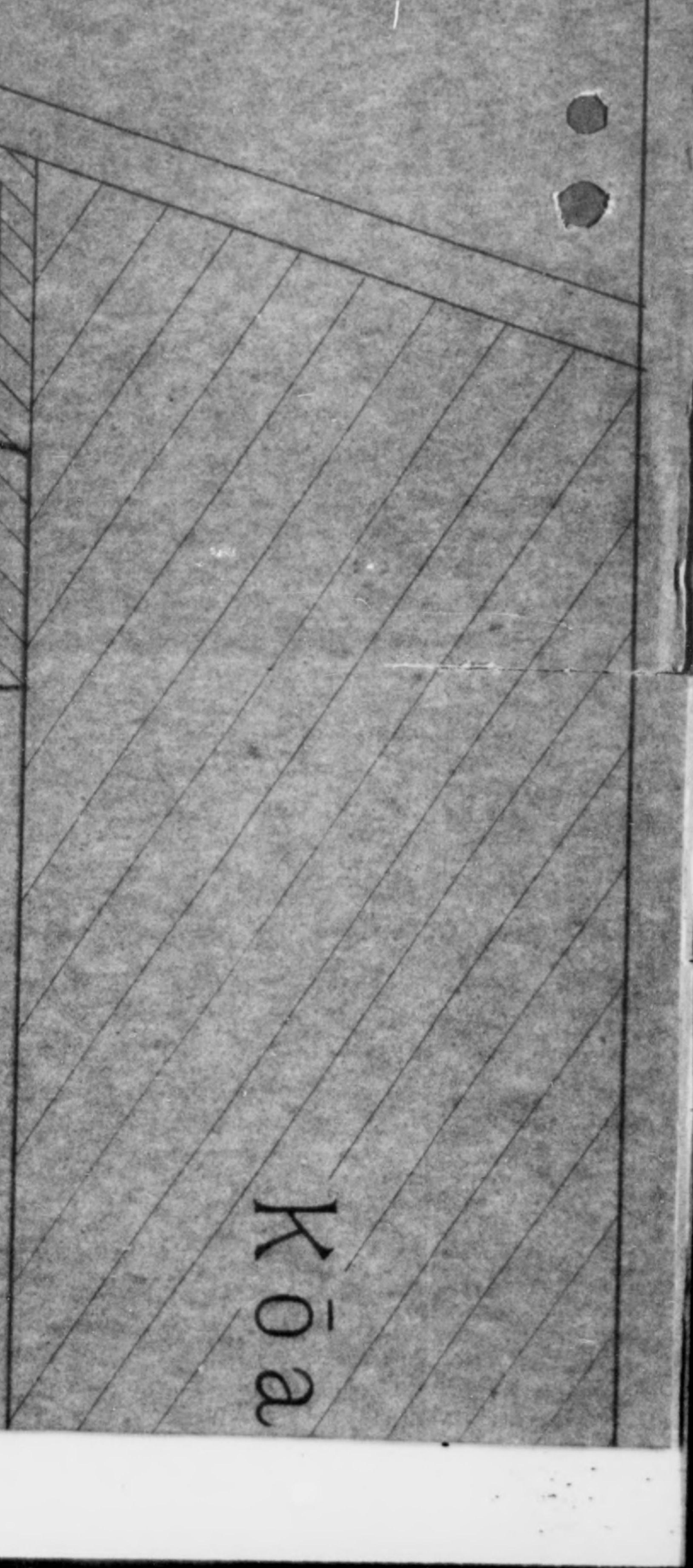
NTS

(846 TSUBO)

SCALE 1/2000







DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775013

F7	499	DRUM MANUFACTURING PLANT
/	/	CRACKING PLANT
22	22	NNC THERMAL TYPE (2 UNITS)
11	11	CATALYTIC CRACKING PLANT (ARMY)
23	23	CATALYTIC CRACKING PLANT (NNK)
12	12	RERUN TOPPING PLANT
F8	4	CLAYTREATING PLANT FOR CRACKED GASOLINE
F8	48	CLAY DRYING FURNACE
35	35	HIGH PRESSURE HYDROGENATION PLANT
F9	/	ISO-OCTANE PLANT
18	18	GAS SEPARATION PLANT
20	20	PROPANE REFINING PLANT
17	17	NO.1 ISO-OCTANE PLANT
F9	39 40	BUTHANE DEHYDRO POLYMERIZATION PLANT
19	19	SPECIAL EMULSION PLANT
F9	41	NO.2 ISO-OCTANE PLANT
49	49	CATALYST PLANT
F10	/	SYNTHETIC LUB OIL PLANT
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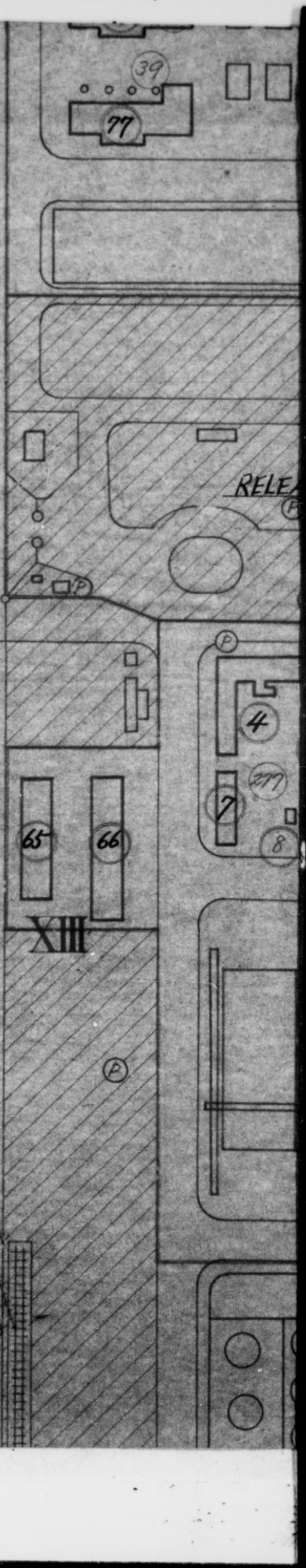
13	13	PARAFFINE CRACKING
14	14	OLEFFINE POLYMERIZATION PLANT
15	15	CONTACT RERUN PLANT FOR POLY. PLANT
16	16	TANK AND PUMP FOR ABOVE PLANT
24	24	PITCH COKE PLANT
F11	38	PRODUCER GAS PLANT
F12	37	HIGH PRESSURE EXPERIMENTAL PLANT
F13	46	STEAM BOILER PLANT
F14	45	HIGH PRESSURE STEAM BOILER PLANT
F15	55	WATER FEEDING PUMP PLANT
F16	50	SEA WATER PUMPING PLANT
F17	52	CRUDE OIL TREATING PLANT
F18	144	WASTE ACID TREATING PLANT
F19	57	5 GALS. CAN MANUFACTURING PLANT
F20	246	5GALS. CAN FILLING PLANT
F21	44	POWER STATION
	47	SUBSTATION



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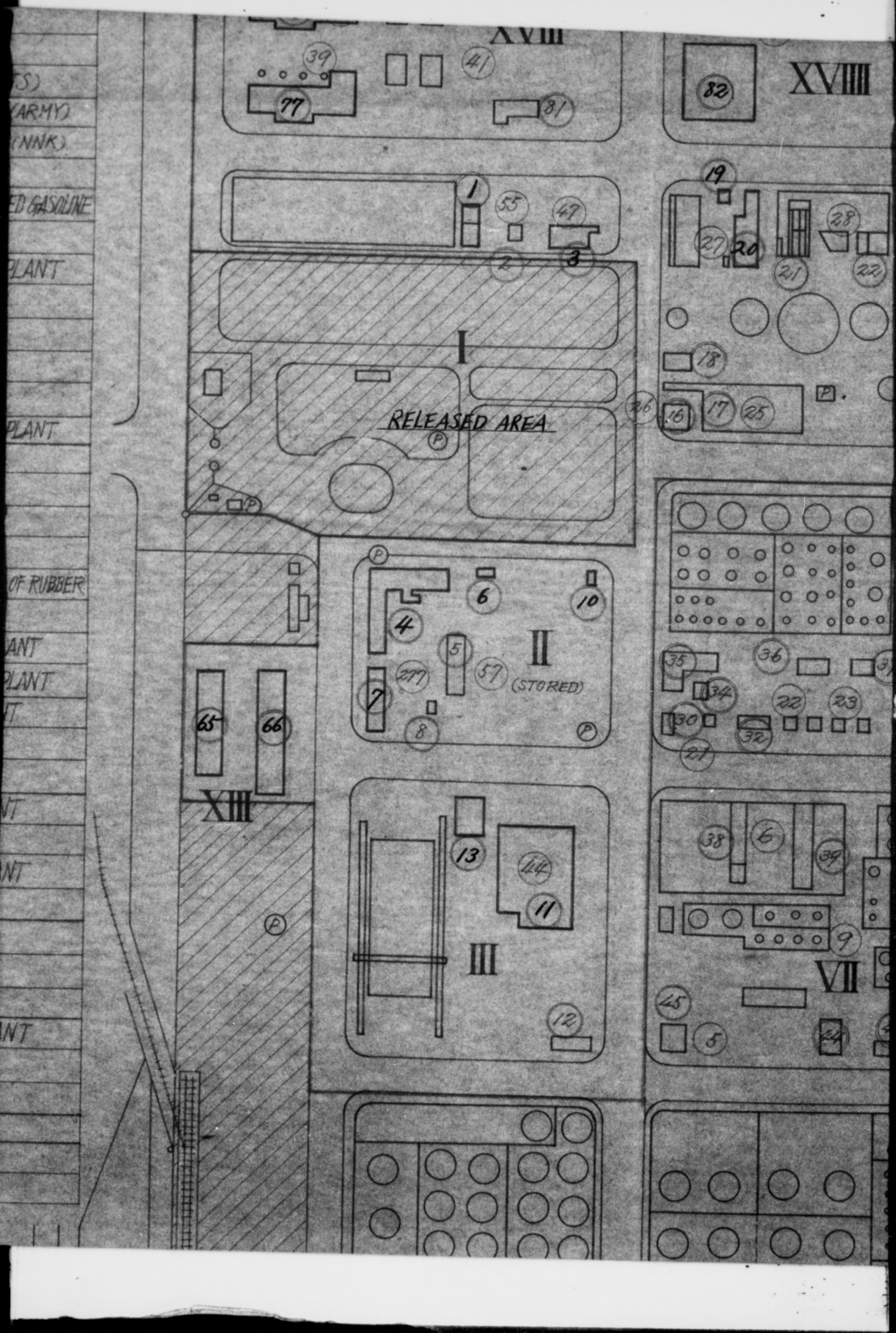

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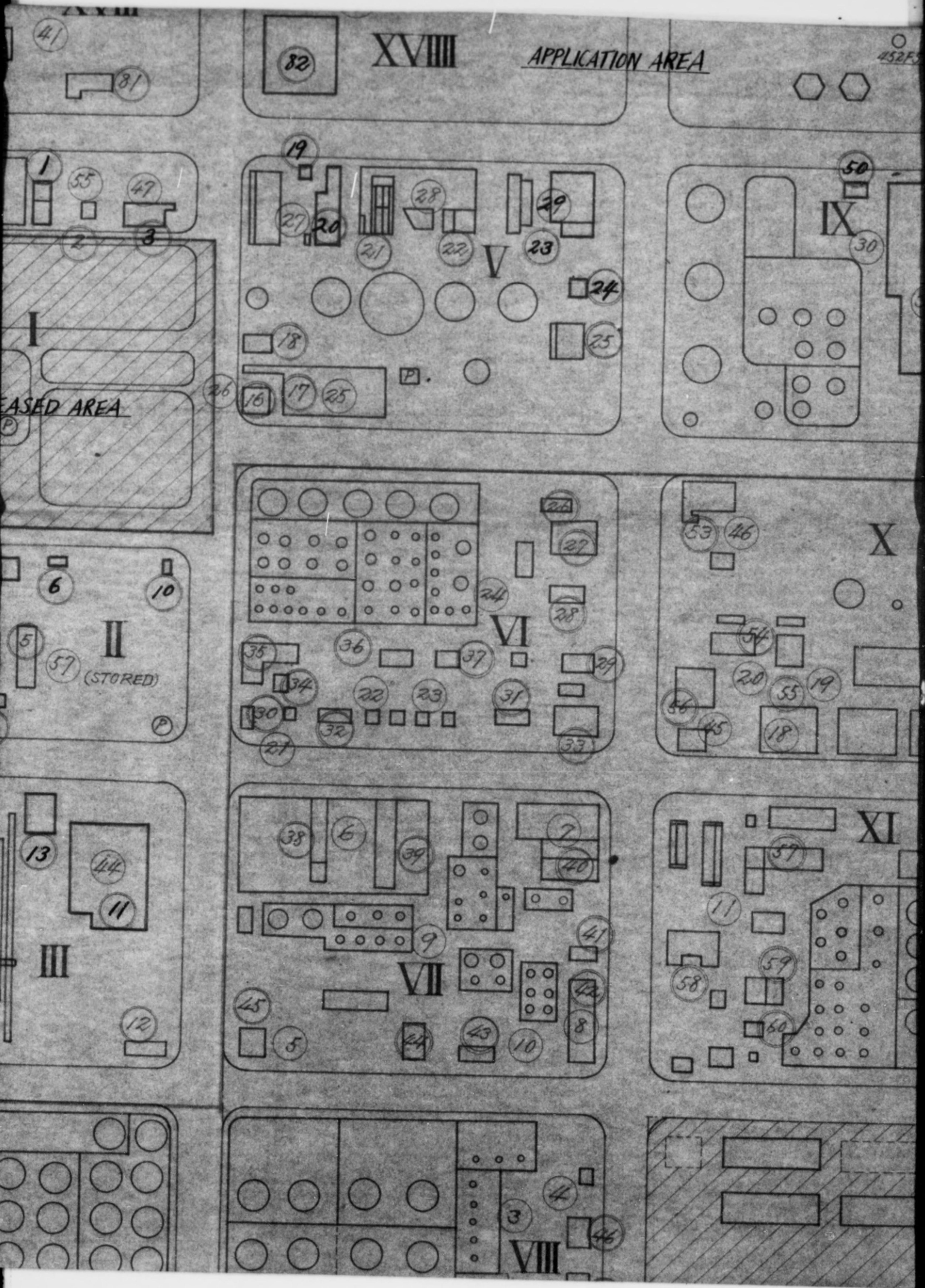

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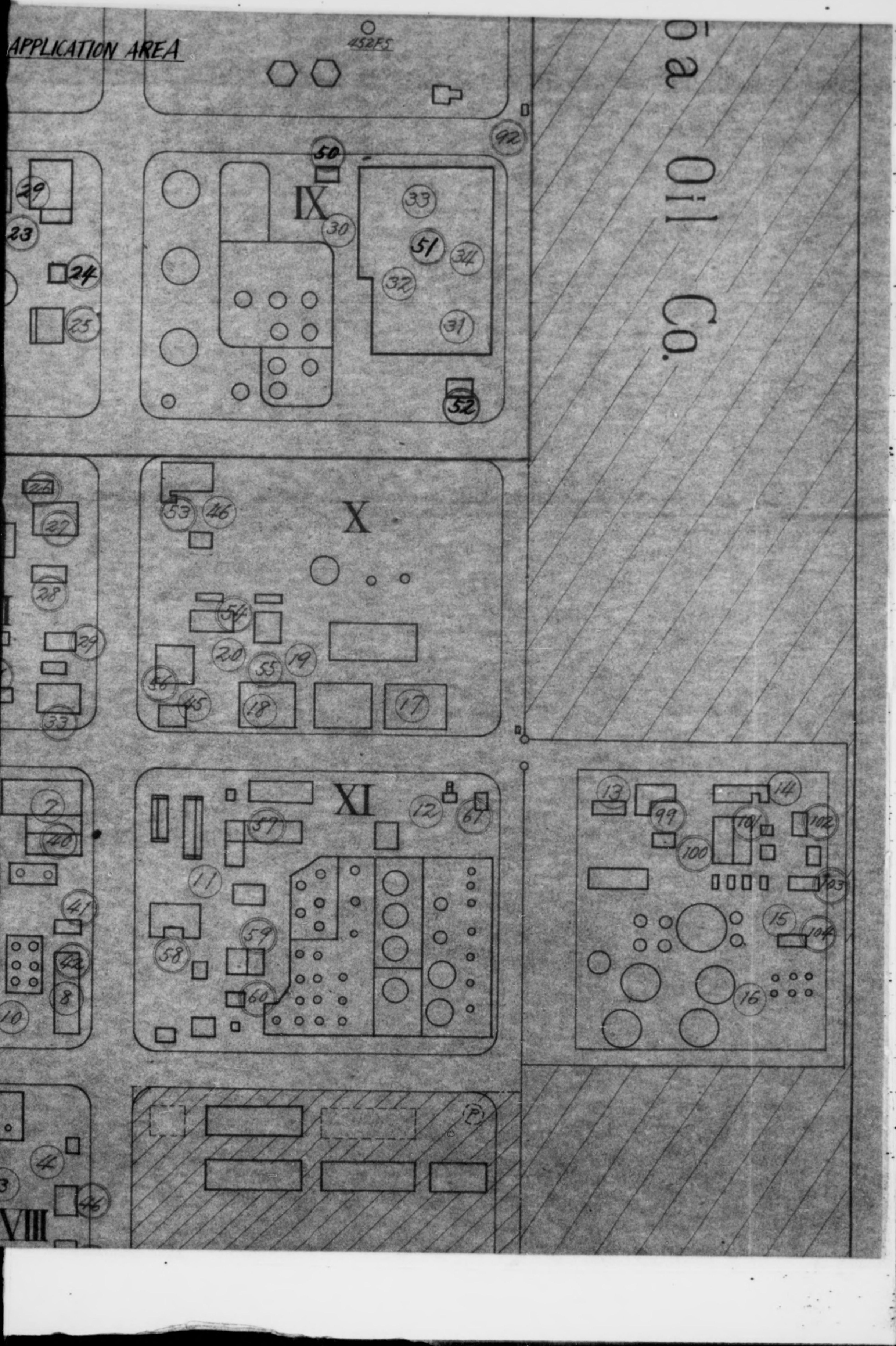


DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775013

F12	37	HIGH PRESSURE EXPERIMENTAL PLANT
F13	46	STEAM BOILER PLANT
F14	45	HIGH PRESSURE STEAM BOILER PLANT
F15	55	WATER FEEDING PUMP PLANT
F16	50	SEA WATER PUMPING PLANT
F17	52	CRUDE OIL TREATING PLANT
F18	144	WASTE ACID TREATING PLANT
F19	57	5GALS. CAN MANUFACTURING PLANT
F20	246	5GALS. CAN FILLING PLANT
F21	44	POWER STATION
	47	SUBSTATION

: Released Area

: Plant No.

: Building No.

: APPLICATION BLG.

XII

XIII

XIIII

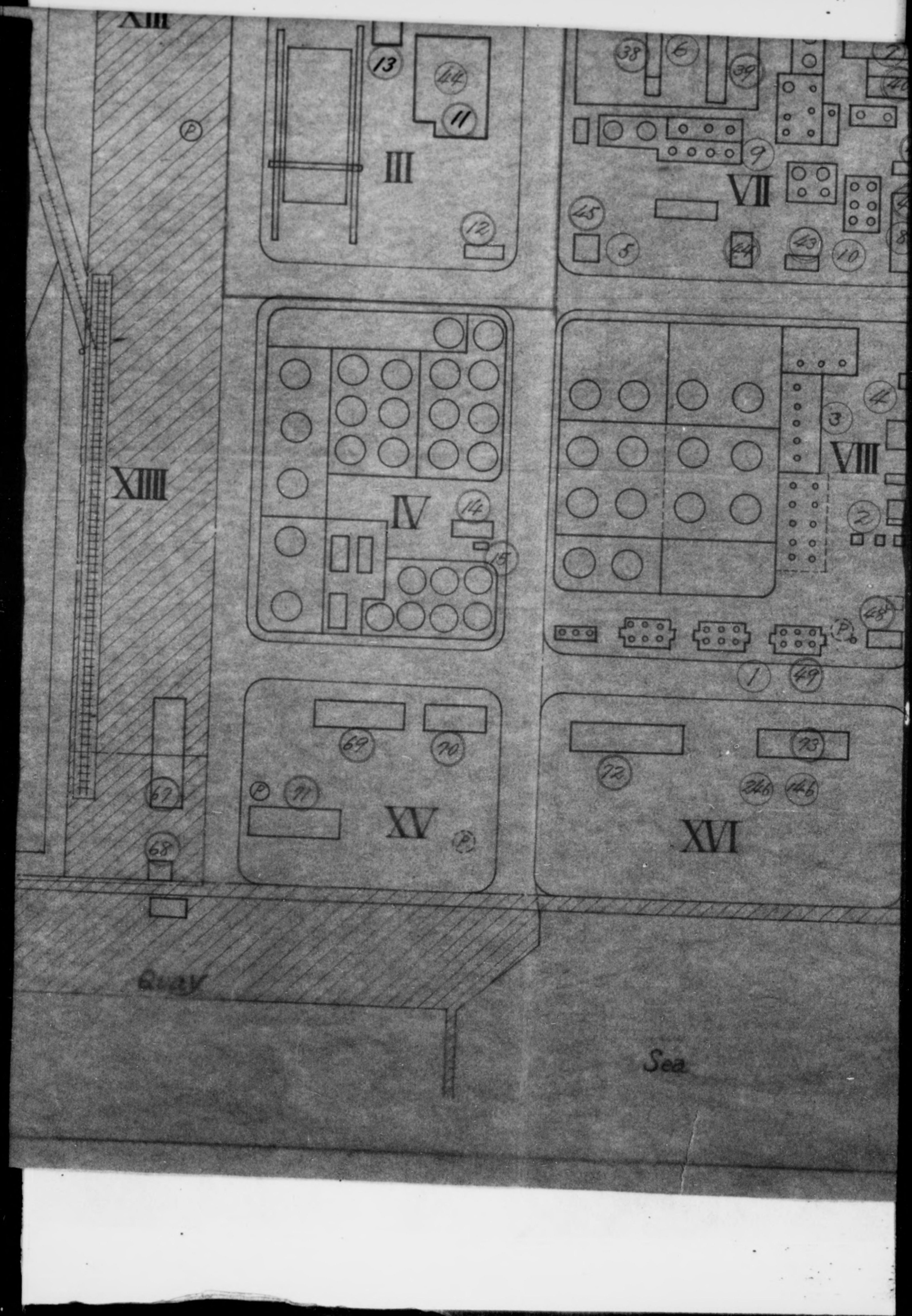
67

68

71

Quay

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775013



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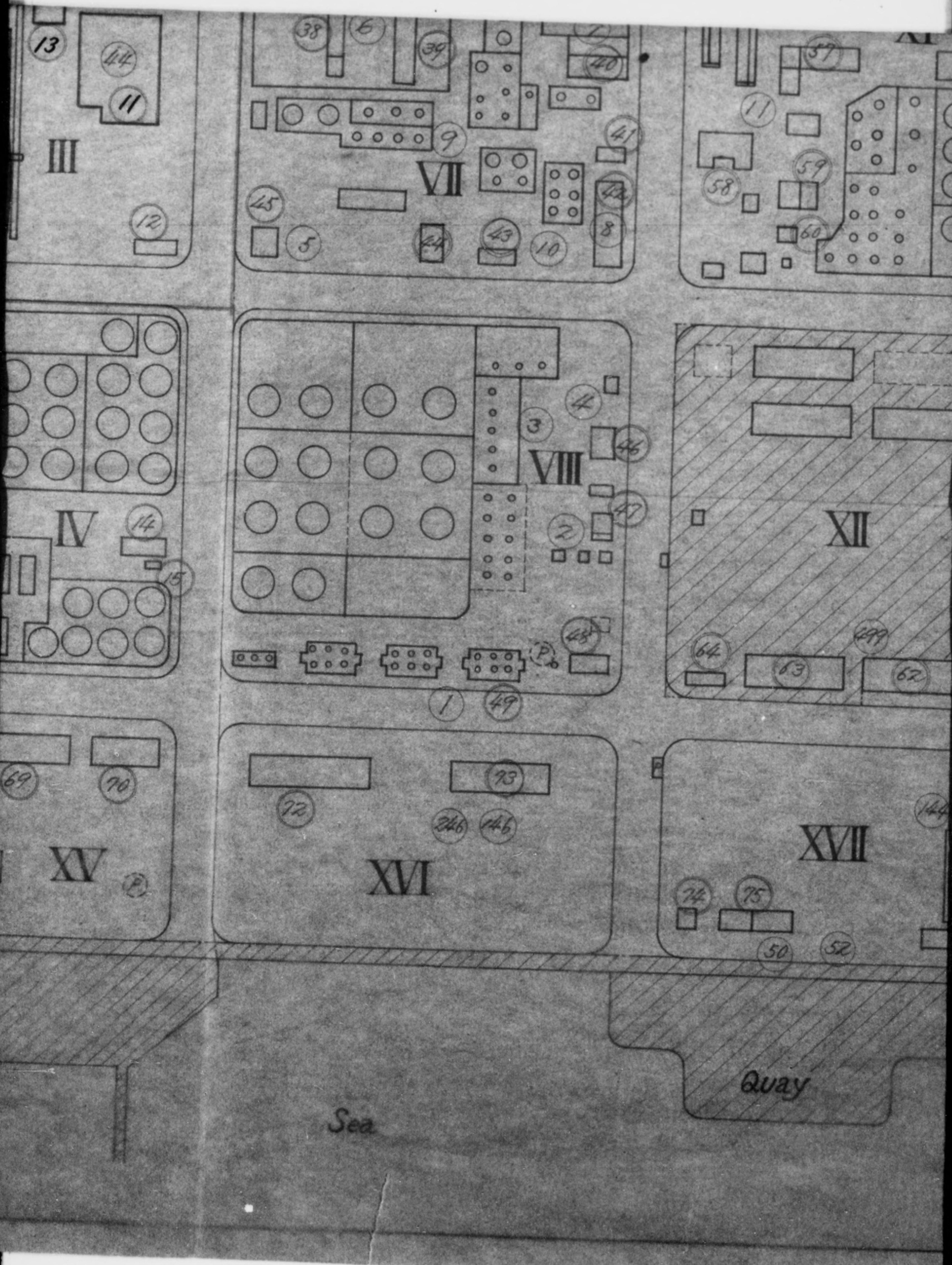

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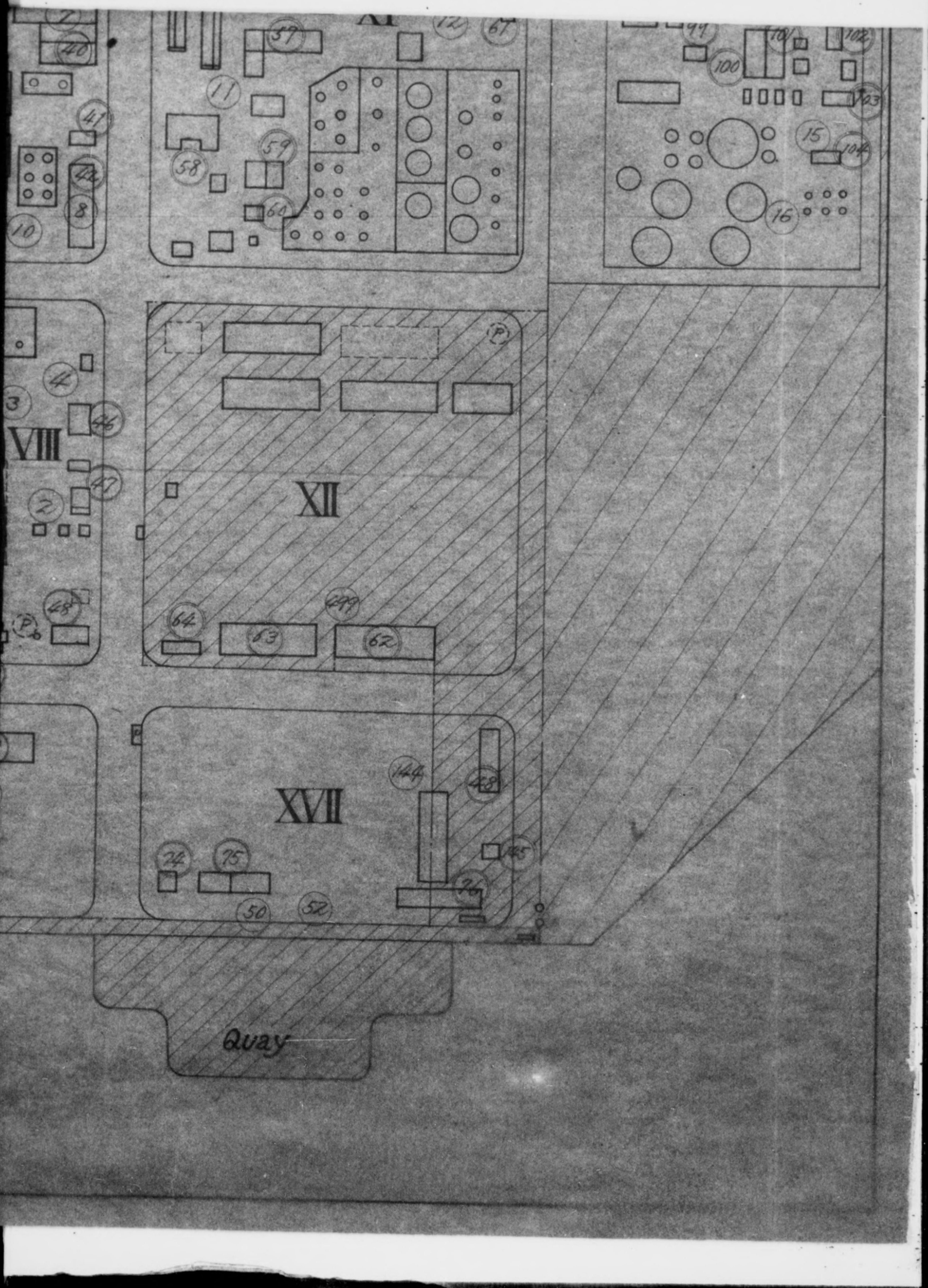


DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775013

FLOW SHEET OF AMMONIA SYNTHESIS

(40 TONS PER DAY).

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775013

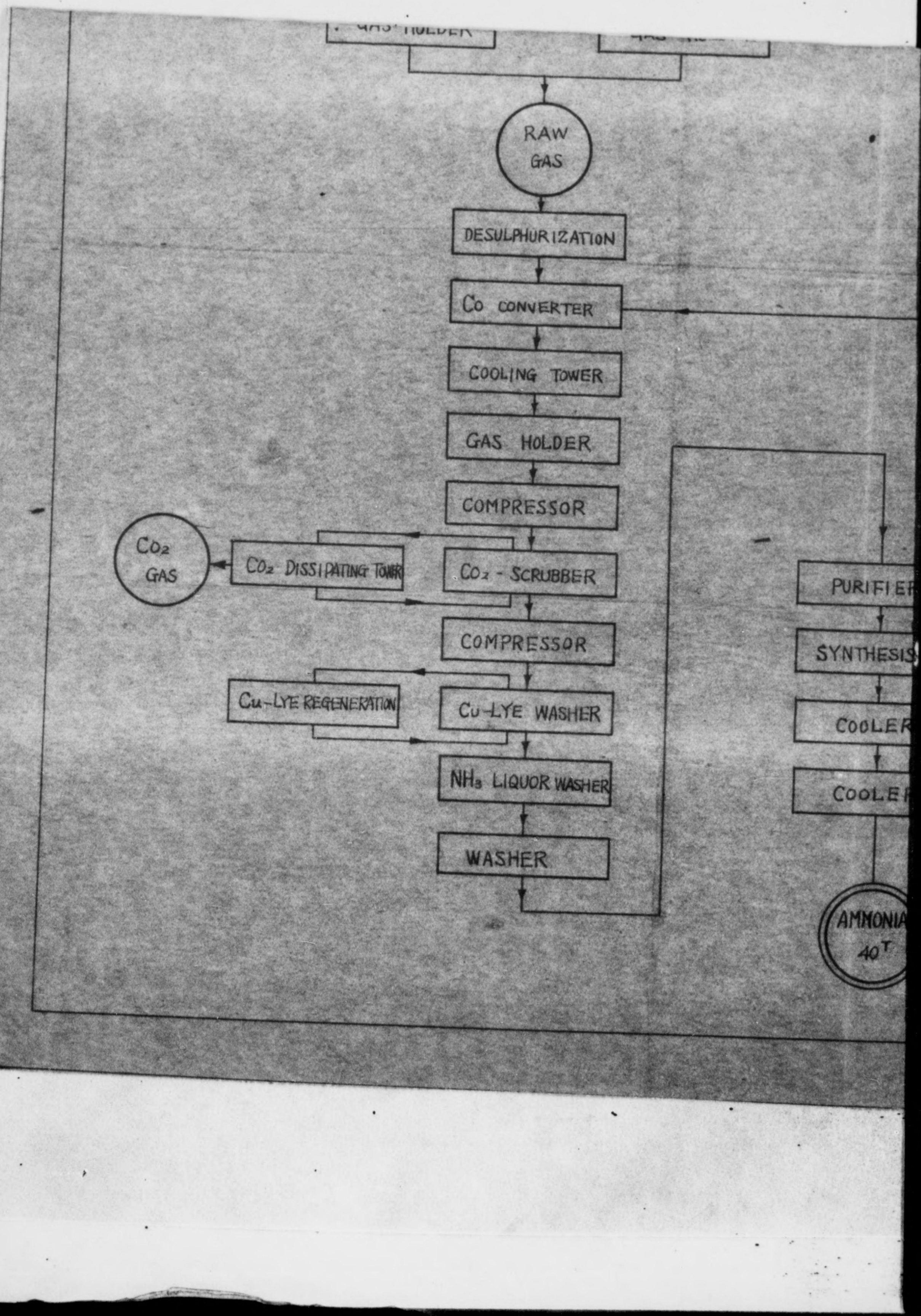
EET OF AMMONIA SYNTHESIS PROCESS

(40 TONS PER DAY)

TOKUYAMA SODA CO., LTD.

AUG. 1949

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775013



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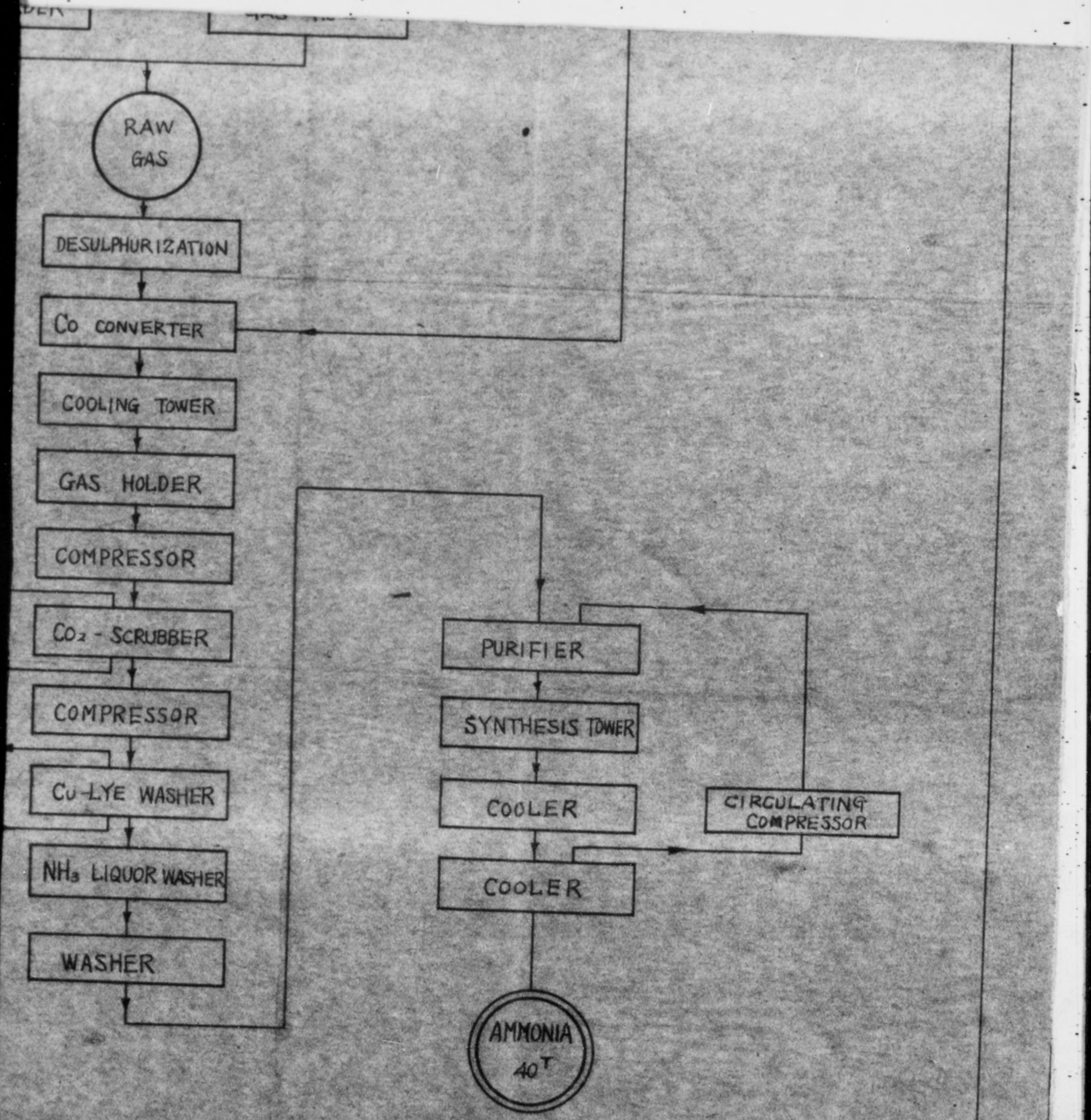

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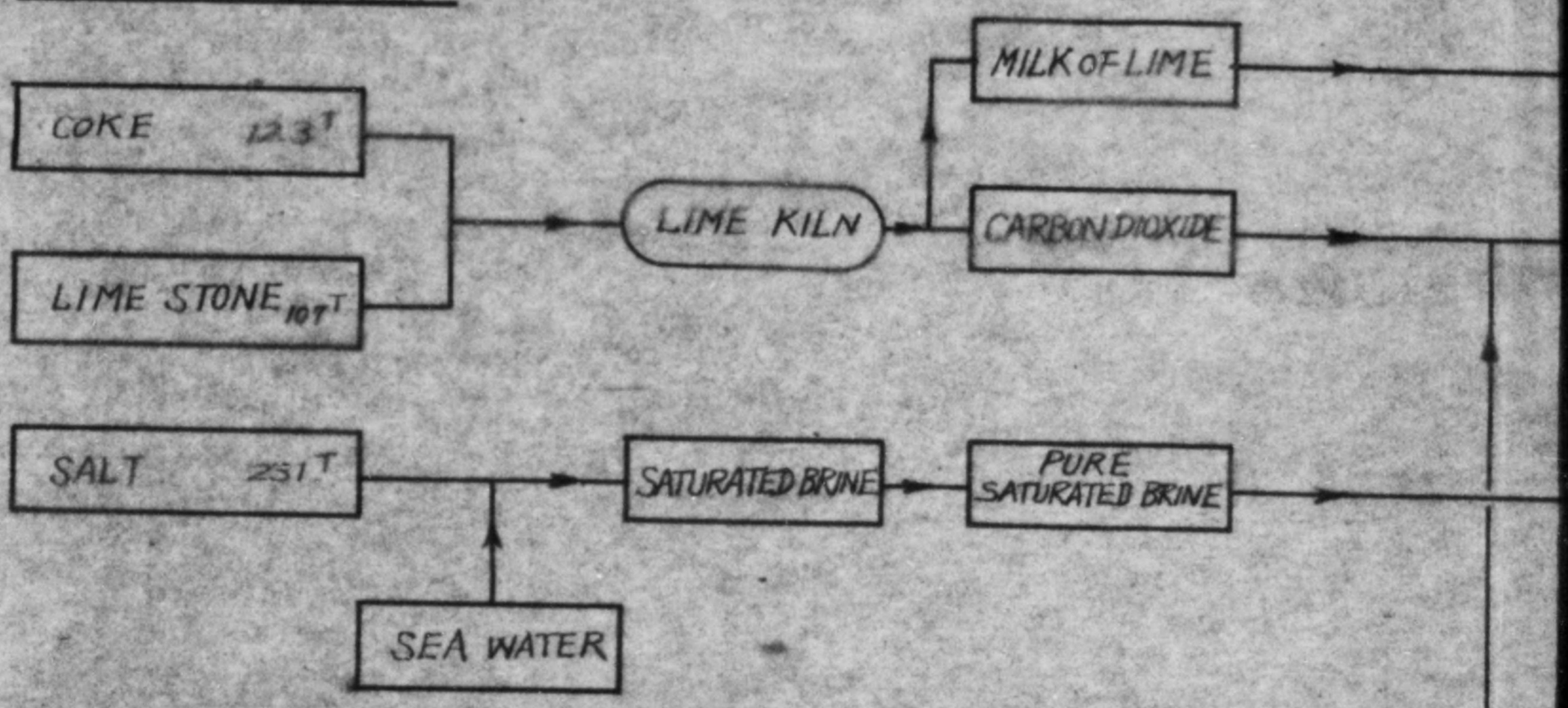
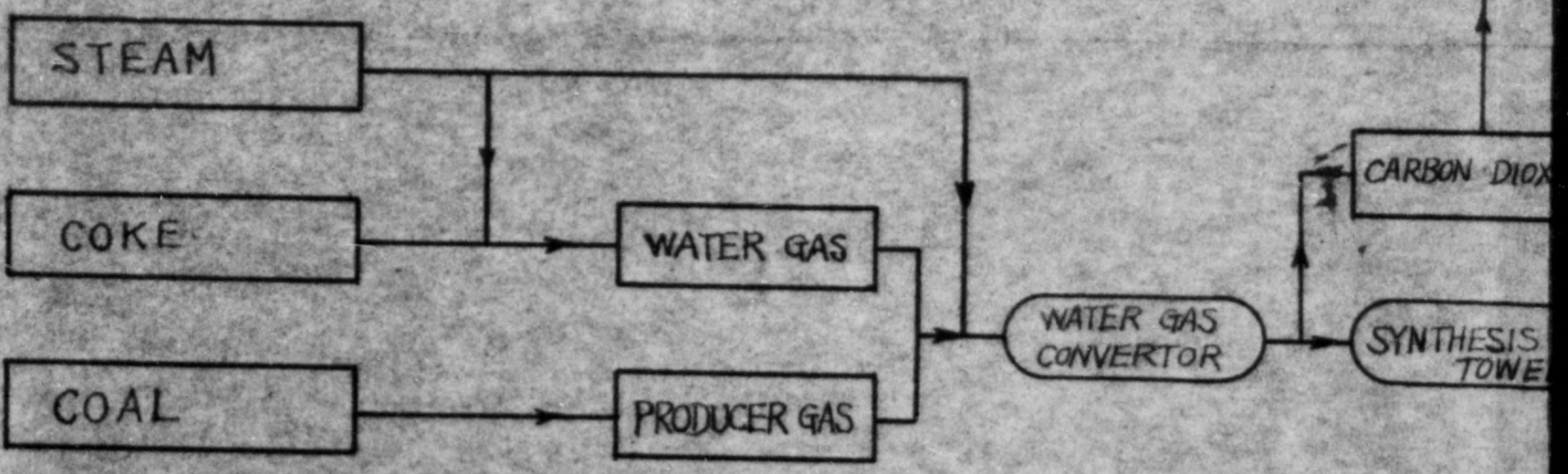
FLOW SHEE

SODA ASH PLANT



AMMONIA PLANT

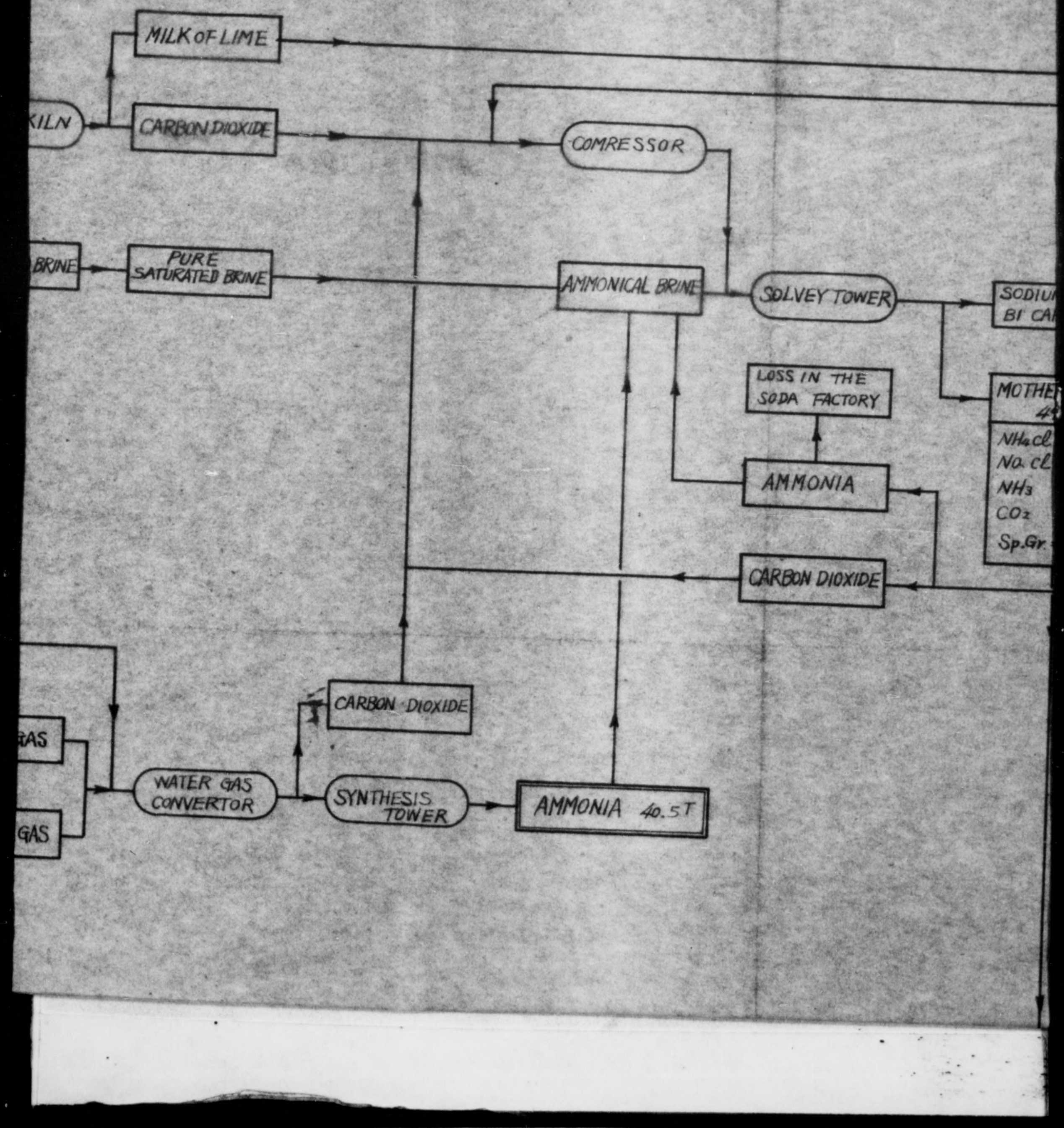


FERTILIZER PLANT

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775013

FLOW SHEET OF AMMONIUM CHLOR

(150 TONS PER DAY)



DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775013

AMMONIUM CHLORIDE FERTILIZER

(50 TONS PER DAY)

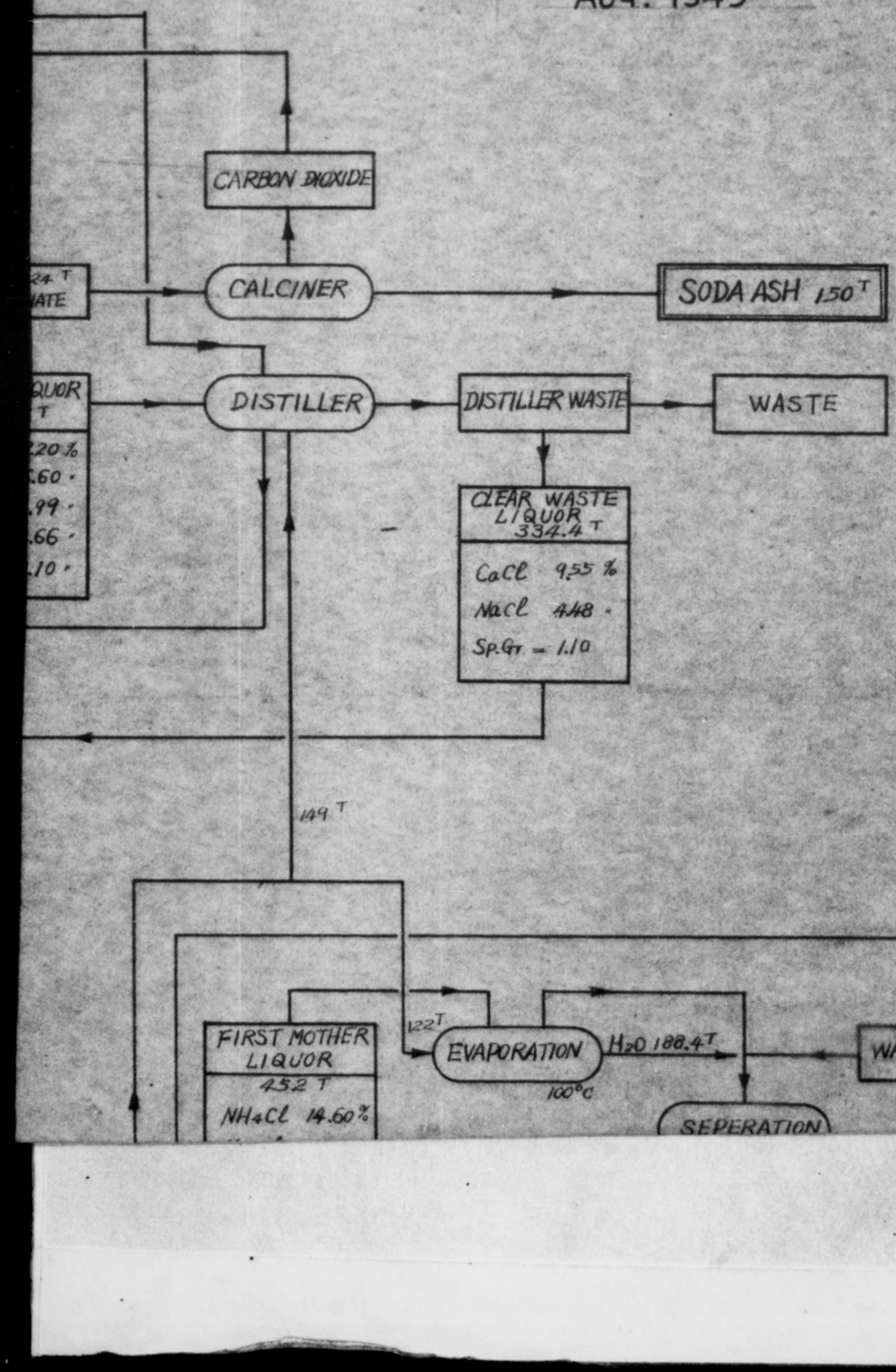
TOKUYAM SODA

AUG.

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775013

E FERTILIZER

TOKUYAM SODA CO., LTD
AUG. 1949



DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775013

SEA WATER

AMMONIA PLANT

STEAM

COKE

COAL

WATER GAS

PRODUCER GAS

WATER GAS CONVERTOR

CARBON D

SYNTHESI TOW

FERTILIZER PLANT

STEAM 188 T

COAL 25 T

CALCIUM CARBONATE 83.7 T

13 T

DRYING

MIXED MASS 158.9 T

NH_4Cl 78.60 %

$NaCl$ 3.30 .

$CaCO_3$ 18.10 .

LOSSES IN ALL

AMMO CHL

150 T FE

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SODA FACTORY

491.7 T
NH_4Cl 19.20 %
$NaCl$ 6.60 "
NH_3 1.99 "
CO_2 4.66 "
Sp.Gr. = 1.10 "

AMMONIA

CARBON DIOXIDE

CARBON DIOXIDE

WATER GAS CONVERTOR

SYNTHESIS TOWER

AMMONIA 40.5 T

CALCIUM CARBONATE 83.7 T

DRYING

DRYING

MIXED MASS 158.9 T
NH_4Cl 78.60 %
$NaCl$ 3.30 "
$CaCO_3$ 18.10 "

LOSSES IN ALL PROCESS

AMMONIUM CHLORIDE 150 T FERTILIZER

DRYING

AMMONIUM CHLORIDE
126.4 T
NH_4Cl 92.10 %
$NaCl$ 1.40 "
H_2O 6.50 "

REACTION AND PRECIPITATION

SEPARATION

RAW LIQUOR 962.6 T
NH_4Cl 18.90 %
$NaCl$ 7.89 "
H_2O 73.16 "
Sp.Gr. = 1.12

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775013

SODA FACTORY

AMMONIA

CARBON DIOXIDE

491.T T
NH4Cl 19.20 %
Na Cl 6.60 .
NH3 1.99 .
CO2 4.66 .
Sp.Gr. = 1.10 .

CLEAR WASTE LIQUOR 334.4 T
CaCl 9.55 %
NaCl 4.48 .
Sp.Gr. = 1.10

40.5T

149 T

FIRST MOTHER LIQUOR
452 T
NH4Cl 14.60 %
Na Cl 16.30 .
Sp.Gr. - 1.16

122T

EVAPORATION
100°C

H2O 188.4T

SEPER

REACTION AND PRECIPITATION

SEPERATION

AMMONIUM CHLORIDE
126.4 T
NH4Cl 92.10 %
Na Cl 1.40 .
H2O 6.50 .

SEPARATION

SEPERATION

COOLING
15°C

SALT
47.6 T
NaCl 88.20 %
NH4Cl 0.60 .
H2O 11.20 .

LOSSES IN ALL PROC

RAW LIQUOR
962.6 T
NH4Cl 18.90 %
Na Cl 7.89 .
H2O 73.16 .
Sp.Gr. - 1.12

217 T

EVAPORATION
60°C

H2O 384.2 T

BRINE FOR SODA FACTORY
NaCl 39.6 T

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0 %
50 .
9 .
6 .
0 .

CLEAR WASTE LIQUOR 334.4 T

CaCl 9.55 %
NaCl 4.48 .
Sp.Gr = 1.10

149 T

AND TION

TION

QUOR 6 T

8.90 %
7.89 .
73.16 .
1.12

FIRST MOTHER LIQUOR 452 T

NH_4Cl 14.60 %
NaCl 16.30 .
Sp.Gr. - 1.16

122 T

EVAPORATION 100°C

H_2O 188.4 T

WASH WATER 4.2 T

SEPERATION

SEPERATION

COOLING 15°C

217 T

EVAPORATION 60°C

H_2O 384.2 T

SALT 47.6 T

NaCl 88.20 %
NH_4Cl 0.60 .
H_2O 11.20 .

SECOND MOTHER LIQUOR 220.2 T

NH_4Cl 29.90 %
NaCl 14.00 .
Sp.Gr. = 1.22

LOSSES IN ALL PROCESS

BRINE FOR SODA FACTORY

NaCl 39.6 T

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移動を伴ふ賠償指定機械設備の使用許可申請書

昭和二十五年五月廿五日

山口縣德山市大字德山八三五五番地
德山曹達株式會社
取締役社長 蔭山如信

通商產業大臣 殿

一、賠償指定機械設備を使用しようとする工場の名稱（コード番號）及所在地
岩國舊陸軍燃料廠（四五ー五）
山口縣岩國市大字裝束（目下転換使用許可申請中）

二、使用しようとする賠償機械設備の現に屬する工場の名稱（コード番號）
賠償指定區分及び所在地
德山舊第三海軍燃料廠（四五ー七）
山口縣德山市大字德山字新宮

三、移動して使用しようとする賠償機械設備
別紙

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775013

四、移動及び使用を必要とする理由

弊社はアンモニアソーダ法に依りソーダを生産して居りますがア法ソーダ工業の合理化策として鹽安肥料製造の必要を痛感し目下之が計畫を進めてゐます。之れのアンモニア源として岩國舊陸軍燃料廠の裝置を使用すべく昭和二十四年九月十五日附を以つて御當局に申請中であります。之は

(一)ソーダの主原料たる輸入鹽の三〇%低減

(二)ソーダ生産價格の二五%低減從つて化學工業の基礎産業たるソーダ工業の確立

(三)低廉なる鹽安肥料（硫安肥料に比し鹽安年産五万屯の場合は一五%年産十万屯の場合は二五%廉價）の生産による食糧增産への寄與

(四)鹽安肥料の輸出による外貨獲得

等我國産業經濟再建に寄與する處まことに大であります。從つて、貴省に於ても昭和二十五年度に於ける最主要計畫に計上せられる所以と存じます。

尚本計畫の詳細については添付資料を御參照願います。

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さて岩國舊陸軍燃料廠の適正能力は第一期開安年産五万屯第二期十万屯の計畫をして居りますが現在の一酸化炭素除去裝置は年産三・五万屯に相當するものでありまして、他裝置に比して弱少であります。即ち一酸化炭素を完全に洗滌除去する爲には洗滌塔類の大さが小さく洗滌能力が不充分であります。幸い德山舊第三海軍燃料廠に別紙機械設備表の如き適應品がありますので之を移設轉用しますと、この裝置は約十一万屯に增强され、全裝置に適合することになります。依つて之れが使用許可を仰ぎたく本申請に及ぶ次第であります。

此等申請する塔類は、三〇〇瓩／平方糎の高氣壓で運轉します關係上、材質は特殊鋼を必要としますが現下の、我國技術を以てしては製作不可能であり、又特殊品に屬するもので、これを他工場の遊休品に求める事も不可能であります。

尙現在岩國舊陸軍燃料廠に於ける一酸化炭素除去裝置及德山舊第三海軍燃料廠より移設增强した場合の裝置に就ては別紙略圖御參照願います。

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別紙

使用しようとする賠償機械設備表（国有財産）

德山曹達株式會社

名稱	製作者名	型式、寸度、能力	インベントリー番號	稼動休止の別	員數	備考
ガス分離塔	呉海軍工廠	竪型、容量一・六立方米 三〇〇瓩／平方糎〇・六六×五米	四五—七—二四一（四四）	休止	一	
ガス洗滌塔	仝右	竪型、容量一・六立方米 三〇〇瓩／平方糎〇・六六×六米	四五—七—二四一（四五）	仝右	一	
ガス分離塔	仝右	竪型、容量一・六立方米 〇・六六×六米	四五—七—二四一（四七）	仝右	一	
熱交換器	仝右	竪型、容量、寸度、耐壓、不明	四五—七—二四一（四八）	仝右	一	
仝右	仝右	仝右	四五—七—二四一（四九）	仝右	一	
高壓塔	仝右	竪型、容量一・七八立方米 〇・六六×六米	四五—七—二四一（五三）	仝右	一	
合計					六	

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承諾書

昭和二十五年四月十日

賠償指定機械設備を使用しようとする者

徳山曹達株式會社

取締役社長　山陰如信

大藏大臣殿

徳山曹達株第三海軍燃料廠（コード番號四五―七）に關する別紙（申請書に添付）賠償指定機械設備を岩國海軍燃料廠に移動搬入したる後は右工廠の保全管理責任者に對し當者が責任を負擔することを承諾する

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別紙

使用しようとする賠償機械設備表（国有財産）

徳山曹達株式會社

名稱	型式、寸度、能力	製作者名	インペントリー番號	稼動休止の別	員數	備考
ガス分離塔	竪型、容量一・六立方米 三〇〇瓩／平方糎〇・六六×五米	呉海軍工廠	四五—七—二四一（四四）	休止	一	
ガス洗滌塔	竪型、容量一・六立方米 三〇〇瓩／平方糎〇・六六×五米	仝右	四五—七—二四一（四五）	仝右	一	
ガス分離塔	竪型、容量一・六立方米 〇・六六×五米	仝右	四五—七—二四一（四七）	仝右	一	
熱交換器	竪型、容量、寸度、耐壓、不明	仝右	四五—七—二四一（四八）	仝右	一	
仝右	仝右	仝右	四五—七—二四一（四九）	仝右	一	
高壓塔	竪型、容量一・七八立方米 〇・六六×五米	仝右	四五—七—二四一（五三）	仝右	一	
合計					六	

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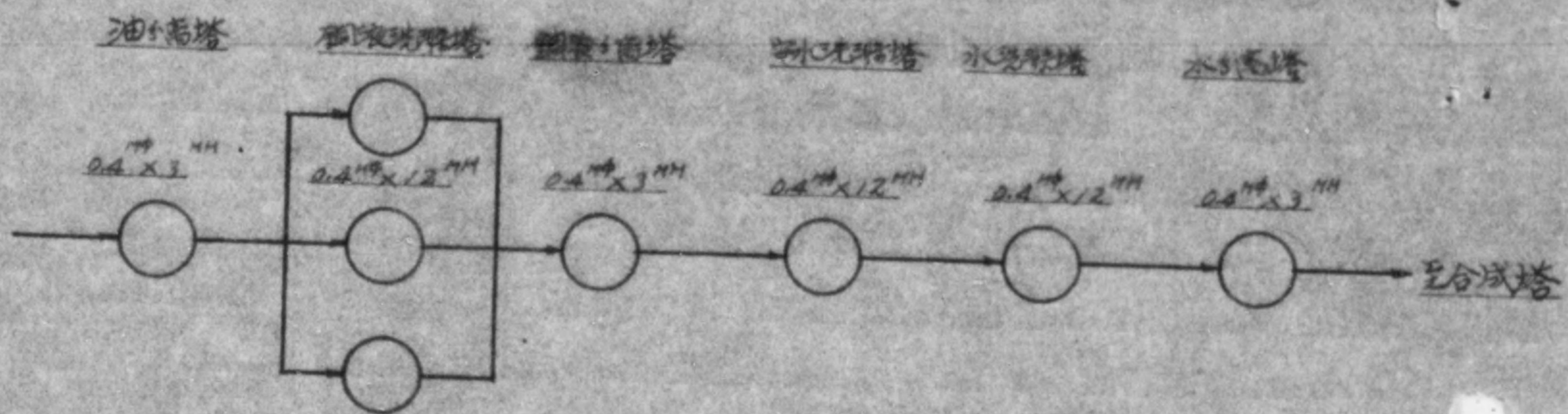
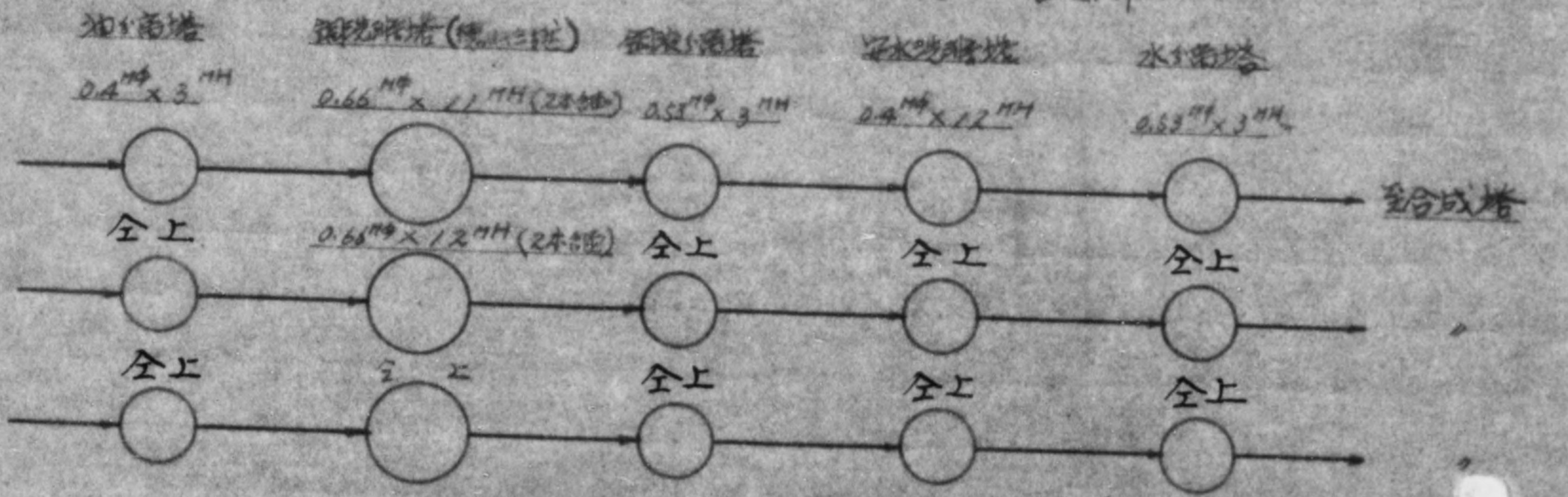
一酸化炭素除去装置略図

25. 4. 8.

現在ニ於ケル旧岩国陸軍燃料廠ノ設備



第三海軍燃料廠高圧塔ヲ利用シタ場合ノ設備



DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775013

寫

賠償指定工廠の轉換申請書

昭和24年9月15日

宛　大藏大臣　池　田　勇　人　殿

發　山口縣德山市大字德山八三五五番地

德　山　曹　達　株　式　會　社

取締役社長　蔭　山　如　信

1．工廠名及コード番號　　舊岩國陸軍燃料廠　45～5

2．工廠所在地　　山口縣岩國市大字裝束

3．工場種別　　化　學　工　業

4．製產品

現生產品並に數量　　無　し

計畫生產品並に數量　　アンモニア（鹽安肥料用）

		アンモニア	鹽化アンモニア肥料
第1期計畫	年產	14,000 屯	年產　50,000 屯
第2　〃	〃	28,000 屯	〃　100,000 屯

5．轉換の必要性

弊社は30數年間『アンモニアソーダ』法による『ソーダ』製造に從事して居りますが。これが合理化の一端として鹽安肥料について10數年來研究を重ねた結果肥料として硫安に遜色なく却つて有効な働きがある事が確認されました

現今の狀勢は『アンモニアソーダ』工業として寔に憂慮すべき狀態にあります。即ち補給金の全廢及び低操業度による價格の高騰等は最も重要な問題で之れが對策としては鹽安肥料を副產するより外ないのであります

『ソーダ』の製造工程に於て電曹を濾過した液（母液）には鹽安19％．食鹽7％程度を含有してゐますのでこれを蒸發濃縮しますと鹽安を副生し又食鹽を回收出來るのであります

從來母液は石灰乳を蒸溜して『アンモニア』を回收してゐましたが．これが爲石灰石。コークス（又は無煙炭）及び水蒸

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汽を多量に要し、其の上食鹽（約３０％）は流失してゐた譯であります。即ち鹽安を副生しますと原鹽の「ナトリウム」分のみでなく鹽素も完全に利用出來且つ石灰石「コークス」水蒸汽電力及び勞務等の節減をなす事が出來ますので「ソーダ」の生産費は中常り18,300圓より14,600圓に低下します

次に鹽安は硫安に比して高價なる硫酸を使用する必要がありませんので、それだけ低廉なる肥料となり同時に貴重なる硫黄資源の濫用を防止することになります

この鹽安製造に於て最も重要なる部分は「アンモニア」製造装置でありまして「アンモニア」供給源を確保する事は經營上眞に重要な事でありますが幸舊岩國陸軍燃料廠の分解水素添加装置及び瓦斯發生装置を轉用しますと高壓水添塔の内部構造を一部改造する外何等の變更を加へる事なく「アンモニア」を生産する事が出來るのであります

此等の水素添加装置は現在我國に於て新らしく製作する事は殆んど不可能であり新設するとしましても數十億の資金及び３・４ケ年の長年月を要するのであります

以上述べました如く本計畫によつて

１・輸入原料鹽の３割低減

２・低價格の「ソーダ」生産（約２５％低下）從つて化學工業の基礎産業たる「ソーダ」工業の確立

３低廉なる肥料の増産による食料増産への寄與

４肥料の輸出による外貨獲得

等我國の産業經濟再建に寄與する事大なるものと信じ之が轉換使用を許可され度く本申請に及ぶ次第であります

６・前述の生産に必要なる賠償施設

土　地	91,689坪	（56873坪（46.475エーカー） 34,846坪（28.059エーカー）返還地）
建　物	6,048坪	（4.9エーカー）
機械及設備	1,543件	

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附表　使用しようとする機械及び施設表

申請者　薩山如信

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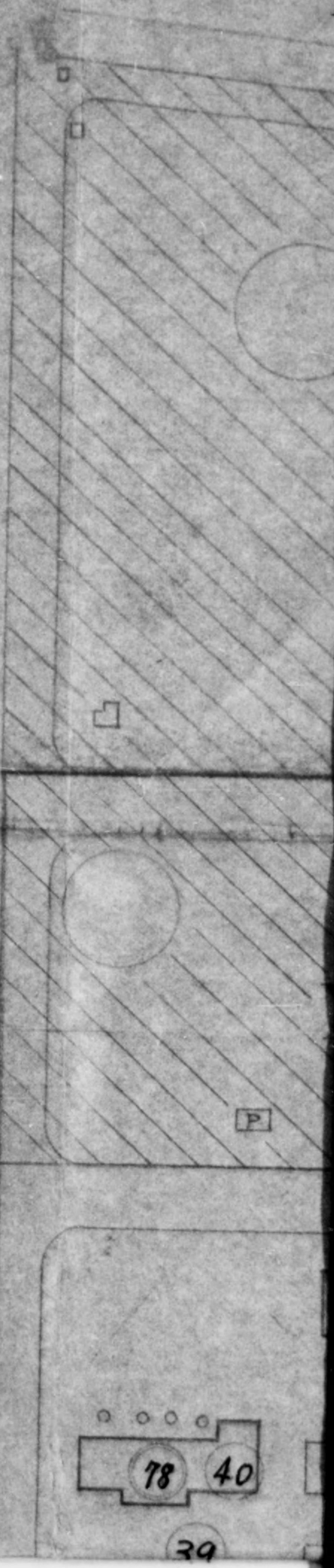
PLAN OF FOR

IN

INVEN-TORY NO.	PLANT NO.	NAME OF PLANT
F1	/	LUBURICATING OIL PLANT
F1	5	VACUM DISTILLATION PLANT
F1	10	ACID WASHING PLANT
6	6	SOLVENT EXTRACTION PLANT (DUO-SOL)
7	7	DEWAXING PLANT (BARI-SOL)
F1	8	CONTACT RERUN PLANT
36	36	SOLVENT EXTRACTION PLANT (EDELEANU)
F1	499	DRUM CLEANING PLANT
F1	146	DRUM FILLING PLANT
F2	/	CRUDE OIL DISTILLATION PLANT
F2	21	NNO TIPE (2UNITS)
3	3	CONTINUOUS GASOLINE TREATING PLANT
F3	34	HYDRO CRACKING PLANT
F4	25	WATER ELECTROLYSIS PLANT
F4	26	OXYGEN FILLING PLANT
F5	/	HYDROGEN PRODUCTION PLANT
F5	27	WATER GAS PLANT (P.G.C.)
F5	28	METHANE CRACKING PLANT (KOPPERS)
F5	29	CO CONVERTER
F5	31	CO REMOVING PLANT
F5	30	CO_2 REMOVING PLANT
F5	33	HYDROGEN PURIFICATION PLANT
F5	32	NITROGEN GAS SEPARATION PLANT
F5	277	LIQUID AIR SEPARATION PLANT
F6	43	ALCOHOL PLANT
F7	499	DRUM MANUFACTURING PLANT
/	/	CRACKING PLANT



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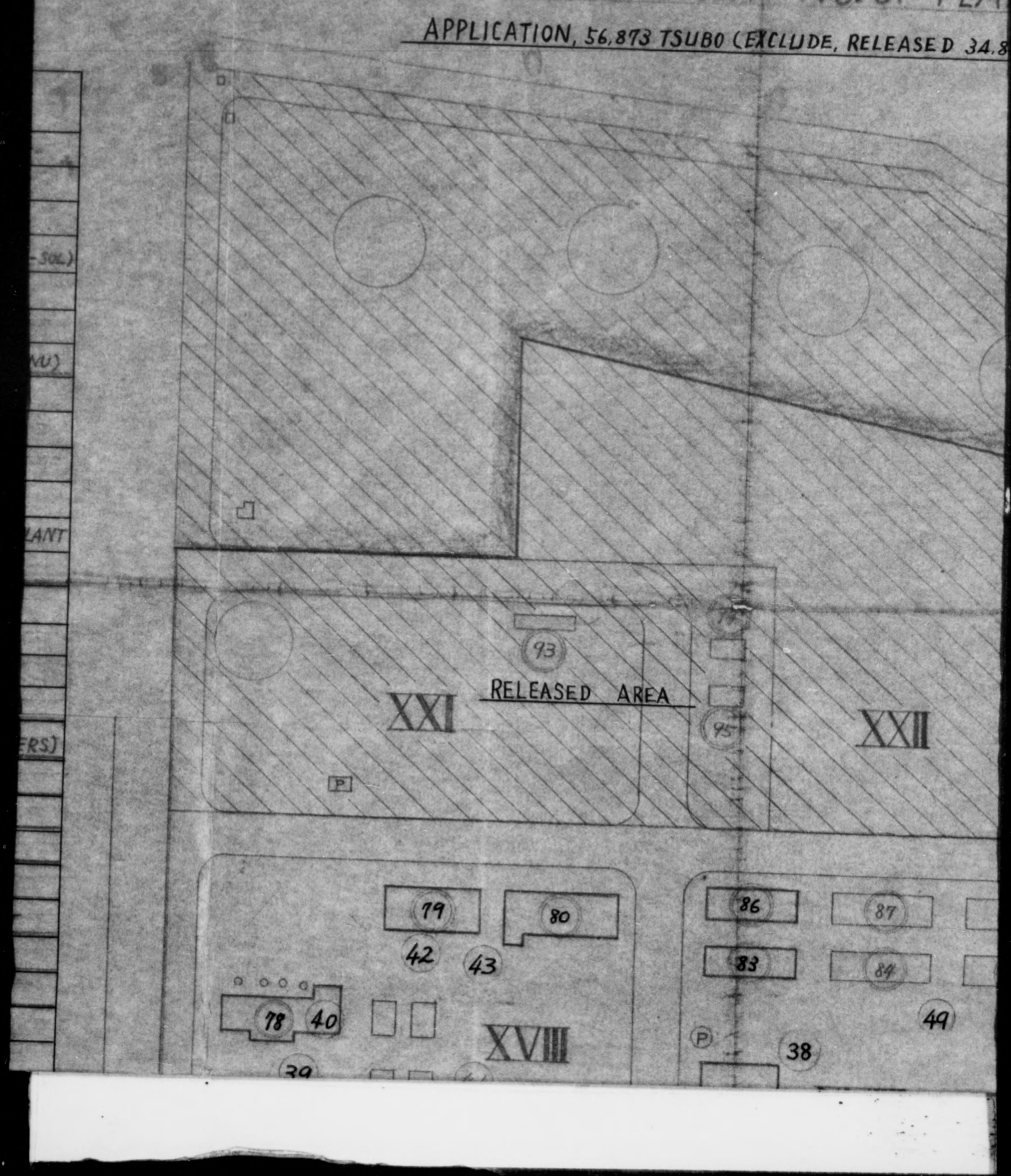
PLAN OF FORMER IWAKUNI ARMY

INDICATING INVENTRY NO. OF PLA

APPLICATION, 56,873 TSUBO (EXCLUDE, RELEASED 34,8



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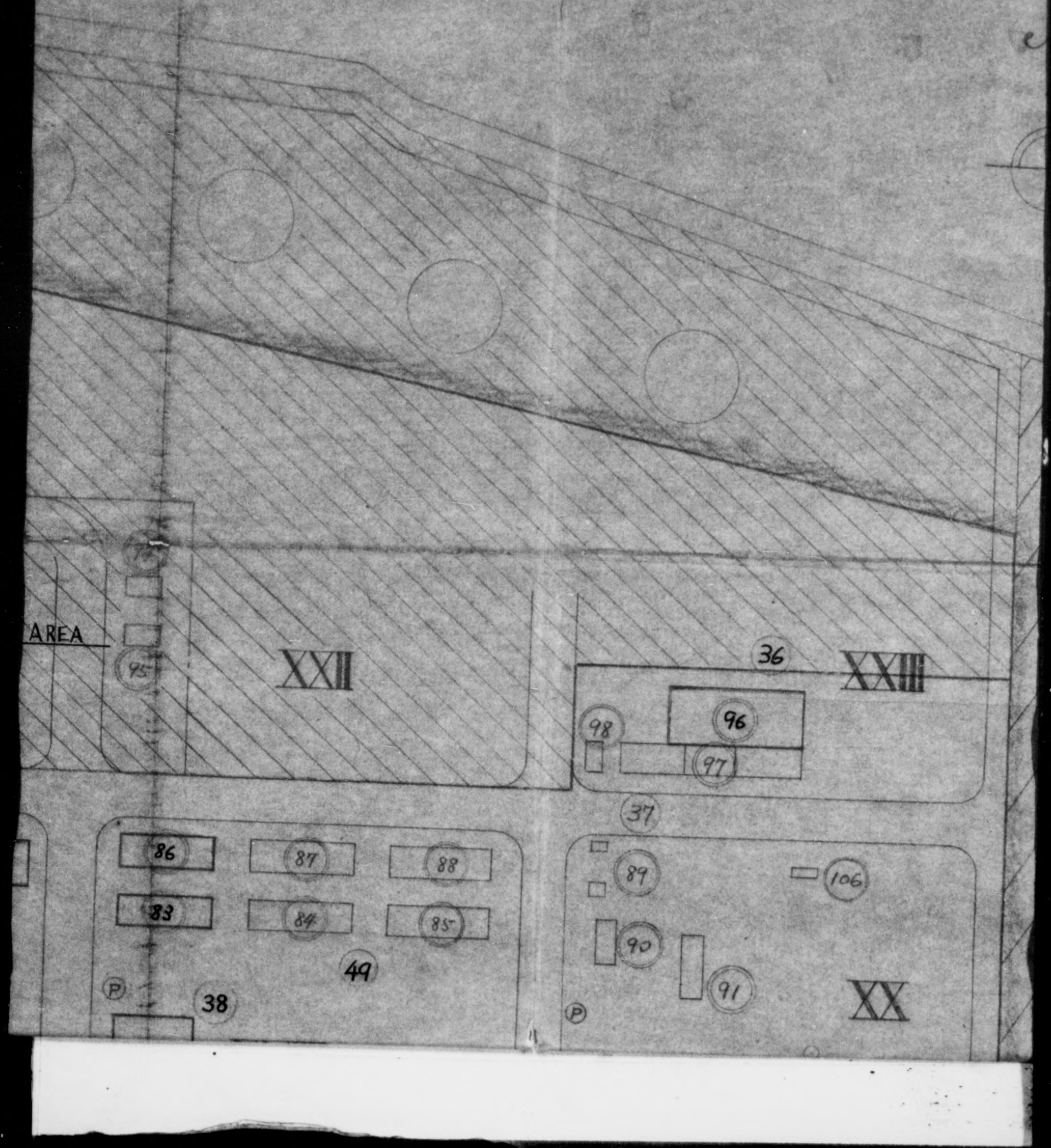
AKUN ARMY FUEL DEPOT

NVENTRY NO. OF PLANTS

373 TSUBO (EXCLUDE, RELEASED 34.846 TSUBO)

SCALE 1/2000



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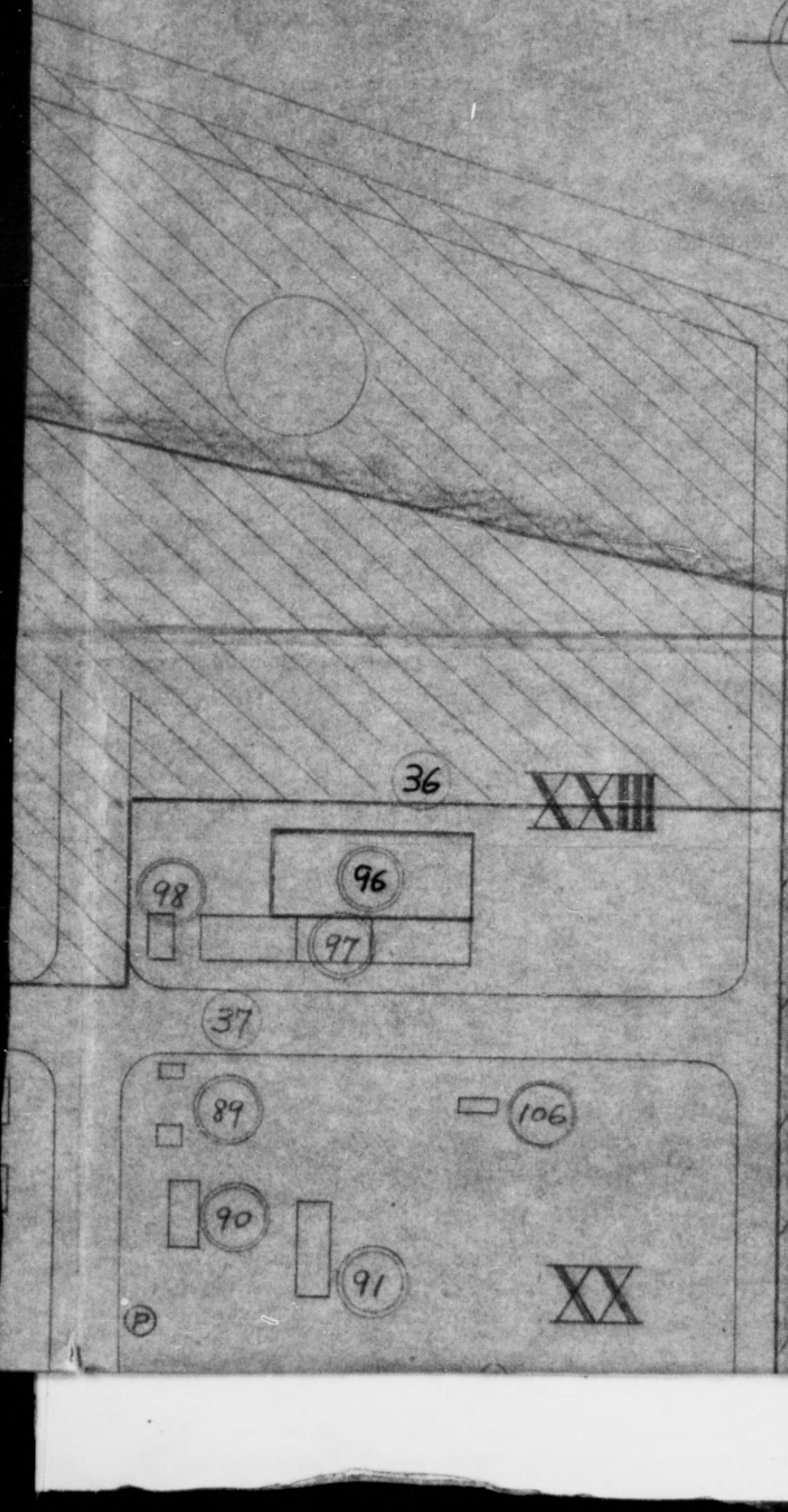
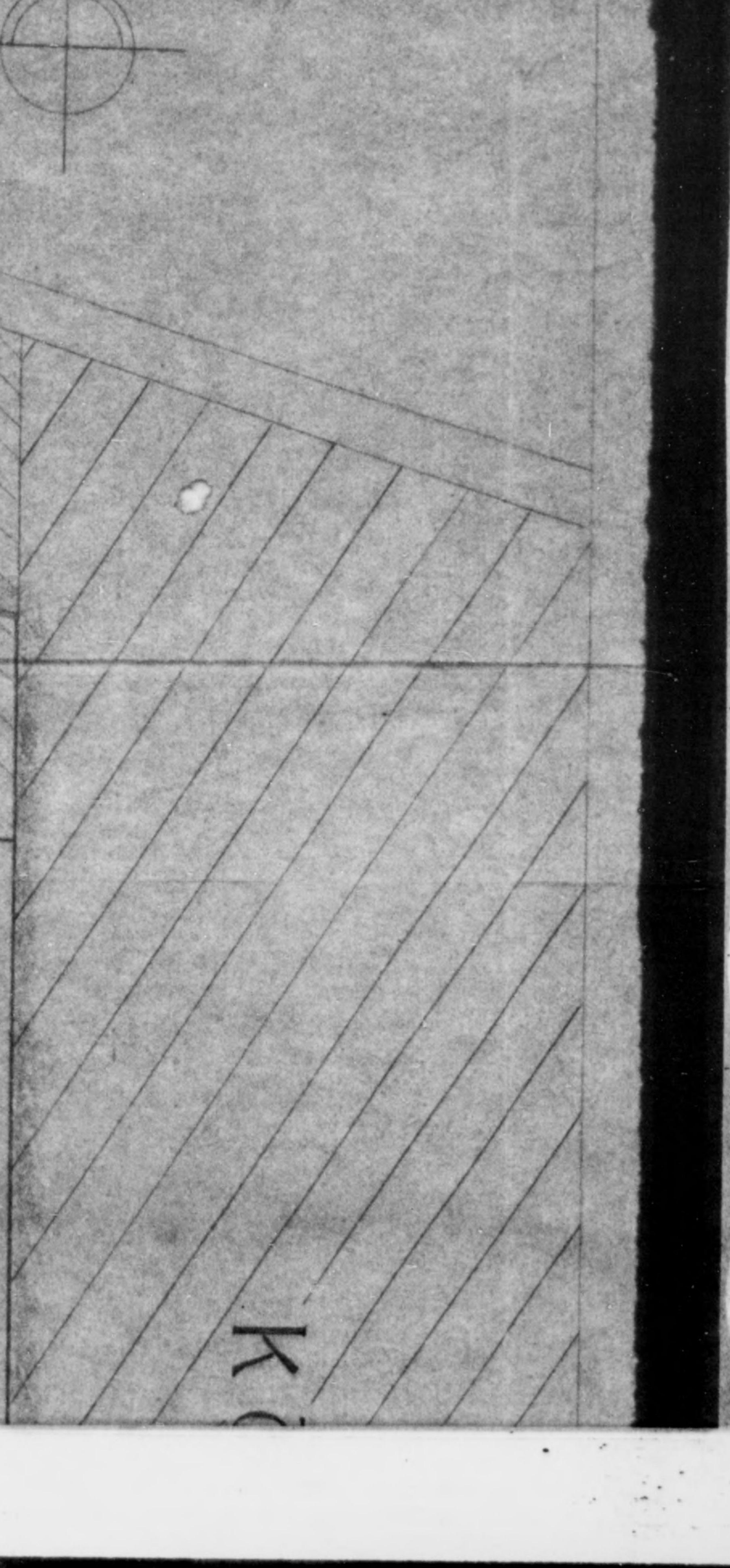
EL DEPOT

(30)

SCALE 1/2000





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F5	28	METHANE CRACKING PLANT(KOPPERS)
F5	29	CO CONVERTER
F5	31	CO REMOVING PLANT
F5	30	CO_2 REMOVING PLANT
F5	33	HYDROGEN PURIFICATION PLANT
F5	32	NITROGEN GAS SEPARATION PLANT
F5	277	LIQUID AIR SEPARATION PLANT
F6	43	ALCOHOL PLANT
F7	499	DRUM MANUFACTURING PLANT
/	/	CRACKING PLANT
22	22	NNC THERMAL TYPE (2 UNITS)
11	11	CATALYTIC CRACKING PLANT (ARMY)
23	23	CATALYTIC CRACKING PLANT(NNK)
12	12	RERUN TOPPING PLANT
F8	4	CLAYTREATING PLANT FOR CRACKED GASOLINE
F8	48	CLAY DRYING FURNACE
35	35	HIGH PRESSURE HYDROGENATION PLANT
F9	/	ISO-OCTANE PLANT
18	18	GAS SEPARATION PLANT
20	20	PROPANE REFINING PLANT
17	17	NO.1 ISO-OCTANE PLANT
F9	39 40	BUTANOL DEHYDRO POLYMERIZATION PLANT
19	19	SPECIAL EMULSION PLANT
F9	41	NO.2 ISO-OCTANE PLANT
49	49	CATALYST PLANT
F10	/	SYNTHETIC LUB OIL PLANT
F10	42	PLANT FOR DESTRUCTIVE DISTILLATION OF RUBBER
13	13	PARAFFINE CRACKING
14	14	OLEFINE POLYMERIZATION PLANT
15	15	CONTACT RERUN PLANT FOR POLY PLANT
16	16	TANK AND PUMP FOR ABOVE PLANT
24	24	PITCH COKE PLANT
F11	38	PRODUCER GAS PLANT
F12	37	HIGH PRESSURE EXPERIMENTAL PLANT
F13	46	STEAM BOILER PLANT
F14	45	HIGH PRESSURE STEAM BOILER PLANT
F15	55	WATER FEEDING PUMP PLANT
F16	50	SEA WATER PUMPING PLANT

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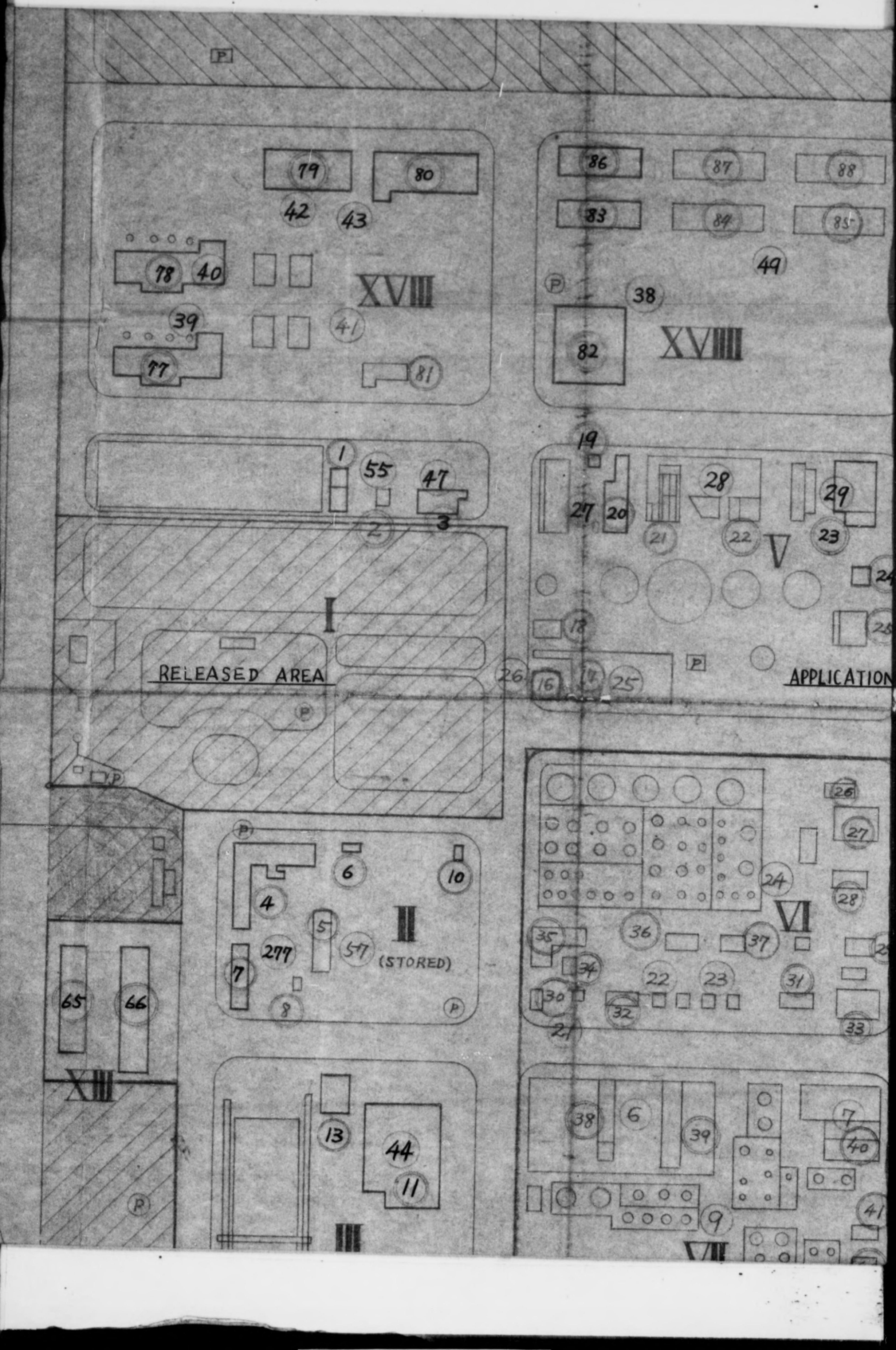

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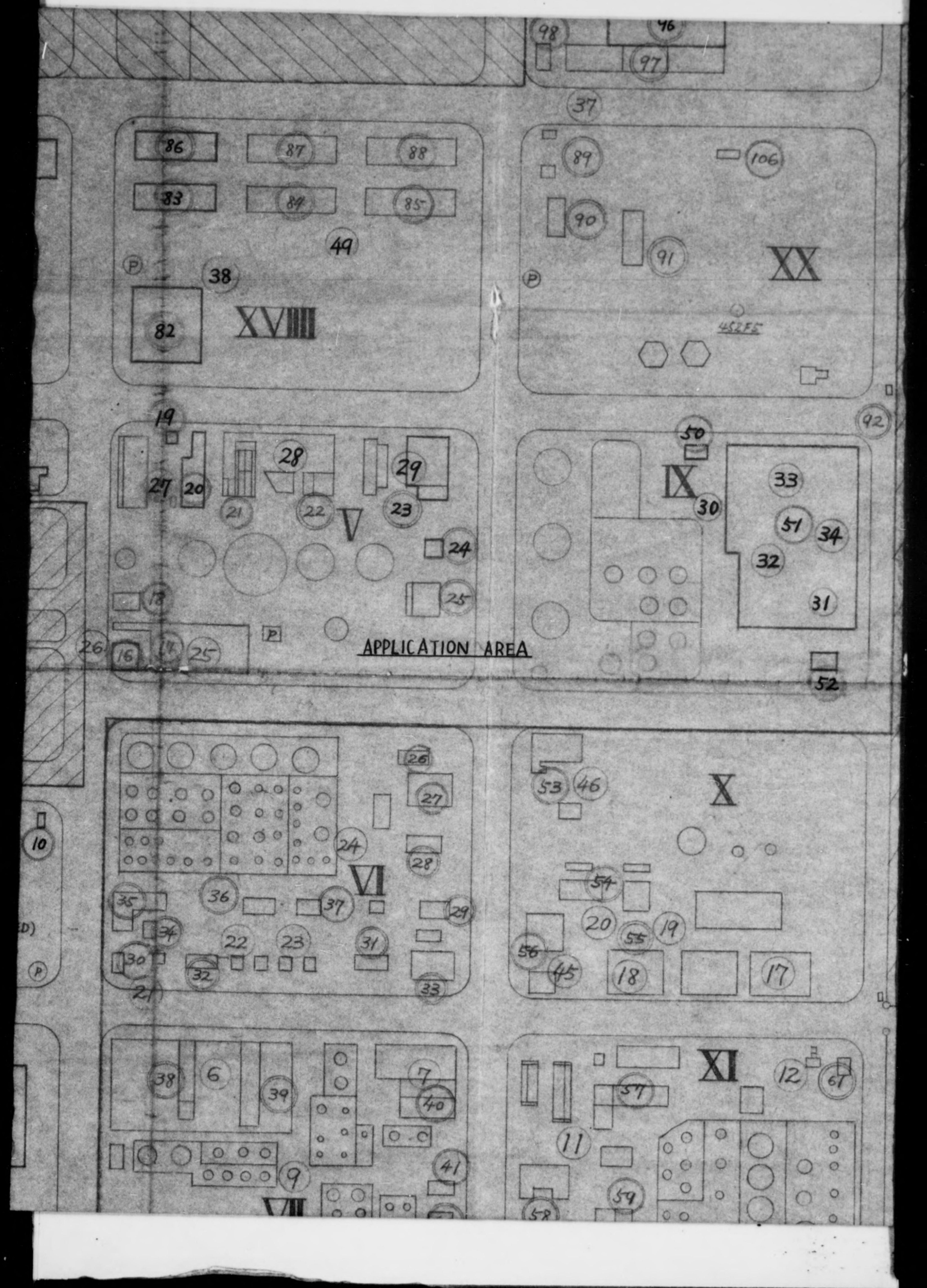

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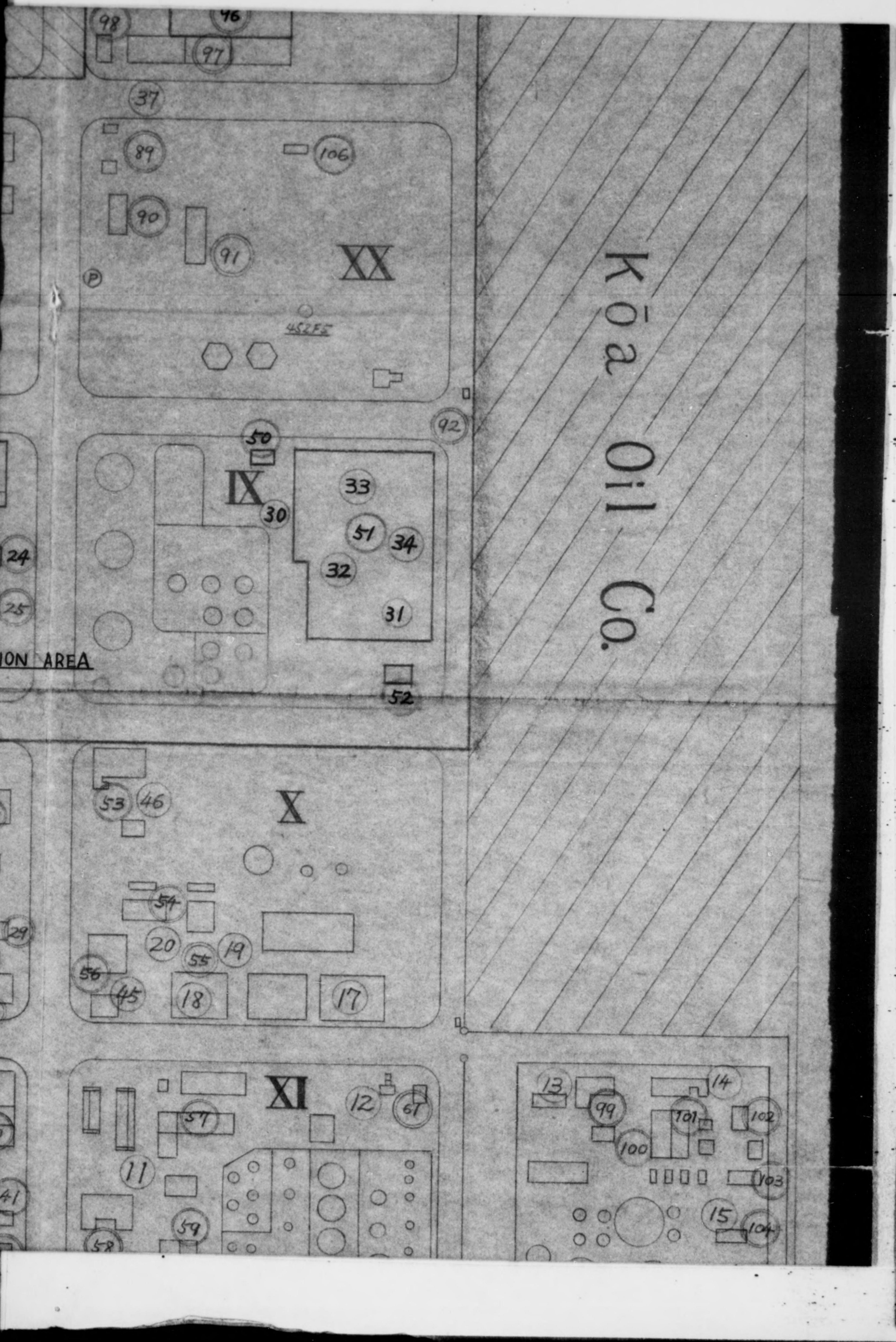

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F11	38	PRODUCER GAS PLANT
F12	37	HIGH PRESSURE EXPERIMENTAL PLANT
F13	46	STEAM BOILER PLANT
F14	45	HIGH PRESSURE STEAM BOILER PLANT
F15	55	WATER FEEDING PUMP PLANT
F16	50	SEA WATER PUMPING PLANT
F17	52	CRUDE OIL TREATING PLANT
F18	144	WASTE ACID TREATIG PLANT
F19	57	5GALS. CAN MANUFACTURING PLANT
F20	246	5GALS. CAN FILLING PLANT
F21	44	POWER STATION
	47	SUBSTATION

: Released Area.

: Plant No.

: Building No.

: APPLICATION BLG.

XIII

XIIII

P

67

68

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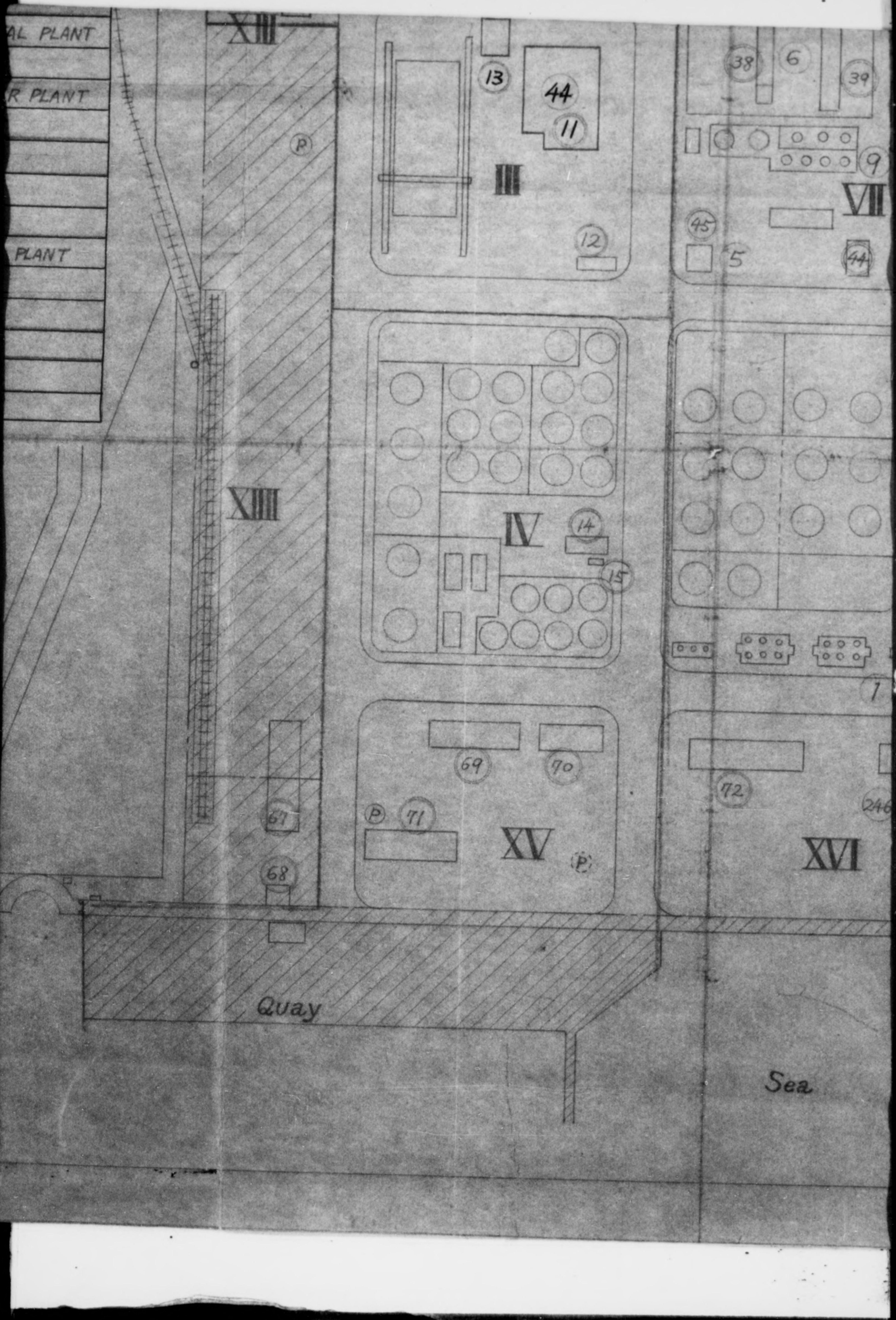

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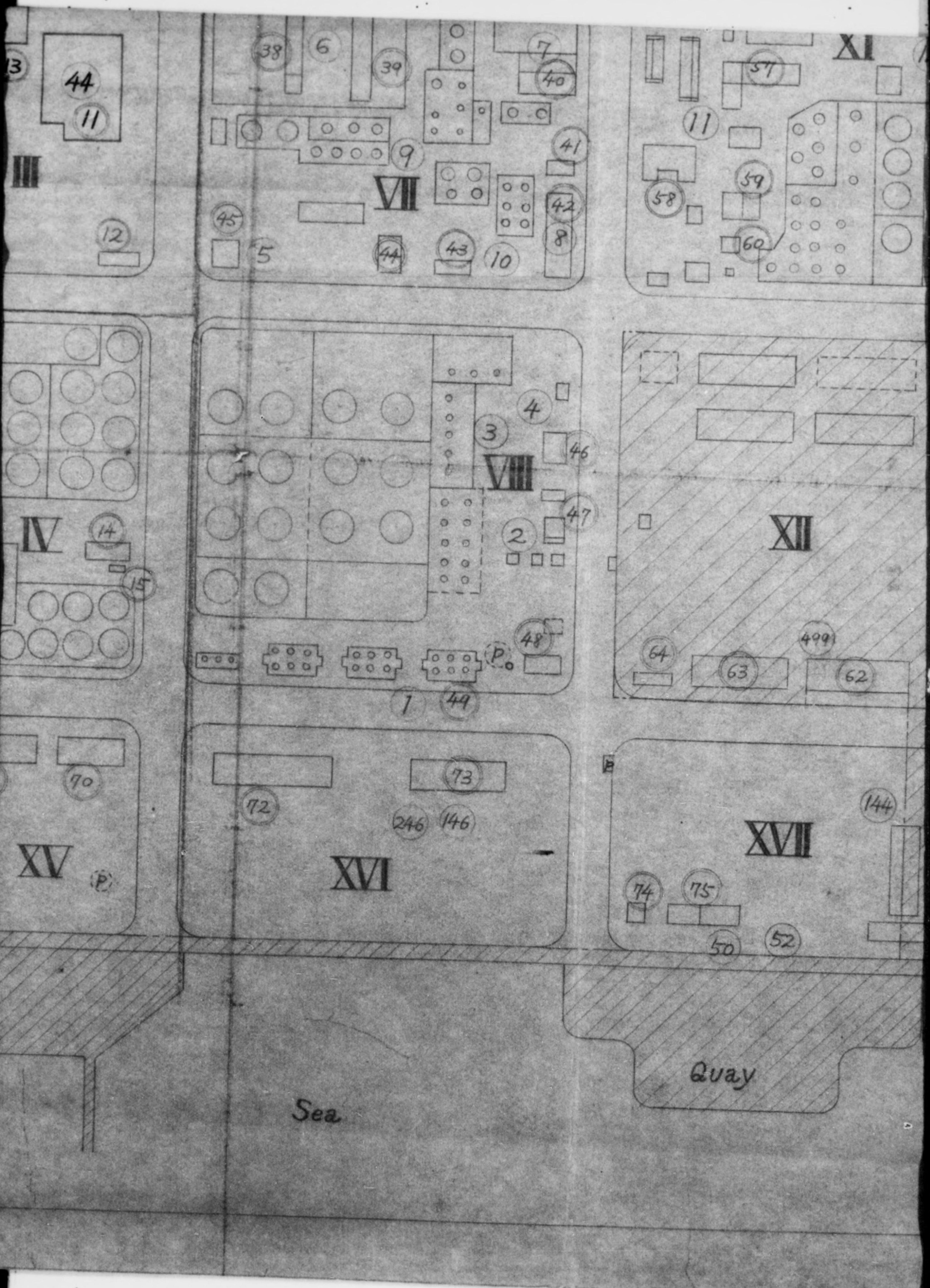

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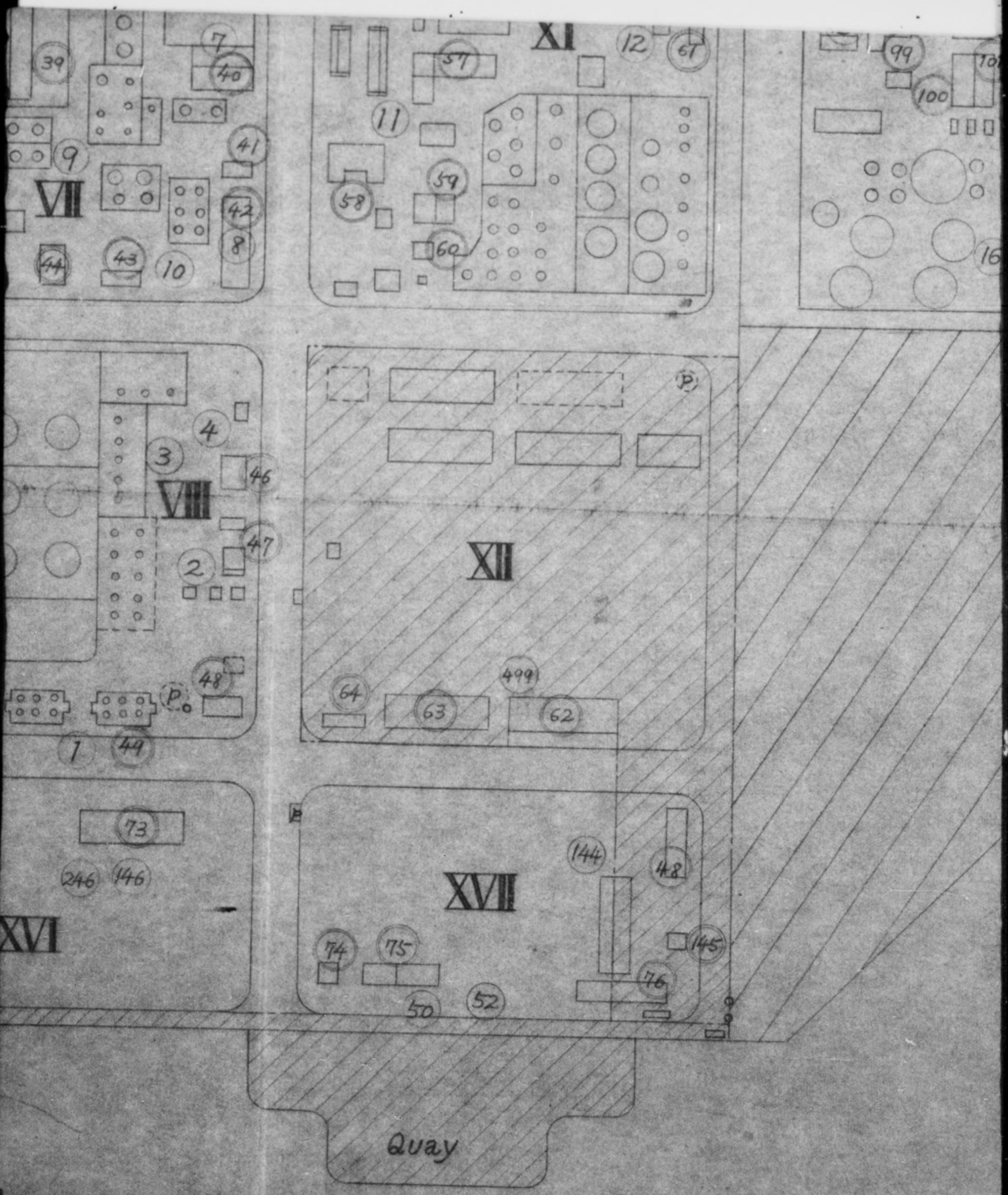

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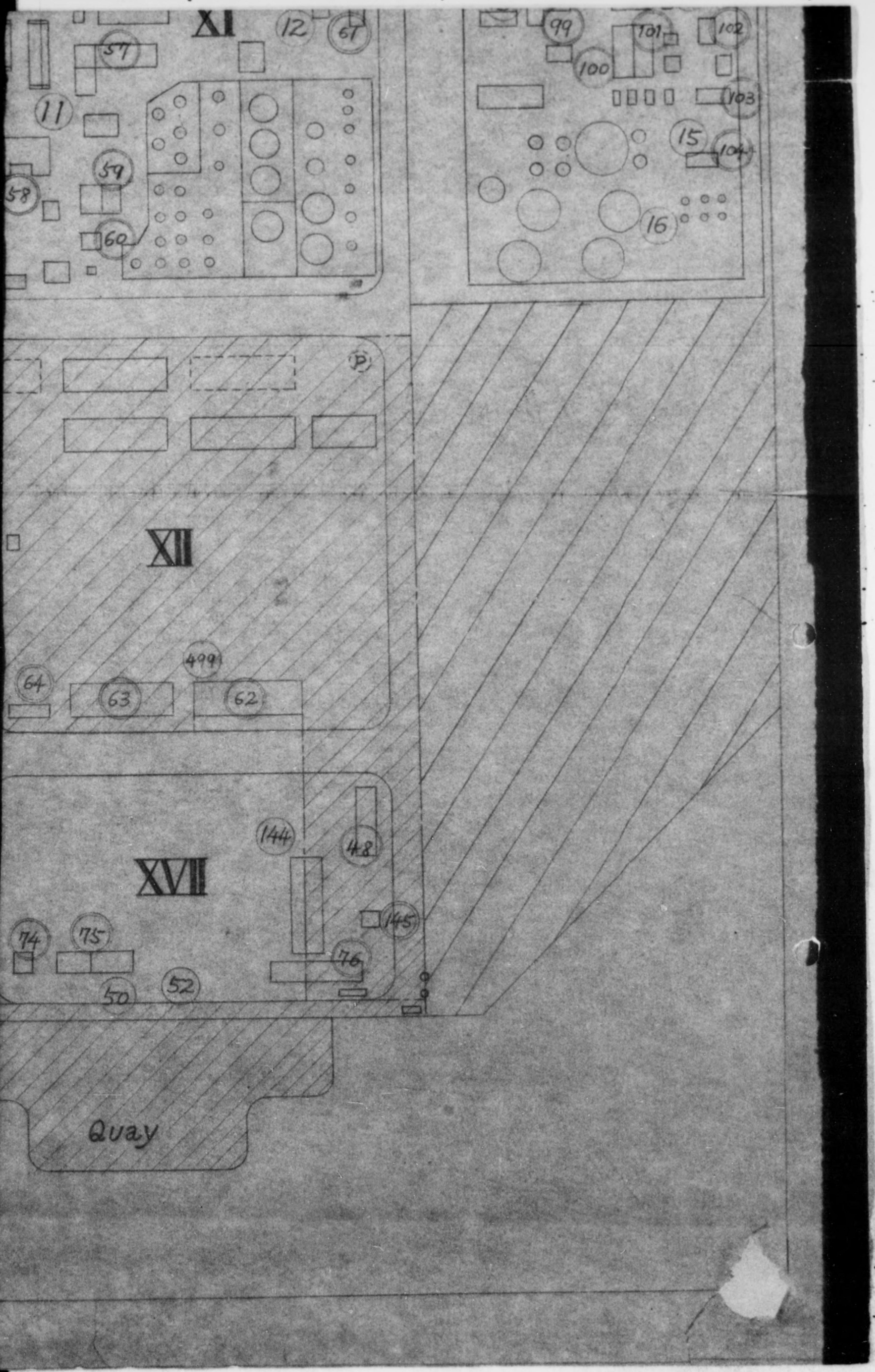

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事業計畫

德山曹達株式會社

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一ノ一、塩化「アンモニア」肥料と弊社
一ノ二、塩化「アンモニア」肥料生産の必要性
一ノ三、ア法「ソーダ」合理化策としての塩安製造
二、本事業計画の概要
二ノ一、「アンモニア」合成設備の概要
二ノ二、塩安製造設備の概要
二ノ三、「アンモニア」合成設備の移設について
二ノ四、本計画による弊社塩安製造方法の概要
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三、製造方法の概要
三ノ一、「アンモニア」合成方法
三ノ二、塩安製造方法
四、塩安肥料の商品価値
五、工場設備計画（所要資材及資金）
五ノ一、「アンモニア」合成工場
(一) 土地
(二) 建物
(三) 機械設備（別紙機械設備明細表添附）
五ノ二 塩安肥料製造工場

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本事業計画の趣旨

一ノ一、塩化アンモニア肥料と弊社

弊社は既に昭和十三年「ドイツ」IG社と折衝して日産「アンモニア」四〇瓲の工場を建設し、「ソーダ」工場に於いて塩化「アンモニア」肥料を製造しようとしたのでありますが、当時の為替管理強化の為、この計画が実現に至らなかつたのは弊社の誠に遺憾とするどころであります。

併し乍ら同年直ちに肥料研究所を工場内に設置し、東京大学農学部春日井教授御指導の元に、塩安肥料が硫安と全く同一肥効を有し殊に水田に於ては土壌の酸性化を防止する長所がある事を確認し、その研究結果は普く学界に認められている所であります。塩安製造については種々な方法が提案されておりますが、弊社は之が工業化の方法についても研究を進め、昭和十六年七月三十一日附商工省より年産二〇〇瓲の中間試験工場の建設を命ぜられ、工業化の試験研究を終了したのであります。其の後、特許一三一三四一号として許可された如く、塩安の製造方法についても種々な研究結果を得ているのであります。

今回茲に本事業計画を申請する所以は、以上に述べました、弊社の従来の研究の結果に基き塩安肥料を製造すれば次の如き時代の要求を満たすことが出来ると確信するからであります。

一ノ二、塩化「アンモニア」肥料生産の必要性

肥料の増産復興は、「食糧の増産と延いては國民経済の恩惠環を断つことが出来る」ので

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ありますが、硫安、過燐酸石灰については硫酸從つて硫化鑛の増産に於て大きな制約を受けます。

そもそも硫酸は「アンモニア」の固定にのみ役立つのであつて、外國の例に見る如く液体「アンモニア」を直接施肥することも可能でありますが、之は日本の現状に於いては困難と思はれます。從つて「アンモニア」の固定剤として「ソーダ」工場の廃棄塩素を利用した新しい塩安肥料の製造が慫慂されつつあるのであります。

一、三、ア法「ソーダ」合理化策としての塩安製造

從來の「ア」法「ソーダ」は電力石灰の価格の「バランス」原料塩が比較的低廉に得られた等の事情に依つて大きな飛躍を遂げたのでありまして、此の期間には弊社以外には餘り塩安製造に関心をもつ向が少なかつたのでありますが　現在の塩事情に於いて低廉な「ソーダ」類を造る為には徹底的な合理化即ち塩の完全利用を計る以外に現在及將來の苦境を切抜ける方法が見出されないのであります。

即ち「ソーダ」製造後の母液中の食塩を回収して再び使用すれば、原塩歩止りは電解法と略ゞ等しくなり、一方食塩中の塩素は「アンモニア」固定に利用し塩安肥料として製品とすれば輸入品である原料塩を完全に利用することになります。

其の他蒸溜工程の縮減に依る石炭原単位の節減「アンモニア」合成に於ける濃厚硫酸「ガス」利用に依る電力節約等に依つて「ソーダ」の製造原価の切下げを行う事が出來、原塩補給金徹廃に對する對策を樹てることが出來るのであります。

將來の塩価が如何になるかは豫想に困難でありますが、假に一五弗五二五〇円とすれ

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は「ソーダ」灰価格は一五九〇〇円（一五〇瓲生産）及一四五〇〇円（三〇〇瓲生産）程度となり、國際価格に輸寄することが出來るのであります。

二本事業計画の概要

二ノ一、「アンモニア」合成設備の概要

弊社は「アンモニア」合成設備を有しないため、山口縣岩國市旧岩國陸軍燃料廠高圧分解水添設備を転換使用することとして、本計画を樹てたのであります。即ち同所の高圧分解水添設備は石油精製に際して生ずる「メタン」の分解装置及附属水素精製装置を除いて其の儘「アンモニア」合成装置として利用されるのでありまして、配管の変更、装置内部の點検修理、破損機器の整備　一部の模様替え、建家補修を要するのみであります。従つて此の場合「アンモニア」年産瓲当り建設資金は二二〇〇〇円（但し整備費用のみであつて建設費は一時使用賃借料として計上し、帳簿価格は第一期五万瓲計画として約一、五〇〇万円であります）で現在新設する場合に比して数分の一であります。

而かも、同所の設備は石油工場よりの水素源を利用した関係上　原料ガス部門に比して合成設備は、餘力があつて塩安換算一〇万瓲の能力を有して居ります。従つて比較的経費のかゝらない原料ガス部門を倍増し、ガス変成設備を五割増とすれば、年産一〇万瓲の設備が完成するのであります。

二ノ二塩安製造設備の概要

岩國工場に於て製造された「アンモニア」は安水及炭酸アンモニア水溶液として、タン

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ク船で徳山工場に輸送します。此の間、海上輸送約五時間で専用タンク船を使用すれば「アンモニア」砲当り一、〇〇〇円程度の費用で輸送することが出来ます。

「アンモニア」工場で副生する炭酸ガスも此の方法に依れば「ソーダ」工場で必要とする量を、運搬することが出来るのであります。

塩安製造設備は、弊社徳山工場にある旧産業設備當團「塩化カリ」第二工場並に「ソーダ」工場現存の遊休設備を主として転用する必要のでありまして、全く新設する設備は蒸発罐二組を主とするものであり、而かも蒸発罐の基礎、建家は総て完成しているのであります。

塩安計画に對応する「ソーダ」製造能力は、塩安一砲に對して略「ソーダ」灰一砲でありまして、「アンモニア」合成工場の能力に対応する「ソーダ」工場の所要生産量は、第一期塩安五万砲に対応しては、「ソーダ」灰日産一五〇砲、第二期塩安一〇万砲に對応しては、「ソーダ」灰日産三〇〇砲であって、之は現在の弊社の生産高及実稼動能力に對応するものであります。

三、「アンモニア」合成設備の移設に就いて

工場経営の本質上、当然「アンモニア」合成設備は「ソーダ」工場内に建設すべきものでありますが、現在岩國燃料廠の設備が賠償の對象である以上、之を移設することは困難であります。從つて、之は將來の問題として当面は現地使用として計画を進めました。もし移設する場合は合成室建家は所要の規模にて新設する外、総て移設するものとして約五億三千万円の費用を要します。然し乍ら此の場合には「アンモニア」の輸送

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費一瓲、約一、〇〇〇円並びに汽罐室、機械工場各一般管理部門の費用（人員として約一〇〇名）瓲当り、約四〇〇円を節約することが出來ます。

本計画に依る弊社塩安製造方法の特長

従來塩安製造方法については、種々な方法が発表されていますが、弊社の方法は次の如き優位の點があります。

㈠ツーアン法の如き高純度の原料塩を必要としないため従來使用してゐた原料塩で充分であります。

㈡「ソーダ」工場に於ける食塩利用率は、日本に於ける最優秀な成績を見せています。

從つて、母液中の塩化「アンモニア」の濃度も高く蒸発用蒸汽は最も少量であります。

㈢冷却温度は、比較的高い為、特別な冷却設備を必要としません。

㈣「ア」法「ソーダ」製造工程は極めて高度に組立てられた方法でありますが、弊社の方法に依れば「ソーダ」製造工程と全く切離して塩安設備を運転することが出來、本來の「ソーダ」工程に悪影響を及ぼすことはありません。

㈤蒸発法に於ける塩安の分解は、蒸発罐の腐蝕を來し、之が最も重大な障害でありますが、目下特許申請中の液自身に浸蝕防止性を与へる方法、並に非鉄物質に依る耐蝕性材料の使用、其の他の補助手段の採用に依つて腐蝕問題の解決には、弊社は充分な自信をもち、又小規模な試験工場にては立派に成功して居ります。

首記の問題に就ては、既に大いに議論された所でありますが、原料塩の補給金廃止

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に際して「ソーダ」灰の原価切下げが幾何になるかは別項述べることに致します。
此の結果に依れば、もし「ア」法「ソーダ」が現状を維持するならば衰滅を免れないのでありますが、塩安肥料製造によつて合理化すれば存続繁栄する機会が恵まれるわけであります。

三、製造方法の概要

三ノ一、「アンモニア」合成方法

「アンモニア」合成は既に良く知られた工業でありまして、熟練技術者も容易に得られます。

今回採用する方法は次の如くであります。

原料「ガス」　「コークス」を原料とする間歇式水性「ガス」法及石炭を原料とする発生爐「ガス」法の混合使用

脱硫　乾式脱流法

炭酸「ガス」除去　常温に依る高圧水洗滌並に「アンモニア」水洗滌

一酸化炭素除去　炭酸銅「アンモニア」法

合成法　三〇〇気圧アウザー式

三ノ二、塩安製造法

帥社特許第一三一三四号に依る、蒸溜廃液に重曹分離後の母液を混合して、炭酸「カルシウム」を沈殿せしめ遊離「アンモニア」を塩化「アンモニア」として固定せしめる塩安製造方法を採用致します。

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炭酸「カルシウム」分離後の濾液は蒸発法に依つて約六〇度で塩安を1/3重析出せしめ更に一五度に冷却することに依り、残りの塩安を結晶させます。塩安結晶分離後の濾液は、再び蒸発して食塩を析出させ、之を高温下で冷却させることなく分離して洗滌し、回収塩として再びソーダ製品に循環使用致します。

以上の方法に依れば、第一蒸発の仕上液、温度及全塩素の定量を行ふことに依つて、容易に作業を管理し得られ、而かも、食塩及塩安結晶が互いに混在することなく、純度の高い製品を得ることが出來るのであります。

肥料としての塩安は、先きに結晶した塩安を圧縮して「フレイク」状と爲し之を適当に粗砕し炭酸「カルシウム」をまぶして、乾燥すれば防湿に適当な粗状塩安肥料となります。

四、塩安肥料の商品的価値

塩安肥料はいはば新製品でありまして、既に独逸及び朝鮮に於いて販賣せられたことはありますが、吾が國に於いては、其の肥効に就て疑問を持たれる方もあると思われます。

此の場合問題になるのは塩安の肥効及吸濕性であります。

肥効に就ては、既に述べた通り、東大農学部春日井教授の御研究がありますが、其の中の一、二の例を引用致しますと、千葉縣下に於ける試験農場で昭和十四年夏作水稲と冬作小麥、昭和十五年夏作水稲と三作合計收量を硫安、硫安石灰、塩安、塩安石灰各地肥区に就て、比較致しますと段当り（三作合計）八石七四、八石七九、八石六四、八石九一と全く同じ結果が得ら

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れています。

土壌酸性化に就ては、寧ろ塩安の方が良い結果が得られています。

此処に一例を挙げたに過ぎませんが、前述の東大農学部報告並徳曹研究所報告に数多くの実例が挙げられてゐます。

一般的に云へば、水稲には硫安より適当であると云へます。

硫安は、屢々硫酸化となつて土壌に有害になりますが、塩安の場合には植物の莖及葉を強くし「バクテリヤ」及蟲害に関して抵抗力を増大させます。

防濕の點に就ての、実験結果に依れば、製造方法に於て述べた如き、炭酸石灰粉を以てまぶした粒状塩安肥料は、防水紙一枚を加へた石灰窒素用包装紙袋に入れて、梅雨期、夏期を通ずる一〇〇箇日の放置積重試験に於て、全然変化がなかつたのであります。又往々にして、吸濕した肥料は固結するものでありますが、上記の如く調製した肥料はかかる傾向が認められず容易に砕けます。

硫安肥料の窒素分は、理論値二一、二%、塩安肥料は二六、二%であります。弊社製品は、土壌の酸性中和剤として有効である炭酸石灰粉を加えて、通常の硫安肥料と同様の窒素分に調製して製品と致します（二〇、六%）

五 工場設備計画（所要資材及資金）

五ノ一、アンモニヤ合成設備

(一) 土地　岩國市旧陸軍燃料廠内