Howlett

AN ANALYSIS OF THE COSTS AND EQUIPTMENT NECESSARY TO BRING THE DAVIS-GOLDFIELD PROPERTY INTO PRODUCTION

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General Information On The Goldfield Mining District

Most of the gold ore produced near Goldfield came from a 0.6 square mile area, immediately Northeast of the town itself. This area is known as the "Main District" and it is a small part of a fifteen square mile area of hydrothermally altered Tertiary volcanic rocks extending to the North and East, called the "Goldfield altered area". The main district lies at the western margin of the Goldfield hills, a group of peaks with a maximum relief of about 1200 feet nearly surrounded by desert basins. Maximum relief in the main district is only 180 feet, with elevations ranging from 5640 to 5820 feet. The climate is arid and the vegetation is generally sparse. U.S. Highway 95 passes directly through the town of Goldfield. An all-weather gravel road skirts the western and northern sides of the main district and several dirt roads, improved by current mining operations, transverse it.

GEOLOGY OF THE GOLDFIELD AREA

The geology of the Goldfield area has been described by Rnasome (1909), Locke (1912), Searls (1948), Albers and Cornwall (1968) and Albers and Kleinhampl in 1970. The main district is at the western margin of a Tertiary volcanic center composed of silicic and intermediate tuffs and volcanic brechias, ryolite, quartz latite, trachyandesite, and ryodacite flows. These rocks cover Ordovician metasedimentary rocks that crop out in many small inliers to the North and Northeast of the main district.

Argillized rocks represent the bulk of the material within the altered area, but many silicified zones also appear, always surrounded by argellized rocks. The silicified zones are localized along, and delineate the faults and fractures that served as conduits for the hydrothermal fluids that produced the alteration. Along the South side of the area, from the main district and continuing to the East, these faults and fractures are very numerous, and trend Northwest to nearly East-West, with steep dips both to the North and South. Alteration in the central part of the area, in the vicinity of Vindicator and Banner mountains, was controlled by Northeast trending, East dipping shingle faults. The

fault blocks dip West and are successively downdropped to the East. The West and North sides of the area are defined by an area of altered rock which extends from the main district Northward through Columbia mountain to Kendall mountain, then Eastward through Black Butte. This belt reveals an arcuate structural pattern, with most of the faults and fractures aligned approximately parallel to the inner margin of the belt. Although the faults here do not dip consistently inward toward the Vindicator-Banner mountain area, the arcuate pattern suggests that the ring fracturing occured during the Tertiary volcanism, possibly accompanied by collapse, thereby forming at least a partial caldera.

The Tertiary volcanic flows that occupied the main district were hydrothermally altered, metalized, and later oxidized to the depths now accessible. Hydrothermal alteration and metalization were related as follows. Strong fracture zones which cut the flows provided channelways for the hydrothermal solutions; the rocks adjacent to these fracture zones were silicified and rocks farther from the fracture zones were argellized. According to Ransome (1909 p 158) and Locke (1912 p. 800-801) ore is associated with silicified zones (veins), and a little ore extends into the surrounding argellized rocks. Changes in the ore grade were

often abrupt, but boundaries between ore and low-grade or barren rock were always gradational over a few feet. Hydrothermal wallrock alteration was well advanced when metalization began, but some hydrothermal quartz and alunite formed contemporaneously with metal sulfides and gold. Fracturing of the silicified ledges during the later stages of alteration produced local concentrations of gold and sulfides and provided relatively large open cavities in which rich ore formed. The bulk of the silver and gold recovered in previous mining was, however, apparently disseminated through volumns of rock within the silicified zones; therefore, most ore is structurally controlled by prealteration fracturing. In the extensive barren parts of the Goldfield altered area, the silicified zones show structural relationships and alteration mineral assemblages identical to those in the metalized areas, so metals were deposited during and after wallrock alteration only where they were available to the hydrothermal system, presumably entering the system at deeper levels.

WATER

There are two avenues open for the securing of sufficient quantities of water to leach the Davis-Goldfield ore. One is to use geophysical means to locate a nearby source and drill a well. The second is to tap existing sources that are available at a distance. Since the first alternative is relatively uncertain and represents a considerable expense the second should be considered more seriously.

Water is available on one of the Davis-Goldfield claims that is located approximately 2.2 miles away from the proposed pad and pond area. The water is located in an old mine shaft known as the Jupiter Shaft and is 163 ft. below the surface. This shaft was used for water by a previous mining operation in the area and the well casing still exists and is in good condition. The casing is capped and therefore the shaft could not be plumbed for depth but several locals have reported it to be at least 300 ft. in depth. One advantage of the water available in this location is that the PH is slightly basis (7.4), thereby facilitating a cyanide leech. The following page contains a break-down of the costs of developing this water source.

JUPITER SHAFT AS A WATER SOURCE

Equiptment Needed

1.....50 Hp. submersible pump six inch O.D.
1.....Portable generator at least 75KW
250'.....4" black iron pipe with couplings
300'.....Neoprene cased #4 copper wire
3.....4" valves
2.2 mi....6" PVC (schedule 160) or aluminum irrigation pipe
10.....2" valves for drains in 6" line
10.....6" to 2" tees
300'.....5/8" cable to hold 50Hp. pump
300'.....¼" cable to hold electric wire
5.....cable rings to hold cable
1.....pressure cut-off mechanism

Rolling Stock And Hrs. Needed To Complete Job

Dozer.....2 nine hour working days
Cat 12 Road Blade...2 nine hour working days
988 Loader.....1 nine hour working day
Crane.....3 nine hour working days

Labor Requirements To Complete Job

5 man crew.....6 nine hour working days to lay and assemble pipe line.
5 man crew.....1 nine hour working day to lower and secure 50Hp. pump.

SAMPLING PROGRAM

A sampling program has two basic purposes. The first is to establish sufficient ore reserves in order to maintain a continuous supply of ore to the processing facilities. The second is to make cash flow predictions possible and accurate. To accomplish these ends on the Davis-Goldfield property a continuous program of sampling should be established. This program should include both the dumps and the ground with open pit potential. The following is a list of both the equiptment and manpower that will needed for the sampling phase of the operation.

Manpower

2.....full time samplers that will double as utility men when needed. Their cost will be approximately $5.50 each per hour.

1.....lab tech will be needed when the flow of samples becomes sufficient to warrant his hiring. Salary should be approximately $5.50 per hour.

Heavy Equiptment Required

1.....backhoe about two weeks out of every month

1.....air-track drill with compressor and 300' of steel. It will be needed about two weeks out of every month.

Lab Supplies And Equiptment Required

$1500.00.....This amount will cover additional glass-ware and chemicals required.

1.....Shaker table with rack (cost approx. $550.00)

1.....Hot plate (cost approx. $235.00)

1.....Addition to lab bldg. (cost approx. $500.00)

Since laboratory facilities are already in existance in Goldfield the purchase of another AA unit will be unnecessary. The lab can run approximately 150 samples per day testing for both gold and Silver. The cost of this analysis including supplies and the services of a lab tech is about $4.00 per sample. One out of every twenty or so samples should be checked by fire assay (AA testing is inaccurate for gold content of over 0.2 oz./ton) and this cost is approximately $5.50 per sample.

MAPPING AND SURVEYING

Before any ore is removed from the Davis-Goldfield properties it is essential that the claim corners be established. This should be done by a professional surveyor since mistakes could put the company in legal jeapardy. A quality proffessional surveyor is available locally at a rate of $25.00 per hour. It will take a maximum of four weeks work to establish all the boundaries that we need be concerned with; therefore $4000.00 should be budgeted for this service.

In addition to the above mentioned need for surveying, we continuous need surveying done for pad and pond layout, building contruction, the laying of pipe and power lines, and geologic mapping. This could be done by company personnel if provided with the following equiptment:

Equiptment To Be Purchased For Surveying

1.....Transit accurate to one minute (1')
1.....Tripod for the transit
1.....Plum bob and survey string
4.....Range poles
1.....Chain (100 ft.)
1.....Stadia Rod
500.....Survey stakes 1" x 2" x 3'

PAD AND POND LAYOUT AND CONSTRUCTION

The following is a detailed analysis of the various requirements for the construction of the pads and ponds that will be needed for the processing of the ore on the Davis Goldfield properties. The area being considered as the site of these pads and ponds is a claim known as Kewana #3, which may be purchased from the owners for $950.00. The map on the following page depicts the present topography of that claim. The diagram on page three of this section shows the proposed configuration of the pads and ponds within the claim boundaries.

Pad Capacity

location	sector	tons (5' lift height)
South	South	13,186 tons
South	East	17,218 tons
North	North	13,186 tons
North	East	17,218 tons
	TOTAL	60,908 tons

Time And Equiptment Requirements For Construction Of Pad

480,000 sq. ft. pad (capacity 60,000 tons)
To move and level 7200 cu. yds. dirt:

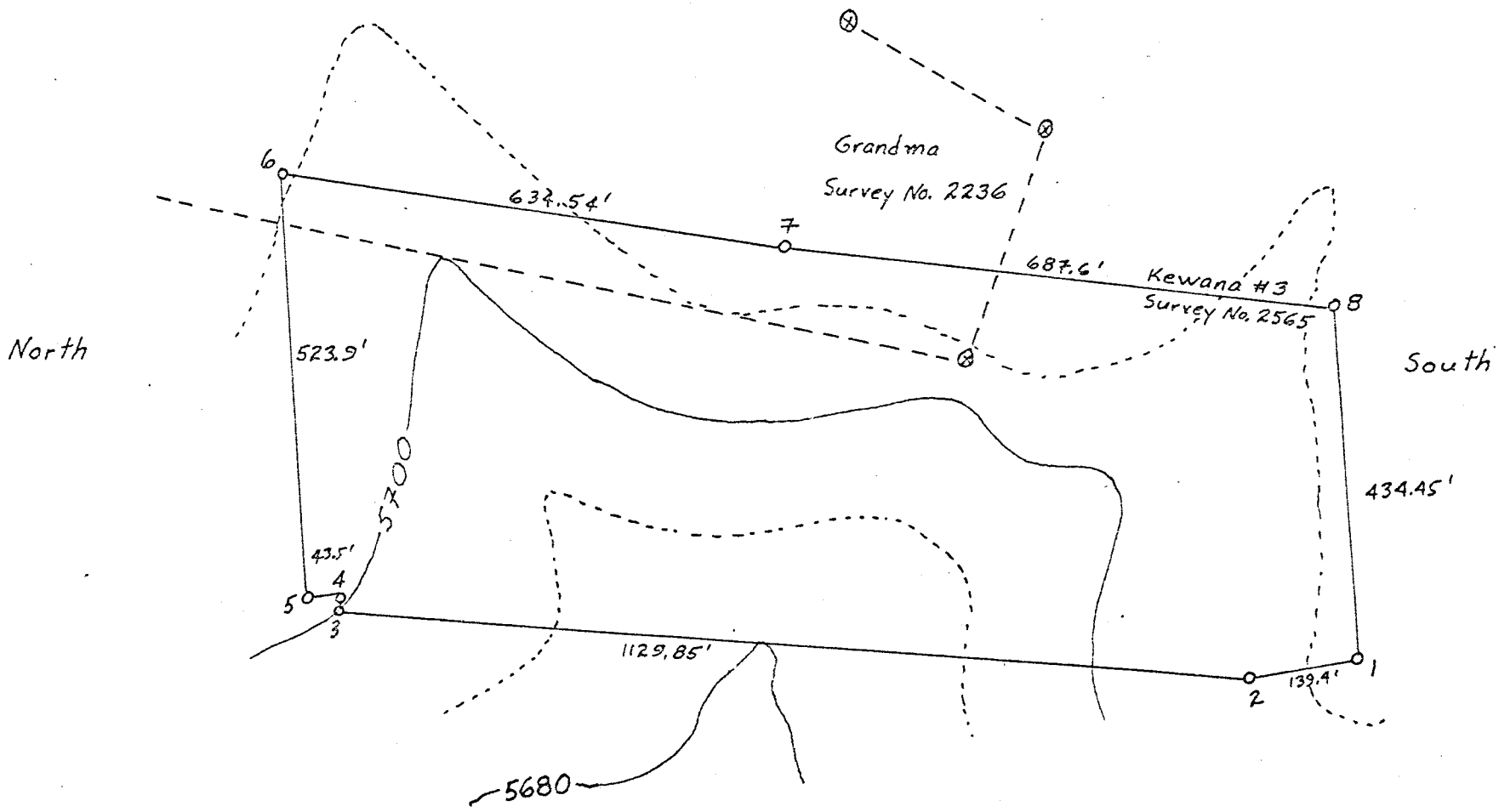
WITH:
1 Dozer.....12 - 9 hr. working days
1 Cat 12E Road Blade.....5 - 9 hr. working days
1 35-ton Truck (compacting).....5 - 9 hr. working days
1 4000-gal Water Truck.....5 - 9 hr. working days

OPTION

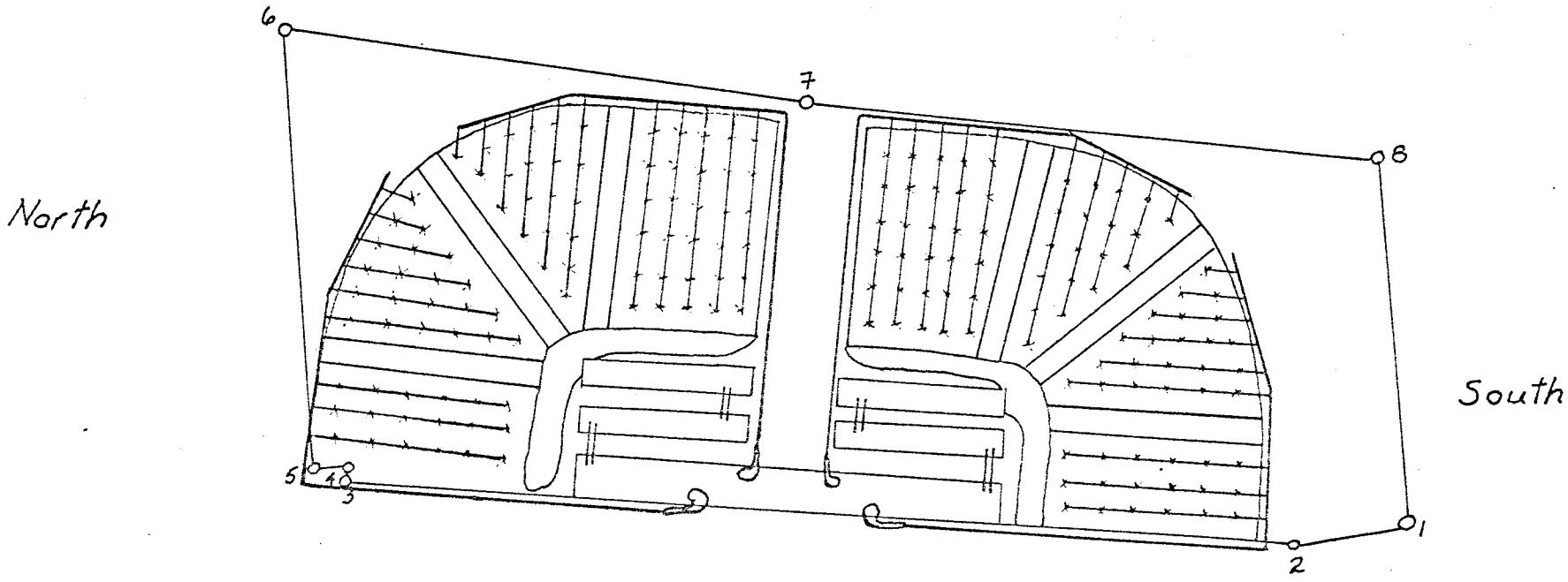
WITH:
2 35-ton Trucks - 1 988 Loader.....5 - 9 hr. working days
1 Dozer.....5 - 9 hr. working days
1 Cat 12 Road Blade.....5 - 9 hr. working days
1 35-ton Truck (compacting).....5 - 9 hr. working days
1 4000-gal Water Truck.....5 - 9 hr. working days

*NOTE: With scraper, water truck, road blade, the above can be done in a third less time.

Kewana #3 Survey



Kewana #3 Pad & Pond Layout



480,000 sq. ft. pad (capacity 60,000 tons)
To haul process and compact 4320 cu. yds. of clay:

WITH:
2 35-ton Trucks - 1 988 Loader.....5 - 9 hr. working days
1 Dozer.....12 hrs. leveling for trucks
1 Cat 12E Road Blade.....12 - 9 hr. working days
1 35-ton Truck (compacting).....12 - 9 hr. working days
1 4000-gal Water Truck.....5 - 9 hr. working days

(Depending on moisture content of the clay, the water truck may work one day less or one day longer.)

Pond Capacity

Kewana locat.	type	capacity (gal)	rectilinear specs. L.	W.	H.
South	Preg.	192,112 gal	200'	34'	6'
South	Precip.	192,112 gal	200'	34'	6'
North	Preg.	192,112 gal	200'	34'	6'
North	Precip.	192,112 gal	200'	34'	6'
Both N+S	Spray	1,107,188 gal	500'	50'	10'

Time And Equiptment Requirements For Construction Of Four Ponds (Two Preg. and Two Precip) 200' x 34' x 6' Each

Ponds to hold solution to process 60,000 tons of ore.
1500 cu. yds. each - 6000 cu. yds total excavation.

WITH:
1 Dozer.....12 - 9 hr. working days
1 Cat 12E Road Blade.....2 - 9 hr. working days
1 4000-gal Water Truck.....4 - 9 hr. working days

2 35-ton Truck - 1 988 Loader.....6 hrs to haul 800 cu. yds. clay to seal ponds.
1 Dozer.....3 - 9 hr. working days to spred the clay
1 988 Loader.....12 hrs. to compact the clay

Time And Equiptment Requirements For Construction of Spray Pond

Pond to hold solution for 60,000 tons ore
7400 cu. yds. excavation

WITH:
1 Dozer.....7 - 9 hr. working days

1 Cat 12E Road Blade.....1 - 9 hr. working day
1 4000-gal Water Truck.....2 - 9 hr. working days

2 35-ton Trucks - 1 988 Loader.....4 hrs to haul 500 cu. yds clay to seal pond.
1 Dozer.....1½ - 9 hr. working day to spred the clay
1 988 Loader.....5 hrs. to compact clay

Time And Equiptment Requirements For Construction Of The Sand Ditch

To construct one 400' x 20' x 10' sand ditch
3000 cu. yds. excavation

WITH:
1 Dozer.....6 - 9 hr. working days
1 Cat 12E Road Blade.....1 - 9 hr. working day
1 4000-gal Water Truck.....2 - 9 hr. working days

2 35-ton Trucks - 1 988 Loader.....2 hrs. to haul 250 cu. yds of clay to seal ditch
1 dozer.....1 - 9 hr. working day to spred the clay.
1 988 Loader.....5 hrs to compact the clay.

Fencing Required for Safety

The following supplies are needed to fence off the entire Kewana pad and pond area:

Posts (steel 6').....180
Barbed Wire (#12).....11,000 ft.
Stays.....750 stays

4 man crew.....4 - 9 hr. days

PIPES, PLANTS, PUMPS AND SPRAY

Pipe Requirement To Process 60,000 Tons of Ore

pipe line	sector	type	feet	gpm	diameter
South	South	spray manifold	740	540	6"
South	South	spray line	1480	90	3"
South	East	spray manifold	790	540	6"
South	East	spray line	1875	68	3"
North	East	spray manifold	780	540	6"
North	East	spray line	1920	68	3"
North	North	spray manifold	770	540	6"
North	North	spray line	1470	90	3"
North	Both	plant line	100		3"
South	Both	plant line	100		3"

Total 3" PVC required.....6945 ft.
Total 6" PVC required.....3080 ft.

Plants Required For Processing The Davis Goldfield Ore

It is recommended that two filtration plants of 100 gpm capacity each be purchased from the State of Maine Mining Co. in Tombstone Arizona. This will allow one to precipitate at a rate equal to the formation of pregnant solution. A trailer should be provided for each one.

Plant Cost.....$13,000 ea.
Trailer Cost.....
Shipping Cost For Plant.....$500.00
Shipping Cost For Trailers.....$950.00

Rainbird Requirements for Processing 60,000 Tons of Ore

area	sector	number of rainbirds
South	South	39
South	East	49
North	North	39
North	East	51
	TOTAL	178
	Cost	approx. $3.50 ea

Note: Each rainbird will require a saddle (3 in to 1 in.)

Joint, Valve, and Gauge Requirements

The expenditure for these items should be roughly the same as for the North section of Kewana #2. The exact amount and type has not yet been calculated. Included in the budget should be two three inch flowmeters.

Reagent Tank Requirements

2 Tanks (steel or fibreglass).....8' x 14'
2 Tanks (steel or fibreglass).....8' x 6' or 8' x 8'
Cost should run between 10¢ to 20¢ per gallon

Pump Requirements

Four pumps will be needed that will supply 540 GPM at a head of 81 ft.

Electrical Costs

No exact amount can yet be calculated since it is a variable of pump size, plant and auxilary needs, but an estimate will be obtained from both the electrical company and a licenced contractor. It should not run in excess of $10,000 total.

Time And Equiptment Requirements For Preparation of The Plant Sites

WITH:
1 Dozer.....4 hrs. leveling
1 Cat 12E Road Blade.....7 hrs. grading
1 4000-gal Water Truck.....3 hrs.
2 35-ton Trucks.....2 hrs. to haul 210 tons of sand for the plant
1 988 Loader.....2 hrs. to load the sand.

Time and Equiptment Requirements For Piping For 60,000 Tons Of Ore

Pumps.....3 men - 4 - 9 hr. working days
Plants.....3 men - 8 - 9 hr. working days
Heaps.....4 men - 8 - 9 hr. working days
1 Backhoe.....4 - 9 hr. working days
1 Flat Rack Truck.....8 - 9 hr. working days

Time and Equiptment Requirements for Reagent Tanks

1 988 Loader.....4 hrs. to build ramp for trucks
1 35-ton Truck.....4 hrs. to build ramp for trucks
1 988 Loader.....1 hr. to haul and set tanks
1 Lincoln Welding Machine.....1 - 9 hr. working day
1 Welder.....1 - 9 hr. working day
1 Helper.....1 - 9 hr. working day placing flanges for pipe connections

HAUL ROADS AND HAULING

Time And Equiptment Requirements for Construction of Haul Roads

Assuming a one mile haul with no large cuts or fills

WITH:
1 Dozer.....5 - 9 hr. working days
1 Road Blade.....5 - 9 hr. working days
1 4000-gal Water Truck.....5 - 9 hr. working days

Assuming a one mile haul with large cuts or fills

WITH:
1 Dozer.....7 to 9 - 9 hr. working days
1 Cat 12E Road Blade.....7 to 9 - 9 hr. working days
1 4000-gal Water Truck.....7 to 9 - 9 hr. working days

Ore Haul

To load 60,000 tons of ore on the pad, assuming an average of 3200 tons per day, will take 19 working days.If the stockpiled ore on the Davis property is taken first, then the lift height may be 10 ft. and this amount of time will be require to load one half the pad.

The exact length of haul will determine how many trucks are needed to meet the 19 day schedule for 60,000 tons of ore. Extra trucks are needed on long hauls to keep the 988 Loader busy.

CHEMICAL COSTS

The exact chemical nature of the ore on the Davis Goldfield property is not yet known. The 200,000 tons of ore that is stockpiled does not appear to have a great deal of unoxidized sulfides as does the ore currently being processed by Goldfield Ltd. This will facillitate going to a cyanide-basic leach very rapidly. A figure of one dollar of reagents for every ton of ore should be used until chemical testing demonstrates otherwise.

MAINTAINANCE COSTS, EQUIPTMENT AND FUEL

A complete supply of tools is already on hand with Goldfield Ltd. There is no need for duplication. The following is a list of additional equiptment that should be purchased:

Lube Truck (fully supplied)
Lincoln 200 Welder with Leads ($2350.00)
Gasoline Pump (portable) with suction and discharge hoses

A sum of $2000 per month should be budgeted for the purchase of small parts, grease, filters, lube oil and small additional tools that will be needed.

Fuel Consumption

According to calculations, to supply the equiptment planned, 8000 gal. of diesel will have to be purchased every 20 working days. ($0.444 per gal delivered)

Gas Consumption

$150.00 per week should be budgeted for gas for companies vehicles and private vehicle used on the job.

LABOR AND MANAGEMENT COSTS

Hourly Personnel Required for Planned Operation:

1 Dozer Operator.....$7.00/hr.
1 Road Blade and Small Cat Oper.....$7.00/hr.
1 Loader Operator.....$7.00/hr.
x Truck Driver.....$6.00/hr.
1 Crane Operator (optional).....$7.00/hr.
1 Crane Driver.....$5.00/hr.
1 Backhoe Operator.....$5.00/hr.
*5 Plant Operators.....$5.00/hr.
*2 Samplers.....$5.50/hr.
*1 Lab Asst.....$5.00/hr.
*1 Welder.....$7.00/hr.
*1 Welders Helper.....$5.00/hr.
*1 Mechanic.....$6.00/hr.
*1 Construction Foreman.....$7.00/hr.

*denotes personnel that need not be hired until production has begun.

The payroll should run approximately $6500.00 per pay period until additional personnel are hired (denoted by asterisk) at which time the payroll should increase another $4400.00 per pay period.

Management Personnel

Division of labor between Goldfield Ltd. and Davis development should be as follows:

Person	%Time Goldfield	%Time Davis
Dick Hewlett	70%	30%
Al Watterson	30%	70%
Kurt Grunewald	50%	50%

An appropriate division of overhead (rent, phone,gas, etc.) will have to be made.

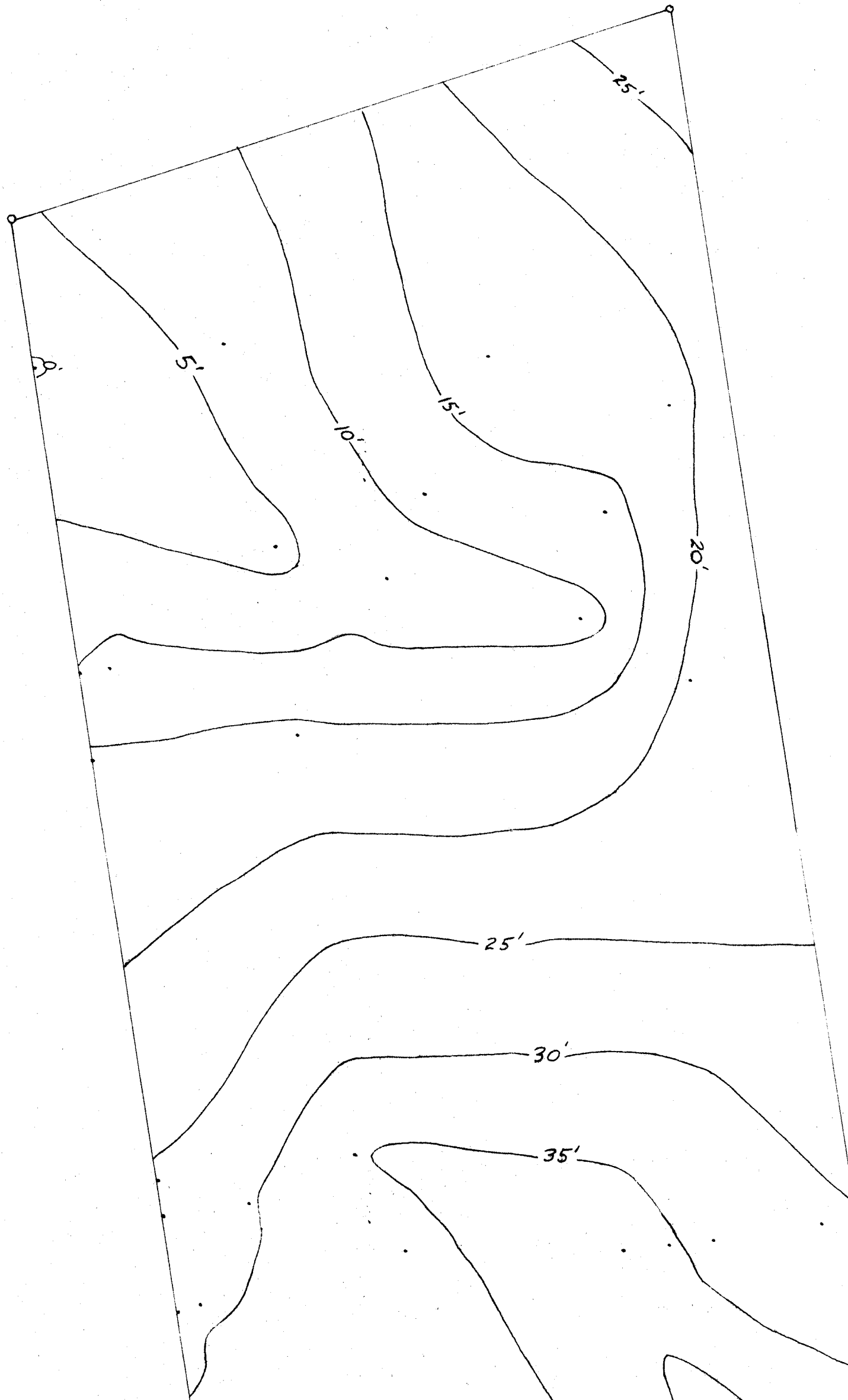
HEAVY EQUIPTMENT RECOMMENDATIONS

Prepared by: Al Watterson

1 1200 CPM Compressor
1 D8K Dozer or Komatsu Dozer
1 Cat 977 with Combination Dozer and Clam Bucket
1 Cat 988 Loader
x 35-ton Haul-Pac Trucks, minimum of two
1 Cat 14 Road Blade
1 AC J.D. 310 Backhoe
1 Crane with Clam Shell and Drag Line Bucket
1 125 Jaguar 125 COM Air Compressor (Check with Max at crown Parts - good buy)
1 4000-gal water Truck with Pressure Pump
1 2-ton Flat Bed Utility Truck
1 15-20 cu. yd. Scraper if desired and possible

Suggest calling Bill Eck, Sales Eng.
Western Road Machinery Co.
Offices: 2300 So. Main Street
Salt Lake City, Utah
Phone: 801-486-2085
Home Phone: 801-278-5447
Have a large supply of used equiptment.

For a multiple shift operation, two high intensity light plants should be purchased.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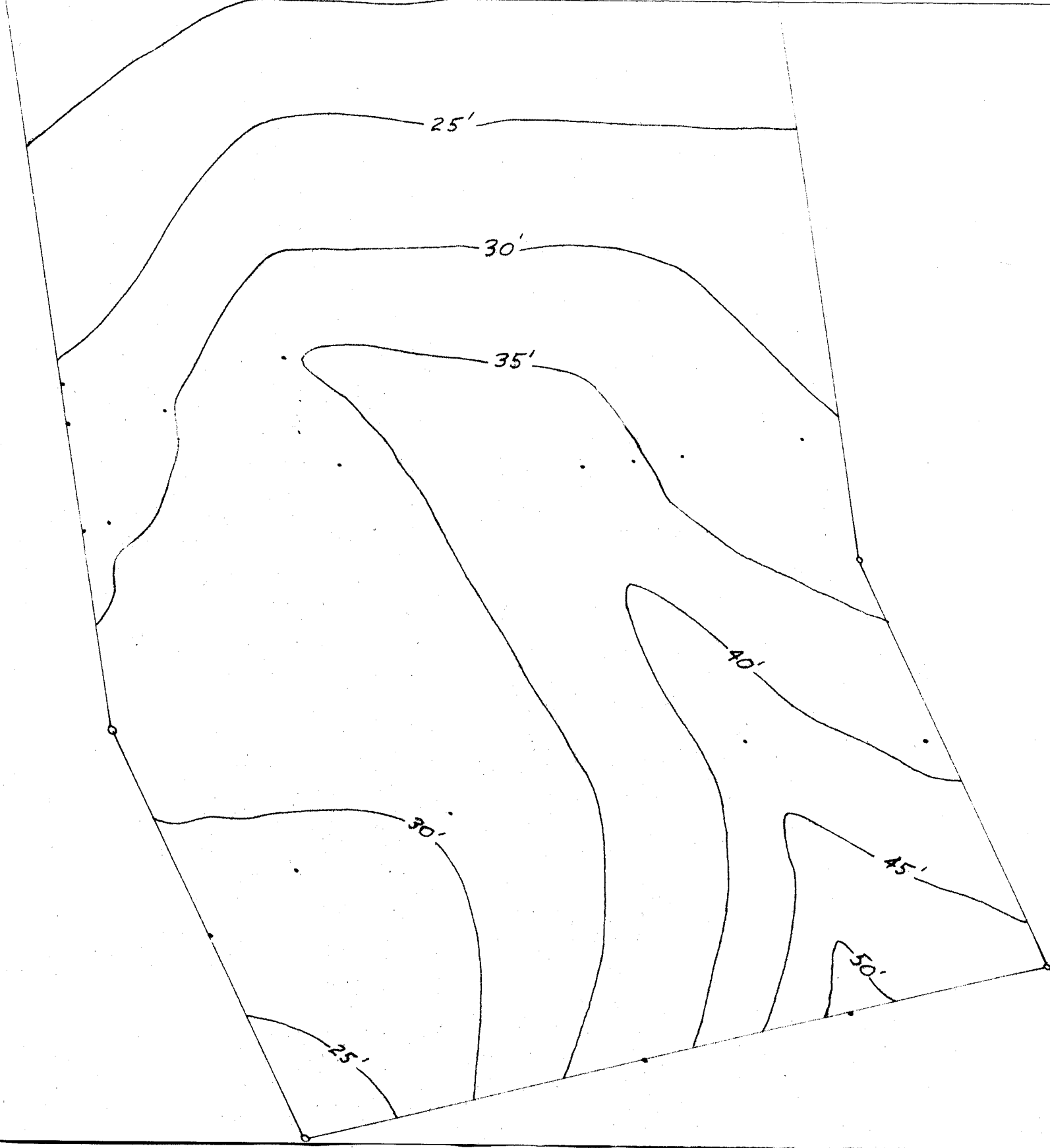
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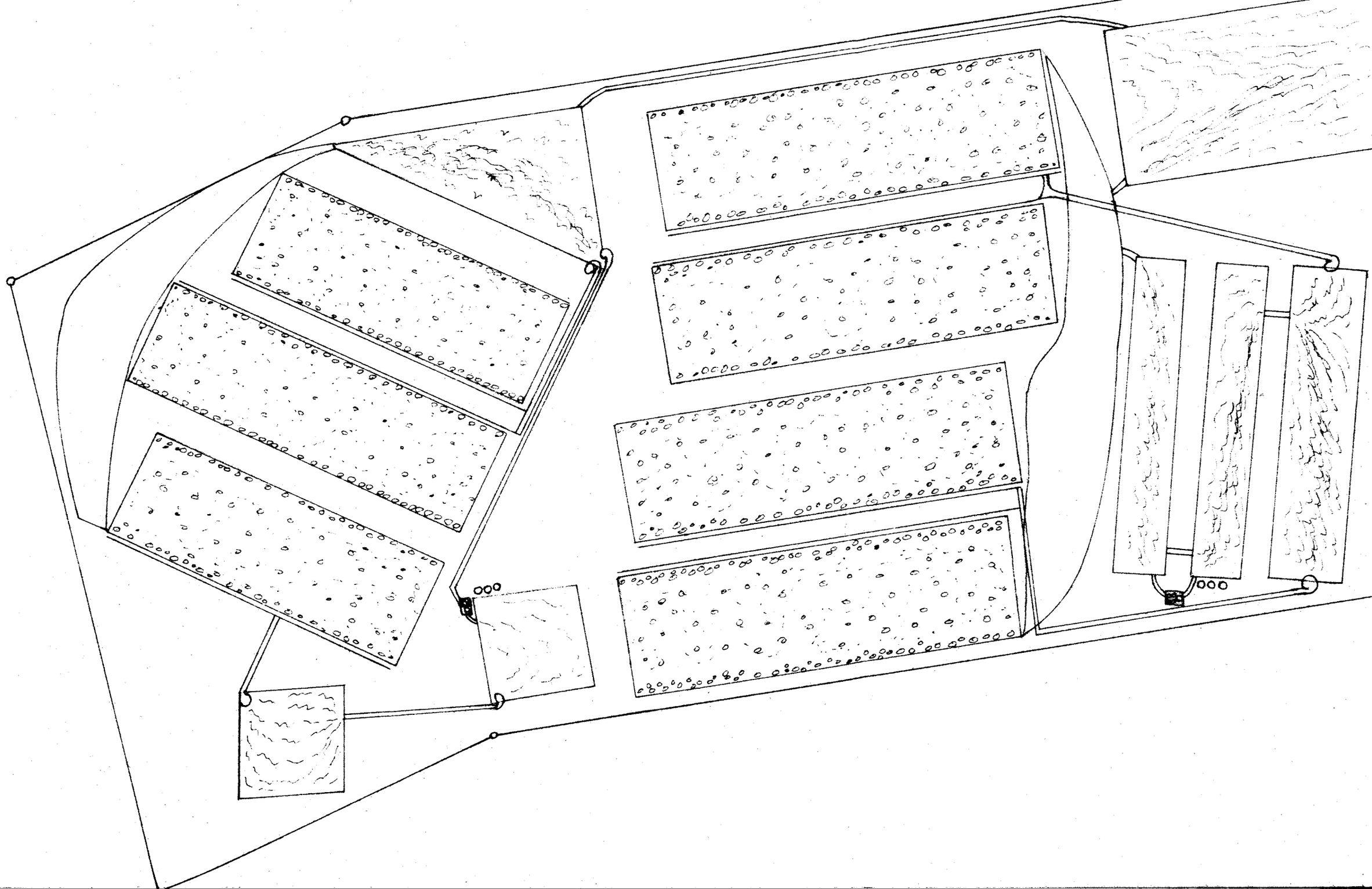

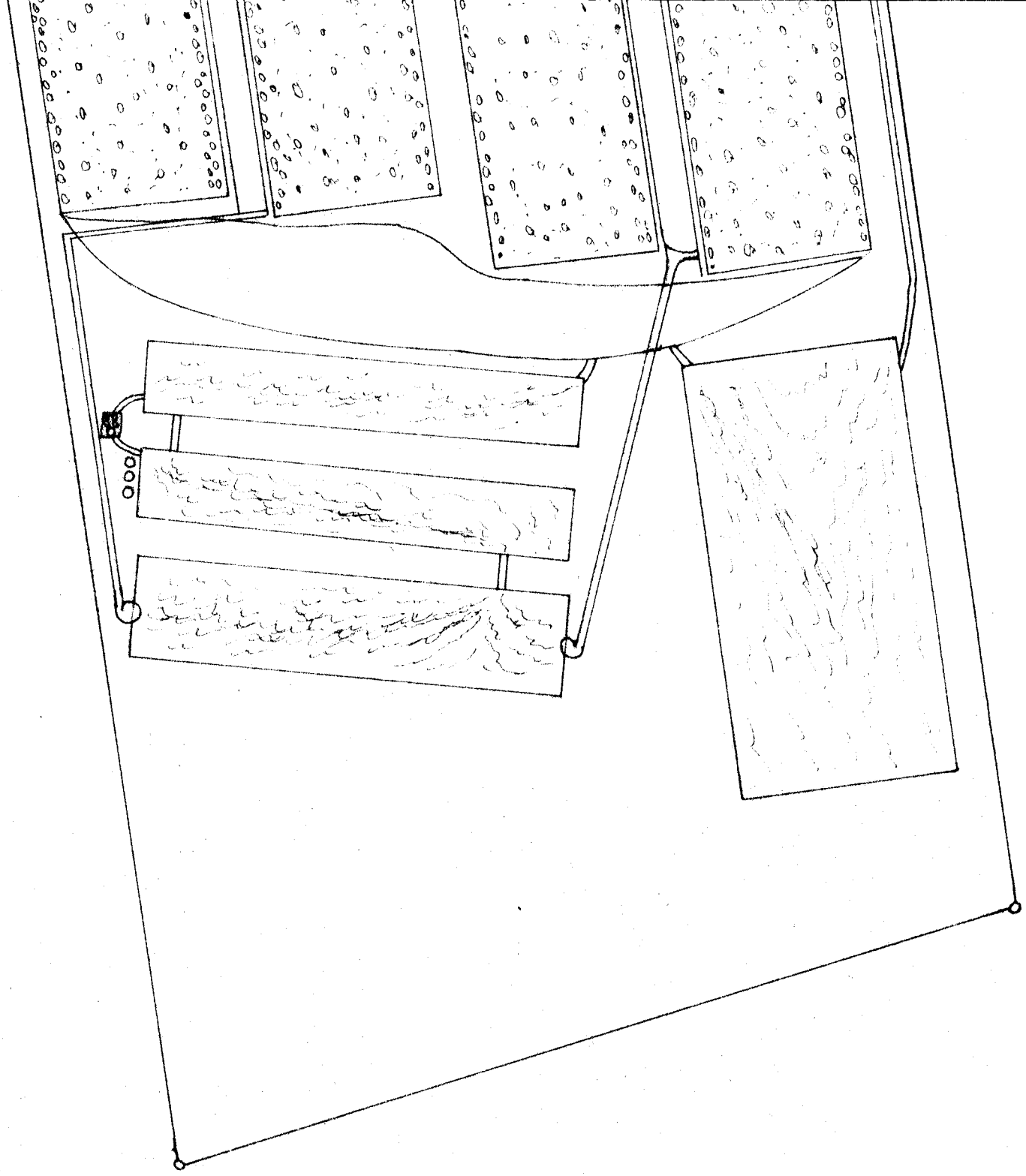

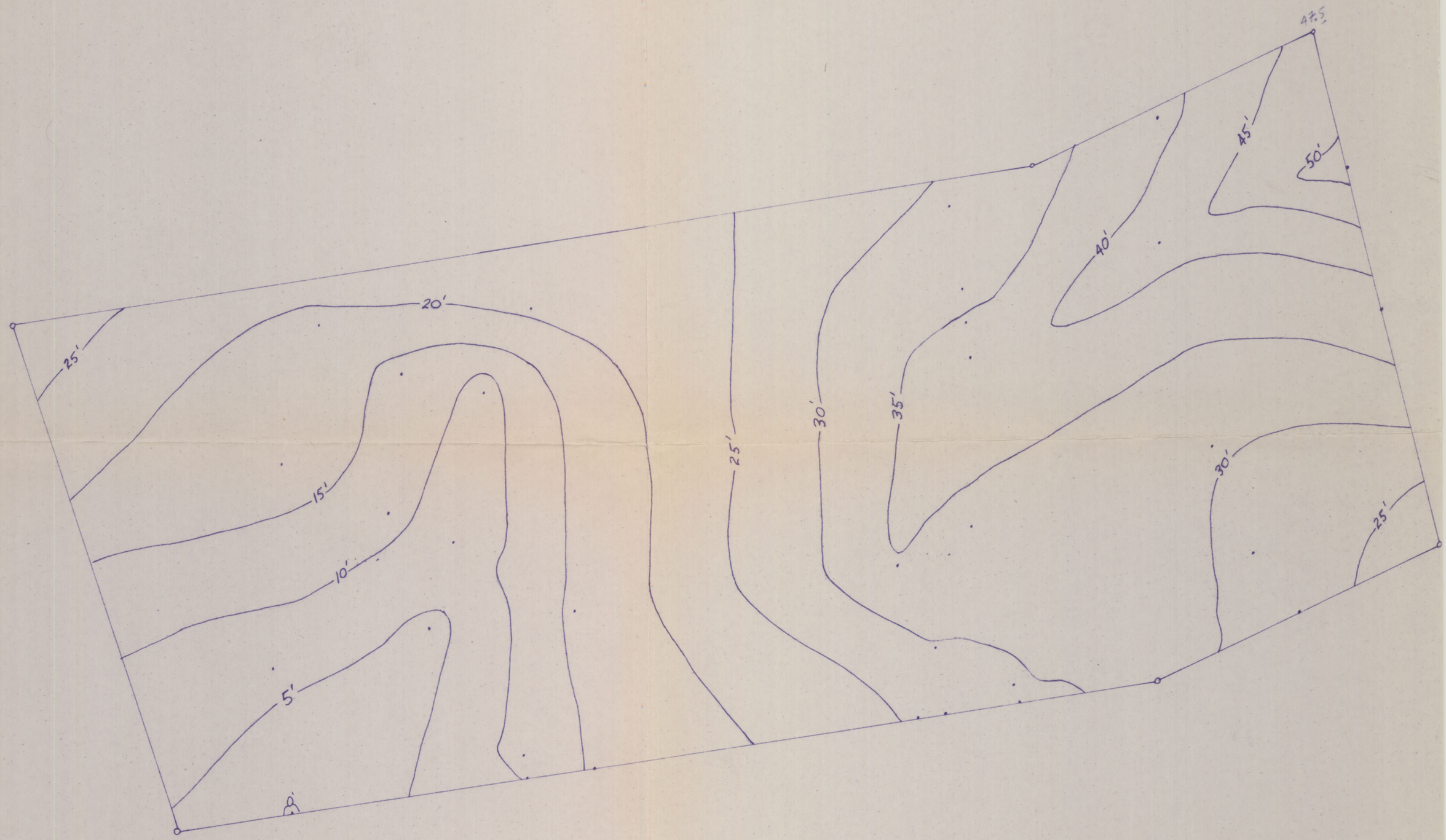

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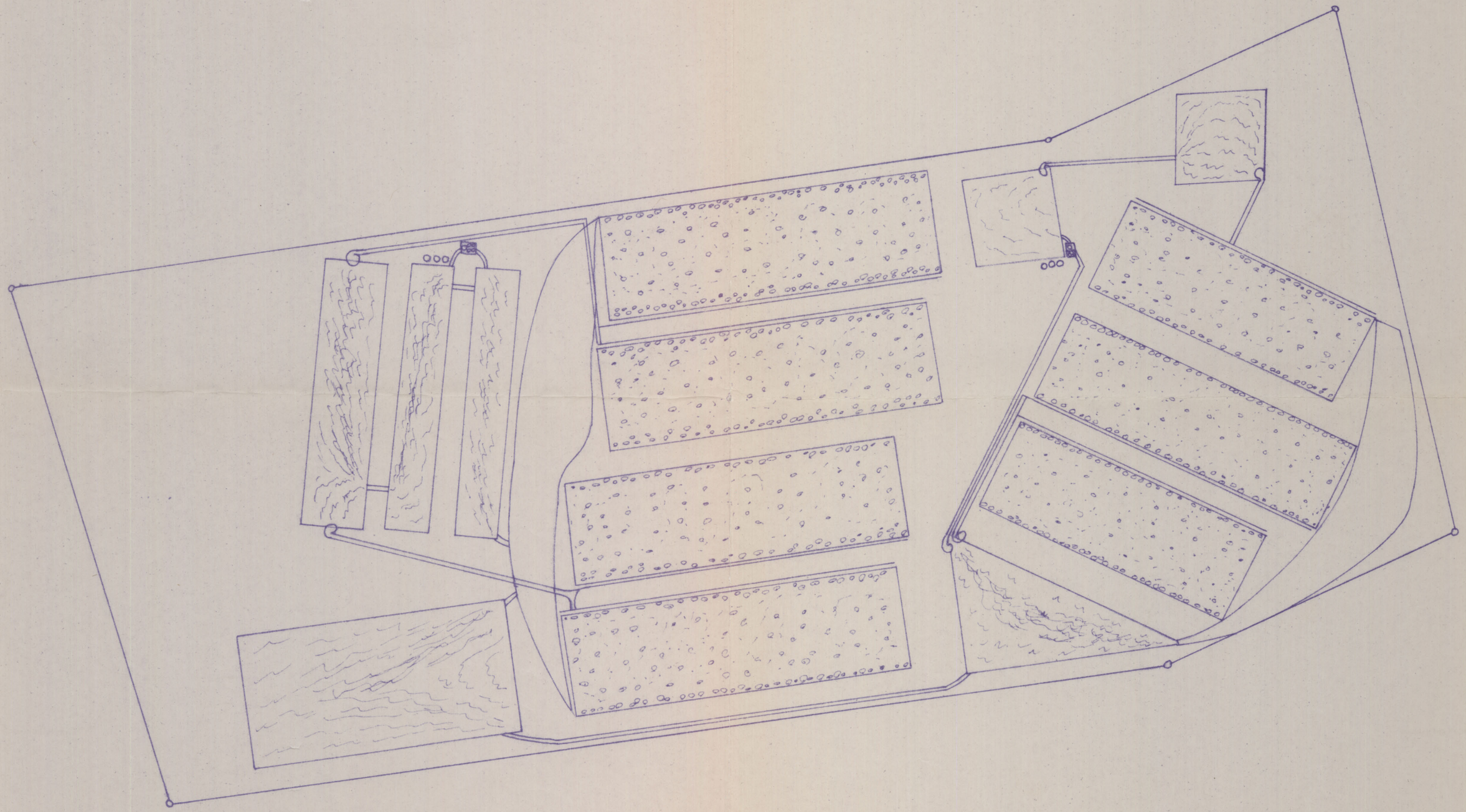

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